

PROCEEDINGS

ELEVENTH ANNUAL MOBIL MEDICAL CONFERENCE

SOCONY MOBIL OIL COMPANY, INC.,
AND AFFILIATED COMPANIES

NEW YORK CITY

OCTOBER 17TH AND 18TH, 1957

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PROCEEDINGS OF ELEVENTH ANNUAL
MEDICAL MEETING - OCTOBER 1957

18 December 1957

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H. Graham, M.D.

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West Africa

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Attn: G.A. Myers, M.D.

PROCEEDINGS OF ELEVENTH ANNUAL
MEDICAL MEETING - OCTOBER 1957

For your information and files, attached is a copy of the proceedings of the medical meeting held in New York City, New York, in 1957. This year we are sending only one copy which will serve management, the physician and the nurse at your installation.

George M. Saunders
George M. Saunders, M.D.

1957 CONFERENCE COMMITTEE

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Miss A.M. Harris

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Dr. H.A. Sinclair

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Albany Division

Dr. S. Kantor

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Mr. J.W. Gillen

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Miss M. Dickeson, R.N.

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Venezuela

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West Africa

Dr. G. Myers

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Mr. B. Fox

Dr. A.E. Hoag

Dr. T. Kinnear

Speakers

Dr. J.C. Foley

Dr. Irvin Klein

Dr. C.A. Poindexter

Dr. Irving Tabershaw

Dr. C.R. Walmer

Dr. J.A. Zapp

Mr. E.R. Alden	Manager, Claims Department Socony Mobil Oil Co., Inc., New York City
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Mr. E.G. Kothe	Employee Relations Advisor, White Star Division Socony Mobil Oil Co., Inc., Detroit, Michigan
Dr. E.P. Luongo	Medical Director General Petroleum Corporation, Los Angeles, California
Mr. J.H. McKenzie	Assistant Safety Director Socony Mobil Oil Co., Inc., New York City
Mr. A.C. Pabst	Industrial Hygienist Socony Mobil Oil Co., Inc., New York City
Dr. C.A. Poindexter	Professor of Medicine New York University-Bellevue Medical Center New York City
Dr. R.J. Potts	Medical Director Magnolia Petroleum Company, Dallas, Texas
Dr. G.M. Saunders	Medical Director Socony Mobil Oil Co., Inc., New York City
Dr. Irving Tabershaw	Medical Director Nuclear Development Corp., White Plains, N.Y.
Dr. C. Richard Walmer	Managing Director Industrial Hygiene Foundation, Pittsburgh, Pa.
Dr. J.A. Zapp	Director, Haskell Laboratories duPont De Nemours & Co., Wilmington, Delaware
Mrs. Eleanor Zar	Plant Nurse, Wadhams Division Socony Mobil Oil Co., Inc. Milwaukee, Wisconsin

P R O G R A M

SOCONY MOBIL OIL COMPANY, INC. MEDICAL MEETING
NEW YORK, NEW YORK - OCTOBER 17 AND 18, 1957
SECOND FLOOR TRAINING CENTER

THURSDAY, OCTOBER 17, 1957

MORNING - 9 A.M.

Moderator:	G. M. Saunders, M.D.
Welcome	B. B. Jennings
The Aims and Goals of the Socony Mobil Medical Department	G. M. Saunders, M.D.
Management's Views on Industrial Health	C. Richard Walmer, M.D.

DISCUSSION

Psychometric Testing of Employees	C. H. Elliott
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DISCUSSION

AFTERNOON - 2 P.M.

Moderator:	E. P. Luongo, M.D.
Present Management of Heart Disease	C. A. Poindexter, M.D.

DISCUSSION

Hearts and Jobs	Irvin Klein, M.D.
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DISCUSSION

P R O G R A M

FRIDAY, OCTOBER 18, 1957

MORNING - 9 A.M.

Moderator: R. J. Potts, M.D.

The Administrative Management of
the Injured Worker

The Nurse Eleanor Zar, R.N.

The Physician M. N. Howard, M.D.

The Claims Department E. R. Alden

Safety Department J. H. McKenzie

Employee Relations Department E. G. Kothe

DISCUSSION

AFTERNOON - 2 P.M.

Moderator: A. C. Pabst

Introductory Remarks A. C. Pabst

Toxicological Aspects of Product
Development J. A. Zapp, M.D.

DISCUSSION

Kerosine Poisoning in Children J. C. Foley, M.D.

Hazards of Radiation Irving Tabershaw, M.D.

DISCUSSION

WELCOME

Mr. B.B. Jennings

Ladies and Gentlemen - It is very nice to see all of you here this morning. I understand that you come from many points of the United States and I wonder which of you will be entitled to the prize for coming the farthest. I notice on the agenda that Dr. George Saunders is going to talk to you on the broad hopes of the medical program of the company. I would just like to say one or two words about the attitude of the company management on this subject. We feel that no company can be any better than the men and women who work in it and in the long run Socony Mobil will succeed or fail depending on the quality of the people in the organization. When you start to think about the kind of people you want, obviously you want people of high character and abilities. These people should enjoy good health because good health is really essential to success. I would just like to emphasize the tremendous importance that we attach to this medical work that you ladies and gentlemen are carrying on for us in this country and abroad.

I hope you enjoy your visit in New York. If any of us can do anything to help you enjoy your visit while you are here we will be glad to do so.

OCCUPATIONAL HEALTH - 1960 MODEL

George M. Saunders, M.D.

American industry, especially that segment concerned with petroleum, has come a long way in the past fifty years. With the expansion, growth and complex specializations of methods, products and jobs, new health problems are being created to take the place of old ones which have been at least partially solved. Industry has come to realize that a healthy working force, secure in their jobs, is a major asset and that a healthy community is also important in relation to the economic well-being of its industry. During the past half-century most large and many small companies have developed health and medical services. The early development was slow and spotty, but was stimulated suddenly by two major world wars with their compelling needs for the preservation and most efficient utilization of manpower so that there has been an accelerating growth in the last two decades. This has paralleled the development of preventive medicine as one of the most important facets of the total structure of health care.

In the early days of this century, emphasis was placed on the care of injuries, traumatic surgery and the company medical facility was a first-aid station. The company physician was often only an insignificant technician. The main purpose was to treat the injured and protect the company against claims. It is now generally realized that careful selection and proper placement of employees is materially aided by pre-placement medical examinations and that much can be done through periodic health inventories, counselling and health education and through control of the working environment to preserve and improve physical and emotional health. Industrial medical programs with in-plant facilities for diagnosis, emergency treatment and health counselling staffed by competent professional people have become commonplace in large industries. The petroleum industry has been among the pioneers in the development of health services, and Socony, I think has been one of the leaders among the oil companies. It has often been stated by members of management that "good medicine is good business." Perhaps they as well as we in their health services have come to accept this statement with too much complacency. It is not only proper but necessary to avoid stagnation to take a critical look at our program from time to time, to raise questions and to seek answers.

I should like to look at our own health program in terms of what is generally accepted as basically important by progressive and successful industries, to see if we measure up, and whether changes to better our services may be in order.

Let us first consider what we are trying to accomplish - our aims and objectives. The broad objectives of any occupational health program are, of course, to help select people fit to perform efficiently the work proposed for them, to keep them healthy and, if possible through proper guidance, to promote better health. There are additional points which also must be considered; namely, the control of possible effects of products or processes on the health of consumers and communities. I think our own basic policy adopted by the Board of Directors in October 1953 covers the objectives

which should be basic in any operation of whatever type and wherever situated. The details of application to attain these ends must of necessity differ according to local conditions and needs. A critical re-examination of the policy was made at a recent meeting of our National Employee Relations Committee. A few changes were suggested which, I believe, will strengthen the policy and more clearly define some parts which were vague and possibly ambiguous.

A separate Policy on Toxicology, adopted in August 1956, extends the scope of the basic medical policy and takes cognizance of the increasing complexity of our industry and the possibility of new health hazards being created along with new methods and products. This policy states in part: "It is an obligation of the health services in our company to ascertain the nature and extent of hazards and toxicity, if any, of ingredients, company products and processes, to employees, customers, and the general public."

I should like to list what I believe to be seven main objectives of any occupational health service:

To assist management in:

1. Selection of employees for proposed jobs
2. Promotion of high level of employee health
3. Proper placement in relation to fitness
4. First-Aid and emergency treatment
5. Promotion of a healthy environment

Work areas
Living areas
Community

6. Cooperation with private physicians
7. Protection of consumers through knowledge of product toxicology

Let us consider these briefly, one by one. First, I should like to say that I think that most of us here agree that under the free enterprise system, we should not become involved in the corporate practice of curative medicine. Our function is preventive and constructive and complementary to private practicing physicians, hospitals and public health services. I would like to quote Dr. Leo Wade, Medical Director of Esso, in this connection. In an article in the Harvard Business Review (March-April 1956) he wrote, "It is essential that industrial medical services supplement and not replace or compete with existing medical services or those which might reasonably be expected to develop in the community."

First, proper medical selection for proposed jobs. Pre-placement examinations are almost universally demanded as a starting point for any constructive health program. They should be carefully and thoughtfully performed with at least some knowledge of job requirements and demands. They should be designed to measure abilities to meet these demands now and in the future. They should include a record of disabilities and abnormalities. However, they are not

designed to exclude from employment any person except those with conditions which might constitute a hazard to themselves or their co-workers under the conditions of employment. They should include a history of past work experience, family illnesses and longevity experience and past personal experience with illness and injury as well as habits and way of life. During the historical interview and the examining procedures, the examiner should attempt from what he is told and what he observes to assess the emotional stability and content of the candidate. This is important. So often the purely objective findings may indicate a fit body and subsequent performance on a job is a failure because of inability to adjust to the work environment and to other workers. Emotional problems are probably the single greatest cause of inefficient work, failure to advance, and finally transfer or termination.

This is particularly true in jobs "away from home" in what may be a strange and alien culture. In this connection, the pre-placement evaluation should always include wives and children and any other dependents who may accompany the employee on overseas service.

The physical examination by the physician, the laying on of hands and stethoscopes and the measurement of vital signs, vision and hearing has become so standardized that we need not go into the details here. It should not be necessary to say that an adequate examination is not possible unless the clothes are removed. Special attention should be given to those abilities and physiological requirements which are of special importance on the job. A strong and stable back is needed for heavy work. Visual acuity, good color vision and hearing may be important. The examination should be from stem to stern, including the body orifices when practical and acceptable. Our practice of doing sigmoidoscopic examinations on males (and some females) over 40 or 45 years of age has paid off handsomely in polyps detected and removed - an important event in cancer prevention. Breast examination in all women may not only detect tumors but can be an important educational event.

The laboratory procedures including x-rays which are considered essential are known to all of you and it is not necessary to list them again. Additional tests when considered necessary should be recommended by the examining physician. X-rays of the lumbo-sacral spine are being done in a number of operations and are regarded with increasing favor.

When the health inventory is completed, all the data should be considered in reaching a decision as to fitness to work and the limitations, if any, to be recommended to management. It is desirable that the findings and recommendations be discussed frankly with the candidate, and the reasons for them explained clearly.

It is extremely important for the medical personnel involved to bear in mind that the candidate's very early impressions and subsequent attitudes toward the company may be conditioned by the way he is treated during the medical examination. The physical surroundings should be attractive, comfortable, light, airy and clean. The personnel - clerical, technical, nursing and medical should be kind, sympathetic and understanding and yet should give an impression of efficiency and competence.

In this field of pre-placement medical screening, I believe we have a good record. It surely must be a rare person who is employed for the first time by any of the Socony Mobil companies who is not passed upon medically before he goes on the job. The care and thoroughness with which the initial examinations are made are doubtless subject to some variation. In some instances, chest x-ray films, which to me are essential, may not be made, or if they are the quality may be poor, or the interpretation faulty. In some cases, the examination may be hastily done and incomplete and the findings not summarized and an impression not given as to fitness to work. This, I may say, applies almost wholly to some of our panel of designated examiners and not to our own group.

To pass on to the second and third items in our table of objectives, promoting employee health and proper placement in relation to fitness, I believe they can be considered together. Fundamentally, these depend upon periodic health inventories, individual health counselling, and group health education.

The periodic medical examinations, the counterpart of preventive maintenance of machines, are of basic importance and should be given to all employees at suitable intervals. Their frequency and extent will depend upon age, conditions of health, and job demands and hazards. The concept that everyone should have a complete examination each year has no sound medical basis and may cause needless waste of time, money and medical manpower. The periodicity and content of medical inventories is recommended in the "Guide for Medical Examiners."

The "periodic" offers an excellent opportunity for early detection of disease and for recommendations for correction and for personal health counselling. As Dr. Edward Stieglitz has said, "Early detection of insidious disorders and arrest of their progression can do, and is doing, much to enhance and prolong work efficiency. It is an essential element of good medical practice."

Item number four in our objectives refers to first-aid and emergency treatment. I think it is self-evident that on-the-job emergency treatment of injuries and acute illness is a proper function of our health services. I believe that in all our operations facilities and trained personnel should be available to provide such emergency treatment. The quantity and quality of these facilities and personnel must obviously be determined on the basis of local conditions, laws, and size and type of operation. Where first-aid kits only are provided, their contents should be recommended by a medical advisor, and they should be assigned to the care of one individual trained in first-aid who will be responsible for the maintenance of kits and records.

Continued or extensive treatment should not be undertaken except where local laws or conditions make this mandatory or advisable.

The promotion of a healthy environment, our fifth objective, is a partial responsibility of health personnel in cooperation with other groups concerned with legal matters, safety, employee relations and operations. The "environment" may mean the work areas - housing, when provided by the company, and the community where the operation is located. The attention to environmental

factors logically falls in the province of the industrial hygienist and toxicologist as a member of the health protection team. In fact, the two important facets of occupational health services are the clinical and the engineering. The first applies preventive measures to people and the second applies control measures to the work environment. Both are important and are inter-dependent.

Our sixth point in the table of objectives, cooperation with private physicians, should be, I think, self-evident, yet it should be re-emphasized. Our medical observations on employees should be made available, with their consent, to their outside physicians if the findings are significant and may help in health improvement. But, this is a two-way street - there may be much of value to be obtained from employees' private physicians - information which would aid us in a better understanding of employees' problems and job adjustments and health status. Occupational health services are playing an increasingly important role in the total health care of our population in this country.

BENEFITS OF HEALTH SERVICES IN INDUSTRY

There can no longer be much argument about the benefits to be gained from a well-administered health service operating under a sound basic policy. "Benefits," I interpret as meaning improved well-being, not only of employees, but, also, of the employers, the stockholders, and the community. Medicine in industry should not be considered primarily as another fringe compensation for workers but a sound investment expected to pay a handsome profit.

The results have been demonstrated many times in different plants and industries where adequate records have been accumulated before and after the inauguration of health services. Some are readily measurable, others are less tangible and cannot be measured in monetary values but are, nonetheless, real. I should like to list nine of them and discuss some of them in more detail:

BENEFITS EXPECTED FROM HEALTH SERVICES

1. IMPROVED EMPLOYEE HEALTH
2. LOWERED MORTALITY RATE
3. IMPROVED EFFICIENCY, PRODUCTIVITY AND MORALE
4. REDUCED ABSENTEEISM
5. REDUCED ACCIDENT RATE
6. REDUCED LABOR TURNOVER
7. REDUCED INSURANCE COSTS
8. BETTER PLACEMENT IN RELATION TO PHYSICAL AND EMOTIONAL FITNESS
9. IMPROVED LABOR RELATIONS

One tangible and readily measurable result of health services is the effect on sick-absenteeism. Costs of absenteeism in a variety of industries in this country have been reported to range from about \$110 to nearly \$300 per year per employee with an average of possibly \$150 per year or more. The costs included numerous direct and indirect items such as salaries paid, hospitalization and medical care, workmen's compensation insurance, reduced production, idle stand-by capacity and payment to substitute workers. Numerous studies carried out by the U.S. Public Health Service and private agencies suggest that the establishment of in-plant health services can result in a reduction of absences allegedly due to illness by about 40 per cent. A 40 per cent reduction of a cost of \$150 per employee per year would amount to \$60 per employee per year. I have not yet learned what absenteeism costs our company. In some installations and categories of employees, the reporting of absences is apparently not complete and systematic records are not kept of absences due to illness either alleged or real.

The reduction in time-losing illnesses probably resulting from company medical activities is usually quite apparent during a period of years after their initiation. There is a fairly rapid decline over the first year or two, after which the reduction is less and time lost tends to level off at what may be a minimum for any given employee group. However, it is possible to measure changes and trends only when accurate records are kept of absences by cause. We have some good examples among company operations where records of absences have shown a substantial and continuing decrease in work time lost from illness over several years following the installation of a medical department. Dr. Max Howard in an excellent paper - "Why Medical Records?" - which he presented before the company's fourth annual medical meeting in November 1949 gave some interesting figures for working days lost and sickness benefit payments at the Brooklyn Refinery from 1946 to 1949.

BROOKLYN REFINERY

WORKING DAYS LOST FROM NON-OCCUPATIONAL ILLNESS & BENEFIT PAYMENTS

<u>YEAR</u>	<u>DAYS LOST</u>			<u>SICKNESS BENEFIT PAYMENT IN DOLLARS</u>
	<u>ACUTE</u>	<u>CHRONIC</u>	<u>TOTAL</u>	
1946	-	-	-	\$ 115,726
1947	6,089	4,377	10,466	103,802
1948	4,286	4,111	8,397	95,570
1949	3,111	2,324	5,435	66,565

THE MEDICAL DEPARTMENT AT THE BROOKLYN REFINERY OPENED IN MAY 1946

The Medical Department in the refinery in Naples which employs about 1,250 people was opened in September 1952. Dr. Mario Russo has recently reported on the percentage of working time lost from illness for the years 1953 through 1956.

NAPLES REFINERY

PERCENTAGE OF WORKING TIME LOST FROM ILLNESS 1953 - 1956

<u>YEAR</u>	<u>PER CENT OF TIME LOST</u>
1953	4.90
1954	3.26
1955	3.23
1956	3.03

(MEDICAL DEPARTMENT OPENED SEPTEMBER 1952)

PER CENT OF TIME LOST BY EMPLOYEES 24 - 34 YRS. OLD 1953 - 1956

HIRED BEFORE SEPTEMBER 1953	4.01
HIRED AFTER SEPTEMBER 1953	2.31

This shows a reduction of about 40 per cent over the four-year period. A comparison was made of the per cent of time lost over this four-year period by employees of the refinery 24 to 34 years old who were hired before pre-placement examinations were started in September 1952 with the time lost by employees in the same age group hired after September 1952. The former group lost 4.01 per cent and latter group 2.31 per cent of working time because of non-occupational illness.

Mobil Overseas Oil Company first established a Medical Department in West Africa under the direction of a full-time medical advisor at Lagos, Nigeria, toward the end of 1955. The Bulk Plant operation near Lagos, with about 550 employees, had a dispensary operation for some time, but mainly as a First-Aid Station, and little or no attention was given to preventive medicine. Under the direction of Dr. Myers, anti-malarial drug prophylaxis was started about December 1955. During the first 11 months of 1955 there were 507 cases of "fever," almost certainly malaria, resulting in 1,214 working days

lost or the equivalent of total plant shut-down for 2.2 days. During the first 10 months of malaria prophylaxis there were 163 cases of fever recorded accounting for only 33 days of lost time. The monthly average of days lost dropped from 110.4 per month in 1955 to 3.3 days in 1956, a reduction of 97 per cent, even though the number of employees was greater in 1956.

APAPA INSTALLATION

WORKING DAYS LOST FROM "FEVER"

<u>PERIOD</u>	<u>NUMBER OF CASES</u>	<u>TOTAL DAYS LOST</u>	<u>AVERAGE DAYS LOST PER MONTH</u>
Jan. - Nov. 1955	607	1,214	110.4
Jan. - Oct. 1956	163	33	3.3

(ANTI-MALARIAL DRUG PROPHYLAXIS STARTED DECEMBER 1955)

(EMPLOYEES NUMBERED ABOUT 550)

MORTALITY RATES

One of the benefits which should result from a health program is a reduction in mortality rates below that normally expected with a resulting increase in useful life-span. Undoubtedly, early detection of potentially serious conditions and their early correction has, in many instances, prolonged the lives of our employees. The collection of mortality statistics among our own employees has not been carried out long enough (reasonably complete returns since about November 1953) to give sufficient data from which trends might be established. However, certain points are worth noting. The rate of dying among our employees has been considerably less than that for the U.S. population as a whole and the difference becomes greater with advancing age. For example, among Socony male personnel 45 to 64 years old the mortality rate was 9.8 per thousand per year (1953-1957) while for U.S. white males the rate was nearly 15 per thousand (1955).

The major causes of death among Socony personnel indicate those conditions which we should be on the alert to detect early, in order to prevent progression, if possible. In the older employees (45 to 64 years) coronary heart disease was listed as the cause of death in about one-half of all cases while cancer was second to heart disease and was listed as the cause in about one-fifth of all cases. In the youngest group of employees, those less than 25 years old, accidents caused the great majority of deaths, while neoplasms accounted for about 10 per cent. Most of the accidental deaths were non-industrial.

I am sure that with the intelligent application of preventive and constructive medicine to a receptive employee group, lives can be still further prolonged and the attrition from deaths still further reduced. In this connection, it must be realized that this is a long-term program, the maximum results of which cannot be expected for many years. A new generation of Socony people, thoroughly indoctrinated and accepting and following the company health program, will reap the maximum results down the years to come.

It is not the place here to explore the technics of early detection, prevention or management of heart disease, cancer or accidents.

In passing, I should like to point out that management, in its planning for development of executive and supervisory personnel, should realize that there will be a loss through death over any 10-year period of 10 to 15 per cent of male employees who are in the age group, 45 to 64 years.

It is difficult to estimate improved health with any precision. In a reverse way, we might assume a measure of improvement based on the results of health examinations - the number and significance of disease conditions detected, most of which were previously not known and many of which can be corrected.

In the next slide are listed the significant findings of numerous health surveys in many different employee groups, including our own. The significant thing to remember is that many of these conditions can be improved under medical counsel and advice, and health and, presumably, efficiency will, therefore, be improved.

SIGNIFICANT FINDINGS OF HEALTH SURVEYS

<u>CONDITION FOUND</u>	<u>PER CENT</u>
OVERWEIGHT	20 - 30
GASTRIC DISTRESS (? NEUROSES)	10 - 12
NEUROSES, ANXIETY AND TENSION STATES	4 - 14
HIGH BLOOD PRESSURE	7 - 15
HEART DISEASE	2 - 10
RECTAL CONDITIONS (POLYPS, HEMORRHOIDS, ETC.)	6 - 14
VISION DEFECTS - UNCORRECTED	8 - 12
TUBERCULOSIS	1 - 6
ONE OR MORE ABNORMALITIES	40 - 60

In this connection I would like to quote a few figures from our headquarters office Medical Department. During the twelve-month period from September 1956 through August 1957, more than 2,300 medical examinations were made. Considering chest x-ray findings alone, significant abnormalities were noted in about thirty, or in slightly more than one per cent. These included seven cases of active tuberculosis, 11 cases of inactive or healed tuberculosis and one case of carcinoma.

Over a sixteen-month period, 335 sigmoidoscopic examinations were made. Polyps were found in 23 subjects or about seven per cent of the total. Most of these have been surgically removed. In one polyp, malignancy was found, but it was felt that complete removal was accomplished through polypectomy.

He would indeed be a skeptic who would doubt the importance of such findings in our ability to improve health and prolong life.

It should be noted that one outstanding conclusion of most studies of the health of industrial workers is the magnitude of "unhealth" resulting from emotional conflicts and psychiatric problems. That should be the concern of all managers, supervisors, employee relations and medical personnel and the fellow workers.

There is a growing recognition of the need for neuro-psychiatric consulting services in industrial health programs and some companies have full-time psychiatrists on their medical staffs. Their role is chiefly advisory rather than therapeutic and consists of counselling medical personnel, supervisory groups and others in the early identification of the emotionally disturbed, the recognition of damaging inter-personnel relationships and suggesting methods for individual and group therapy. I believe that we in Socony should give serious consideration to the uses we might make of such services.

PROGRAM COSTS

Industrial health programs are costly, but they should return in measurable sums double what they cost if they are well conceived and operated, and if enough, but not too much, is spent on them. I have listed some of the personnel requirements and estimated costs in the following table based upon numerous published reports and personal observations.

Unfortunately, costs are not measured in a uniform way, and little comparison can be made between different operations. In addition, most published per capita costs are based on experience of several years ago and are not realistic in terms of today's values.

PERSONNEL NEEDS AND PROGRAM COSTS

PHYSICIANS	3 HOURS PER WEEK PER 100 EMPLOYEES 1 FULL-TIME PHYSICIAN FOR 1,000 - 1,500 EMPLOYEES 2 FULL-TIME PHYSICIANS FOR 2,500 EMPLOYEES
NURSES	1 FOR ABOUT 300 EMPLOYEES 2 FOR ABOUT 600 EMPLOYEES 3 FOR ABOUT 1,000 EMPLOYEES
LABORATORY - X-RAY TECHNICIANS	1 FOR ABOUT 1,000 EMPLOYEES
OPERATING COSTS PER YEAR	\$15 TO \$50 OR MORE PER EMPLOYEE (ONE SURVEY FROM \$6 TO \$108)
INSTALLATION COSTS	ESTIMATE FOR 1,000 EMPLOYEE UNIT - \$10,000
SAVINGS - PER DOLLAR SPENT	\$1.50 - \$4.00

One way of expressing costs is based on percentage of payroll. Dr. Wade has stated that good services can be provided for 0.25 per cent to 1.0 per cent of productive payroll.

I do not have figures for costs in our own company but I assume that in most of our operations they are at the lower end of the range because in most installations the man-hours of professional time per 100 employees is low.

RECOMMENDATIONS

On the basis of personal observations over the past eight years and from general and specific reports and comments, some praising, others condemning, certain recommendations appear appropriate and timely.

1. Every major unit of our company, such as marketing divisions and refineries, should have a medical advisor on a retainer or salaried basis. His functions would be to assist management in the application of medical policy, to carry out such staff and line functions as may be assigned to him and to be responsible for the custody and the transmission, when necessary, of medical records within professional channels.

2. Medical facilities for examinations and emergency treatment should be established within company operations wherever the number of employees and the character of the operation warrants.
3. More man-hours of professional time are needed in many company units in order to realize the full beneficial results which are possible.
4. Greater stress should be placed upon careful periodic health inventories in relation to age, health status and job demands and hazards.
5. Greater attention should be given to potential health hazards of methods, ingredients, and products as recommended in the Policy on Toxicology.
6. Emotional and neuro-psychiatric problems should be given more consideration.
7. Uniform procedures for identifying, classifying and reporting absences by cause, job category and age should be developed.

VIEWS ON INDUSTRIAL HEALTH

C. Richard Walmer, M.D.

An increasing awareness of the importance of health and medical programs in industry has in recent years led to a broadening of health maintenance activities. Perhaps the key word to describe the changing concept is in the word "maintenance". The day of reparative or curative medicine alone is, in general, a thing of the past. Health maintenance today is the concept of positive health, the result of the combined efforts of the entire fields of preventive medicine, industrial hygiene engineering, and human relations to keep well people well, both on the job and off. It entails a proper understanding of man in relation to his working environment and constant vigilance to keep the two in harmony with one another.

This may sound like a pretty big order, but there is no point in keeping abreast of technological changes, in equipping plants with the best in machinery if equal consideration is not given to the most important element of production - the man behind the machine. We would not think of waiting until equipment broke down to check it and repair it. It is kept lubricated and cleaned, and we watch for signs of wear and tear so that costly and extensive damage can be prevented. The same caution, applied to the welfare of the employee, can cut down on loss of production caused by human breakdowns.

As industry has come to realize the value of keeping workers healthy, industrial medical programs have expanded. The early programs provided little more than medical care for injured employees and were initiated because of the enactment of workmen's compensation legislation in the early 1900's. Gradually, however, the medical departments began to extend their activities to other problems beyond surgical treatment. It was recognized that certain illnesses were caused by occupational exposures to toxic materials and efforts were made to eliminate the sources of trouble by utilizing the services of the industrial hygienist and the engineer. Studies of the environment and the medical findings were correlated and formed the basis for initiating control measures, and this advance marked the first real step toward preventive medicine.

Broadening Concept of Health Maintenance

Further extension of the principles of preventive medicine in industry has only recently come to include off-the-job injuries and illnesses. Occupational diseases and injuries have been reduced to the point where they now account for only a little more than 10 per cent of the working days lost. A large proportion of the 90 per cent of absenteeism for nonoccupational reasons could be eliminated by a positive industrial health program. While concern for the worker's well-being off the job may seem to some to be stretching industry's responsibility, it likewise stretches profits. Absenteeism is costly to industry, not only in the form of lost production and higher operating costs, but in higher rates for health and welfare plans, for which the employer is directly or indirectly footing the bill.

