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MEDICAL AND SURGICAL OFFICERS

FORTY-SIXTH MEMBERSHIP MEETING

FEBRUARY 23, 24 AND 25, 1966
SHERATON-PALACE HOTEL
SAN FRANCISCO, CALIFORNIA

ASSOCIATION OF
AMERICAN RAILROADS

PLAINTIFF'S EXHIBIT
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REPORT

of the

FORTY-SIXTH MEMBERSHIP MEETING

of the

MEDICAL AND SURGICAL OFFICERS

HELD AT

THE SHERATON-PALACE HOTEL
SAN FRANCISCO, CALIFORNIA

February 23, 24 and 25, 1966

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MEMBERSHIP MEETING
ASSOCIATION OF AMERICAN RAILROADS
MEDICAL AND SURGICAL OFFICERS
SHERATON-PALACE HOTEL
SAN FRANCISCO, CALIFORNIA

Wednesday, February 23, 1966

The first general session of the Forty-Sixth Membership Meeting of the Medical and Surgical Officers of the Association of American Railroads, convened at 9:05 o'clock a.m., in the Comstock Room of the Sheraton-Palace Hotel, San Francisco, California, with Dr. Ernest C. Olson, Chairman, presiding.

CALL TO ORDER

CHAIRMAN ERNEST C. OLSON: It is my pleasure to welcome you to the Forty-Sixth Annual Meeting of the Medical and Surgical Officers of the Association of American Railroads. We got here a day or two early and I must say that we have been delighted with San Francisco, as we always are. It's a wonderful host city.

You have undoubtedly been advised that there is a meeting of the ladies in Suite 809 at 10:00 o'clock this morning. I hope that those of you who have brought your wives will see to it that they attend. They will be very welcome.

CHAIRMAN'S MESSAGE

Perhaps this is a proper time and occasion to review our position and purpose, our relationship to management, candidates for employment, the employee, our effectiveness and our accomplishments.

Since we are selected by management to perform certain functions for them in the matter of examination of applicants for employment, it follows that we have an obligation to see that they get what they are seeking--an employee who is well suited to his work and is happy and contented in it. The result is a mutually advantageous association. The proper selection plays an important part in the accomplishment of this aim.

We must also provide for a system whereby the employee is examined often and thoroughly enough to guarantee within reasonable limits that he is able to perform safely and effectively insofar as his health is concerned.

Because time, environment, contact with communicable diseases, the effect of degenerative and chronic diseases tends to reduce the health status, it follows that the medical department is often regarded as interdictory, because it may suggest removal of these individuals from service for the good of all concerned.

Changes in our social attitudes and customs exert a decided effect on the practice of medicine and particularly in its liability and medical-legal aspects. Medical opinions and actions pertaining to practice are subject to a closer scrutiny and contention; the responsibility of the railroads for the health of its employees has also undergone considerable change. Aggravation of pre-existing functional or organic conditions is compensible without particular regard to the part played by the original condition. Death occurring on the job is often blamed on the company without much regard for the natural effects of aging or the progress of degenerative diseases. The representative who pleads to have an employee with a given disability returned to work will frequently blame the company for acceding to his request if any untoward result ensues. The courts take the position that social customs demand a verdict in favor of the employee. Private enterprise and particularly railroads are held increasingly responsible for the employee and his health and welfare.

What then is the role of the medical department of the railroad? The fitness of the prospective employee insolar as his physical attributes, body build, strength, stamina and endurance must be assessed by the medical examiner. His psychological make-up, emotional stability, maturity and suitability for the position sought or positions to which he may reasonably be expected to advance, need to be carefully weighed. Since one must assume that once seniority is established, the individual may very likely make railroading in its various phases his life work, it follows that any infirmities which are likely to handicap him in the future and which can be predicted with some degree of certainty, should be a signal to weigh these deficiencies against the special capabilities of the individual and the needs of the company.

It may thus be seen that the medical group is in a position to supervise and exercise great influence in the selection of the personnel of the railroad and act as an effective barrier to the unqualified and undesirable.

It also performs another important function; namely that of safeguarding the health of the employee, the safety and welfare of his co-workers, and the public, and fulfilling its obligation to the railroad to insure efficient and safe performance. It can advise when the risk of continued employment might endanger all concerned.

In spite of contentions to the contrary, it can and does furnish competent, impartial opinions regarding the degree of disability suffered as a result of injury and the ability and safety of the employee to return to his job.

I am sure that the profession is keenly aware of its position in our social and economic scheme and its obligations to the employee, the public and the company. It does not want only or capriciously tend to deprive anyone of an opportunity to earn a living.

Serious thought and deliberation are given to any situation where such a question is involved.

Our efforts to promote our relations with management, to convey our aims and desires to be of the greatest possible assistance, to continually appraise our position, to keep abreast of the changes and progress in our profession, and to apply them judiciously in the conduct of our work, have been our earnest ambition. Our lines of communication may not always have been as open as they should have been, but we have been trying to expand our sphere of activity in the form of more frequent meetings and discussions on subjects of current interest and importance in railroad medicine to the end that those whom we serve will profit by it.

We are presenting at this our 1966 Annual Meeting a program of varied subjects such as panel symposia, reports of activities and suggestions of the standing committees, a discourse or two and an address by the Assistant Vice President of the Southern Pacific Company, Mr. William Jaekle.

I want to acknowledge our debt and gratitude to Dr. Vance Strange, Chief Surgeon of the Southern Pacific Company, for the time and effort he has expended in securing most of the participants in our panels together with our speakers.

It is now my pleasure to introduce to you Mr. William Jaekle, Assistant Vice President of Operations, Southern Pacific Company, who has graciously consented to address us on a timely subject.

Mr. Jaekle.

(Applause.)

ADDRESS: William Jaekle, Assistant Vice President Operations, Southern Pacific Company

Thank you, Dr. Olson. Medical and Surgical Officers of the Association of American Railroads: When Dr. Olson opened the

meeting, it reminded me of the new church which was recently built in Orinda. You remember Dr. Olson said, "We'll everybody move up?"

Well, we have this new congregational church that was built supposedly with a capacity of about five hundred. When the congregation walked in the first Sunday to see it, well, lo and behold, there's only pews for about fifteen or twenty right at the very back. The people scrambled in those fifteen pews and sat there, and suddenly the pews moved ahead. Some came up out of the floor, and just kept moving right on up. So, of course, everybody that was in the back finally ended up in the front.

Our minister stood there, and he was always given thirty minutes to make a sermon. He was a little bit long that Sunday, so at the end of thirty-one minutes, the little yellow light came on, and pretty soon a red light came on, and he disappeared.

So I hope, Dr. Olson, if I overrun my fifteen minutes that you haven't got me wired for the escape hatch. (Laughter.)

You will note by your program that Mr. Lamprecht, Southern Pacific's Vice President of Operations, was scheduled to speak here. Yesterday morning, Mr. Russell, our Chairman, Mr. Haggott, our President, decided they were going to make a tour of the Rock Island properties. This has been scheduled for two days subsequently, but they decided to set it up 48 hours, so Mr. Lamprecht turned around and said, "Bill, here are my notes."

So that is why I am substituting, and it's really a pleasure to be here.

I have Mr. Lamprecht's notes and I have done my best to work them over.

Mr. Lamprecht wrote briefly, "I appreciate the opportunity of welcoming you to San Francisco, Southern Pacific's headquarters city. I know you have very serious matters on your agenda, and I am confident your stay here will be fruitful from that standpoint.

Hopefully you and your ladies will also have at least some opportunity to see and enjoy some of the attractions of our city and some of the many points of interest that surround it. I understand it's been twelve years since you last came here for your meeting. Please make the most of this visit."

I am sure you will. We intend to change the weather a little bit for you tomorrow. It's going to be clear and shiny both Thursday and Friday. I got that on the basis of our weather man that forecasted today's clear weather. (Laughter.)

"On the basis of my own experience, both as an officer of Southern Pacific and of the Operating-Transportation Division of the AAR, I look upon you railroad physicians and surgeons as one of the hardest working, most dedicated groups in our industry.

"The medical profession and the railroad industry share almost a century of the closest cooperation. Even before the first transcontinental rail line was completed, and while the pioneer builders of the Central Pacific, Southern Pacific's predecessor, were still engaged in the monumental task of building the line over the Sierra Nevada Mountains, they had organized a medical department, the first of any railroad. And in 1868 they established their own hospital, probably the first industrial hospital anywhere in the world. Shortly thereafter establishment of medical departments became general throughout the railroad industry.

"In those early days when there were no other public health organizations, these railroad medical people took on a major pioneering responsibility in the whole field of public health service. Out of their close relationship with the railroads came many significant benefits extending to the whole of humanity.

"For example, research of our own medical staff was directly responsible for the eradication of typhus and typhoid fever. There has been a steady flow of new knowledge and new techniques from the continuing research activities in railroad hospitals throughout the country.

"There has also been a tradition from the start, and it has been general throughout the railroad industry, of choosing the outstanding physicians and surgeons for their medical staffs. These men, because of their high caliber, have been the nucleus around which medical societies have come into being, including the American College of Surgeons founded in 1913.

"As your profession and our industry have matured together, there has been a continuing mutual high regard and close collaboration toward the major objective of providing the best possible health protection for railroad workers.

"Much has been done by both parties to make our railroads a safer, healthier place to work.

"On your part, you have developed for us standards of employment which have done much to eliminate at the source many of those whose physical deficiencies would be hazardous both to themselves

and to their fellow workers. The requirement of each long [illegible] X-rays has had extensive practical benefits in [illegible] those not qualified to meet the physical demands of [illegible] as a protection to us against false personal injury claims.

"Almost immediately, when a person becomes an employee, we start building up a substantial investment in his training and the various fringe benefits to which he becomes entitled. So, in addition to all humanitarian considerations, it is important that we keep him healthy and able to perform his duties efficiently, so that our growing investment need not be wasted. For this, of course, we look constantly to you.

"Statistics show there has been great progress in cutting down the average hospital stay. This is due partly to the lesser severity of injuries."

I can speak from rather personal experience, too. Dr. Strange, one of the Chief Surgeons, Operated on me a few weeks ago for a hernia and Vance and Dr. Newberg came in after about sixty hours and said, "It's time for you to go home."

So they bundled me up and sent me home. So at the Southern Pacific Hospital they have done quite a job in cutting down the average hospital stay.

"But, mostly, it is due to the advances in medical science and the treatment and handling of patients that you have brought into play.

"On our part, beyond our never-ending program to train our people to work safely, we continue to strive to improve that part of our technology which will promote the health and safety of our people on the job.

"The modern coupler has long since replaced the old link and pin which was so great a hazard to the hands and arms of switchmen of the old days. The fireman no longer perches precariously on top of the tender to take on fuel and water, thanks to the advent of the diesel, so that we have far fewer of the extremely disabling type of falling accident involving heel and spinal fractures. By the same token, the diesels with their dynamic braking have eliminated the need for brakemen to decorate the tops of moving freight cars to set up retainers. The diesels have also cut down on the hazards of slack action in long freight trains.

"The technical revolution which has transformed almost every detail of railroading in the past 15 years has, in fact, had a tremendous effect in improving the safety of railroad working conditions. Radio communication between engine and caboose and between trains and way stations, centralized traffic control which cuts down the need for brakemen to throw switches by hand, hot box indicators which give the crew and the dispatcher an indication of overheated journals and lets them give prompt attention to avoid derailments, the intricate machines which take most of the sweat and physical strain out of maintenance of way, automatic classification yards--all these and almost every other modern development we have made have contributed in some way to cutting down the chances for accidents and injuries.

"On Southern Pacific our reportable injuries dropped 20%, from 8.66 per million man hours in 1961 to 6.93 in 1964, and 1965 will show a further improvement when the final figures are in. On this basis, together with the fewer man-hours it now takes to run a railroad, one might reasonably expect our bill for injury claims to follow the same declining pattern.

"Unfortunately, this has not been the case. The trend of juries continues to be toward making fantastically high awards, sometimes where even the basic merits of the claim seem highly doubtful.

"So, instead of declining, our cost of settling claims has continued on a high plateau. Claims settlements for Class I railroads continue to run around $100 million a year. For Southern Pacific alone these claims run around $7.5 million, a fact with which I am intimately familiar, since the charge is against operating expense.

"Thus, while between us, I feel great progress has been made in the matter of reducing the instances and effects of personal injuries, we still face a very serious problem from a claims cost standpoint. In this situation, my own concern extends beyond the fundamental matter of keeping our people healthy to a consideration of keeping our railroad healthy, also.

"You have been most helpful in giving expert testimony and, of course, in the very important matter of getting the employee back into service as quickly as possible. You have made independent studies and you have worked very closely with general claims departments of the railroad to see how our experience in this field compares with the experience of other industries.

"Beyond this, you are looking ahead to the overcoming of new hazards that may arise to replace some of the old ones we have overcome, as our technology continues to change. The effects of exposure to detergents, gases and fumes, acids and solvents, irradiation, and so forth, are possibilities we have to consider and

prepare for. I note that one of the discussions [illegible] included for your meeting is a panel on noise, indicating the ever expanding scope of subjects to which you are directing your attention.

"In closing, I wish to express my personal appreciation for all you have done and confess I cannot suggest what more you can do to help us solve our continuing problems of high claims costs. Nevertheless, because you are in a position to observe this problem so closely from our own vantage point, I do want to ask that you continue to be aware of it and to include it in your thinking as individuals and in your deliberations as a group. I can ask no more than that," Mr. Lamprecht wrote.

Personally, I have enjoyed substituting for Mr. Lamprecht, and I want to extend my very best wishes for a most successful meeting, Dr. Olson, and my best wishes to you all here. (Applause.)

CHAIRMAN OLSON: We are delighted to hear what Mr. Jackle has just said. We are glad to know that railroads are so well acquainted with our problems, and I am sure that attitudes of this sort will be highly productive in our efforts.

We do thank you, Mr. Jackle, very much.

We now have an address by Dr. Rodney R. Beard. You will note in your programs that he was designated in a certain manner, and this is in error. I wish to correct it by saying to you that he is the Professor of Preventive Medicine of the Stanford University School of Medicine, and he is going to talk to us this morning on the role of industrial hygiene in the railroad industry.

We are glad to welcome him, Dr. Beard. (Applause.)

ADDRESS: Rodney R. Beard, M.D., Professor of Preventive Medicine, Stanford University School of Medicine

Thank you, Dr. Olson.

I am very much honored to be speaking to you gentlemen this morning. It isn't often that I have the opportunity to talk to a group of people who have such a wealth of experience and background and knowledge on which to build a discussion.

I am the son of a railroad man, a train man for awhile. He had sense enough to get out of that fairly soon and become a station agent and a railroad telegrapher, and he served a long time with the Southern Pacific Company, having recurrent gallbladder problems, he was a patient of Dr. Coffey's and had several experiences with the Southern Pacific Hospital. They didn't get the patients out in

two and a half days back in the 1920's, however.