This does not mean that the industrial dispensary is meant to be a substitute for medical care of the individual by his private physician. Industrial medicine presents the opportunity to discover nonoccupationally-incurred physical conditions which might have gone unnoticed and untreated until irreparable damage was done. When such findings are made by the industrial physician, the employee is referred to his personal physician for treatment.

Health counseling plays an important role in the constructive medical program, not only where physical conditions are concerned but also where ailments are psychosomatic in nature. Personal problems, tension, and stress encountered on the job, diet, leisure-time activities, mental outlook toward the company, and the type of work assigned to an individual can be detriments to his well-being, and consequently have an unfavorable effect on the job he is doing.

Benefits Widespread

The benefits of a medical program are shared by the employee, the employer, and the community. To the employee, poor health means loss of wages, a shorter period of productive capacity and decreased personal provisions for himself and his dependents. Ill, injured, or improperly placed employees mean loss of service, decreased efficiency, morale, and increased manufacturing cost to the employer. To the community, health maintenance signifies increased prosperity and decreased welfare costs and labor strife.

But the application of preventive medicine to industry has even more far-reaching effects because nowhere else is there such opportunity for the continuing observation of such a large segment of the population. Through proper utilization of medical data and records valuable information can be gathered which will aid in the search for causes and cures for diseases still unconquered. Epidemiological studies to determine the relationship of certain diseases to occupation also lead to basic medical data in other areas.

The Economics of Industrial Health

While most managements today are sincerely interested in the welfare of their employees and in the betterment of health in the nation as a whole, at the same time they want to be sure that the money expended for extensive health services will also be favorably reflected in the company's financial statements and on the production chart. They want to know how much an adequate program will cost, and what the company can expect to gain from it. Many attempts have been made to translate into dollars and cents the economics of industrial health. This is no simple task. There are many intangibles involved which defy measurement but have sum and substance nevertheless. Among these are the dividends that accrue because of improved employee relations. The employee who knows his company is interested in his welfare and is doing everything possible to assure his well-being feels important as an individual, is more contented in his work and maintains a better attitude toward his company and his job. And who can begin to estimate the savings in lost time and production from attention to human relations problems that show up in psychosomatic illnesses. Each year mental illness is responsible for the loss of an estimated one million man-years of work and is the leading cause of

illness and disability. A good industrial medical program can do much to reduce neurotic ailments by recognizing and controlling occupational factors and by counseling the employee on both the occupational and personal problems which affect his health.

Secretary of Labor Mitchell has estimated that a million workers must be added to the labor force each year until 1965 in order to supply the needs of an increasing population at the current or a higher standard of living. Is it not logical, then, to conserve manpower by protecting the health of workers?

Many companies have been able to compute the tangible savings which have resulted from establishing health services, and the experience has been that a good in-plant medical program can reduce absenteeism, accident frequency and occupational disease considerably. Reports from various companies on their absenteeism experience show an average annual cost ranging from \$50 to \$90 per employee. Figures given represent the direct cost of absenteeism only and do not take into consideration the cost of such factors as less efficient work, spoilage, and lower rate of production. St. Joseph Lead Company, in an analysis of absenteeism for the year 1956, discovered that there was three times as much absenteeism from sickness as from accidents. The average total time lost for all reasons by each employee was 2.58%, which is lower than in many industries. Even though the total wages paid remains the same, there is a direct loss through the fringe benefits paid to both the sick man and his replacement. Mr. Andrew Fletcher, President of St. Joseph Lead Company, estimates that these benefits amount to 10 per cent of the payroll. When this portion of the wages of all of the extra men needed to offset absenteeism is figured, it is obvious that a considerable amount is involved. Mr. Fletcher estimated that the direct loss comprised only 25 per cent of the total loss for sickness absenteeism. Before and after absence a worker is not up to par, his replacement may be inexperienced and further disrupt production, and there may be more spoilage and even more accidents. Not including the sick employee's own loss, the estimated annual cost per employee of sickness absenteeism amounted to \$47 at St. Joseph Lead Company.

A survey by the National Association of Manufacturers revealed that health and safety programs reduced occupational injuries by 47 per cent and non-occupational illnesses and injuries by 28 per cent. Results will vary from industry to industry, and there are many factors involved which make it difficult to arrive at a figure that would be true for every company. Most companies who have initiated health services have found that workmen's compensation cost was reduced by at least 25 per cent and often by as much as 60 per cent or more. Similar reductions were reported in labor turnover, and I think we can all agree that the cost of replacing an employee is at least as high as the \$100 estimate made by the N.A.M. The savings in compensation costs, or premiums, which result from better job placement, good and prompt treatment, and prevention of illness and injury are also measurable and can be entered on the credit side of the ledger.

Let us take a look at the other side of the ledger. What does a good medical program which is the heart of the health maintenance services, cost? As might be expected in view of extreme variations in the services and scope of medical programs in existence today, the differences in per capita cost are also very wide. In medical audits made by Industrial Hygiene Foundation of many companies

in different industrial categories, the cost per employee has been found to vary from \$5 to \$170. More amazing, in a single survey of a large company, the direct medical costs per employee per year varied between \$6.02 and \$108.86 in different plants of the same organization. Even allowing for local differences in costs it is obvious that all workers in this organization could not have received the same type of medical care.

We feel that a rather complete and modern medical program could be maintained for anywhere from \$15 to \$30 per employee per year. Obviously, a small plant cannot economically sustain an expansive program. But if the basic concepts of constructive medicine are followed and if the working environment is kept healthful, medical services can be obtained through community facilities or through cooperative industrial clinics. Careful planning of the program, regardless of size, can assure that the greatest amount of efficient proper service is obtained for a given outlay of money.

The Elements of Good Health Services

What, then constitutes an ideal medical program? The medical program, to be successful, must be "tailored" for the specific needs of the company. It is particularly important in the petroleum industry, with its diversity of operations and its far-flung geographical nature that the program be a well-organized one. A great deal of good medical service already exists within most oil companies, but in some cases there is no over-all coordinating authority, and as a result the program is not as efficient nor as economical as it could be. The preventive aspects generally suffer when a program lacks unity. But regardless of whether one plant or a large number of operations at many locations is involved, basic to the establishment of a medical program in any company is its policy with regard to health, safety, and working conditions. Management must have a clear understanding of the many ramifications of industrial health and a full appreciation of the value of health maintenance programs if high levels of worker health and efficient production are to be reached.

The place of the medical department in the organization should be well defined, and it should be delegated sufficient authority and proper responsibility for carrying out activities for the protection of health and safety of the workers. The medical department is a staff function, and since it is concerned with people, it is primarily an industrial relations activity. Therefore, where the structure of the industrial relations department is good, the medical department can be made an organizational part of it.

If it is desired to control the incidence of illness, injury, misplacement, and early retirement, the physician must be permitted to do more than diagnose and treat illness or injury in individual cases. Employees must be available for study as individuals and in groups; processes and materials must be catalogued according to their hazards, and unknowns evaluated by research. The physician who is aware of toxic, physical, sanitary, infectious, nutritional, and stressful potentials in the work environment will be constantly on the alert for epidemiological signs of disease in the group of employees for whose occupational health he is responsible. This is the field in which medicine offers the greatest monetary saving and gain in human relations to industry. Since these medical activities involve contact with many levels of supervision in all departments of a company, and since they often require financial

expenditures and modifications in employee relations, processes, and materials, it is obvious that the Medical Director must be so placed in the organization that his recommendations will receive reasonable consideration topside.

The industrial physician, to carry out such a program, must of necessity have a broad general knowledge of industrial medicine and toxicology, and a detailed knowledge of the individual processes and operations of the industry with which he is associated and of the materials processed. He must be familiar with the hazards and the physical demands involved in the various jobs and with the diagnosis and treatment of occupational diseases. Rehabilitation, health education, and compensation laws are also his province.

The objectives of an efficient medical program are: (1) to determine the physical and mental fitness of prospective employees for the jobs to which they are to be assigned; and (2) to maintain, or improve, the health and efficiency of those already employed.

One of the most essential tools for accomplishing this is the physical examinations. The type and extent of preplacement examinations in the petroleum industry will vary, depending upon the job for which the applicant is being examined. This will assure that the worker is assigned to a job that is commensurate with his physical and mental capabilities. Preplacement examinations, as well as periodic ones, are an essential part of the constructive medical program because they permit early detection of deviations from normal health.

The medical department, however, is only one segment of the health maintenance program, although a most important one. The objectives of occupational health are achieved through the cooperation of industrial medicine, industrial hygiene, safety, engineering and toxicological research.

Basic to establishing a health maintenance program is an evaluation of the working environment in which all potentially toxic materials to which workmen are exposed are analyzed and the exposure measured. The industrial hygienist must consider that harmful substances have three modes of entry into the body -- by contact with the skin, by ingestion, and by inhalation. The industrial hygienist and the industrial physician work closely together in the formulation and application of adequate tolerance standards. The findings of the physician in his study of man must be interpreted and used in the studies of the working environment by the industrial hygienist to be of practical use in the conservation of human resources, and vice versa.

In cases where data are sketchy or nonexistent concerning the toxicity of a substance, as is often the case with new materials, studies should be made in the biological laboratory. In order to institute an effective program of preventive measures, the industrial hygienist must have precise data on the nature and degree of reaction. Such data are obtained from toxicological studies.

As more and more new compounds flow from the research and development laboratories to the production line, the need for toxicological research grows correspondingly more urgent. Not only is it necessary for the industrial physician to know the effects that toxic substances may have on workers, but

the welfare of the consumer must be considered as well. Where harmful properties are inherent in a product it is the responsibility of the company to set up codes for its safe handling and use by the public. This too is part of the health and medical program of industry.

Once the environmental hazards and their possible physiological effects are determined, the responsibility for correction lies with the engineer. In the complete industrial health program control of health factors is most effectively and economically accomplished by giving proper consideration, in the original design of processing equipment, to the physiological and psychological requirements of the men who will use the equipment. When unanticipated hazardous situations arise, it is necessary to alter the existing procedures.

Preventive medicine, then, is the meeting of problems in the "pre-clinical" stage, the elimination of hazards before they can inflict injury or illness, and the requirement of teamwork of specialists in many professional fields.

Complexity of Health Protection in the Petroleum Industry

The petroleum industry has indeed a complex problem in providing health protection for its workers. I understand that there are at least 500 separate and distinct operations represented in the petroleum industry, and consequently there are a wide variety of hazards to be considered. Infectious diseases and a high index of hazard is present in the production phase. The refining phase today has all the elements of a chemical industry and the accompanying toxic hazards. Even where enclosed systems and automation are utilized maintenance workers are still subject to exposure. Transportation and marketing pose their own special problems. In addition to this, the industrial physician and the industrial health specialists who work with him to eliminate occupational health problems are faced with constant changes in equipment and an ever-increasing number of new products. So rapid have been the development and application of new chemical substances that the danger exists that sufficient time may not elapse before production to collect data on their toxicity and hazards.

However, few industries have done more to promote the realization of preventive medicine than has the petroleum industry. With the continued wholehearted interest and support of management, which is abundantly evident, I feel certain that health maintenance programs in this industry will continue to lead the field, and both worker health and efficient production will reach new heights.

DISCUSSION

Dr. Schulte - In the case of pre-placement examinations, when further tests are necessary over and above the routine tests, who should pay for these tests. It is my personal opinion that the person should present himself in good health for this examination and should pay for the tests himself. On a routine periodic when pathology is found, who should stand the expense?

Dr. Saunders - You feel that anything beyond the basic tests should be paid by the candidate? It is my own personal feeling that if we are selecting from several candidates and we feel that more than basic tests are necessary in order for us to determine the relative fitness, that the Company should bear the cost of these tests. This is, of course, a Management decision. I would like to hear another opinion on this.

Dr. Howard - We had just such a situation arise. We examined a person who had a 3 plus albumin. We told him that we would not be able to pass him. He returned the next day with lab test reports and a letter from his LMD stating that he was free from albumin. We did another urinalysis and found it to be 2 plus. We then decided that if we were to consider him he should have IVP, etc. He decided that we should recommend where he should have this done. I feel that we had the right to reject him outright, but we were trying to give him the chance to have this condition looked into first. The IVP showed marked impairment of kidney function. I think in a case like that the man should bear the cost and not the company.

Dr. Saunders - In some of our installations, including our own, such tests could be done and would be done in our own laboratory without any charge to the individual. Dr. Sinclair, what do we do when there are tests necessary that we cannot do?

Dr. Sinclair - We usually refer them to their own physician and they pay for it themselves.

Mr. Kothe - Who gets the most benefit from this? If the individual is to be the beneficiary for the further tests, I think that the individual should pay the cost. If the company is to benefit, then the company should pay. For instance, when hiring an engineer, when you want a particular man you are willing to spend a few extra dollars to get him. We had a back injury deal where the man had to go out and get extensive tests and even after these tests we rejected the man.

Dr. Luongo - I agree that it is a matter of degree. On one hand you would no doubt not want to go to the expense of putting him in the hospital for an IVP, but there are cases that come up in the course of a routine examination where you have to clarify the situation. The type of person who is being examined is important. You might want to invest a lot more in certain types. In fact, one of our candidates was hospitalized for diagnosis because he was a very desirable candidate. A lot of these come up because of urinalyses. It is a matter of degree and the type of employee being examined.

Dr. Saunders - It seems to me that it is a matter of degree. I believe it is indicated in the Guide for Medical Examiners that any tests other than the basic tests outlined when they are considered necessary by the examining physician, he should request permission of Management to have these tests done. This happens frequently with people going overseas. We had a case recently of a 25 year old who was healthy, and we got a report from a designated physician including an EKG for which he charged us \$15.00. This is not included in the list of recommended tests performed.

Dr. Schulte - In the Detroit area many companies require as a pre-placement technique an x-ray of the lumbo-sacral spine but we in Socony do not unless we question the man's back stability. Again, we have no uniform policy as to whether or not we do pre-placement back x-rays on candidates for heavy work. It is becoming more and more used and sometimes is favored.

Mr. Kothe - What is the feeling about temporary pre-placement physical examinations. We have quite a problem with training stations. I read the policy that all employees should have a pre-placement medical. We have a great turnover and in the last two months we have had 11 men in one training station. I checked and found that none had had a medical examination. My feeling is that they should have had a physical but when we have such a turnover we cannot spend the money.

Dr. Saunders - I think that if you can determine whether he is warm and can walk or not is enough. It is part of the basic policy that every employee be examined before going on the job. If he is an employee he is then entitled to all the benefits of the company.

Dr. Schmidt - But this booklet says "all employees." I think this should be changed to "regular employees." Later on these people may become regular employees and we might not find out about it.

Dr. Saunders - Are these regular employees or not?

Mr. Kothe - Some are temporary and some are regular. Some of these employees have been listed as temporary for the past three years.

Dr. Saunders - Dr. Samuelson, you have a considerable number of temporary employees, what do you do?

Dr. Samuelson - We do complete examinations on everyone. In the summer we have about 150 students. We do complete examinations on all of them.

Dr. Lonergan - We have the same problem at St. Louis with temporary employees in service stations and we do a complete physical with less lab work to save money. We do a Kahn only. I think it is the lab work that runs into money.

1% finding on Kahns and you might have 10% or more on chest x-rays. I assume that these men are temporary employees who are put on the job with the expectation that they will be put on the payroll as permanent employees in the future. We have the same problem with geologists in the producing fields but all of these men are given the routine physical examination. Most of them after they complete their education come back to work for one of the Socony Mobil companies. Then we have the record and it is a good baseline for our use in the future. I would like to hear Mr. Bellman's views on all of this.

Mr. Bellman - I don't have any explanation on temporary employees but I am very interested in the discussion you have had on cost of examination. I would like to throw a little different light on what was said this morning. I think we should look at it from another point of view. The comments are based on what it means to the company. I feel that you must look at it from the employee's point of view. The statements are based on what it means to the company but if you want to get people to appreciate the value of the medical department, the factors they are interested in are not the savings in lost time, but they are interested in their peace of mind, happiness and longevity. People are basically motivated by what they think is in their own best interest. I was very interested in all of this and the comments regarding the cost of a new employee. I hope that you will not feel that we are extravagant in Marketing. Our costs in our program are very much larger than those you mentioned here. I am talking now about Socony in the central region. We are recruiting about 300 men a year, largely from colleges. We calculate that the training and indoctrination before the man starts to be productive costs us over \$7500 per man. I am quite sure that this figure is exceeded more than overstated. The medical seems to play a very important part and there were several important comments made in George Saunders' talk regarding the neuro-psychiatrist. I think in Marketing there are a good many routine jobs. Basically the marketing function is a selling function with the mental and emotional aspect of that individual very important to the success of his present job. I cannot put too much stress on the value that medical people have to management in observing and passing on information, when it is proper, to the people who are to guide and help develop these people into good and prosperous careers. These are the factors that should be considered. I think that we don't employ in Marketing any man that we do not expect will not advance well beyond the job he is hired for. This is true largely in our company. We have seen in Marketing a good many people who have done very well in certain positions who were not emotionally constituted to carry a greater load of responsibility. They were part of a lower echelon team and when they had more responsibility they fell apart. How are we poor lay marketers able to give advice on that score. Where can we go to get help except from you good people who are here today.

Dr. Saunders - Thank you very much. I am pleased to have Mr. Bellman state that we are perhaps over-emphasizing the dollars and cents. What is done in our overseas operations? Dr. Arcila, do you examine all laborers before they go on the job?

Dr. Arcila - Yes.

Dr. Saunders - What do you do on the pre-placements?

Dr. Arcila - Chest x-ray, laboratory examinations - urine, blood count.

Dr. Myers - At Apapa we examine everybody. West Africa now has the attitude that all employees should have pre-placement examinations. Pre-placement examinations are performed because: 1) there is a large labor market and 2) there is much illness among the population, such as tuberculosis.

Dr. Saunders - I believe you have in West Africa a great deal of pulmonary tuberculosis as well as bone tuberculosis. There is a great deal of active tuberculosis in Greece. In regard to some of the costs and figures that Mr. Bellman mentioned I would say that the average cost of doing a pre-placement examination in the field is about \$35.00

I would like to ask Dr. Richard Walmer what his experience has been. What do the majority do? Do they do pre-placement examinations?

Dr. Walmer - Yes, with the exception of temporary employees. The policies vary widely. I would like to comment on what Mr. Bellman said, "what value is this to the employee." I agree that it is important to show the employee what the value of the medical department is.

Dr. Saunders - I could not agree with you more wholeheartedly. Few outside the medical department know how much time is spent by the nurses and doctors doing health counseling, helping them to solve personal problems at home or on the job. We spend much time as a sounding board and try our best to help the employee solve these problems.

Dr. Worrall, in your operation you have a lot of woodcutters, etc. What are your problems?

Dr. Worrall - Nearly all are in poor health. Many have bad backs and bad feet but they can dig ditches. We examine them all. If they are doing heavy work they have a lumbo-sacral spine x-ray. Many of them do a few weeks work and then disappear. My personal feeling is that if you keep out one man per year who would have broken down as far as a back is concerned, your program is of value. There is nothing worse than a man with a chronic backache. We also have students who apply for summer jobs and they are all x-rayed. This is difficult sometimes as they travel a great distance but I think it pays off.

PSYCHOMETRIC TESTING OF EMPLOYEES

Dr. C.H. Elliott

Psychometrics is the whole field of measurement of behavior-especially of people. Because of the nature of its subject matter, the measurement and its mathematical handling are often different from that in the physical science. The most striking differences are: that most psychological measurements are measures of variation around an average--human behavior has no zero point from which to begin measuring; and that these measures are handled mathematically by ordinal rather than cardinal numbers. Psychometric scores indicate relationships within a group rather than absolute distances on a scale.

Testing is one means of measuring people and is one of many psychometric techniques. Testing is a generic term encompassing a whole gamut of questionnaires, inventories, check-lists, work samples, and similar devices as well as tests proper. (Technically, to be a test, a measuring instrument must be capable of right and wrong answers; questionnaires and inventories do not yield answers identifiable as correct or not. However, the general usage is to call all of these tests.)

In each instance, the test is designed to sample the behavior of an individual in some controlled situation. Insofar as the sample is adequate and the situation sufficiently controlled, the performance of individuals on the test yields quantitative results which are to some degree descriptive of their behavior. From the results it may be possible to predict with a fair amount of accuracy the reaction of these individuals in similar situations in the future. Again, the results may provide an indicator of the level of knowledge or skill which has been attained. Or, the results may shed light on the adequacy of the behavior exhibited and thus serve in the diagnosis of behavior aberrations.

It should become apparent that testing may serve several purposes and that the purpose for which data is sought has considerable bearing on the procedure. Tests are best known in the academic situation where they often are used to determine level of accomplishment. Most such school tests are too informal to be accurately called psychometric instruments. This does not mean that more exact measures cannot be made--some have been and are available to measure a wide variety of skills and abilities. These are useful both in the school situation and elsewhere.

Test results are widely used in guidance procedures. Guidance may be educational as in counselling students on curricular choices when they encounter difficulties in course work or general school adjustment, educational goals, etc. Vocational guidance may be concurrent with educational guidance or may be conducted quite separately. Here, test results are used in helping individuals to arrive at appropriate vocation choices and goals.

More intensive and extensive counselling based, at least in part, on test results characterizes clinical practice. Here test results are interpreted to assist in diagnosis and prognosis of persons suffering behavior difficulties.

Tests also occasionally help to check on the progress of therapy.

The opposite aspect of testing--one primarily concerned with measurement of the individual against some standard rather than primary concern with counselling and advising the individual--is the use of test results for selection and placement of individuals in jobs. Whereas, particularly in vocational guidance, the individual is led to pick and choose among jobs in an attempt to determine the one which suits him best, vocational selection and placement places the emphasis on finding the most suitable person for an available job opening. The objectives of both guidance and selection and placement are substantially the same--a productive individual, well-adjusted in his job. Our topic: "The Psychometric Testing of Employees" indicates that this is our area of primary concern.

It is worth noting that the same measuring instrument may be used in each of these applications. The same tests or kinds of tests are often used with only the purpose varying.

At this point it would be well to turn aside for a moment to mention briefly the users of tests and test results. Without attempting to be definitive and certainly not wishing to become involved in "jurisdictional" controversies among practitioners, a quick differentiation among test users may help clear some confusion.

A psychometrist is a specialist in psychological measurement. He is concerned with choice of appropriate tests for the particular case, administration of the tests, scoring and limited interpretation.

A psychologist, technically, is a behavior scientist. Actually, there are probably as many or more specialties in psychology as there are in medicine. Principal test users among psychologists are the clinical psychologists and the applied psychologists, especially those concerned with business and industrial applications. The industrial psychologist most often uses tests to help in the selection of personnel or as an aid in making decisions on the placement of people in jobs. The clinical psychologist diagnoses and treats behavior problems of psychological origin.

A psychiatrist is essentially a doctor of medicine. He is concerned with diagnosis and therapy of difficulties of psycho-physiological as well as purely psychological origin. Currently, there is a considerable amount of controversy between the organized body of psychiatrists and the organization of clinical psychologists over the relative role of each. Fortunately, this controversy seems not to have impaired the working relations existing among psychologists and psychiatrists working on the same staffs.

Just to set the record straight, we might as well mention the psycho-analyst too. This refers to a practitioner, possibly, but not necessarily, an M.D., who relies primarily on psychoanalytic techniques as derived from the work of Sigmund Freud. Most practitioners use these techniques to some extent--an analyst depends on them almost exclusively.

To return to the main stream--the most substantial industrial application of testing is its contribution to the selection and placement procedure. In this role, tests serve to collect information about people which can be added to

other data already available on them. Thus more facts are provided upon which managerial decision can be based.

Tests cannot relieve the manager of the need for making of decisions about people. Tests will not classify people--there are no "handles" to be put on personnel. Tests will, however, by providing information about people which is not readily available otherwise, give the manager more insights into his people and, used properly, enable him to handle them more effectively.

Counselling is an inevitable by-product of the testing of employees. Improving managerial effectiveness in handling employees, just mentioned, depends on adequate counselling with managers regarding the data available on their personnel. If managers are to reap full benefits in this regard, they must gain an adequate understanding of all personnel information on each of their employees (and this includes that available from other personnel records in addition to test results and any pertinent medical information as well).

Counselling of employees also is an outgrowth of testing. The employee's inevitable curiosity will almost force this. Test results cannot be given out without making certain the employee understands their implications for him. Beyond this, a number of employee problems--or potential problems--may be resolved by consultation with employees revolving around their test results.

Employee testing, then, provides information to aid management in making decisions and in employee handling, as well as offering the opportunity for some counselling (of a non-intensive nature) of employees.

How do tests get this information: How do tests measure?

Testing is based on the concept of individual differences. We know that people are different each from the other. We know that on most physical or psychological characteristics people are normally distributed. By this we mean that on a given characteristic, people vary, with most of them clustering around the average and a constantly smaller number going out towards each extreme. About two thirds of a normal group will be comparatively near the average with the other third stretching out towards infinity in each direction. This, when plotted as a graph, is the familiar bell-shaped distribution all of you have encountered somewhere in your training. It is believed that most measurable characteristics of human behavior are distributed in this fashion.

The important thing is that people do not fall into categories. They are not either "bright" or "dumb", good or bad, extrovert or introvert, pleasant or unpleasant, desirable or undesirable, any more than they are categorically either sick or well. There are all shades of gray between black and white. A good test measures the distribution of people through the shades for a given characteristic.

Testing also depends on the fact that people are creatures of habit. This is technically referred to as individual consistency. A person tends to repeat response patterns each time he finds himself in an essentially similar situation. Behavior which was adaptive in a given situation is thereby "reinforced" and is called up the next time the individual interprets a new situation as similar to the previous one.

Consequently, we can sample the behavior of the individual in a known and controlled situation. On the basis of his behavior in this sample we have some possibility of predicting his behavior in similar situations in the future. This may involve the sampling of a skill--e.g., typing in a test at the rate of 50 words per minute forms the basis for predicting a level of accuracy and speed of the typist when on the job. Similarly, it may involve a sampling of attitudes, preferences, knowledge, or personal beliefs and appraisals. Insofar as the sample reasonably approximates situations people are likely to encounter in reality, our predictions will be as accurate for the group. Tests must be tested to check the closeness of this approximation.

There are a number of implications involved in the sampling of behavior. Because of the nature of human measurement, as pointed out earlier, the measurement of the sample of behaviour has to be expressed in terms of the relationship existing within the group whose behavior is sampled. If we find in testing the test that our measure is a good one, then we are able to predict future behavior or make a general statement based on our sample in accord with statistical probabilities. Put another way, our controlled sampling situation approximates a general and existing situation closely enough that the group as a whole will probably behave in the existing situation as it did in the sampling situation.

The behavior of individuals comprising the group is also predictable; but, because sampling and the ensuing statistical probability are based on the group, individual cases may not conform. According to probability, if the fit is good between sample and existing situation, most individuals will conform. But there will always be exceptions because the fit is never perfect. Individual prediction will be better than chance if the test has been proved, but it cannot be perfect by the very nature of our measuring instruments, our mathematics, and our candidates for measurement. People are consistent, yes; but not perfectly so.

As indicated, if any testing is to be used effectively, the tests themselves must be tested in the actual situation. This absolutely essential procedure is not carried out in too many instances. Predictions based on untested tests may be even less accurate than chance or pure guesswork. Factors considered important by subjective appraisal may actually prove to be negatively loaded--I've seen it happen. Testing which has not been checked for effectiveness frequently "blows up" and produces unusable and even undesirable results--this then gives a bad odor to all testing so far as most of the personnel involved are concerned. Here, as in many other things, the means and the instruments--testing and the tests--are not at fault; it is the procedure and the use made which is erroneous.

The steps required to test the tests can be clearly spelled out. Initially, the purpose which the testing is to serve has to be determined. In the industrial situation tests are usually used for purposes of selection and placement. This means that determinations have to be made concerning the kinds of work and levels of jobs for which we intend to use tests as a means of aiding us select and place people. We have to determine situations where testing may help and the people who will be involved.

Knowing the purpose of the testing, the situation and the people involved, two further steps can be taken either simultaneously or sequentially. Test forms have to be obtained. Large numbers of testing instruments are available from commercial sources. Many of these are perfectly satisfactory in a technical sense. In these, the steps in the development of the instrument have followed standards of good practice. The personnel specialist may choose from this pool of existing materials those instruments which, from his analysis of the situation, purpose and people, appear to offer some hope of providing the data sought. This is the least expensive way to approach the inauguration of personnel testing.

Other situations, people or purposes may not seem to lend themselves to measurement by available tests so that it seems best to devise new tests from scratch. This can be a very lengthy and expensive process. However, it does have the advantage of providing measures which are tailor-made to fit the situation and the people. Tests have "face validity"--that is, they appear to the people involved as having relationship with the situation. This in itself often helps to break down the resistance which some people seem to feel towards any application of personnel testing. Test items can be worded to tie in more closely to the existing situation. Tests can be calibrated to measure to the fineness desired and as extensively or intensively as seems practical. Tailor-made tests have the further advantage of being pitched at a level appropriate for those people who will be subjected to them. Such things as literacy, high educational levels, facility with pencil and paper, physical factors (e.g. bi-focal spectacles), and similar other variables are more easily accounted for by tailor-made tests than by those commercially available. The latter, by their very nature, are likely to have a broader base in order to have broader saleability.

In either instance, ready-made or tailor-made, the testing instrument will serve well if its use has been checked out in our situation. The source of the test is not so important as the proof of its value to us.

To prove value it is necessary to have a standard. This is true of every measure and the better the standard the more accurate the measure. The evolution of the inch is a good example. Beginning as the distance from the joint to the tip of the thumb, the inch was variable. Buyers by the inch were better off if they had large hands and long fingers. Sellers needed short thumbs. To overcome this, the inch came to be defined as the length of the king's thumb from joint to tip. This was more uniform--so long as the king didn't die with the next in succession being someone of different bone structure. The evolution continued until today the inch is a bar of precious metal hermetically sealed in a constant atmosphere at a constant temperature kept at the Bureau of Standards in Washington. This bar of metal is the criterion on which the bulk of our everyday linear measures are based. Testing being a form of measurement also requires standards in order to check accuracy. Since tests measure the behavior of people, the standards must be in terms of people's behavior. If we wish to use tests to help us to choose and place, for example, unit managers, we must have some standard of performance of these unit managers.

Development of adequate standards is one of the more difficult parts of checking on tests. And, of course, the adequacy of the standards is directly reflected in the effectiveness of the measuring device. Many criteria of performance

have been used. Actual work done is among the simplest and most direct. A typing test is simple, direct, and accurate. On the other hand, such a direct standard of executive performance is not usually attainable. Production data have been used as performance standards of managerial personnel who by their managerial actions have direct influence on output. However, their influence is seldom direct enough to make the standards meaningful. It should become clear that standards of behavior are unfortunately limited by the situation and the purpose.

For many situations, especially those involving the typically abstract performance of managerial duties, about the only available standard is the judgment of other people about that performance. Such judgments, if enough are obtained, can be refined to the point where they are fairly satisfactory criteria of performance. These composite judgments are the most frequently used standards against which test performance is evaluated although it is recognized that, as standards, they lack some desired exactness and definition.

After tests have been chosen or developed they will be administered to the group. At the same time criteria of performance for members of the group will begin to be collected. The group may be composed of the present incumbents in the jobs being studied or it may be composed of candidates for the job. In the first instance test administration can take place in a short space of time and the gathering of criterion data on performance can go on simultaneously since these people are already on the job and performing. In the second case--using candidates--test administration and criterion data collection necessarily are extended over a period of time. Individuals are tested as they become candidates and hence data cannot be collected all at once. Criterion information will become available on such persons slowly and only after they become incumbents rather than candidates. While this second approach (for reasons we need not go into here) is considered to be superior statistically, from a practical point of view use of present employees gives results with less time lag and probably more economically.

Once the data is in--the tests administered and scored and the criterion data accumulated--we can test the tests. The first check is made on the reliability of the measuring instrument, i.e., how consistently it measures. A good test available on the market will already have its consistency proved. Tests constructed for the particular situation will have to be checked. We need not spend time on the procedures here. What we are trying to avoid is a measure giving us one answer one time and another the next. We don't want our behaviour measurements to be like the cabin in the woods a friend of mine staked out several summers back. Instead of a rectangle he laid out a four-sided figure with no two sides parallel nor of the same length. He used a cloth tape measure and cloth stretches.

The land surveyor, to get reliable measures, uses chains or metal tapes. Even so, he corrects his calculations for metal contraction and expansion due to temperature. This dependability of a measure is what is sought. We expect that an individual's score on a test will be much the same each time he is measured by the test. Just as we can't measure accurate inches with a rubber band, we can't measure the behavior of people or predict based on these measures if they are inconsistent.

Assuming our measures are reliable, we next check to see that they are measuring as intended. To check validity, the performance of the group as measured by the test is compared to the standards or the criteria of performance. If the group's performance on the test corresponds with its criteria of performance, then the test is measuring what it is purported to measure. The correspondence between test results and criteria of performance is never perfect, but if the relationship is better than chance the tests will have some predictive efficiency. The degree of the relationship between test scores and criterion data is measured statistically by computing co-efficients of correlation. These serve as indices of the common variations occurring in two sets of data. They show co-relationships.

This raises an important point. Persons unsophisticated in statistics often fail to recognize that correlation coefficients show only that two sets of data are concomitantly related. Such people often impute a cause and effect relationship which is not supported at all by correlation. The best recent example is the furor over the alleged carcinogenic qualities of cigarette smoking. This has resulted from interpretations of data showing that as cigarette consumption increases, susceptibility to lung cancer increases. This corrolary relationship does not provide any evidence that cigarette smoking causes lung cancer. It would be just as correct to impute that a high degree of susceptibility to lung cancer causes the person with the susceptibility to consume more cigarettes than the person with less propensity for lung cancer. The two things vary together. This variation may be coincidental or both may be caused by some third unknown or unmeasured variable. Indices of correlation do not show cause and effect.

Another example: In testing, it is often assumed that people who score well on intelligence tests will consequently perform well in school. Many, but not all, do. The two generally go together. But the score on the test does not cause high school marks. Both the test score and the school grade are probably the effects of a common set of causes which may include such things as mental and physical capacities, alertness, motivation, and similar intangibles.

A testing program which has been proved to be valid for use in a given situation, then, provides us with some degree of possibility for prediction of performance from obtained test scores. It does not give us reasons for the relationship. Neither does it imply that people are successful because of scores obtained on any series of tests.

Since the use of test results is so clearly related to the purpose for which the results are proved and since this proof is obtained with a particular group in a specific situation, it is a great risk to use the test results for different purposes or to apply the testing program to another group or in another situation without validating it there, just as in the first application. There is a tendency among many test users to do exactly this kind of thing. They blithely assume that, since a test served one purpose, they can use it for others-- e.g., using for aid in supervisory selection tests which were verified as suitable for use in selection of craftsmen. Or they attempt to apply at another spot a testing program checked out in one location without determining the validity of its use in the different situation. Testing is always relative to the purpose, the situation, and group. Whenever any of

these are changes, the accuracy of the results has to be verified. Any untried use other than the one studied is erroneous and can lead to serious misapplications.

Testing is a useful means of acquiring information about people when the technique is properly used. People may expect too much of testing on the one hand, while others fear it and resist the use of testing because they fail to realize the limits of its application. Testing provides no panacea for our many problems in placing people in jobs. Tests will not provide ready-made decisions on personnel problems. Tests sample the behavior of people and, insofar as that behavior which is sampled is important in job performance, we are given some additional facts which can contribute to judgment. Tests do not replace any of the other techniques for acquiring information about people. Test results merely present some evidence more clearly or gather it more easily than do other means of appraisal.

Among the misconceptions which have grown up around this personnel procedure is the notion that choice of people for jobs comes to be an impersonal and completely mechanized procedure. This fiction has been contributed to by motion pictures and television which come up periodically with the notion that we can measure people and, having punched the data onto IEM cards, can then punch a button for a job and, after much whining of machinery, the card drops out representing the man for the job.

Such a technique is not only impossible but even ridiculous to suggest. There are not now, nor are there likely to be, any measures of the total entity of that which we call an individual human being. The possibility of any meaningful measure of the whole psychological makeup of a person is about as possible and would be about as meaningful as some quantitative statement supposed to encompass and accurately reflect the entire state of his physical being. Specific psychological characteristics of the person can be measured just as specific medical aspects of his being can be measured and studied. The job in both cases is to pick those characteristics or aspects likely to be important in the situation. And there are others which presently can't be measured at all.

One such aspect of behavior which cannot be measured directly is a man's motivation. We scarcely know even the dimensions of this facet of man. Indirectly it is possible to get some insight into a man's motivation by measuring his interests, opinions, and attitudes. These are likely to show the kinds of activities in which his behavior is characterized by a high level of motivation and the converse. His showing on performance tests--intelligence, skills, etc.--may be indicative to some extent of his motivation. None of these are direct measures--all of them are concerned with ends influenced by motivation.

Another often held misconception is that if all placements are made with the assistance of testing, the personnel so placed will be identical--"peas in a pod," so to speak. Several of the factors just cited indicate the falsity of this notion. Use of tests does not result in uniformity of personnel. People don't fit patterns so concisely that they are identical. Two identical test scores, after all, place the two people concerned in about the same position relative to the group on that specific characteristic. The test isn't measuring the entire person, nor is it measuring on an absolute scale. Test scores are essentially ordinal numbers on one specific facet of behavior. Nor does the test score show why the score is as it is. In many instances individuals arrive at similar test scores with somewhat different responses---tests are

after all samples--and the scores show none of the reasons why the individuals responded as they did. Several people from a group may fit a pattern of test scores sufficiently well that we are able to predict with some accuracy concerning their future performance in a job. The scores represent a small segment of their total personalities and are obtained by a sampling of their responses. Why they scored as they did is unknown. The scores were only one more bit of evidence on which placement decisions were based. Nowhere is there any reason to believe that use of tests in placement results in uniformity.

Up to this point we have explored rather widely the techniques, problems, and considerations in the use of psychometric testing of employees. It is hoped that the time spent on some of the details of application will help to make sure that none of us gets too far out of line in our suggestions about and attempts to use these measures. Or that, if in use, we do not misuse, expect too much, or fail to understand the nature of the data which they make available.

There are many possibilities for the use of testing procedures so long as it is always remembered that they serve only as an aid by giving us more information about our people.

We might consider next some of these uses. Test results have been used to improve the initial selection of employees. Here testing has a purpose similar to that of the physical examination--serving to help men charged with employment determine that prospective employees meet certain minimum standards. Tests may be used to help here to check on skills, to ascertain levels of knowledge, to find out something about ability or to evaluate personality characteristics and interests.

Similar assistance can be rendered by tests in helping to choose individuals for upgrading. This may be in upgrading in crafts based on demonstrated possession of skills (although this is not too likely in some locations under present day agreements with unions). It may be a help in choosing hourly employees for promotion to supervisory positions. It may be an aid in picking from among candidates for higher level managerial and staff jobs. In none of these will tests make the decision. In all of them tests may provide useful information.

Closely related to the use of testing as an aid in the selection of personnel is the use of tests in placement procedures. Placement of personnel, especially managerial personnel, must coordinate with the programs for development of managers which are more and more widely adopted in industry these days. These programs rely on appraisal procedures, of which testing is one, to indicate individual strengths and weaknesses. Developmental activities and job assignments are made under these programs so as to capitalize on the strengths of men and build their abilities in areas of weakness.

Tests can help to isolate characteristics desirable in men for various jobs and to determine the degree to which individuals possess these characteristics. Tests can also aid in measuring executive growth as a result of developmental activities and job assignments.

While not providing us with tags to hang on people for easy identification or slots to put them in, test results can help to provide the basis from which personnel people and managers at each level in the organization can carry through the non-intensive counselling--the appraisal interview--which is an integral part of management development activities. Minor problems of various kinds may be uncovered which lend themselves to resolution through discussion in the appraisal interview.

More intensive counselling sometimes follows in the wake of the adoption of a testing program. Test results may divulge problems and potential problems among company personnel. Some of these will be of a personal nature susceptible to resolution through psychiatric counselling. A more effective man can result. Other problems may be uncovered which will directly affect the man's work efforts. Absenteeism, alcoholism, accident susceptibility, job drifting, and similar industrial problems usually have their roots in the personality adjustment of the individual. While industry is not in the business of running institutions for the rehabilitation of maladjusted persons, the possibilities of detecting incipient difficulties and preventing their eruption will enable men to spend their energies productively, just as helping resolve a man's medical problems is economically feasible.

Testing can help to eliminate from consideration those who are unemployable because of poor personality integration. This use is likely to be particularly helpful in screening people for jobs requiring unusual psychological capacities such as the high level of stability required in some of our overseas assignments. This is not to be interpreted as suggesting that tests alone will pick these people or that testing will make the choice infallible. Use of testing may increase the batting average.

One field of activity in which the use of psychometrics holds some promise, also in the general area of placement, is concerned with team composition. Some work is being done, primarily in the armed forces, in trying to find ways of choosing individuals who work together so that they are most productive and so that each complements the group. Since most managerial activity these days is essentially a team activity, placement of men so that group effectiveness is enhanced offers some real challenge. This is an activity at the frontier of our present knowledge and indicative of some of the directions personnel testing may follow for the future.

A presentation of this sort on employee testing covers a great deal of ground. Much of the detail is hard to remember, but it has been covered primarily to give you some impressions concerning the ideas underlying the techniques. If you have comprehended some of the problems involved, the detail is not important. I hope you have been able to see the caution which must be exercised in the use of test results. Tests provide a great deal of help, but they are not foolproof. They can yield much valuable data which can help in making personnel decisions. But tests cannot make them.

Dr. Saunders - I am sure this field is wide open and Dr. Elliott's paper bears on the earlier recommendation on the importance of psychosomatic factors. We have some measurements which are valid in some situations for measuring the man's adaptability in some circumstances. Personally, I have had very little experience with it. A good many years ago, however, I was in St. Louis and was asked by a company to make a survey of a medical department of a steel company in Illinois. During the course of my survey I found that the big steel plant which had a mediocre medical department, was very actively engaged in a psychometric testing program. They were running a battery of tests on some of their employees who were already on the job for a year or more. They tested new employees and then compared their performance after working and compared it with the performance of other employees. The president of the company felt that with the tests they were using they had a very high batting average of the type who might be resentful and might cause bad inter-personal relationships. I would like to throw this open to questions from the floor.

Dr. Schulte - You said "The psychological quality of an individual can be measured as can a medical quality." When we make an examination we see the man for a few minutes. We take only a medical appraisal of the individual. We assume that he is going to be a part of the company and can get along with people. How can we, in a few minutes, appraise an individual's personality. We don't have an opportunity of going out to an individual's home to see what kind of a family he has, etc. We only appraise an individual by the way he comes into the office, by the way he answers questions, by the way he talks and from that we can get an appraisal as to whether he will fit into the organization. Is there a sort of a quick screening process that we can use?

Dr. Elliott - I am not quite sure that the quote is exact. As far as screening of an individual is concerned, this is not solely a medical problem. There are a number of people who are concerned with the same thing. Before an individual is placed on any job you will have the composite opinion of many people and data from many forms of testing. If we can devise this 15 minute way we should patent it quickly. There are ways of getting information on people through psychometrics. There are no ways to predict absolutely the satisfactoriness of an individual. The test provides us with one more bit of information on which to base our managerial decision. All of the information we can get from whatever source is quite valuable to us. I don't think anywhere along the line, even on the basis of information obtained on the application, can we either accept or reject a man on the basis of one of these. In all units of the company there are people who are not physically at the level we would like each one of them to be. Somewhere along the line, however, there has been a judgment made that that individual is a good risk, does not present undue risks, so we take him on.

Dr. Schulte - Is it of any value to ask a man for a military record? We have gotten a great deal of information on physicals in answer to questions that pertain to military records. Many young people will honestly tell you what their military record is. When they are on the table, if it is a young lady we will find out that she is physically unclean, her underwear, slips, etc., are not clean, or if her behavior

Dr. Schulte - in the office is not according to the average. Should this be called to the attention of the employment office or not?

Dr. Elliott - This is my own personal opinion but we would like to make use of any information that we could get. In most of our locations we have not used any form of personnel testing. Whatever information is available already should be thrown into the hopper. Decisions are tough to make and any information we can get helps.

Dr. Potts - If a man's psycho profile is reflected by the tests, will the profile change as this man reaches maturity? Do his drives alter? Do they remain fairly constant? If they do change can psycho tests be used as a guide for industry?

Dr. Elliott - It depends on what you are measuring. Intelligence measured in the middle teens with schooling will hold pretty constant. Skills, obviously will change with training. Testing has a very real use here in measuring the intensity of the change. As far as personality characteristics are concerned these are learned habit patterns. As the individual has new experiences and adjusts to them these will change. An individual's personality characteristics and interest in other related kind of things can remain fairly stable after he reaches the middle 20's. Again tests get to be very useful in measuring these. One of the things we are trying to do in our management development program is to make some of these things change. I cannot say categorically yes or no. They are measures of habit patterns.

Dr. Saunders - Regarding Dr. Schulte's question and answer to it may I say I am sure that all of you who are successful in your profession of medicine and nursing, develop skills that you don't know you have in evaluating people during the somewhat brief contact you have with them during the pre-placement examination. Very often you get impressions as to cleanliness, the way he sits in a chair, etc., indications that you may not note down on the examination. We may find nothing with our instruments but here we feel is an individual who is maladjusted on the job. We have no classification for this on the 1094, but I feel it is our duty to talk to Employee Relations stating that we possibly feel this is not a good candidate for this job.

Mr. Hommel - I don't know that I have any experience here but I believe that at headquarters we have been receiving that type of service. I am happy that in most instances findings of this nature have not caused you to reject the person but you have passed the information on as one more bit of information to appraise the candidate before hiring.

Dr. Saunders - Has there been any correlation between our opinion and personnel's?

Mr. Hommel - I am sorry to say that in some cases your opinions have been correct.

Dr. Saunders - There is an item on the pre-placement history form where it asks for previous employment and the reasons for leaving. This, of course, has some validity but it is also of a great deal of use for recording on the man's medical history what jobs he has had and what he has done, why did he quit those jobs. This is in line with Dr. Schulte's remarks on military history.

Dr. Samuelson - I should like to ask Dr. Elliott if there is any correlation between simple mathematical tests and psycho testing? About two years ago we devised a series of screening tests. With about 40 or 50 openings in the Accounting field we had 200 people applying. Of these 200 there were many that they did not want. By the time they had gone through 1, 2 and 3, many of the undesirables had been weeded out.

Dr. Elliott - I suppose so, yes. It is conceivable that mathematics will have different attractions for people. Sometimes cause and effect relationships cannot be computed by relationships that exist. A 15 minute test showed how an individual absorbed things as he grew up. This may be an effective means of selecting people for high positions. This seems to be a better test than those tests which may appeal to have a closer relationship to the job.

Dr. Myers - It is very important to assess not only the employee but especially his wife when preparing families who are going to West Africa. We had a case of a young man in the wrong job, a job for which he was not suited. He was young, brash, an extrovert with a wife and no children. He eventually had a nervous breakdown - was sent home with the recommendation that he not be returned to West Africa. However, management decided otherwise, the man returned and is now fine and doing fine in a different job which is one he can handle. The family has had a child and all is going extremely well.

Dr. Luongo - I just revised my whole opinion of psychopaths. I think they have a suffering mind. I am just wondering whether it is not conceivable in setting up criteria for future performance if emotional instability might not be an advantage, especially in creative work - nuclear physics, designing. What are your thoughts in not ruling out emotional instability?

Dr. Elliott - You don't rule out anything until you see if it works or not. Psychological testing is a highly empirical business. There are circumstances where you look for the non-average in probably more instances than not. Having verified your tests against some established criteria you find that those individuals who perform well are non-average in many instances. If it were a well established test we might very well be trying to find people who were not in the range of normal.

patients who have been in less fortunate economics where recognition was not likely to be so acute. The group supervising and handling such patients treat first those who have had rheumatic fever within the last 5 years. They also treat all those people with rheumatic heart disease; all children who give the diagnostic criteria of any type of rheumatic heart disease; and all children who give a history, that is bona fide, of rheumatic fever. Remember there are many children with rheumatic fever histories who do not end up with murmurs or with rheumatic heart disease even if they have one or two attacks of rheumatic fever. With adults, the situation is about the same; that is, they treat all the patients who have had an acute exacerbation of rheumatic fever within the previous 5 years. They treat all the patients with a rheumatic fever history who are in occupations where exposure is likely to be particularly great; i.e., physicians, nurses, doormen exposed to cold weather and others in outside jobs. Lastly they treat all types that meet the diagnostic criteria which classifies them as rheumatic heart disease victims whether the patients give a history of acute rheumatic fever or not.

There are two types of drug therapy. Sulfadiazine, which very few people now use except in certain select groups, is given in 1/2 gm. doses daily for small children. The dosage is increased, according to child's size, up to a gram for the ordinary child. Usually, however, penicillin (with monthly visits to the Prevention Clinic) is used in children. A special solution containing a million two hundred thousand units of slowly absorbed penicillin is given to the patient once a month on this program. It is curious how these children who have had rheumatic fever, even the older age group, particularly those who have had good training at Irvington House, return time after time to get inoculated. They are quite faithful about it and unquestionably it does keep down the throat count of streptococcus A. One must always realize that we have had tremendous cycles in the activity and severity of rheumatic fever, particularly as observed here in New York City. I am unable to speak for the rest of the country but in the past few years we have seen much less of the severe fulminating type of rheumatic fever ending up with the severe rheumatic valvular disease after one or two attacks that was formerly common at the ordinary hospital. Even at a large hospital such as Bellevue, I am sure that they are not seeing as many cases of the severe fulminating types of rheumatic fever as formerly. At this period rheumatic fever is on the downgrade so to speak. Since it has reached its peak, we must be very careful about these statistical evaluations regarding effectiveness of drug therapy in preventing rheumatic fever.

Furthermore, this has been a very lush period economically. We know living conditions have a tremendous effect on the incidence, severity and recurrence of rheumatic fever. In the past during periods when the economic condition were the poorest, the highest percentage of occurrence was in Boston and in certain sections of London. Here in New York City, during this same period, we saw a great many more cases of rheumatic fever down on the lower east side than we did on the west side or uptown where the economic, living and food conditions were better. Presently the only thing I would be willing to say as a result of the present study is that the streptococcus count in the throat cultures of these patients is sufficiently down to make one rather convinced; if one is convinced that rheumatic fever is caused by streptococcus A, that the treatment is going to be reasonably effective.

I would remind you of one further item. All people with rheumatic heart disease and those with a history of rheumatic fever whether they have bona fide rheumatic heart disease or not, should have penicillin before, during and after surgery. There is a transient bacteremia with any type of surgery even one extraction of a tooth which is commonly the focal point for producing sub-acute bacterial endocarditis.

One of the major advances in cardio-vascular disease has been in surgery of rheumatic heart disease. Most people are convinced of this. I say most people because there are still some skeptics who are not convinced. The greatest advance has been in the cases of pure mitral stenosis resulting from rheumatic heart disease. As far as the other valvular lesions are concerned, there is a great deal of question. One has to be very cautious in the evaluation of such surgery especially the pre-surgical evaluation of people with aortic valvular disease. There are two types of surgical procedures, one the so-called purse string tightening of the aortic valve, the second which uses an artificial plastic valve which makes a lot of noise after surgery and causes much complaint from patients. Both these surgical procedures and the one for aortic stenosis carry a very sizeable mortality. My own experience with these has made me wonder, except in those patients who are so advanced that we have nothing else to offer them, if we should not do any surgery on the aortic valve until we get a better method. I realize that this is not going to be a popular statement with vascular surgeons. In cases of mitral stenosis, one has to be careful about the diagnosis and you must satisfy two criteria before you should advise surgery. As far as our particular group is concerned, we like to see the beginning of the cachexia, the wasting, and the muscular change that takes place in these patients preceding cardiac failure. Also we expect to find that when catheterized, these patients will show a rise in right ventricular pressure that is quite sizeable after exercise. If you stick to these two criteria, you are likely to meet with success in surgery of such cases.

Another thing to remember is you do not remove the disease with surgery. All you do is open up a tight narrow mitral valve -- the scarring in the valve which has been present for many years is going to remain. These patients cannot go back to heavy type of labor and expect to do well. Most of them fibrillate after their operation and continue to do so. Essentially this surgery is NOT a cure. From our experience and the experience of Richards and his group at Bellevue, it would seem to us that the probabilities are that the surgery for mitral stenosis is going to prolong life and greatly cut down symptoms for a period of 7-8 years. There will be some cases that last much longer than that, but it is not going to be the great cure-all that the newspapers will have you believe. It behooves one to be a little conversative about this procedure.

The greatest advance has been made in the field of surgery in cases of congenital heart disease. I do not plan to go into congenital heart disease today because it is a field all of its own and does not represent a problem in industry. For those of us who have been in cardiology for a long period, our problem was essentially the diagnosis of congenital heart disease. We were not concerned with localizing that particular finding. Now it is a field of its own and requires much special technique, special study, catheterization, visualization before one can give a good evaluation of a case. Also such cases require the best in surgical, nursing teamwork before and after the surgery in order to expect the most successful results.

Hypertension is another one of the most important group that you have to deal with in adult life. There have been many advances in hypertension principally by means of sympathectomy. Sympathectomy is no longer very popular. I am inclined, however, since our group had the second largest series of sympathectomies to think highly of it. Sympathectomy is probably the only surgical treatment that really reversed the disease in a very small percentage of cases, and in about 10 per cent of these patients you seem to get and still seem to have a cure. In about 35-40 per cent you get a tremendous benefit and improvement, but it is a rough operation and rough procedure. It has a mortality rate of 10 per cent or more. It is not popular anymore because drug therapy is so much easier.

Drug therapy offers in the future a tremendous opportunity for advance. There have been three types of drugs that have been used. No great discussion will be made here of the three drugs because it would take more than the time allotted. There is first the group which, pharmacologically, I do not believe we understand how it works. This group is made of derivatives of Rauwolfia which has a mild effect on mild essential hypertension and which has some effect on the more severe types of hypertension. One can never predict exactly how much effect it is going to have. I would like to emphasize here to the physicians and nurses present that essential hypertension in the majority of cases is a mild disease, slowly progressive over long periods of time. A great many of patients with this condition have it over 25-30-35 years. As long as they don't have their blood pressure taken too often and, as long as their attention is not called to it, and they are not warned too much, all will go well. I think that over treatment is just as important as under treatment. Rauwolfia has certain unfortunate side effects. In a small percentage of cases, you get mental depression. Also, there have been reported recently cases of convulsive seizures as a result of over medication with Rauwolfia. Such reactions could and also do occur with rather small doses.

The second group of drugs is called the ganglionic blockers and this group offers the best prospects for the future. There are many different ones in this group and I will not attempt to name each and everyone of these. The most popular ones at the moment are Inversine and Ansolysen. Warning should be heeded that, if you are treating a severe malignant type of hypertensive disease, with an effective dose of the ganglionic blockers, you get certain side effects which make an individual not very acceptable for most industrial jobs. The side effects with an associated but resulting absenteeism are really justified. Many of these patients are not able to control their reactions if they have more physical exercise than they planned, or, if they happen to imbibe in alcoholic beverages, they are apt to faint. Therefore, they represent a group not easily managed as far as industry is concerned. Usually only the patients with milder forms of hypertension are able to work and yet remain on medication. This group of drugs, especially when produced in more refined types, have tremendous future possibilities. They are certainly the most effective in cases of malignant hypertension where heretofore we have been unable to offer any help except sympathectomy.

The central acting drugs, i.e. Apresoline et al can and have been very effective - whether you use in combination with Rauwolfia or the ganglionic blockers. However, again, they have side effects which make a person rather susceptible to reactions which may jeopardize an individual's position. A patient who is on these drugs in any sizeable quantity for severe malignant hypertension, should never be placed where they are responsible for or be able to cause damage to other individuals. We still have quite a long way to go with these drugs but they do offer extremely hopeful possibilities.

Now we come to arterio-sclerotic heart disease. Most of us are convinced that the incidence of arterio-sclerotic heart disease is greater than it was 25 years ago. One of the difficulties is that we have no statistics from that time for comparison to present figures. There are two particular pathological studies which help us to draw some conclusions. One study was done in the first World War and one was done during the Korean War. The results of the study done during the Korean War was alarming enough to make all of us feel a little disturbed. Most people are interested in the prevention of the disease entity but there isn't any prevention. There is much publicity in the newspapers and magazines about diet relating to arterio-sclerosis. I have made as many mistakes on this score as anybody else. In the early days, I worked on the cholesterol problem and published some articles, thirty years ago, which I now wish I could have back. It is my belief that most people who have worked the longest and who are most sensible have concluded that there is no particular food that people must avoid particularly. The only thing on which opinion is unanimous is that an individual ought to stay at or below a normal weight. The fad about cholesterol, the fad about particular fats and diets are, in my opinion, just that, fads. Many people in the medical profession will disagree with me on this point. The difficulty has been that the persons who do the bio-statistics and are fine bio-statisticians don't know anything about arterio-sclerotic heart disease as a disease. Likewise, the people who know much about it as a disease, don't know anything about bio-statistics. Trying to get both sides together produces quite a lot of confusion.