Dad warned me that he would disown me if I ever went to work for a railroad, so, with that kind of encouragement I got into medicine. But not very long after I completed my medical school training and some graduate work in the field of public health, I found myself back in the transportation business, because Pan American Airways had a little problem of diarrheal disease out on Wake Island, and they wanted someone to go and make a sanitary survey and find out what the problem was. It was very simple. They were drinking their sewage and the people in the station knew it perfectly well. They had told the people in the home office what was the matter but, you know, it takes a visiting expert to make the local boys look good and get their message across. I was such a success with this that I soon became a part-time permanent employee of the airline, and for the next ten years I had some of the pleasures that are familiar to you gentlemen with prima donna crew members, and with outlying stations where there are few doctors and no hospitals, and with problems of finding decent food and clean water for the crews and for the people who ride the line.

Despite this introduction to aviation, I still have remained a railroad buff, and travel by train when schedules permit, preferably in a caboose. But it would be false for me to claim firsthand knowledge of special health problems of the railroad operations. To be fair, there ought to be a co-author listed on the program, and this would be Mr. A. C. Archambault of the Southern Pacific Company, who has given me previously and recently a good deal of information about railroad operations.

Industrial hygiene is a field with considerable breadth of activity. One can define it very generally as the detection and control of industrial health hazards.

For purposes of detecting health hazards, in my early days in this field, I spent at least 10 per cent of my time observing men at work in the ships, in the offices and on the line. Direct personal observation of this kind just can't be bettered for giving a doctor an understanding of working conditions, the physical requirements, and the dangers which are met by his patients. The inquiring eye and nose will find out all sorts of strange things. Going through a shop you notice a strange but familiar odor and realize that it's carbon tetrachloride, and knowing the hazards of this material, you trace it down and find that it's being used for cleaning spark plugs, and here is a man soaking spark plugs in an open pan of carbon tet right under his nose. You are lucky if he isn't an alcoholic and if he can survive this kind of an exposure.

Then, in another place, going about with your eyes open, you see bags of chemicals labeled potassium nitrate, and stored close by are some glass containers of concentrated acid. This you might find in the neighborhood of a plating shop; it is convenient to have these things there. They are going to be used close by and where else would you store them?

This would be all right, except for the fact that you know what happens if you put concentrated acid on saltpeter. It will blow up. This is another of the things that just an open eye can detect.

I recall the thirty-hundred brake repair men whose hands [illegible] looked miserable. His explanation of this was that the brakes had sharp edges and his hands got cut. "Well, couldn't he wear gloves?"

"No, he couldn't wear gloves because he had to rely on a sense of touch in order to carry out his operation properly."

Of course he couldn't feel anything with the heavy calluses that he had on his hands anyway, and he might have done much better to put on gloves, but it was not easy to convince him of that.

We find these bad things as we go around our work places. We talk with the people who are concerned, talk with the people on the job, and frequently we can find an acceptable way by which they can avoid injury and disease. This is observation, it's the detection of hazards. After this comes the invention of a solution which will be acceptable and which will provide protection. This is industrial hygiene. Any thoughtful, observant, well-trained physician can practice it. There are a few special points to be learned, particularly about the treatment of the problems which one discovers.

The first principle is to ask if the dangerous material cannot be replaced or the unsafe practice discontinued. It may not be easy to find something which will take the place of the material which is in use and which will do the job as well or nearly as well, but I'm also encouraged when I start doing this, because I remember the examples of success. We have succeeded in displacing carbon tetrachloride as a solvent in industry, and in displacing that extremely useful and extremely dangerous solvent benzol. These agents have almost completely vanished from American industry and where they are used, they are used with very careful controls. It caused some inconvenience to do this, and maybe it raised the operating costs a little, but the increased cost was more than outweighed by the saving in workmen's compensation expenses and particularly by the saving of lives.

The second principle is, if you can't get rid of the beast, put it in a cage. Many hazardous operations like the machining of beryllium or beryllium alloys can be made safe by totally enclosing and mechanizing the procedure. If you can't do that, as a third line of protection, you can dilute and displace the dangerous material by ventilation, preferably carrying material out by a closed duct to a safe point of discharge.

Finally, if no other way is feasible, one can resort to personal protective devices, such as gloves or respirators or ear plugs. These usually are the cheapest and there is a great temptation to use them, but, when you do, there is a great risk involved, because you put too much reliance upon the human factor, that is, the element of the willingness of the worker to use the protective device, and on the mechanical barriers which are too often fallible. I am sure you have all seen instances where rubber gloves extended to provide protection against some corrosive material got holes in them and most simply became containers which kept the irritant material in contact with the skin. Very few of us are willing to bear the burden of wearing a respirator for hours on end; this is unpleasant, and the impediment in breathing is not acceptable. I don't think it's ever reasonable to pick up a respirator as the answer to a toxic gas problem or a noxious dust; it's only temporary.

Any of us can practice industrial hygiene, but we have to learn the limits of our abilities. It will quickly become evident that we need measurements of noxious vapors, mists, and dusts in the area, and an analysis of mixtures of chemicals which are encountered. As physicians, we may lead the way to acceptable solutions of relatively simple problems, but interest and ingenuity are not enough to solve the more severe problems. They are not enough to assure the design of an effective, efficient ventilating system for a large shop, nor for the control of noxious mists from a plating tank. Here the professional industrial hygienist steps in.

An industrial hygienist is skilled in the collection of samples, he is familiar with the numerous instruments which are available to measure toxic materials in the work place, and he knows how to interpret the results. He knows when to take a sample to the laboratory for analysis by the emission spectrograph, for example, and he knows when to take another sample to the laboratory for analysis by a long path infrared spectrometer. He is familiar with all of these available resources; he also has the skill to design suitable guards, enclosures and ventilating systems.

The industrial hygienist may come from any of a number of backgrounds; chemistry and biology are fairly common examples, but most commonly he will have taken a college engineering course.

To this he adds a year or two of graduate school work in one of the dozen schools which give advanced training in this field. His graduate studies include toxicology, an introduction to occupational diseases, pathology and symptomatology, bio-statistics, epidemiology and administration. However, his main concentration is on getting the special skills for the detection, evaluation and control of environmental hazards to health.

If he has unusual talent and energy, he may go on to earn a doctorate in science. There are great opportunities for success in research and teaching in this rapidly expanding field of industrial hygiene.

The railroad industry has long recognized its multitude of problems related to health. It is an integrated industry in the sense that it carries out all phases of the activities which go into transportation, which is its final product. It builds the roads, constructs the cars, paints the stations, even caters food for its passengers. Although engine building and car building of new equipment are done by independent companies and new roadbeds are constructed by independent contractors, the maintenance of the railroad and its equipment involve the operating companies in nearly every task known to the basic manufacturers; thus, the railroad employee is exposed to nearly every kind of occupational hazard known to man.

A quick scanning of the medical journals in the past five years reveals very few publications in the United States relating to the health of railroad employees or the industrial hygiene problems encountered in railroading. By contrast, incidentally, there are about a dozen titles for each year in the Russian literature. Apparently they are getting around to building some railroads and operating them, perhaps on the scale that was characteristic of our own country 50 years ago. I think the reason we don't have more publications in the United States about railroad occupational disease is because of the maturity of the profession in this field and the fact that these things are not unique to railroads but cover the whole breadth of industry.

One valuable report recently published is by one of your colleagues, listed in tomorrow's program, Dr. Isadore Kaplan of Baltimore. He has a paper of a couple of years ago in the Archives of Dermatology which reports an excellent epidemiological study of occupational skin disease. As you must be aware, the dermatoses constitutes more than half the number of cases of occupational disease, and they also contribute very heavily to the disability caused by occupations.

Kaplan observed that the majority of these cases occurred in the operating department, mainly in the maintenance shops. Contact

with solvents, oils and greases were foremost causes, with chromate exposures due to anticorrosive compounds in engine cooling water next. I know you are going to have a much more detailed discussion of occupational dermatoses, so I will dwell no more on that but go on to some of the other things likely to be encountered.

Many of you will have in your shops vapor degreasers which use chlorinated solvents, which properly used are safe, but improperly used can cause liver and kidney damage. Improper use means that the degreasers get too hot, and, in particular, that the cooling coils around the top of them are not operated cold enough, and so the vapor gets away from the degreaser and spreads around the shop.

Nowadays every shop must have a good bit of welding going on, and welding fumes will constitute a risk. I don't suppose it's necessary to mention to anyone here the problem of welding fume fever, metal fume fever, which we have encountered so frequently when people use welding torches or arcs on galvanized metal. Railroad shops often have foundries associated with them where heat, fumes and silica dust are encountered. Plating operations are also not infrequent.

Small plating shops are, in my view, more dangerous than large ones. A big plating shop almost has to be operated safely because the people who are involved in the work are sufficiently expert, the suppliers of materials call attention to the hazards, and a large operation will come to the attention of the State agencies which endorse safety regulations.

Dangers are more likely to arise from the operation of a small plating plant where some foreman has thought, "You know, this would be a good idea, we could save a lot of time and trouble if we would just plate these bolts and nuts ourselves instead of sending them out," or something of this sort. These amateur operations are, of course, the ones most likely to cause trouble.

You still have a good bit of lead in railway shops, used in the soldering of radiators, and in the repair of storage batteries. Wherever lead cell storage batteries are handled, a lead hazard is inevitable. I understand that typesetting is now pretty well out of the railroad industry, though this may still persist in a few places as a source of lead poisoning.

Noise has been mentioned already this morning, and you will have more attention to this later today, so I will skip over that.

We have two relatively new and relatively serious problems, one of these is the use of epoxy resins. I think in the heavier industries, and I think of railroading as among these, the use of epoxy resins has not become so widespread as it has in the aircraft and the missile building industries, but I think you are bound to come to it, because the epoxy resins are so highly satisfactory materials for so many things.

When reinforced with glass fibers or other materials, they make strong light structures. Epoxy resins are quite remarkable adhesives for sticking together pieces of metal or even causing glass pieces to adhere to each other. You will find increasing use of this extremely valuable material.

These are substances for which I am afraid we will be a long while in finding a suitable substitute, much as we would like to have one. The reason for wanting to substitute something else for the epoxies is that they are notoriously troublesome as sensitizers Almost all of the troubles are skin troubles, though other possibilities have to be considered. I have not encountered a case of a systemic sensitization related to the handling of the epoxy resins or the catalysts, which are used with them, but I think this is a theoretical possibility which has to be kept in mind always. The skin trouble alone is sufficient to keep you quite busy, however, another new material which is not quite so hazardous but which we have to watch with care is polyurethane foams. These are materials which are extruded through a nozzle, the resins and the amine accelerators being mixed together in this way and the resultant foam being deposited as an insulator against heat and shock. The stuff is used at a temperature of about 80 degrees Fahrenheit, and problems of heat may be encountered. Also, the temperature is such as to vaporize some of the materials in these polyurethane foams and pulmonary irritation may result from this.

The safe way of handling this is by supplied-air respirators, or a very effective dilution system of ventilation. These foams are being used as insulators for refrigerator cars, and for a variety of other situations in which heat insulation and also some padding against mechanical shock is desirable.

Finally we must look at our old friend, the painting problem. While lead paints are no longer in use, the synthetic resins which have replaced them may in some instances be sensitizing agents. The biggest problem arises from the solvents which are used for these modern paints. Most of the solvents are not severely poisonous. They are, for the most part, anesthetic agents and local irritants. One has to keep close watch on what is being used. One of the difficulties is that the advances in the paint industry are very

rapid and new materials are coming along all the time. You have to be on your toes to keep up with what the latest one is.

I have also in part of my career worked as a consultant in the paint industry and I can tell you that you must not put too much reliance upon the warning labels which their products carry. As in a good many other situations, the attitude of the paint industry is, "Let's play it safe," so they label everything as if it were very hazardous. The fact that you know in a good many instances that you have breathed these vapors and they haven't caused any trouble causes one to lose faith in the whole warning label system.

I want to say a word about the future in the toxicology field and the role of the industrial hygienist in connection with this. I think that within the next ten years or so, we are going to look in different ways for the effects of toxic agents. This is the field of our own research at Stanford, so I suppose I am something of an enthusiast. We are looking for ways to measure the behavioral manifestations which result from exposure to toxic agents. We have used as our typical toxic agent carbon monoxide. This is one with which certainly all of you are familiar, but mainly as it produces symptoms of headache, lethergy and nausea. At our laboratory we have been able to demonstrate effects on behavior with a hundred parts per million within a period of 30 minutes. These effects are subtle and they cause no symptoms.

We do this in rats by training them to perform on a standard behavior pattern, using techniques of modern behavioral psychology. With these techniques we can observe minor changes in the behavior pattern. In animals exposed to one hundred parts per million, we see, within half an hour, distinct deterioration of performance. One of the interesting things is that within a half an hour they are removed from the exposure, they are back up to normal performance, which suggests that carbon monoxide is acting directly and not merely as an asphyxiant.

In general, what we have done is simple. For men, we have a task which involves the discrimination of duration of different sounds. A 50-cycle tone, which is a low pitched buzzing sound, is delivered to the subject through earphones. He hears two presentations; the first is one second in duration and the next is slightly longer, or slightly shorter, or it may be the same. He has to decide whether it's the same, longer or shorter.

Within an hour at a hundred parts a million of CO a man's ability to discriminate between the durations is perceptibly diminished. Now, I don't know how serious this is. Does this mean that the engineer who is getting some CO in the cab begins to lose some of

his judgment? Is he not so sharp at detecting signals?

On the face of it, one would suspect that he is less capable of performing his exacting job, but we have a great deal more to do before we can say how much of a hazard this causes, how much weight we should put on this, and please don't think that I am about to recommend that we change the threshold limit value to some still lower value. We are going to have a lot more information before we do anything so bold as that.

I think this kind of study is going to grow with respect to a lot of toxic agents and in many different fields of activity, so that you will have the information available to you to say how long a man can be exposed to a certain concentration of a toxic agent in the air, and what sort of performance decrement you may expect as a result of various degrees of exposure. We are also going to be way more about how these things act. This is the basis of industrial hygiene, knowledge about how things act, what the toxic effects are, and in the use of skilled personnel, specialists who know how to measure and how to control the toxic agent.

I think you will find yourselves using these skilled people more as time goes by, because they constitute an important part of the occupational health team. The industrial hygienist does not work by himself, he works with the doctor, with the nurse, with the safety director, with the personnel manager. Those are the people that I see as the key elements in maintaining occupational health. Each of them has an important role to play and they have to work together as a team if they are going to get good results. They call upon other specialists from time to time, psychologists, specialists in speech and hearing problems, noise specialists, people who are specialists in radiation hazards. But the fundamental team is the physician, the nurse, the industrial hygienist, the safety director and the personnel director, to see that things are done with due regard for protection of human life, but not only that, for protection of human efficiency.