Detection of arterio-sclerotic disease is important especially in industry. I don't understand exactly why it is so important because there is not much we can do after we detect it. Outside of general measures, we have no specific medication. I would like to caution you that the only way to detect arterio-sclerotic heart disease is by careful history. The most successful of the work classification units have come to the conclusion that the history gives them more important information, if they can obtain an accurate honest history, than the actual physical examination. There are many people with abnormal physical findings who are perfectly healthy and able to carry on with their regular activity for years and years, but it is a thorough history that gives you a lead. In industry, I realize you physicians do not always get a good history. The patient is reluctant to talk to you but may do so to an outside consultant. Sometimes mass testing has been tried such as electrocardiographic stress tests and cholesterol determinations. I have not been convinced by anything else. The only way that I have been reasonably successful in detecting the disease in advance is by a rise in blood pressure or by a history the patient gives of distress when the heart has to increase the amount of work that it ordinarily does.

Dr. Klein mentioned something about the prognosis of coronary thrombosis. This must be determined on an individual basis. There are certain general factors that we know about and always have to take into consideration when you think about the prognosis of a given individual. The family history is probably most important or at least it seems so here in New York City where we have quite a sizeable number of family histories that are astonishing. I have one family in mind where four boys all have had coronaries before the age of 30. The youngest was a senior at age 19 at the University of Chicago when he had a very sizeable anterior infarction. These are particularly common in the New York area and not quite as common in areas outside of New York City. The family history is a very important thing. Age is not as important as the family history and the presence of a preceding increase in blood pressure or a blood pressure which remains elevated during the convalescent stage and again rises to its previous very high level after the episode. Such people are notoriously bad risks and do poorly.

Other people with arterio-sclerotic heart disease have a very good outlook. They live long lives, are very active. If these do not have other special conditions and do not present a history of large coronary thrombosis involving much area of heart muscle or a preceding series of coronary thromboses, such individuals do very well for at least ten years and are much better off if allowed to work. In America, few people are trained well to lead lives of leisure. Either we don't feel we can afford it or we just never take time to learn other things that satisfy us. There are very few patients or individuals who can suddenly retire, particularly from business life. In my experience, the higher a person is placed in the business field, the harder they fall. The higher an executive is placed, less time is spent trying to learn something new to enjoy. This man is so busy being successful in his job that, when you release him after a minor coronary, the majority of such a type is much better off if they are left in their job. They can be reasonably but cautiously watched by their own physician and in conjunction with the physician in charge of the patient's industrial medical department. Such patients have a surprisingly good outlook.

Sometimes we in cardiology get a little bit discouraged. We don't think we make quite as much advance as they do in other fields. This is a particularly wonderful era now. I have seen pneumonia practically disappear, sub-acute bacterial endocarditis which was one hundred per cent fatal, venereal disease, and syphilitic heart disease which used to occupy every other bed in our teaching institutions. Now we have to search in order to find a case to demonstrate to medical students. We are forced to use tape recordings most of the time for demonstration purposes. Then when you think about cardio-vascular diseases, you realize it hasn't been too bad.

REHABILITATION OF THE CARDIAC IN INDUSTRY

Irvin Klein, M.D.

We live in a mechanical age, in which individual acquired skills are essential for the advancement of industry and the improvement of man. When, because of an injury or disease, an individual becomes partially disabled, it is incumbent on industry to re-employ him, so that it need not be deprived of his special experience and knowledge, and that he be not deprived of the means of earning a livelihood. It is clear that industry suffers more through the impairment of a worker's health and the consequent loss of his talents, than through the breakdown of a machine. One of the more important problems in our present industrial civilization is the hiring of the disabled.

Until recently, the efforts of physicians were directed only to the treatment and cure of the physical impairment. The rehabilitation of those who were sick or had been injured was given little thought.

The basic purpose of rehabilitation medicine, vocational guidance and selective placement is to overcome the diminution or loss of special skills. Few patients are permanently totally disabled. The great majority has only a partial disability. It is necessary and wise, therefore, to restore as far as is possible, the maximum physical, mental and vocational capacities to a handicapped person. The residual capabilities and not his irreparable disability, should receive our attention, so that they may be further developed and eventually employed.

In order to achieve this, it is necessary to have the willing cooperation of the physicians, as well as experts in diverse fields - medicine, psychiatry, surgery, social service and those qualified in the retraining of the handicapped.

The employee's willingness to work is in great part affected by his physician and his family. Commonly, as in cardiac disease, the disability is not of overwhelming significance. The fears of heart disease, thoughtlessly suggested by the physician and nurtured by the patient's family, may be the cause of the protracted disability and the unnecessary idleness.

Idleness, whether encouraged by family, litigation, physician or employer attitude, is among the more important destructive factors causing worry, want, privation and fear of dependency on charity, of one form or another. Morale and self-esteem are too easily shattered and family ties broken. Unemployment must be avoided whenever possible. However, a handicapped person's employability depends not only on his willingness to work within his abilities, but depends, as well, on the willingness of industry, both large and small, to hire him.

Rehabilitation begins as soon as it seems wise for the physician to explain to the patient, as simply as possible, the facts and outlook of the heart disease, in order that the patient does not become the victim of careless remarks, unsubstantiated lay impressions and over-zealous relatives' superstitions. A closer view of any problem serves to dissipate much of the fear

and misunderstanding inherent in it. Functional cure of coronary infarction is rather a common finding. Most patients can return to full or part time work, since, rarely, is the maximum effort possible, used in any job. In most instances, the infarction may reduce the total available energy, but frequently not below the demands of the job, so that many are able to return to their old positions.

Those who suffer from some form of angina pectoris, can prevent its occurrence by the avoidance of the precipitating physical and emotional stresses and the proper use of certain medication. The unbridled eagerness of some patients to work can easily be affected by the sage, thoughtful and deliberate advice of his physician.

All endeavors which affect the entire community must have, as their base, good public relations. An employer can hardly be expected to engage a cardiac, if he has little faith in the statements which the physician makes, and if the monetary compensation risk he is asked to assume is beyond reason. The employer must be impressed with the honor, the ability, and impartiality of the physician. He must be assured that the medical reports furnished are adequate, in that they adhere to the known facts and that the medical testimony given is beyond question.

The usefulness of the cardiac in industry has already been well established by experience. Many, who have been permitted to resume work, have evinced an ability to do their assigned task, and have shown a devotion to duty, which compares favorably with that of their healthy co-employees. However, experience has also taught that the employment of cardiac should not be a chance, haphazard matter. The job must suit the particular employee and each employee must suit the particular job to which he is assigned.

Vocational guidance, an essential factor of rehabilitation, seeks not only the job best physically suited to the cardiac, but also the one which will bring him the greatest contentment. To attain this, industry can and should provide a complete list, together with a detailed description of the work entailed, of each available job. Without the latter, listing is worthless and deceiving, since naming each position gives no information about the job. The personnel officer, therefore, would have no guide in placing the disabled cardiac in a job suitable and safe for the employee and employer.

In order that the physician may be able to match his medical determination of the patient's abilities against the demands of the job under consideration, the job analysis must be thorough and well documented. This is a most difficult task but if successful, is most rewarding.

An exact diagnosis is, perhaps, the most important single feature of this study, since upon it rests the original decision to consider a given patient for employment. The physical ability of the patient can then be determined by various standards - the frequency of attacks of pain, need for medication, degree of effort to bring about symptoms, and tests of cardiac function (if not contra-indicated). Vague statements may be very harmful. They may permit a cardiac to work at a job for which he is completely unfitted or may needlessly limit the activities of a person whose abilities exceed the requirements of the assigned position. The diagnostic classification as

promulgated by the New York Heart Association, should be used, so that there would be no confusion as to terms or functional determination.

The experience at the Work Classification Unit at the Cardiac Clinic, Bellevue Hospital, reveals many interesting features on ability, retraining, returning to old job, diagnosis and vocational guidance, as well as other features. Much of this material is being organized and will soon be published in a series of papers.

It is noteworthy that no diagnosis of heart disease could be made in over ten per cent of the patients seen there, after prolonged study. Interestingly, a considerable number of these returned to their former jobs. The experiences of the Sheltered Workshop is revealing in the lessons it taught in a group of cases. Finally, no test has yet been devised which measures more accurately than the clinical evaluation, the function of the cardiac for work.

In many cases, retraining for a new type of work has to be considered before placement can be initiated. This involves a study of the familial background, education, work history aptitudes, as well as psychological testing in special cases. This material must be carefully evaluated, for if an error is made in this area, the patient's future is placed in jeopardy. Repeated retraining or a re-evaluation usually results in discouragement of the patient and makes further procedures exceedingly difficult and unrewarding. Great care, much competence and an unusual understanding of the patient are essential.

When the cardiac has been carefully studied and the job carefully analyzed, he is ready for the work which a balance of these considerations indicate. This constitutes selective placement.

The employer must then be induced to hire the disabled person for work for which he is fitted and trained. Failure to obtain employment will be a waste of all efforts described above, and will serve only to impair the enthusiasm of those interested; the patient, the physician and those in the supporting services. The employer must understand that job shifting without the consent of his physician, the foreman and the personnel officer who originally made the job assignment, is not permitted. If a disabled cardiac is compelled to work beyond his capabilities, the entire Selective Placement program may fail. The improper application and poor results of a program originally well conceived, may make more difficult the future placement of other workers and may eventually lead the employer to decide never to engage the disabled. (Proper follow-up is essential.)

Industry may thus lose certain skills, the worker his dignity and society may be compelled to support a destitute worker and his family.

In order to foster the employment of the handicapped, and to diminish the compensation costs to the employer, forty-three states have enacted some form of "Second Injury Law." The New York State Law has been briefly outlined in an article in the New York State Journal of Medicine (56:14 July 15, 1956). It is to be noted that of these forty-three states, relatively few make provision for the re-employment of the cardiac. Other injuries and illnesses, among workers with untapped aptitudes and skills, are also not given adequate consideration in the Law. An unwise omission in the face of experience.

The re-employment of the cardiac - as well as other disabled people - is to be encouraged and sought. The employment of the partially disabled is a boon to himself, to his family and to the community as a whole.

DISCUSSION

Dr. Livingston - Would Dr. Poindexter please comment on the subject of surgery in arterio-sclerotic heart disease?

Dr. Poindexter - I didn't try to go into the subject of surgery in arterio-sclerotic heart disease. Basically, the results with it have been extremely disappointing in spite of Dr. Beck's enthusiasm and it's inconceivable both physiologically and actually to me that we're ever going to have surgery that is going to cure arterio-sclerotic heart disease. You remember that it is an internist vs. a surgeon's enthusiasm. It is the internist who has to listen to the complaints all day. The surgeon stays in his office just for an hour and comes and says to the patient "My you look better and are better, aren't you" and the patient can't say no. It is the internist who has to really find out. I can't see where it has the potentialities. We have to go back and find out more about the cause of arterio-sclerotic heart disease - which we are beginning to do now. I don't think surgery is going to be the answer.

Dr. Clinton - I wonder if Dr. Poindexter would comment on anti-coagulant therapy over a long period of time.

Dr. Poindexter - This is a popular treatment. I don't have as much enthusiasm for it as Dr. Irving Wright does. Anti-coagulant therapy over a long period of time as yet really has no statistical proof. When it does then I will be perfectly willing to advise it. I think it would always have hazards in industry because of the possibility of any accident which happened which would cause an increased amount of bleeding and for the patient who is working in an industrial job that has the potentiality for accidents. I don't know whether it is of any value or not. I haven't seen anything yet to convince myself but on the other hand I haven't used it very much.

Dr. Roberts - Will Dr. Poindexter name some of the ganglionic blocking agents?

Dr. Poindexter - I have worked with all of them. The two that I have used most are Inversine and Ansolysen and are the two that I like the best. There are many others and a new one that Wellcome is putting out now is also apparently good and not only works very much as a ganglionic blocking agent but also increases the amount of sodium output in the kidneys which has recently had considerable newspaper publicity. I haven't used the drug at all. The English have different types of drugs that they are using. Everybody is experimenting on new types of drugs so it is practically impossible to use all of them. You have to try to line up one or two and learn as much about those as you possibly can and use them quite cautiously. You have to creep up on the level that is really effective, otherwise, you are likely to get much beyond the peak and when you get beyond the peak you have some very unpleasant reactions; i.e. fainting and there have been a number of instances where it looked like it was responsible for the patient's death, and after all that is not very successful therapy.

Dr. Graham - Do you put patients in the hospital for regulation of hypertensive therapy?

Dr. Poindexter - I put patients in the hospital for regulation of hypertensive therapy. I think that ideally they are very much better off in the hospital if they can economically afford it. They are very likely to get the right dose and have it regulated more correctly if they are in the hospital but I think it is perfectly possible to do it in the office. I am very doubtful about this procedure of having patients take their own blood pressure and I am not at all convinced that that is a very good scheme. It is one that is recommended by a lot of people including Schroeder and he is much more of an expert on hypertension than I am. I think it has a bad psychological effect on patients.

Dr. Luongo - Thank you Dr. Klein for a very stimulating presentation. You have heard some of the areas of interest involved in hiring persons with cardiac impairments. You have heard the clinical considerations and we have touched on the employer's attitude. Dr. Klein has touched on the question of industrial liability, insurance factors and he has given you a brief review of some of the findings in the work classification unit with which he has been associated. I think in the experience of most of these work classification units that you can find a lot of benefits have been brought to the people, the workmen who have been returned to jobs and are in gainful employment, many of whom would not be able to resume gainful employment. I think you'll see a lot of benefits to the families of these men, benefits to the community from the standpoint of saving the man from being a public charge. Certainly in my own experience, these cases can be properly evaluated and so properly placed that most of them can resume gainful employment. In our experience in General Petroleum which I mentioned last year, of those that survived their attacks, fifty per cent were able to return to their regular jobs and about fifty per cent were returned to modified duty jobs. I am sure you all have some questions for both Dr. Klein or for Dr. Poindexter.

Dr. Gaunt - How do you handle and rehabilitate a 56 year old man for example. He claims he has chest pains and can't walk a quarter of a block and he has absolutely no physical or laboratory findings. The cardiograph is normal, the white count is normal, sedimentation rate is normal.

Dr. Klein - There is nothing you can do with an individual of that kind. If he claims that he has pain even though you cannot prove he has the pain and if he can't walk more than a block he certainly is not industrial material. Even though we can't say he has a medical disability, he certainly has an industrial disability. If we cannot classify him in one compartment, we will just have to classify him in another compartment. We cannot prove him medically ill but he certainly is industrially ill. We have to drop him. In our unit we do not contemplate work for anyone 3C and below according to the New York Heart Classification, and so he is one of the ones who would

Dr. Klein - fall in the 30 or below category. May I add something that I forgot to say in my direct testimony. I don't think any tests will give us information as to how much work a person can do. I know at the Cleveland Clinic they have them walk on a tread mill but that's nothing like the work he does in driving a truck or a car. Walking on a tread mill seems to me not the way. The only way much of the classification can be worked out is on history. Our forms at the unit go into every little detail from the moment he gets up in the morning, to how much he has to travel, how many buses, subways he takes, how many steps he has to climb. We have had fellows who have gone to work on one line of transportation and come home on another just because of the stair climbing.

Dr. Howard - Being neither an internist nor a cardiologist perhaps I shouldn't get into this. I have enjoyed it this afternoon very much because we have had clear cut statements made until the statement regarding truck drivers made by Dr. Klein brought the subject up again. As you know I have reason to question many of the cardiologists in our program in the past. Is it safe to put this man who has had a coronary infarction and recovered with or without cardiographic abnormalities back driving a gasoline truck? My position has been that it is safe and so far I have no reason to regret it and we have been doing it for a good many years. There is no doubt in my mind that some day soon perhaps we will have an accident but I'm also willing to bet that when that happens it is more likely to be in the individual who has never had a coronary than in one that we know has had a coronary. It has been our experience before that men who drop dead have had no previous known heart disease. It doesn't seem to me logical reasoning to say that a man cannot drive a truck yet can drive a car. Certainly, we need no emphasize on the reports in the papers that the most lethal weapon that the United States has today is not Sputnik but is our automobile on the street. In the 300 h.p. weapon which is our modern automobile, to my mind it is just as dangerous as a gasoline truck. If we say there is such a danger in driving a truck, we should logically follow it through and say that a man shouldn't drive at all. If we are going to quibble why not say that he can drive little import cars but he cannot drive one of our large American cars. If we say there is an abnormal risk we should say that that man should not drive under any circumstances or follow through and say that the risk is so slight, which I believe it is. It is a reasonable attitude to take and certainly we are going to have to take a certain amount of risk but if we are going to practice medicine in such fashion that we take no risk we might as well stop practicing medicine. You will recall in Kansas City that the question was raised about such men driving trucks. We are not talking about the man that has symptcmology and evidence of insufficiency. We are talking about a recovered coronary and when that question was raised the speaker at the time said no he would not let him drive, and he was a little huffy because at that time President Eisenhower had just had his attack and he read into the question some political implication which was not there. After the meeting I asked him why he had said that and he said that he didn't want his name in the headlines of the papers. Frankly, I believe that is the main reason why doctors say they should not drive. They are

Dr. Howard - afraid of the risk that might be implied and the possibility that their names might be spread in the papers. I think that we have to assume reasonable risk in practicing medicine and I don't think that that is an unreasonable one. I would like to go on and ask Dr. Klein about the compensation aspects of the Second Injury Law. Did I correctly understand him to say that you must not tell or it is not necessary to tell the employer what organ is involved in the disability? Is it enough to say that this man has a permanent physical disability and not tell him that it is cardiac or musculo-skeletal or any other type of organ? According to my interpretation, there must be something more specific in order to hold up in the court room. The other thing is, and Dr. Klein knows me well enough to know that I'm not trying to be crabbing in my criticism, I personally would be a little hesitant to use the Second Injury Law. Its intention is excellent. I have criticism of the Workmen's Compensation Law but I am certain that all of us who have been in practice long enough and deal with compensation, recognize that many employers unfortunately have tried to shirk their duties and responsibilities to men who have been injured in the course of their work. I think that we have gotten far enough along in our social system to recognize the liability that rests upon an employer's shoulders in taking care of such individuals. At the same time, it has been my experience unfortunately in many cases to have interpretations come to my attention by the referee that makes medicine seem to be of two kinds, one that we teach in our schools and another one that we practice down in front of the Workmen's Compensation Board or legal court.

Dr. Luongo - Do you have any comment on that, Dr. Klein.

Dr. Klein - I can do nothing more than agree with Dr. Howard. The method of evaluating testimony stems from our judicial system. What possesses a jury to give \$70,000 in one award in one case - \$40,000 for an award in another case with similar circumstances and makes the plaintiff pay the defendant in the third case, I have no idea. I have never sat on a jury. I do not know what mental processes possess these people who sit as judges. I say let the medical testimony be of such nature, such character and such truth and such sincerity that it will leave no doubt in anybody's mind what the medical facts are. I cannot explain to you what or why things happen. All I know is that if you look through the minutes of any given case you will find medical evidence sworn to that covers the point in question - I am sorry that is the best and most honest explanation I can give and I too am not begging the question. Now as far as the knowledge that a condition exists perhaps in my enthusiasm to make the point about disability contrasted to diagnosis, I may have left the impression that we don't need a diagnosis at all. We do, and it is important. The point I wanted to make was that it is the disability that is stressed based on diagnosis. Now a man can fall down an elevator shaft and walk away from it. A fellow can step off a curb and fracture his ankle. A fellow can have a heart attack and be a total permanent disability. A fellow can have a heart attack and have a very mild,

Dr. Klein - permanent partial disability. I mean the diagnosis itself doesn't constitute the disability. The employer must know what is wrong with the man. Now there is some question raised on privilege communication in this particular. I think that if the man submits himself for a job and submits himself for a pre-placement examination, he has waived all privilege communications insofar as his relationship with the particular potential employer is concerned. It doesn't mean that the employer has a right to post this man's medical condition on the billboard.

Dr. Luongo - I'm sure you'll also agree Dr. Klein that the average attorney for a claimant won't take any medical evidence into court that will be damaging to his case and you're bound to have two sides or two viewpoints with the preponderance of evidence resolved in favor of the applicant.

Dr. Klein - Well if there is sincere doubt and that happens occasionally, I think that everyone here will agree that the doubt should go in favor of the claimant. I don't think there's any question in that. We all agree with that but that is only in a case where there is honest doubt.

Dr. Worrall - Mention has been made of the physical factors involved when these men go back to work. Would you say something about the importance of stress factors when the return, i.e. stress factors in the etiology of heart disease.

Dr. Poindexter - As far as original etiology is concerned as to whether or not stress causes heart disease, coronary heart disease or hypertensive heart disease, I think it's a pretty questionable subject. I'm not at all convinced myself in spite of all the enthusiasm that a lot of cardiologists have for pointing out that the pace of modern life is responsible for the increase in heart disease. I'm not at all convinced that it is the responsible thing. I do think, however, that what you have to do is to set down for them the fundamental rules you have to do for any patient with cardiac disease. Whether it's an executive or whether it's a person that works in the most menial job in a factory, he must not get excessively fatigued. He must not do anything fast enough that is going to produce symptoms whether pain, shortness of breath or palpitation. He should have some period during the morning or the afternoon in which he has an opportunity for a short period of rest. I think that he should be protected that much - other than that I think each individual case has to be handled very special - because the higher the executive the more personality you have involved and the more they resent being told what they should do. They are determined then to show the world, particularly the company, that they are able to do their job as they were before, in fact, a little bit more so.

Dr. Luongo - Do you agree that sometimes stress is a factor insofar as making a man eat more and get heavier.

Dr. Poindexter - I don't know whether stress is responsible for eating more or not. I suppose it might be in certain individuals.

Dr. Gaunt - Why don't they allow handicapped people to sign waivers if we are so anxious to have them return to work.

Dr. Klein - In the New York law no waivers are permissible. The waiver cannot be signed as a part of employment. If you have a good Second Injury Law and if you took the trouble to get a waiver for pre-existing disabilities you would then have knowledge of the pre-existing disability and if you had a Second Injury Law, you do not need a waiver because you have knowledge so a waiver would be unnecessary in any event.

Dr. Gaunt - Then shouldn't we lobby to get the law passed so we can get the handicapped back to work.

Dr. Klein - May I ask a question now? Do you believe that with the waiver industry would be far more willing to hire the handicapped than they are now without the protection of the Second Injury Law. Suppose that you hire the cardiac - suppose that this cardiac had a second attack of his heart condition - in that case your waiver would help you. Suppose, however, he slips and breaks his hip, the employer would be out of luck under the waiver system whereas under the Second Injury Law system he is covered for any and all resulting disabilities later on whether it be to his heart again or to his hip, or to his eyes. The employer is covered fully even up to death. I think that the Second Injury arrangement, properly arranged, is better than the waiver system which we cannot use in New York anyway.

Dr. Howard - I would like to favor Dr. Klein's side and say that I would not be in favor of the waiver. I have had enough experience with New York State Compensation Law to know that it would be grossly abused by employers. We all know that such things would be abused unto death. I don't believe it would be justified. The question of Second Injury Law does come up in this way. If the Medical Department has in its record a full history and a record of what they found on physical examination is that acceptable, do you know, as the knowledge that the employer has knowledge of existent medical conditions.

Dr. Klein - If the person that is responsible for the hiring must have knowledge that this man has a permanent pre-existing disability, he must hire him with the knowledge that he is hiring a disabled person or a handicapped individual. There has been held, in certain situations, that where the doctor had knowledge - he had the knowledge on the part of the employer for whom he examined this man. It was presumed that the employer had knowledge. That is a fine legal point which I am not prepared to argue. I would say that the safest way for the physician in the medical department of any employer would be to make sure that the hiring individual hires this man - the man that really puts the stamp on the employment of this particular individual hires him with the knowledge that he has this permanent disability.

Dr. Hinton - Does this apply to service connected disability?

Dr. Klein - The law does not say where the pre-existing disability came from. He might have been born with it. He might have acquired it during some illness, in another compensation accident, in another accident

Dr. Klein - outside of his employment, in any number of ways. The law doesn't care how he acquired it - the only thing that is important is that he has it. The law was originally suggested for the benefit of the veterans coming back from the War in 1944-45, but you could not apply it to the veterans only because that would have been classed legislation so it had to apply to the entire population.

Dr. Kantor - I would like Dr. Klein to answer Dr. Howard's question regarding truck drivers?

Dr. Klein - I believe that the individual case has to determine what the doctor will suggest insofar as driving is concerned.

THE ADMINISTRATIVE MANAGEMENT OF THE INJURED WORKER

"THE NURSE'S ROLE"

Mrs. Eleanor Zar, R.N.

The occupational health nurse functions as a member of a team within an industry to protect and improve the health, safety, and well being of each individual employee. The emergency care of injured employees will probably always be one of her major responsibilities. In this area of care of the worker, the nurse must work under the general or special supervision or direction of a physician. It is recommended that medical direction, for routine emergency care, be provided through well formulated, written procedures outlined and signed by the medical director of the health service. Procedures are designed as written directions, approved and signed by a licensed physician and acknowledged by him to be procedures that may be performed by a designated nurse or staff or nurses under certain circumstances. These procedures serve as authorization for approved routine care of minor injuries and as a directive for emergency care of more serious conditions until the services of a physician can be obtained. Written procedures must be "tailor made" for each plant. Before these procedures can be written for a certain plant the medical director and the nurse should visit the plant, study the industry, and the accident hazards associated with production. It is also recommended that where the plant is staffed by a first aid attendant separate written procedures must be compiled, bearing in mind this attendant's training. This control must be so devised that the employee, the industry, and the nurses are protected. It also makes for an ideal working relationship in the medical service resulting in proper treatment for the injured worker, and a professionally ethical health program for the industry.

Only about 1 per cent of all calls to the health service fall into the major occupational injury classification. First aid is the initial care given in case of injury before the services of a physician are available. However, before the emergency occurs, there is a need for organized thinking and planning of all persons concerned - the medical staff, safety personnel and department heads. The objective being to provide for rapid and effective first aid care outside of the health service. In many instances, the action taken at the scene of the emergency has a distinct relationship to the rehabilitation of the injured employee. Employees selected for first aid duties in the various departments should be selected for their emotional makeup and job stability (e.g. employees who are not subject to shift changes, or departmental changes) and preferably the department head who represents authority, should be trained to assist the injured at the scene of the accident. Not only should they be trained, but refresher conferences should be held to keep them interested and experienced. These employees can be trained by the local American Red Cross Chapter and the medical director and nurse. Instructions should be issued to the department heads and the emergency teams on the importance of calling the nurse to the scene of the emergency in potentially serious cases rather than rushing the injured employee to the health service. Emergency measures such as artificial respiration, control of hemorrhage, should be instituted at the scene of the accident. Department heads should be instructed to send other employees

to another area until the injured worker is removed. At one Milwaukee plant, a nurse recalls that during the time it took to remove the injured worker from the scene, eight observers fainted. The attitude of the nurse is most important to the worker; a calm behavior, the "poker face", but also telling the injured what the injury means, and what you plan to do will do much to allay his anxiety. At this point, it would be well to mention, "in-plant disasters" referring to a catastrophic emergency in which many employees are injured. Preparation for an event of this nature certainly calls for organized thinking and planning. Questions to be asked at that time are: What is the probable source of the disaster? Where will it strike? Can we handle it with existing facilities? In addition to the personnel necessary to handle the emergency, equipment such as stretchers, first aid supplies, should be distributed to strategic areas. This equipment to be checked monthly and instruments and dressings resterilized every two months.

As soon as is possible after the injuries have been ascertained and necessary emergency care given, the nurse should notify the medical director. In Wisconsin, the worker may select his physician from an open panel. If the nurse cannot leave the worker, a responsible person should be requested to make the call following instructions given by the nurse. If indicated, a call to the nearest clergyman of the injured's faith should be made. It is well to keep the telephone numbers of emergency assistance easily accessible. This emergency call list should have the name and address of the medical director, the nearest hospital, ambulance service, nearest clergymen, fire and police departments. After the physician has been notified and his instructions carried out, the employee may be prepared for transportation to the hospital or the doctor's office. The nurse must judge whether she should remain with the injured worker on to the doctor's office or to the hospital. It is advisable that the nurse do so in cases of shock, unconsciousness, severe bleeding. The procedure followed in death due to industrial accident would be to: Call the Medical Director or the nearest physician, and the clergyman. Also notify the Coroner. The Employee Relations Advisor and the Claim and Safety Department should be notified and the body should not be removed from the scene until notified to do so by the Coroner. The department head should be advised to collect and tag the worker's personal belongings. In the meantime, communication "via the grape vine" has taken place. The medical director or the nurse should inform the plant superintendent of the extent of injury and disposition of the case. It is at this point that the Employee Relations Department steps into the picture to notify the next of kin either by telephone or home visit and, if necessary, escorting the relative to the injured worker.