Thank you very much. (Applause.)

CHAIRMAN OLSON: Thank you very much, Dr. Beard. I am sure that we have found this presentation to be intensely interesting. I see that we have about ten minutes, and it occurs to me that some of you might want to ask Dr. Beard some questions about his work.

DR. MILTON [illegible]

for example, there is smoking or inhalation of other kinds of fumes? Dr. L, will the inhalation of polyurethane fumes cause lung damage to the extent that you will have impairment or disability or permanent disability?

We have an identical case of that kind now who is threatening to sue us. That is the reason I am asking the question.

DR. BEARD: On the basis of previous experience with similar materials, I would expect that polyurethane foams, especially the accelerators which are used with them, could be sensitizers, in some proportion of the population. As yet, I don't know whether they are frequently going to sensitize people like some of the epoxy materials or whether they will only be occasional sensitizers. But I should say that this is one instance where I would be inclined to accept the ad hoc ergo propter hoc doctrine. If a man had such an exposure and subsequently showed sensitization to the material, I would say this is a reasonable expectation. I don't know about the permanently disabling effects. Save that question for Corwin Hinshaw. I know he is here.

CHAIRMAN OLSON: Anyone else?

The question that you proposed about noise has not been discussed in our group until last year. I believe there has been some reluctance on the part of management to get into this field, principally because they feared that they would have the same kind of experience as they did in the dermatology field, which leads me to this question: Does the presence of the industrial hygienist in the plant provoke claims on the part of the employees because of what he is investigating?

DR. BEARD: That's a very difficult question. On the basis of experience, my answer would be no. I cannot recall instances of claims specifically being provoked as a result of investigations by industrial hygienists which I have seen carried out. I have to put a little reservation on that, in that I am currently remotely involved with a claim which originated because a man came into a hospital which is staffed by Stanford University; he was found to have a peculiar pulmonary disease which resembled Farmer's lung. The man gave a history of having worked in the Redwood [illegible]

went up to Eureka and got some bloods from people in the industry. Well, nobody else had quite as strong a pattern of antibodies as this patient had, but some of the people who had been employed in the redwood industry for some time showed reactions. Information concerning this got back to the patient, who did file a workmen's compensation claim, which is now being contested. So I suppose we did set something off, but I think that actually it was as much the hospital as it was the field industrial hygienist.

Are we going to have a whole slew of claims coming on after this one? It's too soon to know. I think that that industry, the railroad industry, or any other industry will be best served with respect to workmen's compensation claims by having the most precise information they can get, and though you may have a few claims which appear to originate because of an investigation which is carried out, you will, in the long run, save money by having this precise knowledge.

CHAIRMAN OLSON: I think it's generally recognized that railroads as well as other industrial concerns are concerned about the welfare of their employees, and I would assume from what you say that the preventive effort would produce in the long run a better overall result.

DR. HARVEY NELSON (Soo Line Railroad, Minneapolis, Minn.): Doctor, may I ask a question?

When you go into a shop, supposing you went into the Southern Pacific shops, how open are you with the use of your instruments? How do you answer questions as "What you are doing?"

DR. BEARD: This will depend on the experience of the particular industry and of the particular shop which is involved. If you have not previously had such observations made, if the workers are not accustomed to seeing a doctor wandering around the place asking questions, watching them work, if they are not accustomed to seeing a man going around with some kind of an air sampling device, you had better give them some education ahead of time. If I were to go into the Southern Pacific shop, this would be no problem, they are used to it. If I go into another shop where they haven't had this sort of service, the first thing I would do would be to find out from the personnel manager who are the people who are topmost in the employee power structure in this plant, who are the leaders among the employees. It may be that they are the union officers, it may be that they are not the union officers at all. There may be some employee social club which is more important.

I would look for these people and would explain to them what we were about to do and why. Depending upon the extent of the program, I would issue more or less elaborate written information to the employees. In short, I would try to help them to understand the purpose behind this, which is, in the long run, for their own protection.

DR. NELSON: Thank you.

CHAIRMAN OLSON: Judging by the show of hands, it was quite obvious that industrial hygienists are not in great use in the railroad industry. I'm sure that after your discourse this morning that that might change things considerably.

I want you to know that we all appreciate very much your coming here and talking to us this morning.

DR. BEARD: Thank you.

CHAIRMAN OLSON: We are now in line for a short intermission, during which time I think there will be a cup of coffee or two served to you. We will convene again promptly at 10:30, please.

(Short recess.)

CHAIRMAN OLSON: Gentlemen, we have a very distinguished group of professors who are going to discuss the question of cardiopulmonary problems. I would like to ask each of you at the conclusion of their discussion, if you have any questions, to please state your name clearly so that it may be recorded.

Dr. Stanley J. Cyran, Medical Director, Pennsylvania Railroad, Philadelphia, Pennsylvania, will act as the Moderator of the program and I will ask him to introduce his panel.

PANEL SYMPOSIUM - CARDIOPULMONARY PROBLEMS

MODERATOR STANLEY J. CYRAN: Thank you, Dr. Olson.

Well, this is the cardiopulmonary panel, and I, too, would like to thank Dr. Strange for arranging such a distinguished group. I am honored to moderate this.

I will introduce our members first.

We have on the end Dr. Frank Gerbode, who is Chairman of the Department of Cardiac Surgery, Presbyterian Medical Center, at San Francisco Hospital.

Next to him is Dr. H. Corwin Hinshaw, the Clinical Professor of Medicine at the University of California, San Francisco, California, and I believe the attending physician of the Southern Pacific

Railroad, and also a co-editor of the volume "Diseases of the Chest."

We have next to him Dr. John Sampson, Clinical Professor of Medicine at the University of California. He is the Chief of the Cardiac Clinic of the University of California Medical Center and a past President of the American Heart Association.

Peter Vaughan is one of our own, who is the Medical Director of the Canadian National Railways, Montreal, Quebec, Canada and he will probably be discussing some of the views he may have on some of the problems that will be discussed here.

This panel today is actually in keeping with many of the panels we have had across the country over the past year. These are informative panels, they tend to be a review of some of the things we know, we should know, and some of the things we would like to know. There are formal presentations at first, followed by questions and answers after the speakers have presented their topics. I don't know whether we can really expect them to solve all our problems that we have on the railroads, but we can expect them to give us some ideas, to give us the information which will make us more knowledgeable in evaluating and assessing the problems that we have on the various railroads.

Those of you who were present at the last meeting in April in Chicago will remember that we did have a panel on pulmonary disease then. Our Panel dealt with pulmonary diseases rather generally and their relationship to the railroad industry. I recall some of the questions dealt with disability, estimation of functional capacity, but time did not permit more than generalizations.

Part of this morning's session--the pulmonary half--was prompted somewhat by some of the recent ads and headlines appearing in journals and newspapers, magazines, and especially the medical journals. "One million are disabled." "70,000 will die in this year." "Deaths from chronic bronchitis and emphysema have increased from 2300 in 1915 to 19,113 in 1963, the latest year for which Public Health Service figures are available." "The Social Security Administration pays more than $60 million a year to men disabled by emphysema."

I wonder how expensive this is to the railroad industry. Maybe Dr. Rosen would be able to tell us that.

In ten short years, chronic lung disease has become the fastest growing cause of death in this country. Only cardiovascular disease, the nation's No. 1 killer, eclipses chronic lung disease as a disabler of men. It would appear pertinent, therefore, to discuss some

aspects of these problems, even though our time is necessarily limited and the scope of the subjects overwhelming.

One of the more striking advertisements for their product, but also concerning chronic lung disease, is being sponsored by a well-known pharmaceutical company. I think many of you have seen the multiple-page advertisement concerning lung disease in the various journals. They show a dramatic picture of four horsemen likened to the riders of the Apocalypse, to whom power was given to kill. The ad goes further to say that three of these horsemen kill with suffocation; namely, asthmas, chronic bronchitis and emphysema. The fourth horseman is called Despair, for he attends the mounting toll of death and disability. Chronic respiratory diseases are not inevitably disabling. New means and methods of treatment may reverse these chronic respiratory diseases and prolong life.

Notable advances have been made in the diagnosis and treatment of cardiopulmonary disorders. In one decade, this has moved from the pure research laboratory to the cardiopulmonary laboratory, the clinic, and now into the physician's office. Highly technical procedures that have been developed are now able to definitely establish specific disorders. Thus established, there has been the opportunity to prove the correlation of simpler testing procedures.

Office diagnostic procedures now can provide permanent records of the status of the patient at the first examination. They not only often disclose unsuspected pulmonary disorders in patients thought to have heart disorders, but may detect diseases early enough to permit effective prevention of its progression and also serve as an objective guide for differential diagnosis and therapy. Consequently, just as the EKG and the chest films are providing the characteristic patterns of altered function, graphic patterns of pulmonary function now fulfill an important position in the alliance to diagnose and combat cardiopulmonary and respiratory disorders.

The use of pulmonary function studies has led to more precise knowledge of the pathophysiology and the natural course of pulmonary disease, and has provided a better understanding of normal pulmonary physiology in healthy men and women of all ages. Pulmonary function tests may be useful in ruling out lung disease in non-organic types of dyspnea such as conversion and other psychoneurotic disorders. They may aid in differentiating primary from secondary polycythemia. They have been useful in preoperative and postoperative assessment of the patient with known or suspected cardiac or pulmonary disfunction. In addition, and most importantly for our industry, as well as all industry, these tests may be helpful in achieving an objective evaluation of disability claims. They may be useful in pre-employment examinations, especially in occupations known to be potentially hazardous to the respiratory tract.

They can, and probably should, be made [illegible] our periodic evaluation of the employee's health, [illegible] EEG's, chest X-rays and urinalyses. Of course, the pulmonary function studies cannot supplant a good history and physical examination nor offer a pathologic or etiologic diagnosis.

Limitations are present in all tests used in medicine, and pulmonary function testing has not escaped the usual limitations. They must be appreciated in the light of the condition of the patient. In our capacity as medical directors and chief surgeon of the Southern Railroads, with the increasing importance of chronic lung problems, we are faced with making decisions concerning the employability of such workmen.

Does the chronic cough mean anything? Is this just a cigarette cough or does it actually indicate some incipient serious lung disorder? Should this man be working in a potentially irritating environment? Will the diesel exhaust be more disturbing to this employee than the average, normal employee? Is this man's dyspnea or apparent slowing down at work due to heart disease, or, perhaps, a potentially reversible lung problem or both?

How should he be evaluated?

After he has been evaluated, how to interpret the various reports of pulmonary function.

What does FEV mean, MEFR, MVV, and what do these mean in relation to his functional capacity?

Should he or should he not work?

Will his preexisting pulmonary disease be aggravated?

This is the purpose of the pulmonary part of the panel this morning.

I have asked Dr. Hinshaw to discuss how the pulmonary specialist approaches the lung problem. I expect he will stress some important points in history, some important physical signs that perhaps will give clues to expected results of the function studies and, then, give a description of the various practical lung studies that can be done without need for much complicated machinery. Can these be used to differentiate the various disease states? What can they tell us about the man's functional ability?

I am honored at this time to present Dr. Hinshaw, who will start the discussion.

DR. HINSHAW: Thank you, Dr. Cyran.

Dr. Cyran has pointed out the importance of the recently augmented informational campaign about chronic lung diseases. This field has long been neglected as far as the general public is concerned. Very few people knew the word emphysema until recent years when the National Tuberculosis Association made this a major field of activity in the expectation that tuberculosis prevalence would continue to decline.

Much of the apparent increase in emphysema and other respiratory disorders is only apparent. Public health educators have used all news media to arouse interest in this subject.

The recognition of emphysema, the recognition of obstructive airway disease, the appreciation of the importance of chronic bronchitis, all these are relatively new to physicians, as well as to the public.

We must also realize that this is to some degree a problem of the aging lung, and much of what we call pulmonary disability is really the natural process of wear and tear on the lung.

Dr. Cyran has mentioned the Social Security Administration expenditures in this field. In the State of California emphysema is responsible for more disability payments, than any other condition, with the exception of arteriosclerotic heart disease, and this surely could not have been said many years ago, because doctors did not then recognize the importance of emphysema. We shouldn't underestimate this simply because it is a more recently recognized field of importance.

In the estimation of employability, we don't know the breathing requirements of different jobs in industry. I am constantly surprised to see how little breathing capacity is necessary for the performance of many jobs in modern industry. Any number of men who have been disabled or at least taken off the job and given disability benefits undertake other work or even recreational activities which require much more breathing capacity than their original job required. But lungs do wear out. There's no doubt about that. They do fail. Just as hearts fail, just as livers fail, just as brains fail, so do lungs. Some aspects of lung failure are easier to measure than in the case of heart failure. Too often the patient has not sought medical advice during the years of a troublesome cough and the associated chronic bronchitis, which eventually has led to pulmonary emphysema. Too often he has given little consideration to the fact his exertion tolerance has been dwindling and he doesn't do the things he used to do.

Shortness of breath should be an ominous sign of impending disability if shortness of breath is a progressive symptom. Very few people regard it as such; not until it interferes with the pleasures of life does the average man pay much attention to his breathing ability. He will often assume that it's due to advancing age and perhaps it is. He will assume that it's due to lack of physical fitness, which it often is in part, and will not seek medical advice nearly as quickly as he would if there were a pain somewhere, or if he had known that this was in truth an ominous symptom.

Breathing ability is not likely to be regained in any very large measure: the loss is permanent. I am not saying that there's no help for a man with emphysema. I am saying that the destructive aspect of the disease is permanent and there is no such thing as lung regeneration. But had the patient sought help earlier, I believe his physician might have given him some advice, might have given him some comfort, might have been able to preserve his working efficiency, and possibly could have extended his life span.

Most of the changes tend to be progressive as well as permanent. The aggravating factors can to some extent be controlled and can to some extent be prevented.

We are called upon occasionally to evaluate the pulmonary reserve of a patient who complains of shortness of breath, or one who is considered to be a marginal risk for some major surgical procedure. Dr. Cyran has indicated that simple examinations are often sufficient. When we send the patient for the more sophisticated tests to a larger medical center, such as we have up at the University of California, we are rarely confronted with any surprises. It's nearly always possible, on the basis of physical examination, and some simple measurements of breathing capacity, to evaluate the individual's ventilation function. It's true, of course, that the fine equipment and the skilled clinical physiologists of a medical center can provide us with quantative figures and very often these figures are important. They are more accurate than we can obtain with the simple devices we have in our offices. But the final evaluation of anyone's pulmonary reserve and our estimation of his ability to withstand the stresses of surgery or the stresses of daily work are not very often altered by the sophisticated tests of a medical center pulmonary function physiology laboratory.

It's interesting but very rarely is it very important for us to know such factors as lung compliance, diffusion data, precise blood gas studies, pulmonary artery pressures, and even such fundamental factors as residual capacity can usually be anticipated at least by simple office procedures which are adequate for most purposes.

In other words, the research capabilities of the pulmonary function laboratory are not essential to the solution of most of our clinical problems. Unfortunately most of our measurements in the office, and quite a few of the measurements in a pulmonary physiology laboratory are measures of voluntary effort, and the malingerer or the stupid person may not perform very well, but there usually is no difficulty in recognizing him and usually he can be persuaded into revealing some of his true ability. I don't believe that a clever malingerer could often delude an experienced examiner.

Normal standards have been established, but these are often misused. For example, the range of normal is extremely wide in most measures of pulmonary function, and often we incorrectly use the word "abnormal," when a patient fails to attain predicted performance. Predicted values are not necessarily synonymous with normal values.

For example, 70% or more of a predicted forced expiratory volume is normal. Some of the standards which are quoted do not take into account the man's age. Often tabulations and graphs which do take into account age can be distorted in such a way as to make it appear that a man of 60 years who has only 60% of predicted breathing capacity is disabled. In actuality his job may not require even that much exertion tolerance and it may be a serious injustice not to permit him to work to the usual retirement age.

Frequently, we ask the question: "How much can a man breathe?" We are asked to measure his air capacity. How much can a man breathe is a good deal like asking how fast can a man run. What is the normal rate of running? And you would find a wide range of variation within people who have normal legs. The man who wants to run fast will run better. The man who is trained and experienced as a runner will undoubtedly run faster. The young man will run faster than an old man, and the figure we come up with, expressed in miles per hour, really doesn't tell us whether or not his impaired speed is due to lack of effort, whether it's due to arthritis, whether it's polio, whether he has an amputated leg, or whether he has just had a recent bout with the flu. Any one of those things might reduce the man's running capacity and the same things might well reduce his breathing capacity temporarily or permanently.

When it comes to the measurement of breathing capacity, we are mostly concerned with the common disorders and the most common disorder is generally spoken of as "obstructive airway disease." This is almost synonymous with emphysema, but not quite. Obstructive airway disease refers of course to obstruction in the flow of air in and out of the lungs. Fortunately, here the simplest measurements are also the most meaningful and most of these are

measures of air flow rates, how much [illegible] space of time. Most important is how [illegible] second and hence FEV, the forced expir[illegible] is probably the most useful single measure [illegible] ing obstructive airway disease. We don't [illegible] much he can exhale in five or six seconds, simply [illegible] can take five or six seconds for a single respiration. "Vital capacity," or "timed to vital capacity" is exactly the same thing.

Machines are available which make this measure very simple. Those machines which produce a graph to show the rate of air flow during exhalation are more valuable than the ones which give you a single figure. When that graph, repeated again, and again, shows series of identical curves, you can be confident that the subject is not a malingerer, that he is exerting his maximum effort.

I think you find if you play with the machine using yourself as a subject that it almost is impossible to reproduce the same graph intentionally over several tries, unless you are using your absolute utmost of breathing capacity. These machines are relatively simple. There are about a half a dozen different types. The Jones Metabolism people make a bellows machine "Pulmonor" which is quite reliable, reasonably accurate for all our ordinary purposes. The McKesson people make a little machine they call the Vitalor. These cost in the vicinity of one hundred fifty to two hundred fifty dollars apiece. They should be in every hospital, and the house staff should know how to operate the device and how to interpret the findings. Most machines provide a graph of the forced expiration, and this graph is spoken of as a "spirogram." From the shape of the curve you can estimate the air flow rate in liters per minute the graph provides estimation of the one second forced expiratory volume, the two seconds and the three seconds forced expiratory volume.

The air flow rates will vary for different machines. For example, with the McKesson machine a normal person will only be able to blow out about 200 to 300 liters per minute. That is because this machine offers relatively high resistance to air flow. Some of the more fancy electronic actuated spirometers will give you an air flow rate much greater than that. The most simple measure of air flow is to light a cardboard match, hold it a foot in front of the mouth, and with the mouth wide open, try to blow it out. It requires an air flow rate of a few hundred liters per minute to blow out such a match at the approximate distance of one foot. Don't let the subject purse his lips, or you will get a false reading.

We used to speak a good deal of maximal breathing capacity, but the maximal breathing capacity designation is not so frequently

used these days because it isn't feasible to get the average person to maintain forced breathing long enough to get a good measure of maximal breathing capacity.

I had intended to discuss some other aspects of obstructive airway disease. I may have inferred that emphysema is the only condition we are concerned with. Of course it's not. Obstructive airway disease can also be caused by asthma, which of course is a reversible condition. This, again, can usually be detected by physical examination and simple office laboratory procedures. Such pulmonary disabilities as may be due to pulmonary fibrosis, will be shown on simple machines of this sort.

There are other conditions less commonly encountered. For example, a care of asbestosis might give a reasonably normal measure of breathing capacity, and yet the man might be incapacitated by reason of a peculiar type of pulmonary fibrosis which leads to an interference between exchange of oxygen in the air and hemoglobin, so called--"alveolar capillary block." This is found also in conditions like sarcoidosis and in a few other pulmonary fibrotic disorders.

MODERATOR CYRAN: Thank you very much, Dr. Hinshaw. There will be time for questions after the panelists have presented their topics. I know there are many other things that probably we can ask Dr. Hinshaw, and I'm sure he will be happy to answer those.

In preparing this panel, of course, this necessitated correspondence between Philadelphia and San Francisco and Dr. Strange, et cetera. We had planned on going into heart disease and pulmonary problems. However, we realized that perhaps it would be more practical to talk again about coronary heart disease, since this is one of our major problems today in the railroad industry, so Dr. Sampson will discuss some of the practical aspects of coronary heart disease. How do we approach this. What are the diagnostic procedures available? What are some of the newer procedures available that can be used to again give us more knowledge to assess the functional ability of the railroad employee?

Dr. Sampson.

DR. SAMPSON: Dr. Cyran indicated in his introduction that I would discuss some of the practical aspects of coronary heart disease, but, insofar as it was his desire that heart disease and pulmonary problems would furnish the core of the presentations of this morning's session, I am taking the liberty of opening my remarks with certain brief comments on cardio-pulmonary disease.

Cor Pulmonale is one of the most subtle forms of heart disease and its existence is often suspected by the accompanying pulmonary parenchymal or vascular abnormalities without obvious cardiac manifestations. The commonest forms of the parenchymal diseases, emphysema, is commonly associated with some degree of pulmonary arterial or arteriolar obstruction, which, through increased resistance to the pulmonary blood flow, imposes an elevated load of work on the right ventricle. Under these circumstances, the electrocardiogram may suggest right ventricular hypertrophy prior to the increase in the size of the cardiac silhouette by roentgenograms or by any evidence of right ventricular cardiac incapacity. The physical signs may be relatively inconsequential with the exception of an accentuated pulmonic second sound.

Primary pulmonary arterial hypertension is a relatively unusual entity, which most often occurs in childhood. Similar to the pulmonary hypertension which exists in certain congenital and acquired heart disease, such as interatrial septal defect, interventricular septal defect, mitral stenosis and mitral insufficiency, it is the result of the thickening of the pulmonary arterial or arteriolar walls, and the narrowing of these vascular channels, which may be either transient or permanent. It is important, by the right sided cardiac catheter studies, to determine the existence of such pulmonary hypertension, and by dynamic studies on both sides of the heart to determine the source of it. Very often it is possible to relieve the defect and to cause important reduction of the pulmonary arterial resistance and the accompanying pulmonary hypertension, and thus prevent the crippling or fatal right ventricular strain and failure. Certain of the defects, such as patent ductus arteriosus and interventricular septal defect, are likely to be accompanied by pulmonary arterial hypertension in early life, but interatrial septal defect, and mitral valve disease, resulting in pulmonary arterial narrowing, appear relatively late and are more likely to be reversible.

In the congenital defects, a flow of at least 1.5 times in the pulmonary vascular bed, as compared to the systemic flow, seems to be necessary to lead to these pulmonary arterial changes. However, there is considerable difference from patient to patient in the tendency to develop increased pulmonary arterial resistance, the reason for which is not as yet known. Undoubtedly, Dr. Hinshaw and Dr. Gerbode will present the pulmonary diseases, other than emphysema mentioned above, which could cause these vascular changes, and also of the surgical procedures with the proportion of success now exhibited in erasing the damage done by the cardiac lesions mentioned. Although the risk is quite high in attempting to close the right to left heart shunt when cyanosis is marked and when the pulmonary arterial changes apparently have reached a high degree of development, some success in relatively late cases, es-

pecially in mitral valve disease and in interatrial septal defects, are occasionally reported. These reversals of the pulmonary arterial resistance may, however, occur slowly, and at times six to twelve months is necessary to pass before seeing favorable results in correcting the cardiac defect. The reversals are more likely to occur after acquired heart disease, such as mitral stenosis, than after a longstanding congenital shunting lesion.

One of the most tragic examples of the mistake that has occasionally been made is from the diagnosis of primary pulmonary hypertension, assumedly irreversible, by only partial right sided cardiac catheterization which has revealed a high pulmonary arterial pressure, when, in reality, a mitral stenosis without characteristic auditory signs is the basic lesion. Obviously, this lesion is surgically correctable and could have led to correction if the diminution in blood flow through the restricted pulmonary vascular bed had not led to the loss of the characteristic mitral diastolic murmur, or if a rigid mitral valve had failed to exhibit the characteristic opening snap.

Recurrent pulmonary embolism may, and often does, lead to decreased cardiac output and acute, subacute or chronic right heart failure and death. Since prevention and control of this condition is possible by venous ligation or by anticoagulant drug therapy, and since the results are very often fatalities frequently undiagnosed, it is of vital importance that it be recognized. Recurrent pulmonary embolism is one of the most subtle and difficult entities to diagnose since frequently the roentgenograms of the lungs, the electrocardiographic changes by right ventricular strain, and the physical signs and symptoms often present no characteristic diagnostic picture. There are two technical methods for assisting in diagnosis, and it is recommended that they be used: The first is the scanning of the lung and angiography by radioactive material in scanning and radiopaque material in angiography. An additional method, which is of less specific value, is the measure of CO_2 in the alveolar air or expired air, which would be lower than expected where areas of the lung were blocked, as by thrombi. Frequently, wrong diagnoses of recurrent pneumonia, emphysema and chronic bronchitis, and congestive heart failure are made and retained especially in the presence of a low grade, prolonged or remittent fever. Such useless therapy as antibiotics, digitalis, diuretics, fail to terminate the advance of the process, which eventually becomes irreversible and cyanosis and failure of cardiac outflow from poor intake, eventually terminates life. As a practical matter, the use of adequate anticoagulant therapy, generally Heparin and the Coumadin drugs, should be initiated on suspicion of the existence of pulmonary recurrent embolism, especially in individuals who are recognized candidates for this condition, such as elderly individuals who have been bedridden with longstanding heart failure or immobilized by broken

legs.

As an introduction to my remarks on coronary artery disease, it may be stated that occlusive arteriosclerosis, or atherosclerosis, is practically universal in the adult American population over the age of 50 years, and particularly in the male. Since the publication of such reports, as that of Enos and his Associates in 1955, of the unusually high incidence of occlusive coronary arterial disease among United States soldiers killed in Korea who had been free of any sign or symptoms of the disease, it is broadly recognized that silent coronary disease, which may, however, be well compensated, is extremely widespread. When we later discuss the wisdom of restricting individuals who have had a relatively inconsequential attack of myocardial infarction and who make complete clinical recovery, we should bear in mind that many of these individuals are no worse off than many of the general population who not only may have silent occlusive coronary disease, but actually, as certain of the surveys by pathologists such as Spain, may have completely silent myocardial infarctions. In some of these surveys, as high as 40% of the myocardial infarctions were not diagnosed clinically, and at least 20% of the total were not diagnosable by history or electrocardiography or other physical means.

Intermediate between the two extremes mentioned, namely the individual probably in the third or fourth decade of life in whom there is no reason for suspecting coronary disease and the man who has had a myocardial infarction and has completely recovered, are several classes of individuals. One of these includes men or women who are high risk candidates for occlusive arterial disease, such as those with family histories of individuals with precocious strokes or heart attacks, those with hypertension or diabetes, those in whom a concentration level of certain blood lipids and uric acid have been found on routine examination. Perhaps for inclusion in the high risk group are the heavy smokers and those classified as "stress prone" people whom Russek, Wolfe, or Friedman and Rosenman find particularly susceptible to myocardial infarction.

The next most advanced "coronary" class includes those who have developed angina pectoris. This almost invariably means the occlusion of one or more coronary arteries even though there may have not been a demonstrable myocardial infarction. The next class includes those in whom abnormal electrocardiograms, such as inverted T waves and Q waves which have been found on routine examinations and unexplained.

The most advanced of these "intermediate groups" include those patients who exhibit prolonged anginal pains or abrupt change in their anginal pattern, suggestion a recent coronary occlusion and an impending myocardial infarction. This latter group should probably

be classified as equally serious as that of fully diagnosed myocardial infarctions but without complications are still eligible for complete clinical recovery, and perhaps safe return to almost any occupation.

What, therefore, is the responsibility of the industrial examining physician, and, in fact, of any physician, in limiting the permission for a patient to operate a vehicle in which that vehicle, if out of control, may be a source of danger to people within or outside its structure. This would apply not only to the engineer at the throttle of an engine of a train, but also to the individuals at the controls of airplanes and even automobiles. If all people over the age of 50 years were prohibited from operating an automobile, the impact on the country's transportation would be critical, and yet it is known that well over 50% of this age group have serious occlusive arterial disease. Protective mechanisms against the results of sudden fainting or death have been provided in the operation of a locomotive and an airplane, and perhaps this should be equally applied to the operating mechanisms of an automobile. The general chances of such an accident in the presence of hidden coronary disease, or even known coronary disease, is extremely small by coroner's reports, probably less than 1% of all sudden deaths, but the actual mode of death of people with recognized coronary symptoms is approximately 20%.

We may now devote ourselves to the problems of diagnosing coronary disease in cases presenting doubtful histories, such as chest pain not characteristic of the angina pectoris pattern, or physical signs, and resting electrocardiograms of a borderline character. The resting electrocardiogram may present a normal pattern in from 40-60% of patients with recognized coronary disease, even after myocardial infarction. This false negative "percentage" is reduced about 15% by the application of the Standard Exercise electrocardiographic test, either on treadmill, or on the nine inch step with the standard number of trips up and down two stairs, generally referred to as the Master Test. It is suggested that these step tests or exercise tests be carried on until the subject is dyspneic, or that tachycardia of a given level, such as 110 beats per minute, be induced. Obviously, this is stopped if the patient shows signs of distress or of the occurrence of angina like pain. Recently, monitoring during exercise, by placing the leads over the bony portions of the chest rather than over the muscular portions, and taking records during the exertion or by actual telemetering the electrocardiogram during the exercise, has added another sensitive element to these tests.