A report of any injury serious enough to require the attention of a physician should be sent to the Claim and Safety Department as soon as possible after the accident. Follow up reports should be obtained from the attending physician as often as necessary and referred to the Claim Department to keep them informed of the progress of the case. And finally, when maximum rehabilitation has taken place and the doctor has discharged the worker, a report of the discharge is sent to the Claim and Safety Department. The injury is recorded in the employee's medical folder and placed on the tickler date file for follow-up. Our injured cases are followed monthly or as often as is necessary - a fracture of the leg healing uneventfully may be checked monthly, a skull fracture may be followed daily until he is well recovered. Follow-up may be a hospital visit, home call, or telephone conversations with attending physician and employee.

are minor. Before the nurse follows guiding principles and procedures for an injury she should ask the question of herself, "Is it possible for me to assume the responsibility for the care of this injury without endangering the welfare of this injured worker?" Unless she can answer an unqualified "yes", the injuries should be cared for by a physician. The nurse has the primary responsibility for evaluating each situation and the disposition to be made of it. When the nurse has satisfied herself that the injury is minor she may take care of it following the nursing procedure that applies, and the doctor does not at this time see the injured worker. However, should the nurse or the injured worker feel the need of medical consultation at any time this should be done unhesitatingly. An appointment is made for redressing the injury and the injury is recorded on the daily medical record and the employee's progress sheet.

As I stated, the nurse in industry works as a member of the team and the relationship with the physician has been discussed. While it is not the function of the nurse to determine if an injury is or is not compensable, the nurse should know the provisions of the Workmen's Compensation Act or law in the particular state in which employed. Giving nursing care under medical direction and compiling the facts and recording them are nursing functions. And to fully comprehend the reasons for and the value of, she will need to understand the concept of workman's compensation and employer liability. To protect the employee, the industry and the nurse, adequate records should be kept. All individual records should be written in ink or typewritten and signed by the attending nurse. The time of the accident, nature and extent of injury, treatment or disposition of the case, the method of transportation, whether it be company car, private car or ambulance, or whether the patient left alone or was accompanied by other persons. If possible, the history of the accident should be written in the exact words of the worker, with quotes. Witnesses to the accident should be recorded. No detail is too insignificant to record in the worker's story. Above all, avoid interruption. Listen carefully, and never put words in the employee's mouth by asking leading questions. In the event of legal action, medical records may provide a true and objective record of the injury.

The nurse is an invaluable adjunct to the Safety Department. The nurse should be safety conscious to the extent that she is able to interpret the safety program to others. Motivating a worker to be a safe worker is a nursing responsibility - health and safety education is a nursing function. A good occupational health nurse is curious - why did the accident happen, why was it not prevented, and how can a similar one be prevented. The nurse may be the first person to discover that workers are reporting to the medical service with similar injuries from related jobs or from one department. It is her responsibility to pass this information on to someone who can do something about the situation. In Milwaukee, at the end of each month, we record the minor industrial injuries and forward this information to the Safety Department.

The desired result of the care given to an injured worker is to restore his health and his productive capacity as quickly as possible. Rehabilitation begins immediately following an accident. It is in this area that the Employee Relations Department can function most effectively. This representative has made the first move by assisting the injured's next of kin at the time of the accident. During convalescence the injured worker's concern for the security

of his job and its effect on his family are of primary importance to him. Re-assurance and a positive interest will do much to speed the recovery of an injured employee.

We had a most interesting experience in our Division which will prove the close interrelationship of the departments within the company in the handling of an injured employee. Walter F., age 45, was employed as a truck driver for the past eleven years. In October 1955 he claimed that he had injured his back three weeks prior while placing cases of motor oil and antifreeze, weighing from 56 to 70 lbs., onto a stockpile in the company's warehouse. He was referred to an orthopedic surgeon and a diagnosis of sprain was made from subjective symptoms. X-rays proved no organic pathology. He was advised to lose weight and wear a lumbo-sacral corset until the pain disappeared. He did not reduce, found the corset uncomfortable, but recovered. Six months later his supervisor reported that Mr. F. was refusing to perform his job because of back pain. In discussing his complaint with the Medical Director Mr. F. stated that he was asymptomatic at home and only suffered pain while driving trucks No. 9 and 957. He became so emotional that he threatened to quit rather than continue on these trucks. His voice shook, lips quivered and tears appeared in his eyes. He was again sent to the orthopedic surgeon and the objective evidence was negative. In the meantime, the Claim and Safety Department and the Employee Relations Advisor was advised of this problem. The Claim and Safety Department reported that Mr. F. had had 15 truck accidents and numerous minor injuries during this eleven year period. The supervisor also reported that Mr. F. was argumentative and depressed much of the time. Mr. F. denied any personal or marital difficulties. He was asked to submit to an ophthalmic and neurological examination. The ophthalmologist reported a need for refraction and stated that the discrepancy between the correction he was wearing and one that he should wear did not account for his difficulties. The psychiatric evaluation revealed that this man was accident-prone in the particular job and had developed a neurotic reaction to the back injury of 1955. Our Medical Director recommended to the Employee Relations Advisor that this employee be given another job. The sequel was that if Mr. F. wished to remain an employee of this company, he would have to accept the job opening available at that time which was that of janitor, which he did, with the promise of promotion as job openings, for which he was capable, did occur. We have had no complaints from him since that time and his supervisor reports he appears to be satisfied.

Monthly progress reports on injured workers losing time beyond two weeks are sent to the Employee Relations Advisor. This report includes the worker's name, area of employment, brief history, date of accident, pertinent data on injury, and expected date of return to work. It is the Employee Relations Advisor's responsibility to channel this information.

THE ADMINISTRATIVE MANAGEMENT OF THE INJURED WORKER

"THE PHYSICIAN'S ROLE"

M.N. Howard, M.D.

Although industrial medicine had its inception in compensation medicine the two terms are not synonymous for the scope of industrial medicine has broadened well beyond the limits of merely treating the injured employee. Indeed, a cause for the slow maturing of industrial medicine to its present stage has been the emphasis based on compensation medicine to the exclusion of wider vistas. In early annual meetings of the Socony Mobil medical family, considerable time was spent to make and to emphasize the point that a Medical Department that did little else than serve emergency treatment and follow-up care of the injured employee, was not worth a straw; it still isn't. The major effort should be directed to the overall health problems of the employees with most time devoted to examining and advising the apparently well employee, seeking to detect, delay or prevent those ailments common to all, whether employed or not. In a well oriented Medical Department the care of the occupationally incurred injury or illness becomes but a small segment of its activities, small that is if measured in terms of the number cared for and the hours devoted to this function.

Note, however, that the word is 'small' not 'minor' in establishing this relationship. For compensation illness can exact a high toll in costs both human and monetary. Proper thought and preparation devoted to the treatment of at work injuries is a basic corner-stone in the structure of a successful Medical Department. The detection of a cancerous growth in an employee with prompt referral to his physician and the early institution of the indicated medical or surgical measures will not as a rule circulate widely in an industrial plant but the application of a splint, no matter how simple, to an injured employee sprawled on his back and surrounded by anxious, curious and sympathetic fellow-workers is a dramatic episode that creates a wave which spreads as rapidly and as far as the saltiest of gossip. The dispatch with which the nurse responded to the emergency call, her disregard for her white starched uniform as she knelt beside him on the oily ground, the solicitude of the physician and his calm, sure handling of the injured, will bring approving smiles and warm appreciation. Often when a Medical Department is instituted in an industrial unit, the employee body as a rule reserves acceptance, not quite certain that this service offered may not be a Trojan horse which, by detecting disabilities, might not affect their livelihood and security. Without the full confidence and respect of the employee group, a Medical Department cannot serve adequately or well. The care of the injured frequently is the entering wedge that establishes that confidence in the medical personnel. When all the dressing is trimmed away what makes a Medical Department is not the words lettered on the door but the people within. The word of mouth reporting of the care rendered to the injured, who perforce must visit the Medical Department, the concern manifested in their prompt recovery, is the best press a Medical Department can have.

Reference has been made to the relatively small part that compensation cases present in the overall health problems with which an occupational Medical Department occupies itself. The percentage of sickness lost time resulting from

Occupational injury or disease loss in our installation been very low.

TABLE I

BROOKLYN REFINERY

<u>Year</u>	<u>Average No. Employees</u>	<u>Total D/L* All Causes</u>	<u>Non-Occup. Inj. D/L</u>	<u>Non-Occup. Hernias</u>	<u>Occup. Inj. D/L</u>	<u>Occup. Hernias</u>
1956	604	3,498	263 (7.5%)	80 (2.3%)	156 (4.5%)	156 (4.5%)
1955	623	3,891	315 (8.1%)	87 (2.2%)	185 (4.8%)	176 (4.5%)
1954	638	3,060	295 (9.6%)	-	43 (1.4%)	11 (0.4%)
1953	655	4,079	222 (5.5%)	28 (0.7%)	113 (2.8%)	113 (2.8%)
1952	649	4,182	161 (3.9%)	-	324 (7.7%)	94 (2.2%)
1951	665	3,483	351 (10.0%)	30 (0.9%)	239 (7.0%)	36 (1.0%)
6 yr. Avg.	639	3,699	268 (7.2%)	38 (1.0%)	177 (4.8%)	98 (2.6%)

Thus, over a six year period in a refinery where the work hazards would be rated as high, the average percentage of illness lost time resulting from occupational causes was but 4.8%. This figure includes hernias many of which were of doubtful relationship to their occupation and in many states would not be ruled as compensable. If this figure is subtracted, we then have the very low figure of 2.6%. This compares with the general industrial average of 10% of lost time attributed to occupational illnesses.

TABLE II

MARKETING DIVISION

<u>Year</u>	<u>Average No. of Employees</u>	<u>Total D/L All Causes</u>	<u>Non-Occup. Inj. D/L</u>	<u>Occup. Inj. D/L</u>
1956	306	3,731	271 (7.3%)	131 (3.5%)
1955	308	3,364	203 (6.0%)	120 (3.6%)
1954	340	4,167	241 (5.8%)	276 (6.6%)
1953	359	3,532	74 (2.1%)	132 (3.7%)
1952	373	3,223	171 (5.3%)	175 (5.4%)
1951	357	3,003	174 (5.8%)	134 (4.5%)
6 yr. average	341	3,503	189 (5.4%)	161 (4.6%)

rivers, covered by our Medical Department. Although the figure here is still low, a six year average of 4.6%, the experience is considered far less satisfactory than in the refinery group as the work exposure is far less hazardous. However, the special precautions necessary to meet the requirements for safe driving often result in having a man absent from work whereas in a refinery unit he could perform some other useful job.

No table is presented for the third group, the Technical Service Laboratories, that our Brooklyn Medical Department services since they have not had a lost time accident in seven years.

One may question stressing the importance of compensation cases if they account for but 5% of sickness absenteeism. However, this low figure has been attained only because such stress has been placed on the proper management of the injured employee. Compensation expense can be a costly item on a profit and loss sheet in an industry whether we use dollars, production or suffering as a measuring stick. An industrial Medical Department must concern itself with all three of the latter items for it has as its function the reduction of human waste resulting from medical causes.

The industrial physician's interest in an injured employee starts long before he is carried into the Medical Department; it properly starts at the time of the pre-placement examination. In the course of the latter procedure, evaluation of the applicant's temperament and his ability to get along with others should be attempted. A complete physical examination with the detection and recording of all physical conditions, no matter how minor, should be performed and a rapport established between the department and the new employee. Obviously not all prospective employees are supermen and although we seek reasonably healthy individuals, we must recognize an obligation not to arbitrarily reject individuals for minor conditions thus denying them the right to work. The goal is to match the job and the applicant in a perfect marriage allowing, of course, for the inevitable errors that crop up in the marriages. Consideration at the time of the pre-placement examination must be given not only to the immediate job but also to the prospects in the years ahead. Thus, in one division all promotions are made from the general labor pool; assisted by on the job training, laborers bid for vacancies as they occur and become machinists, electricians or other skilled help gaining thus the additional prestige and financial remuneration that attends such promotions. An applicant for employment who obviously does not have the gray matter to master anything but a pick and shovel and is destined to be a lifetime laborer would be a misfit in this particular group for as time passes him by and newer employees that were his juniors jump over him, he will most assuredly become disgruntled, discouraged, resentful and the likelihood is great that he will lose more time from illness, will be more apt to have accidents and will contribute less to the overall welfare of his industrial group.

An illustrative case history: The employee, a chemical engineer, a year after being hired (at which time he gave a negative medical history) was reportedly away sick because of a gripe. He was not back in a week, as estimated and when still absent the third week, our interest was aroused. Replies to phone inquiries were vague. One day his father phoned to see me on a personal matter; at the appointed interview he stated that he felt he should let me know that his son was having some spells and that he wanted to be above board and tell us about them. When the direct question of epilepsy was put, the father shied away.

the employee would be permitted to return, a complete neurological work-up including electroencephalogram would be required. Both the family physician and neurologist were personally contacted and concurred in the diagnosis of idiopathic epilepsy. It further developed that he had previous attacks and had concealed them. This engineer who had previously been climbing tanks and towers as part of his regular duties, was permanently grounded. A long conversation was had with the patient and it was pointed out that such restriction would probably limit positions open to him for future advancement and he must seriously consider whether to continue in this industry or seek a desk type employment elsewhere. It was further insisted upon that he sit down with the manager of the plant and frankly discuss his condition so that both knew where they stood. This employee was not fired in spite of his short service but his assignment has been changed to protect both him and the company. One looks back wondering how two intelligent college men such as he and his father supposedly were, could have risked a broken neck for the sake of any job. Certainly, a serious injury to this employee would have benefited neither him, his family or the company.

Inevitably one must come to the question of confidential medical information. In an industrial medical department a third party is concerned with our activities, the employer. One might well add a fourth party too, the social group of which we are all a part. Working in an industrial medical department does not absolve the physician from the ethics that pertain to the profession. It is just as incumbent upon the industrial physician as on a private practitioner to protect the employee-patient by not revealing matters that are personal and of no concern to the employer or to his fellow-employees. Such confidence does not apply where an applicant seeks a job and as a condition for employment agrees to submit to a medical examination. Here the situation is similar to that of an insurance examination and all and any information can be revealed without breaking a trust. But here too discretion should be used; there is no point in noting that the young man contracted a social disease years ago while indiscreetly fraternizing during the war. However, there are some conditions where exact reporting to the employer are necessary to protect against unjust claim at a future date. Thus, an atrophied or undescended testicle, personal as it may be, must be noted for a future accident may result in the demand for considerable compensation for loss of manhood when such would obviously not be justified. Under New York State law it is not sufficient that there be a record of the condition in the man's medical file; it is required that the employer actually be aware of a condition to be protected against future liability. Every effort should be made to keep such information restricted and in our set-up, one letter noting the positive findings to satisfy the requirement of employer's knowledge is placed in the patient's personnel file which, like our medical files, is kept under lock and key.

Considerable thought has been given to encourage the employment of the disabled. The New York State Compensation Law, Section 15 (8) commonly known as a second injury clause limits an employer's liability to two years if he has knowledge of a pre-existing condition. It is, therefore, necessary that a note be forwarded that is informative and yet not indiscreet in unwarranted revelation of personal matters. The following is considered an example of this type: this applicant has a long standing cardiac disease of severe degree of which she is aware and for which she has been and is still being treated. She presents a definitely increased health risk; however, for the type

or sedentary work for which she is being considered, the risk is not an unreasonable one to assume; it is the only type of work she can perform and she must work somewhere. If employed, the restriction to sedentary work without physical exertion of any degree, should be strictly adhered to. The patient has been thoroughly instructed in regard to these physical limitations. Such a note should protect the employer and at the same time afford an applicant the opportunity to work. She was employed.

Once on the payroll, the employee is still surveyed as a possible compensation liability before he becomes hurt. Properly supervised, it may be possible to successfully prevent him from suffering at work (and also off work) injuries. Through periodic health examinations, return from illness and special medical examinations, the nurse and physician have the opportunity to become acquainted with an employee and frequently to detect previously unknown conditions which may play an important part in a future accident. A simple and yet very important illustration is the finding of the near blind employee who does not wear glasses. More subtle is the detection of the emotionally disturbed or dissatisfied employee, whether resulting from conditions at home or at work, that make his thoughts wander from the job at hand and through such distraction invite carelessness and accidents. The employee who returns following a coronary incident will, in a laboring group, present a difficult problem as to placement. The disability benefits law in New York which requires the attending physician to submit a detailed report of illness in order for the employee to collect sickness insurance, removes the difficulty of privileged communications. Here again, the restriction sheet sent to management will note the existence of chronic cardiac damage with the possibility of future attacks and spell out the work limitations. Such a note in the employee's personnel folder will protect the employer against unwarranted claim and still permit the employee to return to earning a livelihood. When an employee returns to work following a non-occupational injury, for example, a fractured foot, the residual disability must be carefully evaluated and noted in his medical record. Usually a final evaluation in six months time will be necessary to accurately measure permanent disability. Scars on the face should be measured and defined in the records; this will protect the employer from exaggerated claims in the event of an at-work injury to the same area.

Somewhat circuitously we have now reached the point of the employee entering the Medical Department with an actual injury. Just as when the curtains part on the opening performance of a Broadway hit, the success betokens not only the first night's performance but the unseen rehearsals and the back stage effort, so too the successful management of at-work injuries will be the result of intensive and careful preparation. The injured employee is by now a known human entity rather than simply a broken finger, with a mutual trust established by previous contacts and his known personality traits permitting individualized management his rehabilitation and return to work will therefore be effected more speedily and efficiently. There is little point in covering the medical details of treatment since these are amply covered in the scientific literature and vary according to the type of injury or disease. However, there are several administrative points that should be stressed.

All injuries, no matter how minor, should be seen by the nurse and referred to the attention of the physician where indicated. The neglected simple injury of today may become the major tragedy of tomorrow and no first aid man, no matter how thorough his training, should be left to judge the seriousness of

the bruise on the foot may cover a fractured bone. In our installation where there is a twenty-four hour operation and minor injuries at night are handled by the first-aid man, a slip is made out for each case he sees. These are picked up by the nurse the following morning and she personally checks each case. Most of these injuries will be of relatively insignificant degree and the worker can be promptly returned to his regular duties. As simple a notation as possible is made on the slip which he takes back to his foreman approving his return to work. We have adopted the terms of light, moderate and regular work to designate the degrees of disability. Where a further explanation is necessary for special situations, a phone call has been found the best means of communication. The reaction of most foremen to long forms with multiple notations as to pounds that can be lifted, degrees of walking permitted, etc. has been poorly received. The simple form above has worked out most satisfactorily.

The most important administrative detail is the actual record of the injury - the when, where, what and why. We have been impressed by how frequently the original description given to the Medical Department when the patient is first seen changes after reflection; this may arise either to cover the employee's carelessness, the infraction of an established safety rule or to present an unjust claim. The history of backaches is particularly pertinent. All too often an employee has come in with a simple backache without any history of injury or strain and then at a future visit relates a detailed history of time and place of lifting. It is, therefore, important that at the first visit specific questions be asked as to how and when the complaint originated. One does not want to deny any employee the rights due him for a compensation claim but by the same token unsubstantiated and falsified claims must also be rejected. A case in point might be recounted. An employee presented himself with an inguinal hernia with a history that he first noted it a month ago when he lifted a heavy drum and had felt regional discomfort. The hernia found on physical examination was causally related to his employment and he was operated upon as a compensation case. During his first week's convalescence, a fellow employee asked me how the patient was doing and then remarked, "I told him to have that fixed three years ago." Actually his type of work would render New York State laws have ruled his hernia as compensable without his having to lie.

Quite different is the case of a truck driver seen early one Monday morning with a complaint of leg and knee pains. His flat feet were apparent and in discussing these as the probable cause of his symptoms, he mentioned that on Saturday night he had stood long hours serving as a bartender at an American Legion affair. His feet were strapped and he returned to work for the day. He did not report for duty for the remainder of the week and a form was received from his doctor stating that he had injured his legs while driving that same Monday. The man requested to report to the Medical Department; when he did the case was discussed at length and he was reminded of the history he had given of serving as a bartender. His parting remark as he left the Medical Department was, "that's what I get for telling the truth."

The physician should not try to be a lawyer or a safety investigator. Nevertheless he should in concise but exact terms, obtain a history of how the accident occurred. Usually this can be done while the patient is being examined and treated, distracting the patient from the examining hand and gratifying the

customary urge to explain how it all happened. Immediately thereafter, while the case is still fresh in mind, notations should be made on the chart and signed by the examining physician. Without such signature, the record may be challenged at a formal hearing. The completeness and accuracy of the description of injury may be of great importance should the case be a serious or involved one.

The question of why the accident occurred is also one with which the Medical Department should concern itself. Even in minor injuries, a little study may indicate a hazard that next time may cause a far more serious casualty. Consultation with the safety man or the supervisor may thus lead to the correction of a potential danger, correction of which is preventive medicine at its best.

There is little point in discussing the various forms required by the New York State Compensation law since these do not apply in other states. That the submission of such forms is irksome is evident but it is a very necessary function that serves to protect both employee and employer. In New York State the patient is permitted the free choice of any authorized physician to treat compensation conditions. Whether the patient selects a physician who is directly or remotely connected with the company or one far removed, the Medical Department should maintain contact throughout the period of treatment, always conforming to the ethics of the profession and not interfering either directly or by innuendo in such management. Such contact will frequently lead to the earlier return to work of an employee since his doctor can be informed of the work environment and assured that his patient will be protected against possible aggravation. There is no doubt but that the sooner the injured employee is returned to work the quicker and more complete will be his recovery. Occupied with tasks, the discomfort which at home with nothing to do and surrounded by a solicitous family is a major pre-occupation, becomes minimal.

The above must not be construed as forcing a man to return to work to the detriment of his well being. The function of a physician, whether in industrial medicine or private practice, still the protection of the patient. However, there can be little question but that many compensation injuries lose time out of proportion to the severity of their ailments. The rise in compensation costs in New York State have been startling. The desirability and necessity of a law to protect the wage earner and his family when he is unable to work because of a work sustained disability is not in question. However, the law is not designed to pay for resting at home when one is able to perform useful tasks without harm to himself. It is not the compensation law that anyone quarrels with but rather the abuse of its provisions, for then organized society is being unjustly taxed to support idleness. The ultimate cost is not borne by the employer or the insurance carrier but by the consuming public. An editorial in the New York Times dated April 6, 1957 headed, "A Bonus to Stay Home Sick," reads in part: "The world in which we live has somehow gone cock-eyed when a man can make a financial profit, at his employer's and Government's expense, by staying home sick from his job. Briefly generalized, the end result is that the generous employer continues the employee's wage or salary while the worker is absent from illness; the employee excludes this pay while sick from his total gross income and pays no tax on it. If the employer were especially generous, the employee could stay away for a whole year and, under certain circumstances, live wholly tax free on income for which he had not done a stroke of work. He could even deduct his medical expenses from his legally

non-existent income. One of the curious sidelights of this matter is the fact that the more responsible, the more humane the employer, the more business-like he has been in making the employee secure in his expectation that his income will continue if he is ill, the more certain is the employee to get tax rebate. The less responsible employer, who continues pay on whim only or withholds it if he wishes in the absence of settled, written-down, announced policy, saves himself money. Meanwhile his employees, who suffer the greater hazards of uncertainty as to income while ill, would be treated less favorably also by government or taxation. This is one more inequity. The door is opened to wide abuse, and those--of larger income--who least need this illogical subsidy are the ones in a position to profit most at the expense of other taxpayers. A year off for reasons of health, at government expense, is invited."

The physician is a key person in the administration of compensation medicine. Without his certification as to extent of injury or disability, the patient cannot start or continue a claim. It behooves the profession which, through centuries of ministering to the well being of society has earned its respect and honor, to examine from time to time the actions of its members. Judge J.C. Knox took us to task in the following words: "But the practice of medicine, like the practice of law and other professions, is sometimes accursed by men of base natures and of the characters of charlatans. These sometimes subject the art to the suspicion that it is but little more than a mercenary trade. The quack and the fraud is to be found both within and without the court room. On the highways and byways of life, he preys upon the ignorant and the unwise. Within the halls of justice, he perjures himself upon the altar of truth, and reflects discredit upon the guild in which he claims membership. At times he raises doubt in the minds of intelligent men as to whether medicine in general, and psychiatry in particular, have any real claim to a scientific bases. Day after day, we find physicians arrayed on opposite sides of a law suit. Each will be given the same set of facts, and asked to draw a reasonable conclusion from the evidence before him. Very often the opinions expressed by the opposing physicians are as far apart as the poles; and, in all too many instances, these opinions are determined not by the facts, but by the necessities of the litigant retaining the physicians who gave them utterance. A doctor, it is true, is under great obligation to his patient, and a lawyer, undoubtedly, owes an understanding duty to his client, but the obligation of one, and the duty of the other, is no justification for the prostitution of the law, and the rightful expectations of organized society."

Perhaps the judge could have elaborated further on the dirty linen the legal profession has to hang out but that is wash for another day. Organized medicine has, during recent years, expressed its concern with those physicians that dishonor the profession establishing grievance committees and similar bodies. The profession should carefully scrutinize the abuses perpetrated by what is probably only a handful of physicians in the field of compensation medicine. The industrial physician cannot sit as judge, but by maintaining contact with the case throughout its course he can often discreetly bring to an end unconscionable and exaggerated treatment and an unduly prolonged absence. This does not overlook the fact that often the employee is being short-changed and denied his compensation rights, but that is verse for another chapter; neither form of misapplication of the intent of the Workmen's Compensation Law should be tolerated. We might mention two cases in our records, closed at a formal compensation hearing without awards, where the Medical Department felt that there was a definite residual disability which entitled the patients to a monetary

settlement. At our instigation the cases were reopened and the Compensation Board then proceeded to make the settlements to which these men were entitled.

It has been my purpose in this paper not to cover the routine management of an injured employee but rather to stress considerations in the overall compensation medical picture. With placing main emphasis on industrial hygiene, preventive and maintenance health programs, the industrial physician must not lose sight of the importance and the potential loss that compensation illness and injury can cause. He must remain at all times a doctor protecting the welfare of the patient as well as the rights of the employer, and maintaining the dignity of his profession. By establishing an atmosphere of trust in his department, he can effect a reduction in the waste that compensation costs represent whether expressed in terms of human suffering or lost productive capacity.

"THE CLAIMS DEPARTMENT'S ROLE"

Mr. E.R. Alden

Socony Mobil is a self-insurer in all types of casualty exposure wherever possible. In the field of Workmen's Compensation our self-insured operations cover some 26 states, the Longshoremen and Harbor Workers Act, and the District of Columbia Act.

All of these various compensation acts differ in concept - administration - occupational disease coverage - benefits - reporting requirements - and political pressures, to such a degree that if I were to attempt to discuss them specifically, we would all be on one big merry-go-round. At the end of the ride I am sure we would not only be a bit dizzy, but rather confused.

However, I did mention political pressure. In this connection permit me to quote from a recent speech by the Chairman of the Compensation Board of one of our rather large states - in which compensation costs today are among the highest in the nation - after the Governor had vetoed a bill increasing compensation rates because in the same bill was a provision to permit an Appellate Court to review the facts in a controverted case in addition to conclusions of law, and I quote:

"I suggest to you that if you cannot arouse the Legislature to an awareness of your rights and needs that you give consideration to plans for inclusion of supplementation of Workmen's Compensation payments as a component of your contracts with employers."

End of Quote

Yes, of course, the speech was before a Federation of Labor Convention.

Now to my assigned subject - the role of the Claims Department in the Administrative Management of the Injured Worker.

A Claims Department of a self-insured company can function either as a Trouble-Shooter or as a Bottleneck in the management of an injured worker. Which of these alternative roles it chooses to assume is, of course, vitally important from the viewpoint of the company, because from this choice flow consequences which affect the company's over-all operations to an extent which is generally very much unappreciated even when its importance is recognized.

We're all familiar with the sad story which begins: "For want of a nail, the shoe was lost. For want of a shoe, the horse was lost....." It is sometimes extremely difficult to apply the moral of this story to the complicated operations of a modern business organization---there are so many factors at work the threads

tend to become too entangled for a satisfactory cause--and--effect illustration.

The role of the Claims Department in cases of occupational injury is an exception, however. What the Claims Department does and how it does it---or how it does not do it---are causes which have clearly traceable effects---effects which show up in a disconcerting variety of areas.

Suppose, for example, that the Claims Department has assumed the role of Bottleneck. It can perform the role in several different ways---it can even perform this role in such a way that no one in the company (not even the Department itself) is aware of the role it is playing. In some companies, the Claims Department is in effect a File Room---nothing more. It does a superb job of creating and maintaining records on injuries reported, on medical treatment, on payments made or not made. These beautiful records are eventually filed or tossed out---an accumulation of wasted effort and material. Claims Departments of this type have accurate records and wonderful statistics---but no one could ever give such a course of conduct credit for "managing" injured workers.