There has been considerable discussion and comment on the validity of the criteria for the abnormal response to such exercise

tests in the electrocardiographic tracing. In general, the [illegible] are taken during the exercise, if possible, immediately afterwards, two minutes, four minutes, six minutes and eight minutes, using only certain selected anterior and posterior or anterior limb lead and middle and lateral chest leads. Although such changes as inversion of a T wave or reversal of its direction from inverted to right, and the occurrence of arrhythmias, such as extrasystoles, is suggestive of coronary insufficiency, the basic criterion of a positive test is the definite depression of the S-T segment from a depressed J point, and with either a leveling off or a downward direction of the succeeding S-T period, as a depression at a minimum of 1/2 mm., but preferably of 1 mm. from the baseline.

The evaluation of other signs and symptoms of cardiac disease than angina pectoris may also present some serious differential diagnostic problems. Since cardiac enlargement by physical examination or by roentgenogram almost invariably is present with myocardial failure, although not necessarily in certain of the stenotic lesions such as mitral stenosis or aortic stenosis, one would look with suspicion at such symptoms as cyanosis, dyspnea on exertion, paroxysmal nocturnal dyspnea, orthopnea, weakness or dependent edema, as being cardiac in origin without accompanying cardiac enlargement. Care must obviously be exhibited, first to determine, even in the presence of cardiac enlargement, that such symptoms and signs as mentioned are cardiac in origin and not perhaps due to pulmonary disease, poor training, neurocirculatory asthenia, anemia, polycythemia or obesity as common examples of confusing conditions frequently causing some of these symptoms.

Circulatory function tests, in which, under a given effort such as treadmill exercise, standard changes occur in the pulse rate, blood pressure, respiratory rate and oxygen consumption, or A-V oxygen difference, have been found useful, such as by workers as Bruce and Associates at the University of Washington. This physical fitness index has had remarkably good correlation with cardiac functional variation such as have occurred after surgery in mitral stenosis. In general, however, these tests have not been found widely useful for the practicing physician or even the industrial physician, although they were used in some forms by the Military Services since the first World War.

Perhaps the most precise means of determining cardiac function, as well as structural defects, are the right and left cardiac catheter studies. In general, these are not commonly applied to coronary arteriosclerotic defects, but, with the recognition that the myocardium dilates and cardiac output diminishes, even during an attack of angina pectoris, such studies may come into more general application. They are particularly useful in determining, by the existence of a high end-diastolic pressure in either the right or left ventricle, the co-existence of myocardial disease, especially in the elderly individual, concomitantly with valvular disease. A surgical procedure might be contemplated if said valvular defect was the dominant reason for the cardiac insufficiency and not the myocardial dysfunction. Ventricular aneurysms, which are a sequel of myocardial infarction, generally require such studies of dynamics, and still, more importantly, must be defined in their earlier involvement by angiocardiography.

Coronary angiography is being increasingly developed with greater precision of evaluating not only the uniformity of the coronary arterial patency, but the development of collateral circulation and opacification of the myocardium, as well as the coronary venous return flows. Such investigators as Sones of Cleveland, Dotter of Portland, and others, believe that direct cannularization of the coronary arteries by a curved tipped catheter is necessary for adequate visualization and that Cine-angiography is the mode of photography of choice. These procedures still lack precision and still carry a small risk that critical arrhythmia be induced. They are especially useful when angina pectoris is present in an individual who has not had a myocardial infarction, and who has the evidence of aortic stenosis, which, within itself, can produce this symptom.

A word may be said here as to the importance of recognizing a fairly common entity, as has been described by many people within the last ten years, but most clearly by Lev who uses the term "fibrocalcification of the left heart skeleton." By this, he means that a fibrotic process with calcification can occur in the aortic valve, producing aortic stenosis with moderate aortic insufficiency, which may also occur in the mitral valve but with much less frequency, but actually it is the commonest cause in middle age for the development of high degrees of atrio-ventricular heart block. The aortic stenosis, which either has this origin or arises from a congenital or rheumatic defect, may either produce severe congestive failure or may leave the individual apparently quite well and able to carry on ordinary activity with the exception of spontaneous or effort induced syncopal attacks and angina pectoris. The differentiation of the angina pectoris from this origin as contrasted to coronary artery disease has been mentioned above. In contrast to the relative infrequency of serious episodes occurring in coronary artery disease, the possibility of a syncopal attack occurring in a patient who is developing a severe atrio-ventricular block or sino-auricular block is quite high. It is, therefore, of importance that such people be monitored until the diagnosis is or is not established of an atrio-ventricular block with recurrent Stokes-Adams attacks before a license is granted to such an individual to operate any vehicle.

Among other tests that have been used and are worthy of brief comment is Ballistocardiography. Relatively simple instruments have been developed, recording either the direction and degree of force exerted in displacement or the rate of change of force induced by the rebound waves following the ejection of blood from the heart and its flow through the aorta. The wave forms in the Ballistocardiogram have gained some significance as an index of the quality of cardiac ejection. A very recent publication by Dock and Associates has shown that it is valuable as an index of the quality of circulatory dynamics by the simple means of measuring the slope of the so-called I deflection. Ballistocardiography, however, despite its existence for over 15 years, has not gained general popularity as a measure of cardiac function, probably owing to lack of knowledge of the standards for the normal and the degree of abnormality of the deviations of its waves.

As a variant of standard electrocardiography, commonly required on Vector-cardiography. This is merely an adherence to the recognized principles of the production and propagation of electrical potentials by the contracting heart muscle. Gaining familiarity with the character of the loops in the three planes, sagittal, horizontal and frontal, as well as the twelve leads of the standard electrocardiogram, in many ways simplifies the concept and plot of the important diagnostic points. Another attempt at obtaining this concept of depth interpretation of the cardiac electrical potentials has been the use of so-called Orthogonal leads, termed X, Y and Z, which inscribe a cardiogram similar to the standard pattern, but taken in three rather precise planes through the body. It is not often that information gained from either the Vector cardiogram or the Orthogonal lead cardiogram is of any greater value than that from the twelve-lead cardiogram of recognized common use, but occasionally differentiation of cardiac hypertrophy or of localized myocardial damage, such as myocardial infarction, will be obtained with greater precision by one of these methods.

From the standpoint of employment in relation to coronary disease, the industrial physician may have some interest in various work that has been done in the influence of climate, which may well affect the placement of an individual in a permanent occupational position. One of the first pieces of work of interest was that of Dr. Bazett of Philadelphia, a physiologist who found that the incidence of strokes reported in individuals, particularly hypertensive patients, rose considerably when they had returned to Philadelphia in the middle of a winter, after having had a vacation in a warm climate, such as Florida, for at least three or four weeks. It was his belief that the increase of blood volume, which is well recognized to occur in a warm climate with vasal dilatation, may result in failure to adapt to abrupt vasoconstriction induced by the cold climate rapidly

imposed on the patient by the return north. Rupture of an artery (apoplexy) could be the sequel.

Blot and Heyer in 1955, published in the American Heart Journal, that, irrespective of the change of climate, that there was twice the expected frequency of myocardial infarction with the sudden onset of very cold weather at the beginning of a winter season.

In the opposite direction of weather influences, Burch and De Pasquale have demonstrated increasing morbidity in patients with heart failure in warm humid weather in New Orleans, with definite improvement following the transport of such patients to air conditioned areas. A recent publication in Circulation Research serves to explain in a somewhat precise manner how this might occur, by demonstrating the retention of both sodium and water to a significant degree in individuals exposed to warm tropical climates. Of considerable importance to the employer, as well as to the employee, is the present status of the consideration of the influence on pre-existing heart disease or the induction of either heart failure or myocardial infarction by physical stress. Involved in this consideration is a moral responsibility of the employer attempting to protect an employee whether known or not known to have a pre-existent cardiac disease, and secondly the entire problem of employer's liability for compensation for either injury or death as a result of the impact of such physical stress and the induction of a cardiac attack resulting in injury or death. It is well known that these concerns have tended to deprive men with inconsequential limitations resulting from heart disease, even including coronary occlusions, from the employment needed often by both the employer and the employee. Most patients following an uncomplicated, relatively mild myocardial infarction are able to undertake the same type of employment, even involving the same amount of physical activity as they had engaged in prior to their illness. Hellerstein in Cleveland found in studies of job physical expenditure and job placement that in the steel mills certain individuals tending furnaces actually undertook no more physical effort than they did in such routine daily activities as climbing stairs or changing a light fire. In general, their tolerance for such work was exceptionally good, and the risk to themselves and others was not of consequence. Several tables of work expenditure at various jobs have been prepared by Hellerstein, Gordon, the California Heart Association and others, and should be made available for ready reference by physicians interested in industrial medicine.

Although many cardiologists, members of industrial accident commissions, and legal courts have recognized the probable "cause and effect" (proximate) relationship of effort to induction of myocardial infarction in many instances, there is still considerable doubt as

to the criterion of the degree of stress which could be considered competent to induce a heart attack, and what the temporal relationship should be between the effort and the actual myocardial infarction. In general, it has been accepted that there must be a continuity between effort and the eventual myocardial infarction. The exact mechanism of the myocardial infarction is still unknown under these circumstances, but it is predicated that the so called "supply and demand" of the myocardium oxygenated blood ratio is the determinant factor of the induction of the heart muscle damage of the myocardial infarct, rather than an actual coronary thrombosis or mechanical occlusion.

The relation of psychic stress to heart disease is a still more dubious matter. The claims for this relationship as presented are: (1) whether it is possible to precipitate a myocardial infarction by unusual psychic stress, for example, a person having a violent argument, and (2) whether psychic stress, as a long term influence, may accelerate the advance of occlusive atherosclerosis, presumably as has been shown in certain acute experiments by increasing the clotting tendency of the blood or the blood lipid concentrations. Examples of this are presented as people working under a tyrant or a heckling supervisor.

Under the first instance in psychic stress, the acute precipitating episode, evidence has been shown that the cardiac output can increase materially under psychic tensions. Presumably the release of catechols into the general circulation or at the sympathetic nerve endings in the heart, can cause a stimulation of cardiac output and cardiac work with an increased force of cardiac contraction. This fits into the pattern of the myocardial oxygenated blood, "demand and supply" concept.

It seems impossible to prove or currently accept that persistent stress accelerates the production of occlusive coronary arteriosclerosis in the individual case. The reason for this conclusion is that the "stress proneness" of an employee is the basis of a so-called "stress" reaction, as induced by some extrinsically imposed factor. It would seem inconceivable that the initial employment procedures, at least as exhibited at present, must be dependent on the measure of such stress proneness in the prospective employee in order to evaluate the risk of liability of the employer to the particular tensions of the job involved. It has been reported that a so-called stress

recently presented an interesting evaluation of the present system of industrial liability, namely, that now considerable changes have been recognized as the responsibility of the employer in the occurrence of accidents during employment. It is not how well the employer can protect the employee from accidents or illness, but rather that the industry is now responsible for the occurrence and results of any type of illness or injury incurred during the occupation. This is carried to the extreme occasionally as in the California "Policemen and Fireman's Law," wherein is provided that as a result of the stressful character of the work, irrespective of the temporal relations of a disability onset to the time of actual work on the job, any such illness as a peptic ulcer, asthmatic attack or heart attack, is considered job related and so compensible.

The entire subject of industrial compensation for stress is in such a state of illogical and insoluble controversy that the American Heart Association's Committee on "Stress in Industry" decided that such cases should not be subjected to medical argument and judgment, but rather should be settled as compensible from a socio-economic standpoint.

MODERATOR CYRAN: I am sure there will be many questions after our speakers have finished. My introductions are getting shorter because I think you would rather listen to the panelists than me, so I will proceed with Dr. Gerbode, who will review for us some of the newer advances in cardiovascular surgery, and perhaps maybe we can impose on him to tell us something about whether this is prolonging man's life span, making him more comfortable only, or is it also making him occupationally rehabilitable. Dr. Gerbode.

DR. GERBODE: Well, sir, the philosophical aspect of these questions you have asked me, too. Somebody said the other day when they are estimating the length of time patients are staying in the hospital, they say it's getting shorter and shorter all the time, and one of them said, "I wonder if that is due to the cardiovascular surgeons?"

But, actually, the results in major cardiovascular surgery now are very substantial and very good, and I think the vast majority of people who are being operated upon for major vascular disorders are able to return to some form of very useful life, and of course most of the people we are operating on are [illegible]

to get through with my talk in perhaps [illegible]

Running through some of the varieties of heart disease of major vessel surgery that we are treating surgically at the moment, first of all, in congenital heart disease, you will be surprised the number of patients who have come to us who have been employed actively in all sorts of jobs--secretaries, and drivers and various those who have congenital heart disease, and it wasn't recognized until they had perhaps reached 35, 40 or 45 years of age, when secondary effects of congenital heart disease really brought out the congenital lesion. In one instance actually we found a man of 33 with a total anomalous venous return to the heart, who had gone through and actually served overseas during the war without this thing having been recognized. So don't think that there are not people who look healthy and well and in your employ at the present time who don't have minor murmur or some change in the roentgenogram. I think you will find there are a fair number of them who can still be discovered as having congenital heart disease.

We find a great many of them in the Armed Forces actually. Now, as far as rehabilitating a person like this with congenital heart disease, I'd say the vast majority of them are restored to normal after they have been repaired regardless of the age, except those patients who have very serious pulmonary vascular disease. We have operated, for example, on approximately 250 adults with congenital heart disease, with an overall mortality rate of less than 10%, and those patients who survive, which are more than 90% of them, I would say that 90% of these people are restored back to where they would be if they had never had any heart disease previously. In other words, they go right back to their normal status as of 40 or 45, as if they had never had congenital heart disease, and I think you can generalize this right straight across the board, and I can cite many examples of it. One of the biggest controversial things that is happening now is the treatment of valvular heart disease, particularly in rheumatic heart disease.

As you all know, we have developed over 15 years many operations which have restored pretty good valve function to the mitral valve and aortic valve. Those patients who primarily had aortic stenosis and mitral stenosis we have improved on the closed operations in this regard and we have also added many open heart operations for repair of these two valves and, in addition, occasionally the tricuspid valve. I would say that generally speaking where a surgeon with experience has repaired a mitral valve and made it function practically as good as normal, this patient could certainly go back to very full, useful hard work, and we have many of them who are working as mechanics and truck drivers and so forth, not as many in aortic valve disease, because it's frequently harder to restore

an aortic valve to normalcy by reparative surgery than it is a mitral valve.

However, again, I would say of the total number of aortic valves we have operated upon, there are perhaps 35% at the moment, on an average, who can have a reparative operation and have that valve restored to practically normal function.