In other companies, the Claims Department is playing the role of a Bottleneck by being in effect an obstacle course for the injured worker. Their idea seems to be to make it as tough as possible for the worker to secure benefits or medical care. That department is presumably doing a good job because it contests almost every claim; makes payments with the utmost reluctance; holds medical care to the absolute minimum or less; "crowds" the worker unremittingly. Claims Departments of this type have two sharply contrasting files: (a) a decreasing incidence of extremely emaciated claims folders; and (b) an increasing incidence of extremely obese claim folders. Claims Departments of this type are also populating the Workmen's Compensation Courts with a steady stream of claimants who defy all medical theory by the kinds of injury symptoms they exhibit as a result of events which only courtesy could consider an "accident", and who confound all medical management by becoming steadily worse despite continuing medical treatment, and never, never recovering. Why? Simply because no self-respecting compensation referee places any credence in such claims management or their hearing representatives.

Neither of these two types of Bottleneck Claims Departments is doing its job properly; that is, seeing to it that a worker who is legitimately hurt on the job---and only such injured---receives prompt and adequate medical attention if necessary; prompt payment of compensation if indicated; and prompt return to productive activity as soon as he is recovered. The File Room Claims Department merely observes the progress of the case and makes notes of its observations without offering or making any constructive effort for the welfare of the injured employee. The Obstacle Course Claims Department interferes with, and complicates the progress of the case, and usually delays its termination. The inevitable result, sooner or later, is soaring claims costs---soaring to such heights, in fact, as to prompt top management reconsideration of its decision to self-insure. The equally inevitable result, sooner or later, is a disaffected and resentful work force---resentful in the first instance of the Company's apparent indifference to the welfare of its injured workmen; resentful in the second instance, of the company's apparent tight-fisted and bullying tactics.

It needs little imagination in these days of hard-to-achieve quality and quantity standards, to project the results of this fundamental employee resentment. It needs less vision, in these days of narrowing profit margins, to project the results of falling production rates and rising production costs. Anyone who works with people will need no attitude surveys, or psychological-testing to trace the diffuse and subtle results of mishandled job accidents of the company work-force. It is indeed one of the few situations in modern business which lends itself to clear cause-and-effect illustration.

Well, what does a Claims Department do when it functions rather in the role of a Trouble-Shooter?

First, it operates on a philosophy of avoiding as far as possible contesting, or litigation of claims. This means good liaison between the Claims Department and the various supervisors. This means prompt and careful reporting of accidents in full detail, to the Claims Department by the supervisor in advance of any claim by the employee. This means prompt and careful investigation of accidents by the Claims Department, on receipt of such notice from the supervisor, in advance of any claim by an employee. This means prompt acceptance of a claim brought by an employee for an accident which investigation has previously found to be legitimate.

Here, the benefit of every reasonable doubt must be given the injured workman: he must and should be afforded the highest compensation benefit payment he is entitled to; he must be offered the best medical attention which can be given him if he chooses to continue treatment with our doctors; or his personally selected physician must be given active cooperation in affording consultation where indicated; the elimination of unnecessary or duplicate laboratory or x-ray studies; in keeping the injured worker's mind occupied with thoughts of his active and early return to regular duty, and in eliminating or dissipating any ill effects from his disability or brooding.

Avoidance of unnecessary and unwarranted litigation of claims by the Claims Department means also---and very importantly---close cooperation between the Claims Department and the Safety Department in spotting and eliminating potential accident situations. When the Claims Department, for example, finds an employee claiming occupational dermatitis, the Safety Department should be alerted to check or recheck for injurious substances which might cause similar injury to other workers.

Unexpectedly, known poisons, that were replaced by non-injurious substances in long-established occupations, reappear in new processes in an ever-expanding industry such as ours. Increases in the number, diversity, and complexity of solvents, metals and radioactive substances and their expanding use in industry make the problem of occupational illness an interesting one that may be effectively handled only by the liaison work of all department heads when alerted to these ever-present factors as they may appear in different form; in the careful histories taken by the nurse and physician and sifted by the Claims Department. Complaints of arm strain or back strain might suggest re-evaluation of worksite layouts or operating procedures. Claims for falls on slippery surfaces may indicate the need for examination of housekeeping practices.

As stated, the Claims Department operates on the theory that the best medical care be furnished or secured. This requires close cooperation between the Claims Department and the Medical Department---or close supervision by the Claims Department of medical care being furnished by outside physicians. This includes a careful but sensitive appraisal by the Claims Department of the efficacy of continuing medical treatment by outside physicians. This requires a familiarity of medical care combined with common sense, by Claims Department personnel.

Insistence on proper medical care, where medical care is necessary, means also that the Claims Department should respect the confidential nature of all medical information acquired, whether peculiar to or incidental to a claim for injury by a worker.

Importantly, the Claims Department operates on the theory that the injured employee should be returned to productive work as quickly as medically feasible. This means early and constant attention to rehabilitation theory and techniques by the Claims Department. It means awareness of and cooperation with local agencies which are doing rehabilitation work devoted to lessening the many hundreds of thousands of time hours of labor wasted by extension of disability---an extension that can be greatly curtailed by the timely and adequate use of the various modalities of physical medicine.

These are the criteria that go into adequate and salutary administration by our Claims Department of the injured worker. These criteria have one common base; people. With people and through cooperation of people grouped in departmental function, our responsibility can be---not merely accepted---but successfully effected.

THE ADMINISTRATIVE MANAGEMENT OF THE INJURED WORKER

"THE SAFETY DEPARTMENT'S ROLE"

Mr. J.H. McKenzie

Mr. Jennings in his welcome to the group yesterday morning expressed in essence that the most important of our assets are people -- that their health and good attitude will determine the future of the company.

This is in itself a challenge to both of our respective functions. In the fulfillment of safety's responsibility in helping to develop ways and means for the elimination of injuries, there will be a big step towards the objectives of Medical as outlined by Dr. Saunders. It will relieve Medical of the repair of broken bodies and really permit concentration on health.

In talking about the Safety Department, I want to point out that we as a group, Jim Herbert, Parker Folse, and I have been together about a year now. Because of the increased staff, we have been able to extend the good work previously started.

The year has been one of inventory and study. During the past several months, we have taken a look at practically all of the basic elements of the Fire and Safety Programs. We have many things definitely on their way. Some are in a nebulous state at the moment.

In studying the industrial injury problem in the company, it was evident that the statistics being submitted satisfied the need for reporting to National Safety Council, A.P.I., and for running contests but nothing else. To get a more complete picture a new general work injury report was developed with the help of Pete Grimme. As you are aware, this form was put into the field several months back, even before it was materialized by the Methods Research Department. This was done to determine whether or not it was workable. These forms were immediately accepted, and to date the majority of our domestic operations are using them and reporting not only lost time but medical treatment cases and in some instances first aid. This new form requires field analysis of individual accidents. The greater attention to causes as a result of this has already brought about benefits to the field. It makes them more conscious of their accident and injury problems which makes them do a little more about it. The information when collectively analyzed should permit us to have a better understanding of causes and be able to establish trends and recommend areas of weakness that need attention. At present we have a considerable backlog of these reports, and as soon as procedure is established, they will be processed through I.B.M. Information from these forms, which are of interest to you, will be furnished through Dr. Saunders' office.

OFF-THE-JOB

In considering the injury problem of the company, we find as other companies are that the off-the-job accident situation is a critical one. Where we have been able to spot check in the company, we find that the ratio is approximately

15 off-the-job to 1 on-the-job. Joe Heppe of the New York Telephone Company says that in a large segment of their company it runs over 80 to 1. In order that we can properly approach this problem, it has been decided that the first thing to do is get a statistical background. To do this, a method is being established and should be in effect soon. When the statistics are available on a company-wide basis, we are quite sure they will stimulate an even greater interest in this problem. They should also permit a more intelligent direction to this facet of the injury prevention program.

At the present time we haven't instituted any changes in the gathering of information on automotive accidents. However, its seriousness is recognized and considerable work has been done by the Marketing Department and Safety Department on a proposed driver training program. A rough draft of the plan should be completed soon and in the hands of those most interested for their study.

FIRE -- Methods Research is preparing for us a form to be used in the reporting of company fires. It will contain only the specific information needed in the execution of the fire prevention program. Already started is the distribution of clippings from newspapers on fires of general and specific interest. Also, flash releases on fires occurring in the company. At times we get reports from other companies by telephone which is also released in the same manner. These reports are of particular interest to our engineering and operating people as well as to the fire and safety men. Specific studies are made of critical fires.

Typical of some of the activities being done in the several departments is the revision of the safety and fire manuals of the Marketing Department. All of them are in the final stages of revision. One new one is being developed "Safety in Service Station Construction and Maintenance." Assuredly, we are not doing the physical work on these; but we have been able to contribute extensively to the material contained and the editing of the respective booklets.

During the course of the year, the picture that was made by Claim and Safety "FIRE UNDER CONTROL" was released. Our part was the final editing and shortening to eliminate some sections on cleaning solvents that could be improperly interpreted.

Programs and safe practices of other companies have been reviewed and studied to find ways and means of improving our own. For instance, a week was recently spent in the field with safety representatives of the Telephone Company. Time was spent with one of the major world-wide airlines to see first hand their work and flight check procedures.

As a result of our studies, we have recommended organizational changes which we think will bring about a more effective promotion of the safety effort. Many of these changes have already been accepted.

Also, use of check lists and emergency procedures were recently suggested to the Manufacturing Department. They were also accepted.

Forms to carry out this activity are being developed at the immediate moment.

We have been working with the various engineering departments for uniform standards for fire protection and equipment and are happy to report much progress has been made.

Sub-standard conditions are being corrected as time and money permits.

Fire fighting training programs have been tailored to fit specific operations and as a result there is a greater participation in these events. For instance, New York City Division a couple of weeks ago sent a busload of their key personnel to Paulsboro for special training. Men have traveled as far as Albany to Paulsboro for training.

Research work is being carried on jointly by interested departments for methods of safe handling and storage of JP-4. As you know, JP-4 has a vapor pressure whereby the vapor space is always in an explosive mixture.

Review is being made of incentive plans, safety shoe, and spectacle programs. We will have some suggestions in regard to these items when our study has been completed.

Marketing Department, Manufacturing Department, Geophysical Drilling and Production Safety Meetings have been held throughout the country. In these you have most actively participated and contributed.

Throughout the year we have been able to help the people in the field through the distribution and exchange of information of fire and safety and getting answers for their specific problems. And last but not least, we have had the good pleasure of working closely with Dr. Saunders, Dr. Allen, and their staff. We appreciate their help and their fine cooperation. We have an extra word of appreciation for the fine work and cooperation of Art Pabst.

To you who represent all other operations, we express our thanks for the fine cooperation not only to us but to the field safety representatives as well. Your interest is helping us with our problem of reducing and minimizing industrial injuries.

This isn't all of our projects. Many of them are in such a nebulous state that they aren't worth talking about. At the moment, it is a little early to realize the impact these efforts will have, but we believe the future holds much in the way of accomplishment, and we face it enthusiastically.

THE ADMINISTRATIVE MANAGEMENT OF THE INJURED WORKER

"THE EMPLOYEE RELATIONS DEPARTMENT'S ROLE"

Mr. E.G. Kothe

In trying to put down a few ideas on the subject at hand, I was stumped by the title, "The Administrative Management of the Injured Worker."

Webster defines "administrative" as "having to do with administration" which, in turn, is defined as "the act or process of administering, specifically dispensing or tendering to another, according to a prescribed formula or rite."

The previous panel members have covered extremely well how their departments administered to the injured worker, and it would be fair to say that they have generally followed a prescribed formula or rite. Since the problem of the injured worker, from the Employee Relations aspect, does not always follow a formula, I would like to bring up some points of view that may stimulate discussion.

It was interesting to me to note that the Employee Relations Department was the last one listed in the chronological handling of the injured worker. From a practical point of view, this is a logical thing. Basically, as you all know, Socony Mobil's philosophy regarding employees is that each supervisor is responsible for the handling of any problem he has with an employee within his jurisdiction, and the net result of this is that the Employee Relations Department does not get into the problem unless the supervisor or department head appears to need help or guidance, or actually requests such assistance.

With this in mind, just what aspects do we get involved with concerning the injured worker? As mentioned previously, being at the end of the line, we generally get the problem case that can't be handled by a line supervisor since its solution necessarily must cut across department or function lines. This is a proper place for the staff help of Employee Relations. To illustrate this, I would like to recite a case very briefly: We had a short service employee - a veteran of World War II, seriously injured in a refinery accident. Employee Relations was kept advised of his physical progress - he was badly burned while loading a tank truck with gasoline. The employee had neglected to use the static line while loading the vehicle, and vapor spreading in the area ignited, and he was badly burned about the legs and groin. During a lengthy convalescence, we began to discuss with his supervisor how the case should be handled. Because of his short service, there was a question of what our responsibility was to an employee injured as a result of a safety violation. Since it was shortly after the War and the man had been an extremely fine worker, in spite of his one slip, his supervisor recommended strongly a re-assignment within the man's physical capabilities. Due to his physical condition, he was definitely limited to sedentary work, and we had to find a job on which he could be productive. After a number of discussions with the man and a review of his past experience, it appeared that he had the mental capacity for work in the Engineering Drafting Department or in Accounting. Both functions

were contacted, and after a thorough review of the individual's background, Engineering agreed to a trial. He was carefully indoctrinated on a drafting assignment, and with the sympathetic help on the part of the supervisor and fellow workers, plus attendance at night school, he not only became rapidly productive but, at the last reading I took, he was still with the Company after 12 years, and has been promoted to a supervisory position.

The only point I want to make with this case is that, because of considered evaluation of the problem by all concerned, with the Employee Relations Department carrying the ball, we salvaged a worthwhile employee by getting sincere cooperation of all departments in a large unit of the company. It seems to me that this is a much better result than having a sour ex-employee with a grudge against the company. It is my belief that, in all such cases, if there is a sincere effort on everyone's part to get the most out of the situation, rather than take the easy way out of terminating the employee, both the individual and the company will gain in the long run.

Now, let's consider a case which led to some adverse public relations and how it was administered: We had a 20-year service employee in Marketing - a motor vehicle driver - at a very small bulk plant - who developed heart trouble. Now, we can debate forever whether he was an injured worker in the sense of the subject today, but we have a number of these troublesome cases in Marketing and I feel it is worthwhile taking a minute to talk about it. After a period of full sick leave and with constant consultation with the Medical Department, Management had to make a decision - and it was decided to terminate the employee, pay him termination allowance. In the discussion, it was revealed:

1. He was not totally and permanently disabled.
2. He did not have the mental capacity for re-assignment to clerical or other desk work.
3. In Management's opinion, it was not feasible to transfer him to another plant since no job could be found in the manual classifications where he could be remotely productive.
4. Because he lived in a small community where he was well known, it was felt his chances of securing suitable work was good.

The supervisor, having had many discussions with the employee which had prepared him for the final move, explained the Management's decision and he completely advised the Union of the action that was being taken. The individual felt he had received fair treatment from the company and felt that he could secure employment that was within his physical ability. The Union representative also expressed his feeling that everything had been done to help the employee get started on a job that would not hurt him further physically. After a few weeks, we received word from our sales people in the area that the terminated employee was contacting all fuel oil accounts and telling them he had been badly treated by the company. We immediately discussed this with the employee and sought to assist him in seeking employment. He assured us that things would work out; next thing we knew, a letter arrived from his minister pleading his case. We then advised Management to tell the minister all of the facts in the case, and this was done by letter and through a visit by the supervisor.

the net result was that the minister stated he felt the company had been more than fair, and inquired if we could use his services on a part-time basis at a local plant, since we apparently were very thoughtful and considerate toward our employees. Through the good offices of the minister, the real story was disseminated to the people who were interested and we gradually recovered the business.

Now, the only aspect of this case which I wish to point out is that, in such cases where Management decision is apparently detrimental to the employee, every avenue must be completely covered so that, even though we know and feel the employee was honestly treated, it may be necessary -- as it was in this case -- to take the story to those people in the community who question the company's actions, and I do not think we should shirk the responsibility of doing this. Incidentally, you may be interested to know that once the employee realized he was only hurting himself, he settled down and seriously sought a job within his abilities, and was able to secure one with the help of local supervision. This type of case certainly causes a great deal of disturbance not only to the individual involved but to the management in the area and, in this case, within a small community. I certainly hope we can discuss this kind of thing during the question period, and maybe come up with a better solution.

Now, one last case to illustrate how working closely with Operating and Safety, another typical case was handled. This employee had 33 years of service - 33 years of age - physically not well - family situation really bad - accident record in the last few years not bad, but minor in nature. After each minor accident, Operating supervision in discussion with Safety, talked about grounding the man; but because of intimate knowledge of the family situation and health problem, it was decided to let the man continue to drive, but seek the aid of the Medical Department and try to correct the physical situation. He was examined, and treatment was recommended to his family physician. He refused to cooperate but, strangely enough, his work record improved. He had no other minor accident and, once again, it looked like Operating would ground the man; but because of the need for his services as a driver at that particular plant, we again appealed to the employee to seek the aid of his family physician. He refused to do this and shortly before Christmas, overturned his vehicle loaded with gasoline, with the result that he received a minor head injury but completely destroyed a \$10,000 vehicle. The situation obviously was at a point where a decision had to be made. Since Operating, Safety, and Employee Relations were all completely aware of the facts in this case, it was decided to seek a premature retirement for the individual. It was decided, however, to encourage the individual if possible to ask for such retirement since we felt it was important to him to have the suggestion come in this way, for after all, he had been an excellent employee for more than 33 years. We visited him on his farm and after a friendly discussion of crops, cows, and grandchildren, we wondered if somehow he couldn't retire a little early. Needless to say, he took the bait and successfully concluded a case that might have had another ending if we hadn't planned as we did.

CONCLUSION: Obviously, these three cases do not illustrate all of the aspects of the Employee Relations Department's responsibilities in administering to the injured worker but, to me, they point out the importance of our department doing a strong job of advising, counseling, and helping as requested the line

people on several things:

1. Proper handling of each case to secure sincere consideration of the individuals involved.
2. To insure consistent handling of each case to the best interests of the individual employee and the company.
3. To be sure that the employee's family as well as any other interested people have a full knowledge of the true facts.
4. Where possible, assist all departments in investigating the direct and indirect causes of accidents, and suggest changes to encourage accident prevention.

DISCUSSION

Dr. Gaunt - During the ten years I have been coming to these meetings, every time the words privileged communication came up there seemed to be confusion, apprehension, fear and some misunderstanding. Now in the state of Wisconsin it is felt that that information is privileged which is gleaned by the doctor from the patient through questioning or physical examination of the patient who came to him for the purpose of treatment. That immediately eliminates pre-employment physicals, periodics, eliminates insurance exams. Now the abuse of the privilege is the malicious giving out of that information to unauthorized persons. If the boarder in a rooming house comes to me and I find that he has a communicable disease and he refuses to do anything about it and is using a common bathroom, may I tell the landlady? I'm under obligation to tell the landlady. We have to talk to Claims and Safety, we have to talk to Personnel, we have to talk to different people, if we use our heads, we know with whom we're talking to - don't be afraid to criticize. I would like to have the lawyers correct me.

Dr. Howard - Well, it is my understanding that there have been court rulings to the effect that whether the doctor is being paid by the patient or not, whether he is sitting in his own private office or whether he is sitting in a medical department, that communication between him and a patient is still a privileged doctor-patient relationship. I think Mr. Alden can probably comment on that more effectively.

Mr. Alden - If the patient comes as an accident case, I think privilege ceases then because he's under a Compensation Law where it will be required to report the condition you find. There have been cases so holding in New York State.

Dr. Howard - We're not in disagreement there. We are just talking about a different thing. The subject Dr. Gaunt raised was the periodic health examination, not a patient who comes in with an injury. Once he comes in with an injury, that particular medical examination is open territory as far as the Claims Department is concerned. They have the right to all information. No only that, but once a man submits a claim, he also opens his folder. That folder can be taken to the Claims Law and opened and any and all facets of his medical history are no longer privileged, once he institutes a claim for a compensation injury. Is that correct?

Mr. Alden - That is correct.

Dr. Howard - But I'm certain that as far as revealing any other information, the fact that the patient is not employing you himself, does not alter your relationship to him as a doctor and you still must keep that confidential. I don't believe that applies to New York State. I believe that applies to the entire country.

Mr. Murlless - What about ICC examinations?

Dr. Howard - Again from what I know of it, the ICC examination merely stipulates certain minimum requirements that the applicant for driving across state lines must meet. It does not say that you have to reveal it;

Dr. Howard - all they want from the doctor is simply a statement that this man does meet those requirements. It does not require that that information be submitted to the employer and I certainly would still consider that type of an examination privileged and confidential.

Dr. Saunders - The ICC requirements are that the driver engaged in Interstate Commerce shall be in possession of a certificate signed by a physician, duly licensed, that his vision is not less than 20/30 or 20/40 in the best eye, and he is not suffering from any organic disease which might interfere with safe driving.

Dr. Luongo - I do think there's a little difference among the states on that too. For instance, in California it is a question of reasonable or unreasonable disclosure, but it would apply to any relationship between the doctor and the examinee. On one hand, you might be able to disclose the fact that a man has a bad back but you might be guilty of unreasonable disclosure if you made it known throughout the plant that he had some type of venereal disease. The other point is the guiding principles in medical ethics put out by the American Medical Association. I'm sure you have all seen that recent revision and I think they make some comment on that in those new principles.

Dr. Howard - Yes, I think the word we want to use here is reasonableness. The only difficulty, of course, is trying to interpret. Mr. Fox and I would undoubtedly have a little different interpretation on the referee's interpretation of reasonable medical evidence.

Mr. Fox - I never knew there was reasonable medical ethics. Just a comment on this business of revealing. When you read the C4 form of New York State you will find the question "Is there any evidence or history of any pre-existing disease." As soon as a compensation case is filed, the doctor is on the party-line. There are several interested people, the claimant, the doctor, the carrier, the claimant's representative etc., and I think it is important that the information be revealed. You may have a minor injury and if a man has an underlying diabetes and you have no information about it, the healing of that minor injury may go on ad infinitum and give you no reason for it. So that from the standpoint of the referee, in order to support an award, the complete medical picture should have to be brought to the floor.

Mr. Kothe - Isn't this kind of an academic discussion since we have our own Metropolitan Insurance-Hospitalization and Surgical Plan and EME. I can name dozens of things that expose this information. For example, executives become really sick. What happens? The claim form goes up, his doctor fills it out, the man signs it. If he's on executive payroll, it comes down to Treasury payroll; it gets sent down through certain channels. Everybody in the world knows what's wrong with that guy, so what are we talking about. The thing is academic.

Dr. Howard - I agree that that's what is happening but I'm not in accord that it should happen.

Dr. Saunders - A very undesirable situation exists concerning those Metropolitan forms. I'd like to say first that in order for our program to be on a voluntary basis, which I am sure it must be and should be, the people who come to us with their secrets and with their bodies to be explored must be assured insofar as we can assure them that we are not going to reveal unnecessarily something which might be derogatory to them. In our last staff meeting, Dr. Sinclair brought up four instances of this pink sheet, so called, which had revealed that a condition which was embarrassing to the individual concerned and which had given rise to complaints to the Medical Department on the part of the individual saying "Why must this be so? My supervisor, in one case, knows that I had my fallopian tubes removed, and I think that it is not necessary." I think that the fewer departments or individuals that handle those forms, the better. I recall one case very well. A man had a poor back from arthritis. He also had a nervous breakdown and was being treated with shock therapy in a hospital on the outside. His pink form came back stating he had a sprained back and that was the reason he was out. Undoubtedly, in many instances, false diagnoses are put down because the attending physician realizes the width of distribution of this information and it is not good.

Dr. Howard - I would like to comment on what Dr. Saunders had to say. At the Brooklyn Refinery, when this disability benefits law first came out requiring a form somewhat as detailed as the compensation form, we felt that that was not the sort of paper we wanted traveling across the desks of the Accounting Department. I suggested that a stamped addressed envelope go out with that form to each doctor to come back to the Medical Department. I had trouble with the Legal Department. They said it cannot be done. We set it up that it comes back to Medical and stays there. Then we send another form simply saying this patient has been an ill patient. We went along with that until about seven months ago. We had an inspection team consisting of two men from our own Claims Department and two men from the Metropolitan with our Accounting Department. Employee Relations, myself and the manager of the plant and the conclusion was that we were breaking the law; that the law specifically required that that form stay in the Payroll Department. Now what we have done is simply try to keep it as limited in circulation as possible and it goes to only one individual who keeps it in his file under lock and key. It still isn't satisfactory from a medical point of view. Here we are getting into something that violates our medical ethics. We are introducing third parties and doctors as a rule don't like third parties. They want a patient-doctor relationship which is, by far, the best system there is; and now we have a third party coming into the picture, but unfortunately, if that's the law we must follow it.

Dr. Samuelson - I believe there is a plan in Employee Relations at this time to turn some of this back to the foreman. It is being discussed at Paulsboro where the foreman will be the person to approve a person's sick leave, whether or not they should be paid. The foreman is going to be asking a lot of people what's wrong with them; when will they be back to work; and what is the treatment. I believe that is in effect at some Socony operations now where a person will not be paid unless approved by the foreman.

Dr. Howard - At Brooklyn no medical leave is approved without the Medical Department so stamping it. Remember we are a service unit; we are an advisory unit to management; we should not take over the prerogative to management and whether management feels that there are special reasons for approving it or disapproving it, is still their business.

Dr. Luongo - I think this is a rather important subject. First we have to define a few things. There are these judicial matters that are different than a report of sick leave. For instance, I think any time there is a disputed case in the court, that both parties can get the information. Let's look at Workmen's Compensation. When a man's injured, it is public knowledge that he is injured. So much for that. Let's get over to sick leave reports handled by lay personnel and I want to give you just a brief story of what happened in General Petroleum 20 years ago. There were two young ladies sitting side by side in a drug store and they were both having cokes and one of the ladies heard for the first time that she had cancer by listening to a conversation among the two other ladies. Now, you can't have things like that happening with sick leave information. I don't think it's right. I don't think it's ethical. I don't think we can get the right kind of reports if doctors know that happens. On periodic examinations I think there has to be a strong degree of discretion where this information goes. If the average employee realizes that his physical condition is becoming public knowledge, we're not going to get good physical examinations.

Dr. Samuelson - I would like to change the subject. I would like to ask Mr. Kothe a question. The first case he mentioned was a person who had worked for 20 years with very limited background, all he could do was truck drive. I'm a firm believer that coming events will cast a shadow before them and it has been my experience that many of these people who have long service and become problems, if we review their medical and personnel records, that the first two or three years forecasted this problem pretty well. I would like to ask Mr. Kothe why the Personnel people sometimes tolerate these things for 20 years.

Mr. Kothe - That's a good question. I think first of all we get transferred around a lot so you pick up where the last guy left off and you try to do a job without hurting too many toes. Number one, because we now have ICC we were able to get into our union contracts in Albany, the right to examine these gentlemen every other year by contract. So now we're beginning to get some of these statistics which are necessary to do our jobs. When I first went up there, I took a look at pre-employment medicals which are in the files that we had at that time which were not under the lock and key of a doctor because we never had a doctor. The mere fact that we have a doctor now in Albany is a help, so your question is a good one. There is no answer to it except we've got to get stuff that we need to do our jobs better, and the fact that we are going to have a good Medical Department, good Employee Relations, good Safety, that's the thing we've got to work together on so that we catch some of these cases. Now, I want to bring out one point. Up in Albany where I happen to have a greater degree of knowledge of safety, whenever I happen to see some of these accidents I

go to the medical people and I say have you had an exam. on this fellow. "Well no, we haven't. Well maybe it would be a good idea if we had an exam on him." So we tried to start some of this history business. Now this particular fellow, I don't think he'd ever had an exam except his pre-employment 20 years previously until he had his ICC exam. and it was at that point that we began to see this trouble. So I don't know if I've answered your question or not, but this is a matter of growth and team work to get everybody with all privileged communications being protected, to work together on it. It isn't a simple thing.

Dr. Samuelson - To follow-up my original question, it would strike me that during these periodic surveys and appraisals that you do on your employees for the first month sometimes, for the first six months, that you should ask the Medical Department what their findings have been. We have a situation in Paulsboro, and I would like to cite one example where a boy came in for an examination and I went into the examining room and started questioning him and he said "Can you wait just a minute, I'm thinking." Well, we completed the examination and physically he was all right, but I put on the bottom of my chart "this boy appears to be a screwball." About six months later, the nurse called to my attention that he had been in several times. He couldn't sleep. He had asked for some sleeping pills, he didn't like his job. We checked with the supervisor and the supervisor continued to give him a good rating. We recommended at that time termination. It went on another 8 months and he finally was terminated, I believe that if supervision would ask Medical Departments what they may have on the record during the first six months to two years on many of these employees, we could help you out a great deal.

Mr. Kothe - I think that the refinery folks have got a terrific set-up and in listening to Dr. Howard, yourself, and a lot of others these last two days, I think that it's just something that's wonderful. You've got a little bit of a different problem in marketing. We have two states to cover and I know that's very small compared to White Eagle which has ten states; but if supervision could and would ask for help of either Employee Relations or Medical, I'm sure we wouldn't have as many problems as we do. In marketing you don't have as close liaison with your supervision in the field as we do have in some of the areas such as City Division which has its people in a large cluster or Brooklyn Refinery which again has a larger cluster. I would hope that some day we would have a better deal so that our supervisors in a given area would depend on their local doctor for other than the injury cases and the periodics, etc.

Dr. Howard - In Brooklyn, we have to find it within six months rather than 20 years or we're stuck with them. In other words, we have six months to play with. Now again, remembering that we're dealing with human beings and we don't want to deny any man the right to a livelihood particularly with such a good firm as Socony. We sometimes pass men, just as you have noticed, that we have some question about because we don't have enough firm ground to stand on to reject him and yet we're a little questionable as to his future possibilities. What we do with a man like that, we talk to Employee Relations and we flag that chart. We have a

man just like that right now; a chap who is the son of one of our drivers that died from cirrhosis of the liver about a year ago. This man showed up for a pre-placement examination about a month and a half ago and we'd been talking about the family background. I knew the family background here very well. The wife hadn't left him but it would have been better perhaps if she had. His sons weren't worth a darn. However, we knew there was one son that was supposed to be the redeeming feature in his family of about seven children. When this man came for an examination and I saw his name, the first thing I did before I even examined him was contact one of the men who knew the family better than I did and asked him what he knew about this chap and he said "Well, of all of them, he's the best." Now mind you, here's a responsibility, father dead, about 30 odd years with the Company, we certainly should try to place him and we did. He's been with us about a month and only last week the report came through that this fellow's coming into the Medical Department in the morning because he wants some bicarbonate of soda. We've asked a few questions, it seems very likely he's drinking heavily, he's slated for an interview with me next week. Employee Relations and I will sit down and discuss this man and his form will be brought in the picture. What I wanted to say, Sam, is that I don't think it's fair to say that they should contact us. I believe, rather, that it is the other way around, we should contact them if we are suspicious of a man. It isn't enough to put it on a piece of paper. How do we stop the Safety Department, Mr. McKenzie, and mind you I'm saying this in broad terms not specifically, but how do we stop the Safety Department from getting the supervisors all riled up because their men came to the Medical Department with an injury and then he has to make a report out and bawls the devil out of the man, "What did you go up to the Medical Department with that cut finger for?" What is the approach?

Mr. McKenzie - I have some very definite ideas about Safety people in relationship to the Medical Department. We've had some specific meetings on the subject; Dr. Allen, Dr. Saunders, Miss Harris and I sat down several times and discussed what constitutes the First-Aid Treatment. Some of the philosophy that we want to impart to our Safety people is this: "That you will never have a good accident prevention program until you exploit the Medical Department to the fullest." In other words, my philosophy is that it is our responsibility to see that our people get the maximum amount of treatment and that we have the responsibility to see that these people go to Medical so that aggravated conditions like knees, fingers that are scratched should be taken care of properly. I admit that we have a lot of Safety people that live in the Medical office. They pounce on every case and they worry the doctor and all that and in the educational program that we're going to try to promote, some of the things that I've had the privilege and pleasure of working with Dr. Luongo on and Dr. Allen and Dr. Saunders, in the future. This is that some day we will spell out what First Aid is; what First Aid responsibility is; because the First Aid treatment is the most critical type of treatment there is in my book. A slight injury may be aggravated to the point where a man will have a permanent disability or it can mean the difference between this or complete cure.

Dr. Howard - I realize that it isn't really the Safety Department that usually causes this difficulty, it's the foreman. But I think it is the responsibility of the Safety Department somehow to indoctrinate the foreman so their approach to the injured employee is just the same as the doctors and nurses and that is "your hurt, we'll take care of you, how did it happen" not "how did it happen, stupid," and unfortunately that happens.

Mr. McKenzie - I've been around long enough to know it and probably been guilty of it myself.

Dr. Saunders - What is an injury?

Dr. Howard - I wish I had Ed Kothe's pipe here so I could think that out. Well, an injury, I believe, at least is generally accepted, is a traumatic affair; an external force which has inflicted some pathology on the body, minor or severe. At least, that would be my interpretation of injury. Of course, that's why we talk in occupational compensation medicine not only of injuries but we also talk of occupational disease. There is a distinction made.

Dr. Saunders - Any blow which might damage tissues or any disruption of the continuity of the exterior body or any foreign body inserted in an eye or an orifice, I suppose, would be an injury. Now I work in grease canning plant; I stand in line and I don't have gloves with steel palms and I pick up these sheets of tin plate and move them from place to place. Well every day I get a few little scratches on the palms of my hands and fingers. Now when does that become an injury, I mean from the medical-legal-safety standpoint? What I'm getting at is, what is the extent of trauma necessary before it should be reported or seen by a representative of Medical, Safety or Claims? Do we have any gauge that we can apply?

Dr. Howard - Well the obvious answer or what comes to me first is the fact that this is an injury from the minute he gets a small cut, whether it comes to our attention or not. The two factors, again, that immediately present themselves--failure on the part of the physician or the nurse to get around and note that this is taking place and failure on the part of the Safety man to also see that this is a factor that has to be corrected. We try to give local responsibility so that the ultimate responsibility is on the foreman of that man who should know that this exists and see to it that the man wears the proper protective clothing. As far as the Medical Department interpretation would go, that man has an injury right then and there and he should be seen no matter how minor it is. The little minor cut that he hides may be the major cellulitis that leads to possible loss of a finger in the next month.

Mr. Fox - May I add this, that where an injury requires more than two treatments where there is loss time beyond the working shift or day, that type of injury is reportable to be filed as a compensation claim. Where it falls under these two requirements, then it is not a reportable accident but remains in the files of your office and in the event there is a change in the course of the injury, then you have a record.

Dr. Howard - Well that is a New York State Law but I don't know that it applies outside of New York State.

Dr. Saunders - What I was getting at is how far should we go in bringing to medical attention or nursing attention or physician's attention; the minor abrasions or cuts or scratches that occur during the course of a working day.

Mr. Fox - Well I don't think you can measure that, Dr. Saunders, in distance or time because no matter how well you train an individual as a layman in First Aid work, it is just that one case that he is going to miff. Then there's serious trouble right down the line. So I think that every case should be called to the attention of the nurse or the doctor, but reporting the case becomes another matter.

Dr. Saunders - Mr. McKenzie, you have some ideas on whether all these things should be reported or seen.

Mr. McKenzie - Since 1947 I've been working with the American Standard Association, not directly but indirectly, on the compiling of industrial injuries and in there are several things that permit people to get away with a lot of stuff. It is a carry over of the compensation thinking, and every case should be a lost-time injury. I think we're going to have to change our concept of what industrial injuries are to develop programs like Socony has and give to the peoples' health. Employees are taking into consideration more and more things; beginning to realize because of the experience that they've had in the war that if proper medical attention is given to a twisted knee, the bloated abdomen, blow to the head, the inhalation of gas, the entry of stuff in the ear, something in the eye, that man should go to a doctor. I think that somewhere along the line we're going to have to spell out just exactly what First Aid is so that we will have some kind of bench mark to guide us to a better understanding of our own problem. Now the abrasion and scratches etc. that ultimately lead to going to a doctor, I think that a responsibility has been neglected somewhere along the line in not providing the proper tools and the proper equipment which would prevent that type of thing. That's where the Safety man can do his best work through observation. He should along with supervision anticipate those things and give advise to the mechanic who handles the situation or, give his attention to the situation and provide protection to prevent the minor laceration.

Dr. Howard - The moderator recognizes the moderator, Dr. Potts

Dr. Potts - I'd like to address a complaint or at least a request for some study to the Safety Department in re-evaluating the value of putting so much stress on the number of injuries that a department has over a period of time. What Dr. Howard has brought up and what we've been discussing here for the last 20 minutes, is trying to have individuals report to the Medical Department little incidental, minor injuries so that out of little things, larger complications do not grow. I actually believe that on the working level that there is a resistance from the foreman, there is a resistance on the employee's part, the worker's part, to come to the Medical if he thinks that it is going to go against his departmental record. Now these things become totem poles that are

Dr. Potts almost worshiped in a department. Now the Laboratories say they are very proud of the fact that they haven't lost any time and they've had no reportable injuries over so long a period of time. They are working toward a plaque because if they do this for a year they will get a plaque. If they do it for two years it will be edged in silver, if they do it for four years it will be gold; and there's all kinds of rewards for departments that do not have any injuries. In Morgan City they have a big bulletin board. The first line on it is "Workers Injured and Days Lost." Now if the fellow who has a cut, and who's to say how minor it is because one man's opinion would vary from the other man's, but he has an injury and he looks at it and if he goes to Medical that's going to be marked as an injury for the Welding Department. Now his supervisor says "Why don't you use the little First Aid Kit over there or I've got some bandaids in the drawer." That's where our First Aid program falls down in many instances because they don't want to go to Medical. They don't want to get a reportable injury. They don't want to go against an award stress. Now I'm not saying this is bad, but I think that it creates a problem. I don't know the solution. I think that maybe Safety could spend some time re-evaluating the other side of the coin. It's a fine thing to have a Safety Program, it's a fine thing to stress a reduction in accidents and a reduction in time lost, but there is another side to this coin - that you may be stifling the free flow of workers from the scene of injury to the Medical Department. I think this will come out when you study fully the requirements of developing your First Aid. In many instances I believe First Aid has been looked upon on the operating level as a stigma, something that we don't want to have to avail ourselves of it unless we absolutely have to and with that in mind, I think that we'd benefit too to have you study on this point.

Mr. McKenzie - In my talk I indicated that we were making a study of incentives which would include that. We are working very closely with Mr. Grimme with the idea of getting a new concept and a new method of handling this particular activity; and it would not be frequency, it wouldn't be a severity rating as you know it now, it would be in production index. The philosophy that we're going to try to impart to our people is that we in Headquarters say and we believe that the only way that you're going to get good safety is to use the medical facilities to the fullest.

Dr. Saunders - Might it not be salubrious to give incentive awards to those departments or activities with the greatest reported number of reported treatment for non-lost time injuries?

Mr. Folse - Doctor, this is really a paradox. Here we are on one hand in the Safety meeting and other meetings, telling our people to report all injuries to the Medical Department and then we have the supervisor, on the other hand, saying why did you go to the Medical Department. So maybe we have to test this thing and get the supervisor to say, "Now look, we don't want you to get hurt." This is the feeling that maybe we're not getting now.

Mr. McKenzie - We have a lot of foremen who don't believe you ought to do a lot of things that have to do with Employee Relations.

Dr. Howard - I do believe that every case should be seen, though. Certainly in our local installations we don't have any feeling of criticism directed towards a department. The man who sees that primarily is our Safety man. He comes in every day and sees our record. Of course, if there's an important case, he's immediately called on the phone again. At the end of the month he also goes over it and he uses that simply as a means of an inserting wedge to sit down with the foreman and say "Is there anything we can do." Now these cases that we're talking about, most of them I pick up on my periodic health examinations. We make the man not only take his clothes off, but he turns his hands back and very often you'll see these scratches or you'll see this dry fissured skin and I want to know why and I don't talk to him in the sense that I'm trying to criticize him. I'll say now we have protective cream; we have protective gloves; why don't you wear them. I follow that up though by making sure that the supervisor also knows about it and we see that he gets the protective cream placed right under his nose where he can't possibly miss it.

Mr. Folse - Now if the supervisor would do the same thing instead of raising Cain with him about going to the Medical Department and consult with him along that line, then I think we would remedy this situation.

Dr. Potts - Why doesn't the Safety Department remove the stress on injuries, stress the time lost. I think that's important. Now if you remove the stress on the number of injuries and accidents which are reported, use that as part of your own information but don't put the stress on it. Use that as part of your own information to evaluate the surroundings that the worker is exposed to. If you remove the stress on injury and upon listing the number of injuries a department has, if you take that information away and only stress the time lost as a result, then you have an excellent opportunity to say to the supervisor, "Here, we're interested in no time being lost and we're interested in keeping the working force whole and cutting down the result of not only accidents, but neglected injuries that have not been seen by Medical or did not go there" and I think that that ought to be one way to approach it.

Dr. Saunders - The number of injuries is like an iceberg unless you report them all. Only about one tenth of them appear up above the surface.

Mr. McKenzie - What we're trying to do through this form is analyze everything including first-aid if you'd like to have a definition of first-aid.

Dr. Howard - I think perhaps at the next meeting we ought to have some of these forms and pass them around. I can think of an awful lot of objections and difficulties that you're going to have using that sort of a form. I do think, though before we go any further we should hear from at least one member of the nursing group.

Mrs. Zar - Well, the foreman gives his men a pep talk in the morning. He says we're at the top of the list. A man has a little accident and he comes in for first-aid. You ask when did this happen and he says, "Oh, I didn't do this here" in order to keep from having it reported as an industrial accident. Therefore, we're not getting an accurate record.

Mr. McKenzie - We've got a lot of carry overs from a lot of bad traditions that have existed for a great number of years and we're not going to correct them all and change the complete philosophy of 78,000 people but I assure you we're going to make some attempts.

Dr. Howard - Of course, in safety -- I have always thought of safety as not as a statistical study but as a frame of mind. I must differ with Dr. Potts in that I feel these safety records, the bulletin boards, do accomplish a great deal. I don't care whether you etch them in gold or not, but they do have an effect on the man and they do make him safety conscious. This is what we're after. The difficulty, of course, is in local installations and they have some problems that I think have to be worked out according to the local conditions. No two situations are the same. Taking care of men in a refinery in a small area is quite a different problem from drivers that are scattered over four or five different bulk terminals, and obviously the figures are going to vary because they don't have the opportunity to come and be examined and be noted.

Mr. Kothe - I think we're worrying again about details and the procedure and the forms. Safety is an attitude of mind. I was a supervisor in Paulsboro and I had 53 assorted people working with me of which 23 were girls. We must get to the supervisor with this philosophy, this understanding. A lot of our supervisors haven't got the attitude.

Dr. Luongo - Some of these problems that have been presented sound like problems in communication between Medical and Safety. I'd like to ask Mr. McKenzie "does every refinery and every plant have a Safety Steering Committee."

Mr. McKenzie - Mr. Jim Herbert, when he made his presentation to the Manufacturing group in Philadelphia, made the recommendation that every refinery operation and manufacturing operation have a management advisory committee or the equivalent of a Safety Steering Committee, and Mr. Simpson made them stand up -- those that did have and those that didn't have. I think it was about 60 per cent that had such.

Dr. Luongo - How many of those Steering Committees have plant physicians on the Committee?

Mr. McKenzie - We don't know. The recommendation was given in the Manufacturing Committee and the tentative schedule or listing of the people who should be on was on.

Dr. Luongo - We had a lot of these problems in Communications on first-aid and reportable injuries until we were able to get the plant physician on the Safety Steering Committee where he could educate on the importance of reporting these accidents. And at once we found out that our reportable accidents went up but our lost time went down.

Mr. Folse - Do you think it's important to have the plant physician on the Advisory Committee?

Dr. Luongo - Absolutely.

Dr. Howard - A few days ago I attended a symposium on "The Management of the Acute Trauma" and one of the speakers on the panel was a doctor from Houston and according to his report, he was talking about chest injuries, Houston is a very unsafe city. He pointed out different types of wounds that they met in their emergency rooms, knife wounds, ice pick wounds, gun shot wounds, etc. and he did point out that if you got stuck with an ice pick in the chest your chances of living were considerably better than if you got shot in the chest with a bullet or cut with a knife. Dr. Read from New York, who was the moderator on the panel, in concluding the session said, "Every time I go to one of these meetings and I get home, my wife says 'Did you learn anything'." He said, "Now I'm going to get home and I'm going to tell her that if I have to pick a fight with a guy on the street, I'm going to pick a guy with an ice pick." Now I don't know what you're going to carry home with you and I don't know that necessarily you'll want to tell your wife about these deep deliberations we've had here today, but I do hope that you'll carry some of this back so that the "Republicans" will communicate with the "Democrats" back home and perhaps we can do something about cutting down these compensation cases.

PETROLEUM INDUSTRIAL HYGIENE AND TOXICOLOGY

Mr. A.C. Pabst

Inasmuch as this is the first full session devoted to hygiene and toxicology, I would like to take a few moments to review this subject. The employment of industrial hygienists by the petroleum industry is a relatively recent development starting about 1945. That year, the president of the American Petroleum Institute appointed 16 oil company medical directors and physicians (today there are 29) to serve as a Medical Advisory Committee because of the growing need for specialized knowledge in the health and technical medical field. The Medical Directors, in turn, required the assistance of technical advisors, who knew the petroleum industry from one end to the other, the raw materials being used, the processing operations employed, and the products being marketed. Only chemists or engineers with ten to fifteen years' experience in process and product development laboratories had this training. But this is not all -- one had to know the toxicology and hazards of materials and processes in the petroleum industry, and the engineering approach to protect employees and customers. This sounds impossible but there is more -- one had to know the federal and state laws and regulations concerning health codes, labeling, air pollution, radiation, food and drug requirements and, in addition, follow pending legislation in these matters.

The foregoing briefly describes the activities of the fully trained petroleum industrial hygienist. In 1945, there was one man in the whole petroleum industry having this tremendously wide background -- how others were developed is another story. Today, there are still only 25 men in the petroleum industry who qualify as fully trained hygienists and because of the requirements, it is exceedingly difficult to find such men. Routinely, the industrial hygienist may advise physicians or customers of the toxicology of a product, he will consult with legal counsel on laws and law suits, with the engineers on plant design, with the chemists on product development, the physicists on radiation, marketing people on labeling and product toxicology, and the safety men on protection programs - and he has to know their field and speak their language.

To illustrate the scope of activities, you will be interested in a few typical questions or problems that have come through our office -- each one is a story in itself.

1. How much of one of our lead greases would kill a cow?
2. What is the safe level of combustion products when operating diesel trucks in mines?
3. Could ingested Mobiloil be responsible for the death of a child?
4. Are products derived from Sovaformer bottoms likely to be carcinogenic?
5. Is there a possibility of arsenic poisoning in the operation of Sovaformer units?
6. What radiation laws must be observed in New Jersey. What are A.E.C. regulations regarding face velocity of radiation hoods in laboratories?

7. What product labels are required to meet New York State labeling laws and those of other states?
8. Does our petroleum solvent meet Public Law 518?
9. Can the Company safely recommend micro-crystalline wax for lining barrels containing beer, vinegar, prune juice or honey? What position would the Food and Drug Administration take on this?
10. If Pennsylvania House Bill #34 is passed, what will we be required to do?

Charles Kettering of General Motors has made the statement

"There are two general kinds of education: one is learning a lot about one thing; the other is the almost disappearing kind where you learn something about a lot of things."

In my opinion, the latter aptly describes the work of the industrial hygienist.

TOXICOLOGICAL ASPECTS OF PRODUCTS DEVELOPMENT

John A. Zapp, M.D.

One of the last things I did yesterday before leaving the Laboratory was to submit my budget for 1958. This seems to be a very appropriate time to be thinking about the role of the toxicological laboratory and product development because duPont is not a charitable foundation for dispersing its money but rather a corporation which is in business for the purpose of making a profit through the sales of chemicals. Consequently, if they approve my budget it is because they think that they will get something in return.

duPont started in the year 1802 as a black powder company. The manufacture of black powder had its problems, but they were not toxicological. They blew a great many people out through the roofs of the powder houses, but as far as we know no one got poisoned. With the advent of dynamite, the situation changed somewhat because dynamite contains nitroglycerin and nitroglycerin is not only a powerful explosive but a powerful drug as well. The dose that the physicians are apt to use for medical purposes is measured in one hundredths of a grain, but in the manufacture of dynamite, man may be exposed to one hundred pounds per day. It is quite obvious, therefore, that he might expect to get some effect from the nitroglycerin he is working with. This was the first. Toward the end of World War I, duPont got interested in making other kinds of chemicals and explosives. I might mention the dyes that were developed by our Organic Chemicals Department because we could no longer get dyes from Germany. I might mention rayon and cellophane which were brought over from France. Since the end of World War I, we have been diversifying considerably in the chemical industry field till now we have eleven operating departments, each manufacturing and putting out a different class of products than the other. Now experience taught that a great many of these chemicals had effects on people that had nothing to do with their intended use. These were the undesirable, the unexpected things that happened and we had our share. Nitroglycerin, of course, was one. The dyes involved manufacture of organic aromatic nitro amino compounds which have the unpleasant property of interfering with the transport of oxygen to the blood so the people exposed to them turn blue from cyanosis-rather distressing. The manufacture of cellophane and rayon involved the use of carbon disulfide and the production of hydrogen sulfide. These two had very unpleasant effects.

Somewhere in the very early 30's, management of the company decided that if they kept up this business of manufacturing new chemicals, they could expect to run into a number of materials like these organic amino nitro compounds and carbon disulfide that would have bad effects on the employees and they wondered if there was some way by which they could find out in advance what harmful effects could be expected and, of course, having this information, do something about it before anybody got hurt. Dr. George Gehrman who at that time was their Medical Director was asked what could be done in this direction and he recommended that a laboratory be established which would have the responsibility for investigating the toxic effects of chemicals. This laboratory

was authorized and occupied in January of 1935. It was named the Haskell Laboratory for Industrial Toxicology at that time honoring Mr. Harry Haskell who was the vice-president of the company and who in turn had been responsible for getting duPont to establish a medical division in the first place. This was about the end of World War I. We were and are a part of the duPont Medical Division, which in turn, is a part of the Employee Relations Department, one of the auxiliary departments of duPont.

Now, the chemical industry has two kinds of responsibility. Speaking from an economic and business point of view one is to keep a line of existing products in a healthy condition and the other is to develop new products. We trust that most of the existing products, either through experience or testing, have been adequately surveyed so that we know something about their toxicity hazards. But the new ones are very often new compositions of matter. There is no information in the literature or in the experience of people which would enable one to predict what kind of effect they might have on man. And that's the kind of problem that we are faced with in the Haskell Laboratory. We try to find out by testing the effects of these products on animals, what kinds of effects might be anticipated in man. Now, for the moment, I would like to speak about the objectives of a laboratory of our type. In other words, what the company might reasonably expect of us. Now I think the first thing they expect of us is to develop information that will enable them to protect their own employees.

I would like to take an example from the field of the petroleum industry which you are all very familiar with and so are we and that is the tetraethyl lead problem. Since Mr. Pabst mentioned Mr. Kettering I think it might be interesting to recall briefly just what role he had in the development of tetraethyl lead. I think it is a fascinating story of product development. But as it is told, Kettering and Midgley were interested in the problem of knock in gasoline engines and they had been studying the performance of an American military aircraft engine, comparing it with that of a German military aircraft engine. The German engine was alleged to perform a lot better in combat than the American engine. So when a captured one was brought over, it was found that it knocked very badly so the experts decided immediately that the pilots were just looking for an alibi. This wasn't a very good engine -- it wasn't as good as ours. However, some more curious engineers took the German engine apart and found that it had a compression ratio of 6-1. Now they knew that the ideal compression ratio was 4-1 so, of course, the German engine knocked. It was not only a bad engine but they knew why it was a bad engine.

Kettering and Midgley, on the other hand, were not convinced that this should conclude the matter and they sent for some German gasoline, and when they used German gasoline in the German engine, it did not knock. Now the only obvious difference to them was that the German gasoline was dark brown in color. Ours was white. So they concluded that maybe the color of the gasoline was responsible for its anti-knock properties. This being on a Saturday, I believe; they sent down to the store room and asked the keeper of the store room if he had any brown dye that would dissolve in gasoline. He didn't. So they said "do you have anything that will color gasoline brown." Well, he said, "All I have is iodine." So they tried that and it colored the gasoline brown. When they tried it in the German engine it didn't knock so their theory was confirmed all in one afternoon. Later the same afternoon, however, the store keeper got

some dyes from downtown. They tried those and they didn't work at all. So the theory was destroyed the same afternoon. However, they had proved to their own satisfaction that the addition of a small amount of a chemical to the gasoline changes anti-knock performance. It soon developed that iodine was of no earthly use because it chewed up the engine. So they proceeded to take all the chemicals they had on the shelf and try those one after another. They found that selenium and tellurium compounds also prevented the knock but the exhaust smelled so badly that they realized that they couldn't use them. So they went to the Periodic Table and they looked for iodine, selenium, tellurium - they were all down in the lower right hand corner. In that corner was lead and bismuth and so they said we will try these. And after that it was just a matter of development. Lead worked. It was possible to make an organic lead compound, lead tetraethyl, which was soluble in gasoline and that was the beginning of our leaded gasoline era.

You will recall, however, that in the 20's, in the process of commercializing tetraethyl lead, a very substantial number of research and production workers were killed as a result of the lead poisoning. Tetraethyl lead is not only like lead in the fact that it is a toxic material, but it is particularly vicious because the lead happens to be soluble in the lipoid substances of the body and in particular, it gets to the brain and produces quite drastic central nervous disturbances. Another large number of people, a larger number as a matter of fact, were made seriously ill and recovered. Now duPont had a part in this because they were manufacturing tetraethyl lead. This was just one more thing that I think led to the establishment of the Haskell Laboratory so our origin in a way, I believe, is tied up to the petroleum industry.

Now, our function is to study the effect of these new chemicals on various laboratory animals. We use rats, guinea pigs, rabbits, dogs and mice. We don't use any cattle or horses but there have been a few times when we have had to send out, under contract, research work on chemicals that had to be fed to cattle just as Mr. Pabst mentioned in his leaded grease. Through the development of information, passing it back to the Operating Departments and particularly to the plant physicians, we hope to give them a guide to a good preventive medical program. We can tell them whether or not, a chemical handled in a certain way in the plant is apt to be hazardous. We can tell them what effects to expect from acute exposures, in case of accidents, spills, blow ups and things of that sort and we can tell them what to look out for as a result of chronic exposure which means the day after day exposure to sub-lethal amounts.

Now there is another very important obligation which the chemical industry has and that is to enable the consumer to use the product safely. I know that you all have heard of product liability which means that if your product injures a person when they are using it in accordance with your directions, you are certainly liable, and it is very important if you want to stay in business to make sure that you don't injure or kill too many of your customers. This is very bad for public relations and bad for the Claims Department.

I might mention a couple of examples where this sort of thing happened. We had a number of complaints right after the end of World War II about nylon dermatitis. A number of women discovered that they could not wear nylon stockings or nylon lingerie. In some cases, they had a very definite dermatitis as a result of wearing these stockings or lingerie. Now investigation of this situation

revealed that the dermatitis was not due to nylon, the polymer, but rather to the dyes and the finishes that were used on nylon. You see the nylon hit the market rather suddenly and a line of dyes specifically designed for the dyeing of nylon had not been developed. Acetate dyes worked fairly well but they were not held to the nylon fiber nearly as tightly as they held to acetate. This resulted in what they call bleeding of some of the dye from the nylon and this in turn was able to cause dermatitis. The situation has been corrected, I think, pretty well throughout the industry because people now recognize that only certain dyes and finishes should be used on nylon. I think that we have demonstrated that we learned a lesson because there have been no comparable complaints about dermatitis from the other synthetic fibers, dacron and orlon in our line and the other synthetics of other companies. We recognize now that before you put a dye or finish on a new fiber, you ought to find out what it is going to do.

One of our competitors in the early 40's developed a new textile finish, not specifically for nylon; it was actually used on cotton. Now, unfortunately, one of the first wide applications of this finish was on men's shorts and the results were disastrous. It cost the company, I think, in the order of a million dollars to settle the claims because the customers were really enraged and probably, with some reason. One man even came in and asked for added compensation because his wife left him. The story was that he consulted a specialist about his condition, came back and told his wife "Well, the specialist says it isn't syphilis" and she said, "Well, if you didn't have a guilty conscience, you would have never thought of that in the first place." So she packed up and left and he wanted compensation for this. We do have this obligation to protect the public and all of us have to face up to it.

Now, when we get into certain aspects of products like those that are concerned with food processing or the packaging of foods, we have to go beyond the moral obligation to protect the public and satisfy governmental agencies that the application that we have in mind is really safe. If we in duPont want to market a new insecticide or fungicide, we have to comply with the law, the so-called Pesticide Act, which requires that all new pesticides be registered with the Department of Agriculture and that their label complies with regulations set up by the Department of Agriculture. We must also comply with the Miller Amendment of the Food, Drug and Cosmetic Act which states that "before the Department of Agriculture will register a pesticide, they must have a tolerance level from the Food and Drug Administration saying that it is safe to use this pesticide on food up to a certain residue level. For example, they may say that it is all right to have 14 ppm of methoxychlor on cabbage. It is all right to have 3 ppm of DDT on apples or 1 ppm of aramite on something else. There is a long list of these things and you cannot get a label until you have gotten a statement from the Food and Drug Administration that it is safe up to a certain amount as a residue.