You must remember that most of these patients will have a murmur and a great many of the patients who have had reparative surgery for congenital disease will have murmurs. Murmurs are not necessarily a sign of pathology or disturbed physiology. A murmur is merely a sound and it has to be interpreted in various ways. This frightens cardiologists very often because we send a patient back to them after, for example, a complete repair, and the patient is said to still have a loud systolic murmur. Therefore, he must be sick. Actually, he has a loud systolic murmur because the outflow tract to the right ventricle has been reshaped and gouged out and made patent, and we can't make that as smooth as nature can, so he will have an outflow tract murmur simply because of the roughness of the tract, but his physiological measurements and his permanence will be normal, and, in most cases, even though he does have a systolic murmur.

Valve replacement is before us now every day, and in most active cardiovascular units, I would say a valve is put in a patient perhaps once or twice a week, and in some places even more frequently than that. What happens to patients who have had an artificial ball valve prosthesis, which is the one most commonly used, must be vitalized. I would say that if the patient is less than 50 or 55 years of age and has a fairly good myocardium, not too much coronary disease, he certainly can go back to practically full activity, but I would not recommend sending any patient with a valve replacement back to severe physical or marked physical activity. Certainly in all patients who have valve replacements, they should be relatively not inactive, but shouldn't force themselves or extend themselves for at least six months, because it takes at least that long really for that valve to be firmly seated in the aortic or mitral area.

The other thing about valve replacements which is disturbing is there is an incidence of at least 20%, in some places even higher, of minor or major emboli from the valve prosthesis, even though the patient is physiologically able to do a great deal of work. This means, therefore, that if a man has been a truck driver, or bus driver, or an engine operator, or something like that, perhaps he ought to be moved to some other type of activity where if he has a

respect, but if a patient has had one embolus from a valve prosthesis, even though it's a minor one, I recommend to him that he doesn't drive an automobile any more because I think it's just too dangerous.

Now, we have many patients with valves replaced who are secretaries, bank managers, superintendents, timekeepers, all sorts of sedentary active jobs, and they get along extremely well in this capacity and should be re-employed on this basis.

In regard to aneurysms--which I am sure all of you find among your older employees quite often--I think, there again, it's a matter of individual judgment as to what that man can do. Certainly if we remove an abdominal aortic aneurysm in a man 60 years of age and he is otherwise quite sound, there is nothing about that graft or replacement that would prevent him from returning to what he was doing. That grafted area is probably the soundest part of his cardiovascular system, actually.

Graft failures, that is from leakage or disruption, are practically non existent with the materials we are using at the present time. The thing that happens to people who have had an abdominal aortic aneurysm removed for arteriosclerotic disease is they eventually die of coronary disease or some other disease, not a recurrence of an aneurysm or any disturbance in the area in which the surgeon has worked upon previously.

And I would say that this is true also of the thoracic aneurysms which we find occasionally in this age group as well. There are a fair number of people who have various types of medial necrosis, and which you might characterize as forms of Marfan syndrome, where there is a weakness actually in the structure of the aorta. These people have been employed by you and others and then at the age of 35 or 40 they suddenly have an enlarged proximal aorta or they dissect somewhere. These cases have been visualized, you can't really collectively say that you can or cannot employ them. I have, for example, perhaps nine patients now whose proximal aorta has been restored for a section at the base above the valve. Sometimes associated with acquired valve insufficiency due to displacement of the valve, prolapse of it from the area of dissection. All of these people have no murmur and their proximal aorta has been restored, and I have permitted them to go back to practically what they did before. One man, for example, is a roofer. He is doing his roofing. Another one is a car salesman. He is selling cars. Another one is a big rancher in the Sacramento Valley. He likes to ride horseback. He is still a rancher and riding horseback and riding around with his proximal aorta replaced and the valve repaired.

Now, where there has been a valve replacement in association with an aneurysm operation of this type, I would again put the man back into a safe type of job where he can't endanger other people in the public conveyance or some other things of that kind, should he have an embolus from his valve replacement.

Pace makers are occupying a good deal of our time these days. As you look at this follow-up group of patients, I would say that for the most part they are extremely grateful for having a satisfactory pulse rate and cardiac output, because these are patients who have been having Stokes-Adams attacks and have fainting spells at odd moments where it's kind of embarrassing; sometimes when driving automobiles. Again, this does endanger the public generally.

Now, about employability and the job classification of a man with a pace maker. I think, again, this is a matter about which the physician should use his judgment. These pace makers are fine while they are working, and they certainly are life-saving and extremely beneficial. I would say, however, that there is always the possibility of failure of the wire, the battery will tire or wear out after a couple of years in most instances and have to be replaced. There are a certain number of patients who will develop discomfort where the battery has been inserted, depending on which kind has been used, so that these people I think generally can do sedentary jobs, clerical jobs, bookkeeping jobs, superintendents and things like that, where paper work is involved, and not get into anything that is very active. However, we have a man 65 with a pace maker who is now contemplating his fourth marriage to a woman of 35, so I guess a certain amount of activity is permissible under some circumstances.

Coronary disease, which Dr. Sampson mentioned, that is the surgical treatment of coronary disease, has certainly not been accepted generally by the medical profession, but there is convincing proof that the Vineberg procedure is a beneficial operation in certain selected cases. Now, you have to do a lot of coronary angiograms and you have to see a lot of patients to find the patients for whom a Vineberg procedure would be satisfactory. I won't go into the anatomical classification or the method of selection, but suffice it to say that if a cardiovascular man is going to go into this field, he has to have a lot of patients going through a diagnostic unit to find the number for whom the operation is beneficial, and in the circumstances I am quite convinced now, having seen the evidence accumulated by a number of very reliable people, that there are some patients who are distinctly benefited from this procedure. We have a few ourselves and, again, there's so much subjective element connected with coronary disease and there is also the difficulty from a scientific point of view of proving whether you are really

benefiting the patient. The only [illegible] group of double blind procedures [illegible] also you do what Bellevue does, [illegible] of training for living with coronary disease, and on the [illegible] you do the Vineberg procedure and perhaps [illegible] same way and then perhaps in five or ten years [illegible] way, you might really find out whether the operation is [illegible] more beneficial than not operating and treating [illegible] certainly can be done with treatment [illegible] function.

With that, I think I have used up my [illegible] are only ten minutes left I think for one [illegible]

MODERATOR CYRAN: Thank you, Dr. Gorlin.

As with most panels, they get to be so interesting that we forget about the time and actually just about any one of these topics could take a two or three-hour discussion.

For the benefit of our claim people, I probably ought to mention that they perhaps now know what problems we have when we are trying to make our decisions concerning some of these cardiovascular problems, especially with optimistic reports like Dr. Gorlin gives us, and maybe I should say opinions expressed here are those of the panelists and do not necessarily express the opinion of the Association of American Railroads.

Why don't we have some questions now. I am sure there must be many of you who are just waiting to ask one of the panelists something.

We can start off with anyone.

Dr. Hollo.

DR. HOLLO: Dr. Sampson, I would like to ask a question in reference to anticoagulant therapy in reference to a post coronary, and what period of time do you usually leave them on anticoagulants and, also, providing that this patient has made a satisfactory recovery and his electrocardiogram is stabilized for six months or a year, would you restore him to full activity without limitation after that time?

DR. SAMPSON: I think this depends on the severity of the myocardial infarct that comes into a classification of coronary deficiency across the board.

For example, there is a very mild form in which an individual also has had several spontaneous anginal pain episodes, lasting five to thirty minutes for a period of two to three days, and is sent into the hospital whereon study of his electrocardiograms reveals serial T wave inversions for a period of five to ten days, and then returns to normal. The patient exhibits no abnormal rise of his temperature or RBC sedimentation rate, and only a slightly elevated serum transaminase activity on the first day of observation, followed by a complete and eventual recovery of both clinical and laboratory phenomena. This type of case is so mild that the return of the patient to a normal existence may almost neglect the concept that he has had a myocardial infarct. It would perhaps be reasonable and safe for him to return to his occupation exactly as he had occupied the position previously, and probably within a period of one month. His occupation, obviously, should not include very strenuous physical effort, and assumedly he would be free of anginal pain. There would be little more concern about his work or his future, even including his undertaking such recreation as golf on a hilly golf course, as if he had not had evidence of occlusive coronary disease. Insofar as he, however, is recognized to have had coronary arterial disease, he perhaps may be considered in a somewhat more sensitive risk class than other adults in whom the disease has been existent but concealed. He may well have a prognosis of over twenty years life expectancy, and only about a 50% chance of having secondary infarcts.

If the individual has a more severe coronary attack, but still is free of complication, it is probable that he may be able to safely undertake similar work to what he had before his episode. If he were symptom free he may follow the pattern of the very mild case mentioned above. Some degree of physical effort seems to increase work tolerance of certain individuals, as has been very interestingly demonstrated by McAlpin and Katts of the University of California at Los Angeles, published in Circulation, and in February of 1966 by Hellerstein who also showed that some degree of physical training in an individual whose tolerance is carefully tested seems to improve his cardiac capacity. As mentioned above, even people who have angina pectoris may undertake a surprising number of jobs that involve physical effort which does not exceed their anginal threshold.

At times, one encounters an individual who is actually undertaking quite strenuous work after having had a mild myocardial infarct, and apparently suffering no ill effects from it. One case which I personally encountered was that of a mailman who had had a myocardial infarction and then had been lost for follow-up for about six months. At the conclusion of this time, I accidentally encountered him on the fifth floor of a walk-up apartment house with a 75-pound bag of mail on his back. He had been doing this work ever since

one month of convalescence from the myocardial infarction and never had either angina or dyspnea.

My answer to the first half of the question, relative to results of the anticoagulant therapy, follows:

You can get any answer to the value of anticoagulant therapy that you desire by talking to different cardiology authorities. There has never been a symposium on anticoagulant therapy in which the participants have come to a general agreement as to whether (1) the drug should be used at all unless thrombo-embolic episodes have been quite evident, (2) used in long term cases but not for over one year, as would be suggested from the statistics of the British Working Party and of Sir George Pickering, or (3) that if be used continuously and indefinitely on the supposition that if the thrombus prevention is ever effective, all effort should be made to prevent and maintain its prevention permanently.

The late Dr. Paul Wood implied that he would have every known coronary disease patient placed on anticoagulant drug therapy indefinitely. In my own experience, having available excellent laboratories for the performance of prothrombin times and the Owren "Thrombo Test," and having, through considerable experience, recognized the values and dangers of this treatment, I follow the same plan of the indefinite use of the anticoagulant drug therapy on every patient with known occlusive coronary artery disease who has had either angina pectoris or a myocardial infarction. However, I do have a series of contraindications, most of which are well recognized, as, for example, blood dyscrasia, serious renal disease or hepatic disease, and one which I rigidly follow. This is the occurrence of any history of a substantiated diagnosis of ulcer of the stomach, duodenum, or other portion of the gastrointestinal tract. Another firm contraindication is the uncertainty of the patient's ability to meticulously fulfill the orders and comprehend instructions in the use of the anticoagulant drug regimen.

Despite my opinion, if the physician in charge of a patient with coronary disease prefers to use anticoagulant therapy for only a period of one year after the acute myocardial infarct, he would be pursuing the most generally accepted procedure, and may justifiably feel that this was the most rational therapy from the statistics available.

I think if the average person wants to use anticoagulant therapy for the period of one year after he has had an acute episode, he would be falling more in line with the general consensus of opinion.

MODERATOR CYRAN: Does anybody have a question for Dr. Hinshaw? We will just spread the work around here a bit.

DR. HINSHAW: Dr. Beard had referred to me this question on foam rubber that can be answered simply by saying that some of the materials that are used in the manufacture of foam rubber, particularly the di-iso-cyanates, are capable of producing intense and permanent sensitization to these materials, to the di-iso-cyanates.

QUESTION FROM THE FLOOR: Would it make him sensitive to other substances? And that is the question which we have with one case. For example, he contends now he cannot be around where people are smoking cigarettes, where formerly he could, and he attributes it--he and his lawyer attribute it to the exposure to the fumes.

DR. HINSHAW: I am not sure that lawyers are very good judges of such things. I have only seen two patients with the di-iso-cyanate syndrome, and so far as I know, they were not sensitized to anything else, nor am I familiar with anything in the literature which would make that possible and, offhand, it sounds rather ridiculous to me.

MODERATOR CYRAN: A question for Dr. Gerbode.

DR. ISADORE KAPLAN (Baltimore & Ohio Railroad, Baltimore, Maryland): You discussed the ball valve prosthesis, the replacement for the aneurysms, and you stated that most of these patients could in all probability return to their former status, and might possibly return to their former occupation. Then later you mentioned that there's a possibility of emboli from either one of these operations and on this basis they really should be restricted from a position that would entail responsibility, such as a railroad engineer, or possibly a brakeman. Would you elucidate on that, please?

DR. GERBODE: I think you probably answered your question yourself in a way. I tried to say that each case has to be individualized. Now, there's at least a 20% possibility of emboli occurring following a valve prosthesis. It's a little higher on the mitral side than the aortic side. Perhaps it's even 30% generally throughout the world in mitral valve prosthesis. For this reason certainly anyone who has formerly been employed in a public conveyance should not be employed in it any more. I think, however, that if this man were at a desk job, or as a timekeeper, or secretary, or some place where he doesn't actually run a machine or a machine that is dangerous or vital and might endanger somebody else, he certainly can be re-employed in it.

valve prosthesis not to have him engage in any of the more active play or sports for at least six months after the valve has been put in because there are a few instances in which more leakage has occurred during stress and strain in the period after. It takes quite a while for that thing to be really firmly set in there. I think it probably varies with individuals, as it certainly varies with the type of body that a surgeon has to deal with. So that that is as far as I can say.

All these patients with valve prosthesis in our unit are kept on anticoagulants indefinitely. This, again, poses a little bit of a problem to employability. Not much, but some. These patients, if they are injured, of course, are on anticoagulants and are apt to bleed more, so you don't want to put him where he is going to get his hands cut or something like that. So that is a factor.

The evidence I think is in favor of using anticoagulants in this instance and I am in favor of using them. In other words, there are enough patients now with and without anticoagulants to make you believe that anticoagulants do help some, but they certainly don't prevent thrombosis or embolization. I think it's a crutch which the medical profession needs a great deal, in our field at least. I won't say anything about coronary disease, but I know that is extremely controversial, although I think most people do use them. Although I use the Coumaral drugs in most of these patients with valve replacement, all of them with valve replacement, in fact, I don't really honestly believe that I am preventing thrombosis or embolization entirely even in the best regulated groups of patients because I can show you many of them who have been on absolutely immaculate control with the best laboratories and best physicians watching them who had tiny emboli. So, to my mind, the only real drug that will prevent this difficulty is heparin, and for that reason we use heparin during the early phases of the postoperative treatment of these patients, and we only switch to Coumaral drugs when I think things are fairly well organized internally and the patient has to be dismissed from the hospital. So I probably have only confused the question a little bit further, not really clarified it for you. I am sorry if I have.

MODERATOR CYRAN: Dr. Vaughan has sat here patiently and I am going to put him to work now asking him to

to more or less lend support to Dr. Cyran as a practicing railroad physician in trying to keep this discussion on a practical level. I am glad to say that the discussion has been on a very practical level all through and I am sure that many of our questions have been answered by the members of the panel here.

I might just say that, as railroad surgeons or physicians, we are of course interested in three aspects of the cardiopulmonary problems. One, we want to be in a position to give a decision as to whether the particular job an employee is working at has produced or aggravated the disability. Two, we should know whether it is safe for an employee with such a difficulty to carry on, and three, we would like to know on routine pre-employment or periodic exams whether a cardiopulmonary disability does in fact exist.

Now, it would be of considerable value if we did have a nice easy screening test that was rapid and inexpensive that we could give on a routine employment or periodic examination, but we have heard here today that really such tests have no place in a routine examination of this sort. We still must rely on a careful history and our ordinary physical examination. There may be other procedures we can do, such as pre-employment chest X-rays, which may be indicated chiefly to have as a baseline if somebody develops a pulmonary disability later on. There are routine electrocardiograms, et cetera, but sophisticated pulmonary tests, are probably not indicated in ordinary pre-employment examinations. Where they are, of course, of some value is when you have an established employee who has developed a pulmonary disability, then he can be referred for such tests to determine possible impairment in function.

However, all the panelists here--particularly Dr. Hinshaw--have issued a word of warning as to the reliability of such tests. There are many tests, and if you are interested in a detailed description of them, in the latest issue of the Archives of Environmental Health, there is a very good article by Dr. Wright, who gives a description of all the common pulmonary function tests, their reliability, et cetera. The normal standards for such tests have not been well worked out and there's a considerable range of variability. What you are measuring in these tests is, after all, not dis-

summary.

Well, gentlemen, it's now noon and our surgeons and physicians have a busy day ahead of them. We will have to stop the discussion and proceed. (Applause.)

CHAIRMAN OLSON: Dr. Cyran and members of the panel, we are grateful to you for a very interesting and instructive discussion on cardiopulmonary problems. We appreciate very much your coming here. Thank you again.

At the time that you registered this morning, I think all of you were given copies of some of the work that had gone on during the year by the various members of our committees, and among them was a volume on medical standards. This is a tentative type of production and was primarily intended for the use of our doctors, who were expected to read it and study it and bring it to the attention of their managements for such consideration as they might want to give it. The idea being that this would ultimately be used as a reference text in medical standards on railroads, and if you are one who is not particularly involved in such a situation and you have no use for it, we would ask that you return it to the desk. If you keep it, please be careful how you use it.

We have now reached a midpoint in today's program, and we will have a reception and lunch in the French Room, to which you are all invited. Will you please reassemble here shortly before 1:30 for the afternoon program, at which time Dr. Harvey Nelson will preside.

Thank you.

(Whereupon, at 12:00 Noon, the meeting was adjourned until 1:30 o'clock p.m. of the same day.)

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Wednesday Afternoon Session
February 23, 1960

The second general session convened at 1:30 o'clock p.m., with Dr. Harvey Nelson, presiding.

CHAIRMAN NELSON: Will everybody take their seats, please?

Dr. Olson thought a little change of scenery up here would be an asset.

The first item on our program is a panel on neuropsychiatric problems and assessment of neuropsychiatric factors in pre-employment examinations. For me, at least, this is a rather new enterprise which we first touched upon last year. The question of return to work of individuals who have suffered from various neuropsychiatric conditions has been, and is increasingly so, a headache to the Railroad Medical and Surgical Officers. It will be very interesting and quite instructive, I am sure, to go into this matter and at this time I would like to introduce the moderator, Dr. Abbott Skinner, of the Great Northern Railway and have him introduce his panel.

PANEL SYMPOSIUM - NEUROPSYCHIATRIC PROBLEMS

MODERATOR ABBOTT SKINNER, M.D.: Thank you, Dr. Nelson. Dr. Olson, members and guests: It's a pleasure to be up here, I think. I am sure that you are no more surprised than I to see me up here, except I have known about it for a little longer. Maybe it's good or maybe it's bad to have a dumb surgeon up here as moderator. He can parry the questions and he probably won't take too much of your time.

Our panel has just arrived. Some of them are still breathless. Otherwise, I would expect the last member to be here. We shall wait and see, and I think Dr. Strange will tip us off if and when he arrives.

I will briefly go over the panel members and we can withhold the applause until after they have talked. Is that a dirty crack?

At my immediate right, as you all know, is one of our members, Dr. Ben Stockwell, also an authority on neuropsychiatric problems. To his right, Dr. Moire McAuliffe, Assistant Professor of Neurology at the University of California, and she said that was enough to say, but you see that she has other titles.

I am sure that she has had nothing on her mind lately. Yesterday she took her Boards and I think we are in a position to congratu-

late already.

To her right is Dr. John Moody, Clinical Professor of Psychiatry at the University of California and to his right is Dr. [illegible] Calanchini of the Teaching and Research Staff of the Letterman Medical Center in San Francisco.

Dr. Calanchini and Dr. McAuliffe are closely associated with the Southern Pacific Memorial Hospital, where they are in a particularly viable position among their colleagues across the country, I am sure, because they have a separate inpatient service of neurology. I am sure that this makes for good feeling of the staff and better care of the patients.

Dr. Morrissey has not yet arrived. As Dr. Nelson indicated, to the best of my knowledge last year was the first time this organization had ever tackled neuropsychiatric problems in a panel form and, in fact, in practically any form. We realized at that time that we were just opening a door in this complex subject. It has many ramifications and I am sure it is going to take us many sessions to get very far along the road.

Meanwhile, with our group today we will become much better oriented. I remember Dr. Winston pointing out last year that railroads will get bids and spend weeks, days or months investigating equipment that costs fifty, a hundred, $150,000, but when you consider the cost, no matter how you count it, of a valuable employee, are we spending enough time in evaluating our applicants?

Without further from your moderator, I will ask Dr. Stockwell to open the program and give us a little of the railroad doctors' approach to the complex subject.

Dr. Stockwell.

DR. STOCKWELL: Thank you, Dr. Skinner.

Gentlemen, I hate to waste the time of this valuable panel speaking, of course, as a general surgeon, but I have been asked to present the railroad physicians' point of view.

It is interesting and challenging to sit on a panel with such distinguished company to discuss a subject that I know so very little about. When asked by our Chairman, Dr. Ernest Olson, to participate in this discussion, he told me that my function was to present, if possible, the practical viewpoint of the railroad chief medical officer in the handling of these perplexing situations.

In presenting the industrial physician's viewpoint, I would like to recommend for all of you the textbook entitled "Occupational Diseases and Industrial Medicine" which was published in 1960 by the W. B. Saunders Company and written by Dr. Rutherford T. Johnstone, Consultant, Industrial Medicine Clinic, Professor of Preventive Medicine and Public Health, and Clinical Professor at the University of California, Los Angeles; and Dr. Seward E. Miller, Director of the Institute of Industrial Health, Professor of Medicine, Medical School, Professor of Industrial Health, School of Public Health, at the University of Michigan, Ann Arbor, Michigan. Specifically, Chapter 5 in this text, entitled "Man's Adaptation to Industrial Life," is pertinent to our problem. It is pointed out that in our rapid evolution from a strictly agrarian life to our present highly mechanized life it has placed tremendous stress upon all individuals. Thus "An increasing number of people need help in achieving a satisfactory adjustment."

It is suggested that emotional disturbances are responsible for about one-third of all adult sickness and absence from work with a tremendous loss of productivity.

The immature individual presents a real problem for the railway industry. It is suggested that the first job may be the first contact with reality for many young adults. These people who may be classed as immature and inadequately adjusted individuals, appear normal on the street or in a crowd, and frequently in the examination room. Their identification is not easy and handling after identification is even more difficult.

These people lack self-discipline and are definitely accident prone, with high absenteeism rates.

It is stated, "They are the ten per cent that take 90 per cent of the supervisor's time."

They are constitutionally inadequate and not only are they unable to perform their duties properly, but they are very quick to blame their employer for this deficiency. It is apparent that this type of individual would be very prone to seek the advice of an attorney under the provisions of the Federal Employers Liability Act.

It has been suggested that most management groups should accept the responsibility of employing some of these inadequate individuals and training them to be productive workers. I suggest that the railway industry is in a little different situation because of its responsibility to the public.

The next question is how can they be eliminated from the railway industry? It is my opinion that the experienced examiner who re-

views the medical history carefully and talks a lot with the applicant while he is conducting his physical examination is able to spot a certain percentage of them, and I further suspect that constitutional inadequacy should be listed in any tabulation of disqualifications. It has been my opinion that it was very difficult to spot these individuals by psychometric testing, although, as you are well aware, some of our group feel otherwise. The question as to how far a railroad should go in psychiatric examination, psychometric testing and other devices for eliminating this group is debatable.

Drs. Johnston and Miller suggest that the functional illness or psychosomatic disease rate has not been determined by any large study in this country, but that in Europe such studies have revealed over 20 per cent of the individuals in certain work groups were so afflicted. They suggest that the functional psychosomatic illness, the neuropsychiatric disturbance and the frank psychotics account for about one-third of all sick absences from industry and, further, that the true psychotic is a relatively minor group. In the railroad industry, as far as the running trades are concerned or those concerned with the operation of trains, there is no place for the psychotic individual.

I am sure this is well recognized by our Committee on Medical Standards and the correct way of handling these individuals will be recommended by this Committee.

There is no question that railway medical departments can benefit greatly from the service of a psychiatric consultant. How he will fit into the functioning of the medical department will depend on the individual situation and the funds available for this aspect of the work. Obviously, management will have to be convinced that their contribution will be of value and help improve their "operating ratio."

Frankly, I am skeptical of the value of some of the proposed methods of attacking this problem. I have recently had the opportunity of observing a "new" type of approach which is being carried out at Wayne State University College of Medicine as a result of a Grant from a governmental agency in which a roundtable of "experts" consisting of an internist who evaluates the complete picture, a psychiatrist, a plant physician, a clinical psychologist, and one or two other individuals in related fields, who go into the background of the injured employee both mentally and physically at great length and with prolonged discussions with the entire "roundtable" group. It

Our next speaker will be Dr. Calanchini, who will talk on the [illegible] disorders, including epilepsy and some of the practical applications of treatment and evaluation.

Dr. Calanchini.

DR. CALANCHINI: Thank you, Dr. Skinner. I think that you all are aware loss of consciousness is not at all an uncommon problem. Interestingly enough, it's more common in males and interestingly enough in surveys that have been done on its frequency, approximately 15 to 20 per cent of the young adult males at some time in their life lose consciousness. Obviously, then, a number of these people are going to end up working for the railroads and at some time in their employment they are going to end up having a loss of consciousness.

Now, we are all aware, I am sure, that we don't want these kind of people who are going to have periodic losses of consciousness operating around moving equipment or operating this equipment. However, I think it's imperative that we be fair to these people who have lost consciousness in that we give them the proper evaluation so they are not unnecessarily removed from their job, particularly if it's a good type of work where they are working around moving equipment or operating this equipment.

Now, our experience at Southern Pacific has been that this is a very frequent occurrence, loss of consciousness. In evaluating these patients, a number of things have become apparent. First of all, I think we have found--and this is true in most people that we have written on this subject--that in evaluation of these patients, by far the most important part of the evaluation is the history. In fact, if a proper diagnosis is to be made, it's usually made through the history. If the wrong diagnosis is arrived at, it's because the history has been inadequately or improperly interpreted. It's been our experience this is one of the weakest parts of the workup of these patients, that these people usually do not have an adequate history, and when we see them, we find the information on the chart inadequate to arrive at the proper evaluation of the patient.

I do not think you can come to any firm conclusions about any patient who has lost consciousness unless you have this good history.

in any patient who has lost consciousness, we will probably be able to arrive at the correct diagnosis and from that we will be able to determine his management, his treatment, and if he should be returned to duty or not.

So in trying to arrive at our correct diagnosis, I think we can answer most of the questions that might arise.

Now, as I said, loss of consciousness is not uncommon. By far the most common cause of loss of consciousness is vasodepressor syncope or, as some people call it, neurocirculatory collapse. This is in layman's terms, I suppose a simple faint.

As I said earlier, about 15 or 25 percent of all young males experience this and usually this form of loss of consciousness, the second most common cause is that associated with a hyperventilation syndrome. And then probably, though I am not sure that this is the third in frequency, epileptic disorders. And perhaps even more frequent than that, alcohol withdrawal seizures. And in the fifth one that I will mention is postural hypotension.

Now, the number of causes of loss of consciousness are many. They actually run into a couple of hundred, but the five I have just named are by far the most common I believe in our experience at Southern Pacific and in the experience in general practice of medicine.

Now, in almost all of these the correct diagnosis can be arrived at simply by history. All other things are rather ancillary to this. The physical examination and the neurologic examination for the most part are unrevealing. They are useful in those people who lose consciousness say from aortic stenosis or from cardiac arrythmias, but otherwise they really do not help us too much.

The lumbar puncture is almost routinely done on these people and is usually of no value at all.

The only other thing other than the history that I think is of value, and it is of considerably less value than the history, is the electroencephalogram. In most people who lose consciousness this will be normal. In a small percentage in which you may be in doubt of what their cause of unconsciousness is, they may have an admirable EEG, admirable in such a way that you can feel reasonably confident that they have a convulsive disorder. So then I would emphasize, as I have several times, that history is the crux of the matter.

I don't want to go into this in any great detail for each of these, but I would say that the most common cause, vasodepressor syncope, usually occurs in a patient who has warning symptoms. He

has a restlessness about him, a need to move about, he then begins to feel lightheaded, he may break out into a cold sweat. If he is unable to escape from the situation which is unpleasant to him--and usually this is the case--the guy who is typically standing in line waiting for his shot, the fellow who is anticipating a painful procedure, or the fellow who is getting chewed out by his supervisor and can't get away--if he cannot move away from this, then his lightheadedness will go on, he will get nauseated, he will, as I say, be in a cold sweat and he may lose consciousness. If he is erect and motionless when he loses consciousness, this may be for a relatively prolonged period of time, more than 30 seconds or so. If this occurs, this poor fellow may have some twitching movements of his arms and legs that look rather like a mild generalized seizure. This is only because his brain has been anoxic long enough to release some of the centers, motor centers, which allow him to have these twitching movements.

Now, all too often these poor people are called convulsive disorders and labeled as such and treated as such, when all their movements meant was that their brain was anoxic for a little longer period than usual than in a patient with a simple faint. If the history had been properly taken to start with, one would recognize this for what it was. So what I am saying is all that twitches is not necessarily epilepsy.

Now, if a patient has an epileptic disorder, on the other hand, the usually most significant part of his history is what happens to him when he awakens. Most of these people who have had a generalized seizure are confused, and they remain confused for a few minutes, and then they have a great desire to sleep. It doesn't matter whether they have bitten their tongue or not or had incontinence. This is helpful if present, but it often isn't. But if they have this confusion, this desire to sleep afterwards, this usually implies that the brain has an abnormal spread of electrical activity and they indeed have a convulsive disorder.