Well, the only way to get a tolerance from the Food and Drug Administration is to go down there and present them rather detailed toxicological data on which they can base an opinion. They are not impressed with what you think about your product. I will say quite frankly that they are not interested in your opinion unless it is backed by evidence they can have in their file so if anybody else asks about it they can say we said that such and such a tolerance is safe because of the following evidence and here it is. And so we have to do that type of thing if we're going to stay in the pesticide business.

Now, Mr. Pabst mentioned the label problem. Labels are your only sure method of getting precautionary information to the ultimate consumer. He may not have read any published articles or any reports that you have issued. He may not even have read the advertisements that you have put out in the various magazines, newspapers and what have you, but if he has the product there in his hand, it has a label and on that label you can put precautionary information. A certain amount of that information is required by law. For example, in the transportation of chemicals, you must have a shipping label which meets the ICC regulations. Now this is not a consumer label. It is the kind of label that is on your shipping container, not necessarily the label that is on the package that is in the container. But there is a very definite criteria. The ICC has Class A, Class B, Class C poisons and the shipping regulations, the kind of containers, the size of the containers and so forth vary from one class to the other. So if you ship a Class B poison with a Class C container, you are in violation of the law if you ship in a mislabelled container. Sometimes the only way you can get that information is to carry out toxicological investigations. There are a set of criteria based on animal experiments which enables you to label a material as a Class B poison for transportation purposes. These criteria are overridden by human experience if that is available. I would like to make it clear that you cannot label Class B or not Class B solely on the basis of rat experiments or rabbit experiments if you have the human data. Human experience counts far more. And then I might point out that the Manufacturing Chemists Association and the Chemical Specialty Manufacturers Association as trade associations have been very much concerned with getting adequate labels for the benefit of the user. Now the purpose of these labels is to call attention to hazards, not to give a long recitation about what a chemical might do to you in detail, but rather to say that this material is hazardous, can be absorbed through the skin or cause skin irritation. Things of that sort, with simple directions for how to avoid these bad effects should be mentioned. As a member of the two associations that I have told you about duPont is anxious to have its labels coincide with the principles set up by the MCA and CSMA. Here again, if you do not have human experience the only way you can devise a reasonable label is by carrying out animal experiments and finding out what might be expected for human beings.

Now, I would like to say that the public is very much aware today of the possible hazards of chemicals, particularly in their food supply. We did not feel in duPont that we were in the food business. We do not manufacture any food products and make very few intentional food additives. We have found, however, that we are in that business despite ourselves. For example, if we sell pesticides and they are used on food crops or even on crops that are eaten by animals which are later consumed as food, we have to worry about the amount of the pesticide that gets to the consumer. We have to worry about the amount that's in the meat that the cow ate. We have to worry about the amount that might be in the milk that the cow gives and so forth.

Another thing we do is make food packaging films. Now, for awhile this seemed to be a rather remote situation in food itself. But the Food, Drug and Cosmetic Act states "that a food shall be deemed adulterated if its container is composed in all or in part of any toxic or deleterious substance which may render the contents injurious to health." There doesn't have to be any proof that it actually does render them injurious to health but may. We do make things like cellophane, and nylon film and polyethylene and so forth, and as a result, we have to consider this business of food additives.

You in the petroleum industry may have felt fairly remote from that field too, but you probably are aware of the fact that in August of 1956, there was a symposium in Rome on "Carcinogenesis of Food Additives" and one of the chemicals that was mentioned by name over there as a potential carcinogen was paraffin. After that a lot of questions were asked about whether it's safe to use paraffin wax coatings for milk cartons and that sort of thing, and it is serious to the point that the American Petroleum Institute, I think, has decided to invest several hundred thousand dollars in a study of this problem. They can't avoid either establishing the fact that it is or establishing the fact that it is not a potential carcinogen. You have this business of chemicals in foods, if any, of your lubricating greases used on the machinery for the processing of food. This seems a little remote, too, but, in Texas a few years ago, several hundred head of cattle were killed because a manufacturer of a pelleted cattle food used a certain kind of EP lubricant on his pelleting machine and the traces of the EP additive that got into the food of the cattle actually killed the cows and there was one terrific hassle about who was going to pay the bill for that one.

Just to show you the seriousness of this situation, I'd like to read just a few things from an article in the September issue of Consumers' Bulletin which is put out by Consumers' Research Corporation. It is read by a lot of people and they take it very seriously. They say the history of food and drug adulteration is rife with instances where a toxic substance has been used and later found to be dangerous to health or even life. Among these are nitrogen trichloride aging, used for 30 years as a flour bleach, discontinued in 1949 after animal experimentation done in England, not by English or American Food and Drug Administration, had proved the material was dangerously toxic. It is for a dog but not for a human, but that is beside the point. Thiourea and dihydroacetic acid, both poisonous, and the first a cancer causing agent, were used for a time as a preservative in mold inhibitors. That is not true either, but nevertheless, the story persists. Thiourea, as you physicians know, is used as a drug or was until some more potent anti thyroid preparation came on the market, but it is extremely toxic for rats. In fact, the derivative, alpha naphtha thiourea was quite a widely used rat poison until something even more toxic came along, but the toxicity for man is very much less. Now, somebody once upon a time did decide that it would be a good preservative for frozen peaches. It would keep them from turning and they were going to put some on the market but the Food and Drug Administration heard about it, tested it out on rats, and because of the high toxicity for rats they told them they couldn't ship the stuff and they didn't. But they have always said since then that they saved the country from mass poisoning. I doubt very much whether they did although I wouldn't want to advocate the use of thiourea in food because of the anti-thyroid effect.

Several hundred chemical compounds are known to produce cancer in animals when fed, injected or applied to the skin. At the present time, no chemist can say with certainty that a given chemical food additive or contaminant will not produce cancer in some person under some circumstances after a period of time. That is perfectly true, you can't. Now, the tone of the articles of this type is such that it will definitely create a lot of concern in the mind of the consumer and this, in turn, passes the burden back to industry to find out in advance just what these things will do. Now, when you are dealing with the field of carcinogens, of course, there above all, you cannot experiment on human beings and so you are faced with experiments on animals. They have to be very thorough and expensive experiments.

that the manufacturer has to do, is to get enough information to assure himself of the safety of the product for the intended use. Just what you will do about this point depends upon your point of view. We still have a few people, you'll find them particularly in sales, who say that they are perfectly sure that product X is not toxic, therefore, it is not even necessary to test it. Here is an intermediate opinion that I think might be worthwhile reading to you; it is a letter taken from our files received in 1939 from a manufacturer of chlorinated paraffin. What they said about the toxicity of the chemical was this, "for several years we have had a customer for this product, who has used it in a soft drink preparation." Before deciding to use it for this purpose, the customer investigated to some extent the possible toxic effects of this material. This investigation was quite limited. However, their decision to use chlorinated paraffin was based largely on the opinion of a chemist who at the time was a member of the Chemistry Department of an eastern university who stated that, as a result of a literature survey and his own general knowledge of similar materials, he thought there could be no harmful effects to users of the soft drinks. After several years of such use, the customer knows of no cases of any bad effects due to the material. You couldn't get away with that today.

To take the most extreme case, I would like to just mention briefly the recommendation that was made at this Rome Symposium in August of 1956 for the testing of chemicals as carcinogens. The recommendation was that you should use as many species of animals that you could get your hands on. This would be for example, rats, mice, rabbits, dogs, monkeys, chickens, maybe even snakes and, if possible, you should use within each species a cancer resistant and a cancer susceptible strain. You should give the material by mouth and by injection to another group of each, over their entire life time up to the third generation.

I don't know of anyone who has ever carried out that kind of experiment. Even if you use all the species that I have enumerated, you might find later that you should have tried it on horses. But, to carry out an experiment on cancer resistant and cancer susceptible rats plus cancer resistant and cancer susceptible mice plus dogs, is estimated to cost more than \$250,000 and to take ten years. Even then, as I say, if you do that you still can't be sure. Somewhere in the intermediate range is what we are trying to do. We are not exhausting every possibility but we do try to accumulate experimental evidence that will lead us to a logical and, we presume and hope, correct opinion. We have been lucky. I hope that we continue to be lucky but judging from the trend of events today I think that we, and perhaps you, are going to have to think more and more seriously about this problem of the unsuspected, harmful effects that might occur from the use of the chemicals that we produce. Now I haven't gone into any specific details about the Haskell Laboratory but I will be very glad to answer any questions that you might have.

DISCUSSION

Dr. Samuelson - When duPont presents their evidence to the government people in the FDA, are they ready and willing to accept it or do they look upon it as biased?

Dr. Zapp - Dr. Samuelson, they are quite ready to accept it. They have checked, I think, in a reasonable number of cases the statements that we made to them. For example, we ran a two year toxicity test on the insecticide, methoxychlor. So did the Food and Drug Administration. The conclusions came out quite similar and I would say that there is no hesitation whatsoever on the part of these government agencies now to accept our data.

Mr. Daniels - Dr. Zapp, you mentioned some of the problems duPont had and I recall that at one time you had some difficulty with aniline and bladder cancer. I was wondering what is the present status of that hazard now? What has been the total experience? You have had quite a few years experience now.

Dr. Zapp - Well, we have had quite a few years of experience. The bladder tumors are not caused by aniline but rather by beta-naphthalamine. The early German workers were mistaken in calling it aniline tumor because aniline will not do it but beta-naphthalamine, which was an important dye intermediate, will produce these tumors of the bladder, which in a certain percentage of cases, do become malignant. We had quite a high percentage of the relatively small number of people involved in the manufacture of this material that came down with bladder tumors. We are no longer manufacturing it. I don't think anybody else in the United States is either because you no longer depend on the dyes which were made from beta-naphthalamine. There are better ones available now.

Dr. Luongo - Are you aware of any compound we might be using in the petroleum industry that might be similar to beta-naphthalamine?

Dr. Zapp - Well, there are only 3 that I think have been definitely shown to have this bladder tumor effect - beta-naphthalamine, benzidine and the para aminodiphenyl, which is benzidine with one amino group knocked off. Now, there is evidence from the British statistical literature that compounds like orthotoluidine and some of the dyes may do it. But I don't think the evidence is conclusive that the men exposed to these were not also exposed in the plant to beta-naphthalamine, benzidine or para aminodiphenyl.

Dr. Luongo - Did you find it necessary to do cystoscopic examinations on pre-employment for awhile there?

Dr. Zapp - Anyone who worked in the beta-naphthalamine area had a routine cystoscope. This was a condition of employment. Now, although we are not making the material any more, every man who ever has been exposed to beta-naphthalamine in that plant is screened by a sort of Papanicolaou technique and if there is any indication of abnormal cells in the urine sediment, he is cystoscoped. We still have a full time urinologist on the staff of that plant.

Dr. Saunders - When a new product is being developed by your company is your operation called into consultation to give an opinion as to the potential hazard, if any, of such a product?

Dr. Zapp - I think that I can say that in almost every case, it is. It is not mandatory because we are advisory. We have no authority to step in and study a product but, on the other hand, if a department wants to invest money in plant facilities for the manufacture of that product, I am quite certain that one of the questions that our Executive Committee asks is "What is the toxicity aspect?" and if they have neglected to find that out, they will be sent back with their project unapproved. So, just through policy and custom, I am sure that we are getting most of them at a very early stage of development.

Dr. Saunders - When in a plant, new compounds are introduced as a part of some change in production, is your opinion asked about that new compound?

Dr. Zapp - I am not so sure about that if it is somebody else's product. There have been incidents just like those Mr. Pabst mentioned - the depth gauges. For example, somebody brought a rust remover and it turned out to have a very high per cent of hydrofluoric acid in it. It was a good rust remover all right but it also removed fingernails. We have had radiation things come up. One of our plant physicians had a man come in to see him one day and he noticed that he had some kind of tube sticking out of his trousers belt and he said "what's that?" "Well, that's one of those static eliminators", he replied.

Dr. Saunders - I might cite just one incident on the importance of toxicological testing before marketing a food or food ingredients. A chemical company, one of your competitors, was developing synthetic caffeine. Instead of making it from the cocoa bean, they found that they could make it very easily in the laboratory and they spent I don't know how many hundreds of thousands of dollars, a million or more probably, in the development. They came up to the point of putting it on the market and they finally realized that someone had forgotten they had to have Food and Drug Administration clearance on this. In the laboratory, it was caffeine, it tasted like caffeine, looked like caffeine, and was analyzed to be caffeine, but they had to go ahead and conduct their acute and chronic toxicity tests before they could market it.

Dr. Zapp - That takes usually somewhat better than 2 years of work because one of the things that you have to do to establish safety, is to feed the material to rats over their entire life span which is assumed to be 2 years for practical purposes. So that by the time you do that, you end up with a certain number of survivors, you hope. They have to be sacrificed and autopsied to study for gross and micro-pathology and the results of those examinations presented to the Food and Drug Administration before they will accept the fact that there have been no harmful effects.

Dr. Samuelson - Is cortisone used for lipoid pneumonia therapy?

Dr. Foley - No, not too much. It has been used, however, with some results in the South.

Dr. Saunders - Don't you agree that lavage is completely out of order in cases of kerosine poisoning?

Dr. Foley - Yes, I do. Lavage is of no practical use.

Dr. Veith - Have you seen any cases of ingested gasoline?

Dr. Foley - Never in humans. However, we put gasoline in the trachea of a rat and it died in 4 seconds.

Dr. Veith - Have you seen many adult cases of kerosine poisoning and what were the results?

Dr. Foley - What I have seen have been mostly attempted suicides and all have recovered.

HAZARDS OF RADIATION

Irving Tabershaw, M.D.

was delighted at the invitation to speak to you on radiation. I am particularly pleased to speak to a group of industrial physicians, industrial hygienists and industrial nurses because I am going to take the liberty of bringing to your attention the kind of problems that bother me in this particular field. The topic as it was assigned was "Hazards of Radiation" and in discussion with Mr. Pabst, he said it would be in order to take up what I felt was pertinent. As he has indicated, you know very well that radiation is increasing in industry and particularly in yours and I would bring you nothing new if I simply reviewed with you the various devices and developments in the field.

There is an aspect of radiation, however, that I think concerns us and concerns you particularly as physicians. It concerns us to a point that we have to, I won't say do anything about it at the moment, but keep in mind the kind of problems that are being thrust upon us. I say particularly for industrial physicians because we have a three-fold role in this. First as citizens. How hazardous is radiation? We are constantly bombarded now from the outside with interpretations of standards as to how much radiation is permissible and what it will do to us. I am sure that this concerns us all as individuals. Secondly, as physicians. We now find that we have been using an instrument for many years that turns out to deliver quite a sizeable and possibly lethal dose to people, and as doctors, we are under some defense, shall I say, as to whether we have used this instrument wisely and how we will advise it in the future. I have heard some rather derogatory comments about executive health programs that subject an individual to a complete GI series etc. every year, giving him as much as 75 to 100 roentgens presumably every year. Thirdly, we are interested as industrial physicians because we do have an exposure in industry and an increasing one which we have to bear in mind and, in fact, do something about it as Mr. Pabst has indicated. At least four states now have definite codes regulating it. We also use medical x-rays. So, I tell you nothing new when I say it is of particular interest to us.

The aspect that I want to discuss with you is the one about standards as to just what the maximum permissible dose means and to try to interpret it a little bit or at least some of the questions that it poses for us as industrial doctors. It is nothing new for us to deal with maximum allowable concentrations. We have developed them. We have recognized what they are. We have participated in committees. We have attempted to properly guide them and as a state official, in fact, when I was in the Public Health Service also, we tried to get these standards as advisory rather than mandatory. They were professional standards which the profession decided were necessary for control. There was another point about the maximum allowable concentration. It was definitely understood and repeated almost endlessly that it was not a standard which would say whether an individual became ill or not, that it was essentially an engineering benchmark which the industrial hygienist and industry would aim toward reaching to prevent disease in the majority of those exposed. With the development of

radiation, with the publicity on anything involving radiation, standards are set, and being set, and imposed upon us. I don't say wrongly, I don't say necessarily too stringently, but the standards are something that we have to live with and instead of having an opportunity to develop these out of industry and out of experience, they are coming from above and we must, as industrial physicians, apply these in our work.

This aspect of the maximum permissible dose which is constantly undergoing modification, as you well know, is introducing difficulties for essentially two reasons. One is that the basis is not clearly understood as to how some of these standards are arrived at and secondly, that they have been, at some degree, arbitrarily applied without regard to the industrial problem. Now, you might say "Where are the industrial physicians in this picture?" "Why don't they raise their voice through their committees?" The field is dominated primarily by two groups of people. One are the physicists, and rightly so, as this is their primary field. Secondly, by the physicians who are not industrial in background. If you will review the status, the training, of many of the men who participate in these committee meetings and the National Committee on Radiation Protection, you will find that the background of the men, the physicians now, are primarily as radiologists. In fact, I had an opportunity to review the early ones in the field and even to this day, they are dominated by radiologists. There are not more than 3 or 4 industrial physicians who have actively participated in the setting of the standards. Now perhaps, being one of those physicians incidentally, who try to participate with this, I find it difficult having a very small voice in pointing out the problem that is brought about in the plant. Perhaps also, ineffective because I don't know what to do about it. Standards have to be set. We use them in New York State. In fact, the decision that a code could be written was based upon the fact that the National Committee on Radiation Protection was willing to set a series of standards which seemed to be meaningful.

I would like to mention some of these confusing factors in a little more detail and give you at least my point of view about them. The first one that I have noted is what I call the sudden introduction from on top. Most of us shy off from the problems of radiation. There are specialists in the field. We accept their interpretation. It is amazing really, how little grass roots knowledge there is about radiation and radiation damage. Even as physicians, we left it to the radiologists to advise us as to what the meaning of radiation exposure was and we always felt that since they were the ones most intimately connected, that they would have the best understanding of what a safe limit of exposure was. As it turns out their interpretation is not entirely true of what could be safe. Not only is the top talent so imposing and so highly trained but there is such publicity around it that you must accept what has been published. No one individual, no group of individuals, has any real information in such a specialized field and it is one of the things that I think we must remedy in time, namely, to gather information on exposure.

Our industrial medium is one of the best in which you can develop long time meaningful data to perhaps answer some of these questions that they raise. The second confusing factor is the technical language. The field of physics is a changing field. Findings are constantly expanding in the field and we find that the language is quite difficult. Most of us, I am quite sure, unless we thought it through and looked at it, get confused between a REM and a RAD and

roentgen and use them perhaps interchangeably and perhaps wrongly or just walk away entirely and leave it to somebody else to determine what's being said. A third confusing factor is what I call the unity of radiation effect. There has been an attempt and technically sound obviously to try to put radiation into one group, into one number and to try to come out with one figure which will provide all the standard that is needed. If we could say that 300 mr per week is the maximum permissible dose and if this would cover all situations, this would be the ideal picture and this, of course, is the reason for our developing terms like the REM instead of the RAD, etc. It is true that the physiological effect or the biological effect of radiation is the same, if you're talking on the fundamental cellular level. However, exposures are not the same, there are various types of radiation and various organs, various critical organs and various amounts to different parts. There is internal and external. So that actually the attempt to make radiation one unit is futile. I wish to quote one statement which is in an official release of the National Academy of Sciences, "that all radiation is harmful." That is rather a broad statement and it is true. I repeat, on a cellular level, all radiation is harmful but is all radiation harmful in the terms of the way we live?

Suppose we said that all chemicals are harmful. How difficult it would be. Suppose we try to find one maximum allowable concentration for all chemicals or even groups of chemicals. We know how we have to individualize depending upon the substance and its potential for reaching various organs, etc. I suppose that I accept that this is a good approach to try to make it one unit. But it is one of the confusing things. Another confusing aspect is trying to find a general term for what I call a scientific method. The expansion from experimental techniques and mathematical formulae to human experience while, generally, is philosophically correct and even mathematically correct, is quite difficult to accept in its totality. For example, it might be shown that, in animals, every roentgen is worth 5 days of life. But to simply say every roentgen exposure that we get wholebody means that our days are going to be chopped by 5 is kind of difficult to live with. I am sure that you already recognize what I am trying to point out from an industrial standpoint because this implies that there is no threshold at all. Every bit you give is doing some damage, and in industry if you are doing some damage, you become responsible in terms of aggravation. In fact, you become responsible in terms of aggravation. In fact, you become responsible for the whole.

This leads me to the last point that I have in regard to this confusing or difficult aspect of it. I think that as industrial hygienists, as industrial physicians, we all accept that industry can use what it wants. We are going to show them how to use it safely and make sure that they use it in a safe way. With radiation, the implication is that this is not true. Radiation is harmful. Anybody who is using it is producing some damage and furthermore, all the experimentation that goes on is consistently looking for the minor and more minor changes and if you won't find it in an individual, you will find it in a group. So that essentially we can never prove that there is a threshold and that it is official or at least not harmful. This is the one place I know of, where we are being pushed to the interpretation that there is no real protection. You minimize but you don't protect. This is, in my experience, a new concept and one in which I am quite sure we do not fully appreciate what is going on. You can see what this does to the insurance picture. In New York and New Jersey, and almost anywhere in highly industrialized states, the interpretation

is that if you reduce by even a fraction of a day, a man's life, or if you increase his susceptibility to disease, you are responsible for the entire amount. With the weight of the evidence that is accumulating, both experimentally and statistically, you can assume that any amount of radiation that you give is doing some damage to the individual.

Now, the standards themselves help confuse the issue somewhat. Not that I have a better answer, but one of the difficulties is around the standards as they are promulgated by the National Committee on Radiation Protection. This is the lack of distinction, or very clear distinction, between their discussion of genetic effect and the discussion of a somatic effect. For instance, the National Committee on Radiation Protection, and incidentally, I might comment that the AEC simply accepts the National Committee's standards and has promulgated them now into laws and the New York State Labor Department did exactly the same thing. They all stem from the original recommendation from the National Committee, referring back to the International Committee. In the latest revision, they indicate that one should reduce the dose by a factor of 3 and suggest that no individual get more than 5 REM in a year. Previously, at 300 mr per week, one, at least in theory, could get as high as 15 REM in a year. They suggest that this dose be cut by $1/3$ and that no individual be allowed to get more than 5 REM in a year. They furthermore suggest that no one, especially workers under the age of 30, be permitted to get more than 50 REM, meaning that up to age 30 there is a more restricted standard. Well, this is not entirely based upon a somatic effect. This is a genetic problem as to what is happening to the germ plasma of the population. Now this standard based upon the genetic effect is valid but you can see how it confuses the issue in industry that has to take care of this aspect in protecting the worker. There is some basis for cutting the dosage permitted in a life span due to somatic effects, but the real reason for cutting the dose was essentially a genetic one.

It raises the issue, for example, should industry hire anybody to work with radioactive materials if they are under age 30. It raises the issue whether the 300 mr is really valid when they say you can permit the individual to be exposed up to 300 mr per week, when actually, you should not expose them to more than 100 mr, assuming an equivalent exposure over the year. How will this be interpreted if an individual gets 150 mr per week which is not too uncommon an exposure in industry working with atomic energy. It means you have over exposed this individual although your standard still says that you can give him up to 300 mr per week. Perhaps, what bothers me is essentially the interpretation of what a maximum permissible dose is. I felt comfortable with it when professional people were discussing it, when they recognized what it was, when they realized that there would be some who might get injured below the maximum allowable concentrations, and some would not be injured even if exposed above the maximum allowable concentration. This incidentally is true of any maximum allowable concentration and because of our experience, we are especially careful not to promulgate these and certainly not to put them into codes. What the end result will be, I don't know but it does, I think, pose a major problem for industry. The answer as I see it is the experience must come out of industry. In fact, the Government has imposed these standards because there was no experience in industry. Industry hadn't worked with radiation enough. I think that in the years to come, we will have to be in a position of developing data, information of various kinds including the medical data to back up the exposure. I know that from the governmental standpoint we discussed the question

of some kind of records should we ask for and it became evident that we did not know. This is why you will notice all the codes are relatively loosely worded. The governing bodies have asked for whatever records it deems advisable. The burden then is on industry to provide a record and to teach the government what it needs in the way of data or what is a reasonable kind of data to accumulate. I know, for example, that the Commission has tried to set up records on radioactive waste materials, the disposition of them and it is almost impossible to do with the kind of red tape they asked for. The experience must come from below. The experience must come out of industry.

My appeal is that we treat this subject as another toxic hazard; that we develop individuals with an industrial hygiene point of view. Preferably industrial hygienists, should be trained as radiation experts, given the instruments and the help of the medical department, to develop the kind of data which I think we are going to need quite badly in the next few years.

DISCUSSION

Mr. Van Zandt - Is 5 REM per year a law or is it a recommendation?

Dr. Tabershaw - It's not a New York State Labor code now. It is a recommendation of National Committee on Radiation Protection. It will be incorporated into the law of New York State as soon as it can go through the political machinery.

Mr. Levin - You mention the uniqueness of this problem of limit with respect to industry where the concern is for compensation. It seems like a new concept is brought in from the genetic field, namely, if there is a certain amount of transfer genetically as far as damage is concerned, how liable is industry for the second or third generation?

Dr. Tabershaw - Well, that is another point that has never come up before. We, of course, were always interested in the individual who presumably had damage to his genitals, but this is again a new concept and I am quite certain the way New York State courts interpret things, and the way New Jersey now is, and I speak from experience in these two states, it would seem to me that we might be responsible for a second or third generation.

Mr. Van Zandt - Would you think that possibly we might be held responsible even though an employee received less than the recommended dose?

Dr. Tabershaw - I would think so. As I say the damaging statement, the shocking statement to me and shocking from the standpoint of an industrial physician who has a job to do, is this bold statement that "all radiation is harmful" and when you are talking about the cell, it is true, but is it true in the sub threshold dose? I think that we should begin to re-educate people that there must be a threshold. That we have got to assume that there is one. That just exposing someone to radiation, doesn't ipso facto make him guilty.

Mr. Pabst - Would you comment briefly on the value of blood tests and blood counts in a medical program?

Dr. Tabershaw - In the New York State code, I don't remember now if it's official, but we did not ask for blood counts unless an individual was exposed to at least the equivalent of 200 mr per week. Below that blood counts would not be interpreted as being a necessary control. I think the attitude of the profession generally now is that the routine blood count is not very helpful in low exposures.

Dr. Worrall - What is your view on the clinical approach to this problem? What do you think about routine chest x-rays, etc.?

Dr. Tabershaw - Being so close to radiation, I feel that we should not use them unless with discrimination. I would advise going to a radiologist who has an awareness of the meaning of his instrument and who does not do it just on a casual or perfunctory basis. I see no reason at all to stop using x-ray but there should be an indication

Dr. Tabershaw - and need and I'd leave it to the professional conscience of the radiologist. There is certainly no reason to not take a chest film if you have some clinical signs. On the other hand, there is certainly no sense to the kind of routines that have been carried on. In New York City, for example, every child between the ages of 14 and 18 gets an x-ray every year, and we know that the incidence of tuberculosis in the adolescence is the lowest; but they are a captive group and you have a machine so you go through the routine. Now, they come up with other answers. Perhaps you do a tuberculin test first before you do a chest x-ray. I certainly don't think as physicians we ought to abandon the approach but on the other hand, we have got to recognize that it does have definite possibilities of harm and certainly in pregnant women and women in child bearing age, you must look with askance at it.

Dr. Selby - I wanted to say that I was interested that the State was so concerned in the industrial exposure and to my knowledge isn't doing very much about the number of physicians who use fluoroscopes so indiscriminately. To my knowledge, the general practitioner in the State of New York can buy a machine that is not calibrated, put it in a room that is absolutely unprotected and use it just as he wishes. The question of the use I certainly agree. I think that the radiologists who are trained and who use machines that are calibrated and filtered are the ones who should be using it more and more. The question of when you use an x-ray and when to get it, I think certainly has to be individualized.

Dr. Tabershaw - May I just comment that the real issue is fluoroscopy as Dr. Selby pointed out. There is a great deal that can be done here. If I did say that only symptoms should be an indication for a chest x-ray, I didn't mean to go quite that far but all I ask for is discrimination in its use. I want to make one comment regarding this question on the control of physicians and their use of this instrument. I might point out that in New York State the Labor Department is interested in industry and the Health Department deals with the private physician.

Dr. Hinton - There is a film now that is much more sensitive than the films that have been used in the past and also much more sensitive to fluoroscopic screen. I wonder if any of the radiologists present could tell us how extensively they are now being used?

Dr. Foley - I think industry itself has a part in this. I had occasion about 6 months ago to review the output of all the dental machines in the city and you would be surprised at the output of the different machines. Now one dentist, we calculated, gave 120r in a fullmouth x-ray and that is a tremendous dose and you could divide the machines right down the line. I am not going to mention companies, but one company certainly had no filters, no cones and no protection whatsoever. What I feel is a better company, the output was reduced 70-80% and I think it behooves the industry itself to calculate the output of their machine before they put it out because an average dentist I am sure has no conception of damage that radiation is doing. Someone walks in and gets a full mouth x-ray and then 3 or 4 months later, they have to check the teeth again, so they give another full mouth and the amount of radiation that person is getting is tremendous.