Now, the other problem that is very common is the hyperventilation syndrome. This is usually in the young anxious person who is somewhat neurotic. He gets into a situation which causes his anxiety to increase and this is often a free floating anxiety. It isn't something you can pin down to an unpleasant situation that has happened that day or something else. It's not well related to any events in his environment. He starts to overbreathe, as he continues to overbreathe his blood becomes alkalotic, several blood vessels become constricted, his brain becomes ischemic, and he may lose consciousness. To illustrate how badly some patients can be mislabeled, I once saw a poor teamster who had taken a trip to Denver and was driving back to Minneapolis. He was in the middle of Wyoming when he must have hyperventilated. He got out of his car, was

found sitting in front of his car by the side of the road at night. He was taken to the hospital in a small town in Wyoming and he presented with a probable heart attack. These people often have chest pain accompanying their hyperventilation. He was kept there for several days, they couldn't find any evidence of a heart attack, but they weren't very sure of what his problem was, so they air evacuated him to Minneapolis. He was placed in the hospital there. After several days it was decided his problem was psychiatric and he was put in the V. A. Hospital.

Well, by the time he got out of the V. A. Hospital, his car had been in storage a month in Wyoming, he had a bill for air evacuation from Wyoming to Minneapolis, he had two hospital bills, and when he got back to Wyoming they wouldn't let him have his car because they said he had had a seizure and he couldn't drive it back out of the State. And he was also being threatened with the loss of his job.

Now, this is a very extreme example, in my experience maybe the most extreme, but it's not uncommon.

We really sometimes do these people an injustice, and always I think because we have failed to get an adequate history.

Now, one other thing. I want to talk about alcoholic withdrawal seizures and then sum this up. This perhaps as well illustrated by a patient we recently had at SP, who came in because he had a seizure, and he was rather confused afterwards and stayed that way for a few days and it was obvious that he had mild D. T.'s. His wife said she knew he drank but she didn't know how much and he didn't drink around home. Well, the patient admitted to us that he drank every day and rather steadily, but he was never intoxicated. Well, every year for the past four years when he and his wife went on vacation, two days after they started vacation, this fellow had a seizure, and his wife made the classic statement, "I am just going to stop going on vacations, I don't understand this."

Well, what happened was this fellow told us he stopped drinking when he went on vacation with his wife, and so about two days out his blood alcohol level dropped enough and he had a withdrawal seizure. On this most recent event he had also the D. T.'s.

Well, these people, with the exception of a convulsive disorder, these other people that have seizures after withdrawal or the people that have mild convulsive movements when they lose consciousness, they do not have epilepsy. They do not need to be treated as such. They don't even really need an EEG.

As to postural hypotension, it is my feeling unless his problem

has been proven to be recurrent, in other words it's occurred more than once, that these people do not need to be treated with any great caution, that they can go back to work, they can operate motor vehicles. On the other hand, a patient with convulsive disorders obviously has to be treated as such. He has a good chance of recurrence and it will take a couple of years on medication to evaluate whether he will have a recurrence.

The patient with alcoholic withdrawal seizures remains in a unique category. At the present time at Southern Pacific we do not withhold these people from work. I am not just sure what to do with these people actually. It is a bit of a problem. If they stop drinking they are not going to have any more trouble, if they continue to drink, as soon as they stop drinking for a day or two, they may have more trouble. This is not necessarily a medical problem, it is a social and medical problem. I think part of the burden of deciding what to do with these people rests upon their immediate supervisors. However, we have seen them and they have had a couple of these withdrawal patients, but then our feeling is we usually do not return them to duty but, rather, write a letter and leave this up to somebody else to make the decision.

I think then in summary that most vasovagal unconsciousness is not recurrent and they can be well defined by a good history and that most of these people can be returned to work, and I would like to call your attention to the best monograph I know on the subject. It's a book called, "Fainting." It's by George Engle. It's put out by Thomas Brothers, and it covers this field very well, and it's a real practical book for this sort of thing.

Thank you.

MODERATOR SKINNER: Thank you very much, Dr. Calanchini. I am sure this will give rise to some questions at the end of our program.

Our next speaker is Dr. Maire McAuliffe, who will talk about the chronic brain syndrome.

Dr. McAuliffe.

DR. MCAULIFFE: Thank you, Doctor.

Of the myriad of neurological signs and symptoms, dementia or the chronic brain syndrome is an extremely common one as well as being most vague and least understood. In the Southern Pacific Hospital, we are often confronted with the patient who laments, "I just can't think as well any more," or, more often than not, the

patient is accompanied with a note [illegible] acting strangely or is "mad [illegible]

The patient arrives. Unlike the [illegible] history is usually of no value whatsoever [illegible] totally unable to give an accurate history, [illegible] a history but the tendency is to believe [illegible] sounds plausible and to disbelieve the [illegible] to do is to not believe any of it at all.

The first thing that we do then is try to learn [illegible] the relatives or friends of the patient. Have they noticed any mental deterioration in the patient? Have they noticed any mental deterioration recently, we call the supervisor and try and get him to do [illegible] by "acting strangely."

This is not always very successful.

The second part of the evaluation is the detailed mental [illegible] examination as well as the general physical examination, which is of utmost importance in these cases. Frequently a general examination will reveal the presence of cerebral arteriosclerosis or generalized arteriosclerosis.

Recognizing the importance of a total evaluation in such a patient, we have standardized at the Southern Pacific Hospital a mental status evaluation. By using such a constant, our ability to classify the patient and to carry out such an evaluation has been greatly enhanced. The form used is called the neurological index of mental impairment. It was devised by a neurologist and a psychologist who are working under an NIH Grant in the investigation of cerebral vascular disease. It was recognized that many people with cerebral vascular disease are asymptomatic except for diminution of mental functioning. The index of mental impairment is very simple, very concise and a very accurate bedside test. It takes about ten to fifteen minutes to administer, and can be done quite efficiently by the house officer.

The examination which we use covers tests of recent and past memory, calculating ability, conceptual thought and constructional ability. The results are evaluated in light of the patient's educational and social background, although, surprisingly enough, this has little or no effect on the general profile which is obtained by consistent use of the same test. This is not true of course if the patient is an [illegible]ament. (An English psychologist once described the demented person as a man who went bankrupt and an ament as one with nothing to go bankrupt with.)

In any case, I have a copy of the test with me and I would be glad

to answer any questions or show it to anybody who is interested in it.

What are our factual gains, what happens with this test? Well, in fact all about 10 per cent of all brain tumors are actually diagnosed as a psychiatric illness. This diagnosis is made by either a psychiatrist or a non-psychiatric medical doctor. The mental status examination in most instances will accurately unveil the basic organic deficit in such a patient, and will lead the search immediately to a thorough evaluation consisting of an EEG, lumbar puncture, skull films, brain scan and/or contrast studies in the form of pneumoencephalography or arteriography.

In the past four years at Southern Pacific Hospital, we have had five primary brain tumors and two metastic brain tumors which have presented solely as a chronic brain syndrome, dementia. Most of these were in age groups which are under these in which we expect a chronic brain syndrome and in all of them the organicity of the deficiency of mental functioning was revealed through the use of this simple test. The test is so constructed that parietal lobe function is incorporated as well as other deficits in mental functioning which lead us to a diagnosis of focal brain lesion. Now, the converse is also frequently true, unfortunately, to the detriment of both the patient and the hospital. That is to say that a basic psychiatric problem is mistreated as an organic one, and the mental status evaluation as done at the bedside frequently unveils the basic psychiatric problem. I said previously that the examination includes tests of conceptual thinking and as one administers this test over and over again, one recognizes the bizarre and strange replies that immediately alert one to this being a psychiatric problem. The patient then can be channeled toward the proper care with little loss of time or effort on either the part of the patient or the doctor.

Thirdly, organic dementia is most commonly associated with the diffuse pathological process. By using the standard form repetitiously, we are afforded an accurate index of any progression of this deficit. This is, of course, of great importance in terms of employment. If we have a patient who is sent in because of this "acting strangely," then we are able to establish a baseline--just how much responsibility can this patient now accept--and follow him along at two, three or four-month intervals. One will frequently see a pattern in that the test will continue to deteriorate in a stepwise fashion. The case never "gets away from us."

Fourthly, in recent years there has been developed an increasing interest in the occurrence of strokes secondary to carotid artery disease in the neck. This has given us a surgical arm in the treatment of strokes. The arteriogram and the surgery are certainly

not without tremendous risk to the patient, and the combined morbidity and mortality rate in the realistic series has been as high as 10 per cent. Many of these patients also have diffuse small vessel disease. As I said before, this is often entirely asymptomatic, save for depression of mental functioning. Needless to say, an accurate assessment of the patient's mental ability is a necessary prerequisite to surgery. This is also very true of the use of stereotaxic surgery to relieve the victim of Parkinson's disease. Very frequently in the arteriosclerotic form of Parkinson's disease, there is accompanying dementia. Needless to say a cold probe into the globus pallidus isn't going to help the dementia and, again, is a very hazardous procedure.

The fifth area in which we have found the [illegible] of tremendous help is in the cases of head injury, in which the patient (following an extremely mild head injury) will complain of all sorts of personality changes, memory loss, etc. Sometimes, of course, this is quite legitimate in the more serious head injuries, but again, by using this mental status examination, a certain profile of organicity and non-organicity will evolve.

In some instances proving that indeed there has been enough brain damage to say that this patient is no longer able to function at the level at which they presumably functioned prior to the accident and in other cases proving unequivocally that there is no organic brain damage of this sort.

Finally, by creating a standard form the all important problem of returning the patient to work is made much easier as well as more accurate. We no longer have to use nebulous terms but, rather, the mental status is defined, is clearly documented, there is organic mental impairment.

Thank you.

DR. STOCKWELL: Maybe the panel can make a quick comment. First, I would like to comment on this alcohol withdrawal syndrome that was mentioned by Dr. Calanchini. It seems to me that the treatment of that is obvious and rather pleasant. Let's keep drinking. Let's have a cocktail before dinner.

Dr. McAuliffe mentioned a study she had been conducting for the past forty years. I doubt it very much.

DR. MCAULIFFE: Why?

DR. STOCKWELL: I don't think you have been studying this problem for forty years, doctor.

DR. MCAULIFFE: Four, not forty.

DR. STOCKWELL: Incidentally, she has a test here and I am going to take it in the next few minutes, and I will let you know how I make out.

MODERATOR SKINNER: We will follow up on this later. Thank you very much, Dr. McAuliffe. Incidentally, is this test in such a form we could pass it around?

DR. MCAULIFFE: Yes. I just brought one copy of it.

MODERATOR SKINNER: Maybe Dr. Stockwell wants to take it and show everybody his results. Otherwise we will pass it around the room and everybody can take a look at it.

DR. STOCKWELL: Very good.

MODERATOR SKINNER: In the newspaper before I left home a short time ago there was a letter to "Dear Abby."

I don't know whether you saw it or not, but it started out: "Dear Abby: I am a 16-year old girl, and my friends say that I am fairly pretty. I get 11's in school. I finally found a boyfriend. Maybe I should tell you about my family. My mother is a paranoid schizophrenic, but I don't know how to spell it. My older sister is an alcoholic. My brother is in the penitentiary and my younger sister, well, she is just in some sort of a mental school. My father is a psychiatrist. Dear Abby, shall I tell my boyfriend about my father?"

(Laughter.)

I am sure the psychiatrists get tired of hearing those jokes, but I am sure that Dr. Moody is more than equal to it and has a reputation for being an exceedingly practical and effective psychiatrist. We will hear from him now.

DR. MOODY: Should I say thank you? I didn't think it was even necessary to introduce me as a psychiatrist, as Dr. Vance Strange has said, "Moody, you know anyone can tell that from the back of the room."

But I put my sandals aside today and shaved.

(Laughter.)

Now, I don't know what the place of psychiatry is in the railroad at the moment. I don't know what place it has in compensation work

in general at this time. I am not sure that anyone really does, but I want to take up the question of pre-employment evaluation. There are two things that could [illegible] the separation of the psychotic and the [illegible] as Dr. Stockwell pointed out. The other [illegible] accident prone individuals or the psychosomatic problems.

Now, why would it be of any value to separate these people from the general work force? Well, probably several reasons, but mainly else, it gets down to where it might save some money. Well, if we take a look at the value of selection procedures as they have been studied to some extent in the past few years by the military services, for example, that did a study in which they attempted to predict in advance which ones would be discharged under general conditions, that is unsuitability, within a certain period of months, they discovered that they could have pretty much flipped a coin, that even with psychiatric and psychological assessments, it is quite difficult to make this decision.

In work done with other groups, such as religious groups, trying to screen candidates for these various vocations, they have had similar difficulties in prediction, but I think that there is some value to consider the question of assessment if it's done not on the basis of detailed, prolonged psychological and psychiatric evaluation but if it's done on a basis which will attempt to exclude the people I put in Group No. 1, which are the psychotics, and the inadequates.

I think these people can be screened in their medical evaluation and they can be screened by history to some degree. That is, I think time spent would produce proportionate rewards in these two groups. As far as detecting accident prone individuals and psychosomatic, potentially disabling psychosomatic problems, I just don't think at the present state of our understanding that this is feasible in terms of the results. There might be more that some of you can bring up about this, but I will leave it at that.

Another topic I would like to take up is in regard to accidents. Every patient I guess potentially that comes into the rehabilitation hospital could be a compensation patient, but the ones that particularly have accidents present problems in my area, since there are times when those people who have been taking care of these individuals have come to the end of their rope and feel that something has to be worked out in terms of the etiology and the disposition. Now, I have some fairly definite views about accident problems, the kind of accident problems I am referring to are accidents that do not recover in a reasonable time based on the experience of the orthopedist, the surgeon, whoever is taking care of these people. If after a reasonable length of time the individual is not showing the progress that can be expected, then I think it is important for us to watch very

and think about what is going on, and I think it's not always easy to do that. I also feel that when you have someone who does not respond in the usual length of time, I mean plus or minus, but in the usual length of time required to recover, that almost invariably there is basically a functional etiology to their continuing disability and inability to improve. So, obviously, the first thing is to recognize this, and this is important of course for the mental well being of the physicians. After six months, a year, two years, three, four or five years, it gets a little hectic trying to parry the continuous requests of these individuals on one's time and medical skills.

Let us say you recognize someone as having a functional problem relating to an injury. The compensation problem, if they are on compensation, is a little bit unsettling. It is to me. I know that I consider this whenever I see someone where this is involved. What do you do with someone like this?

I don't think there is a good answer to this. As far as treatment is concerned, there is relatively little specific treatment to offer. I think early recognition, laying the cards on the table and really getting across to the patient that, "Your difficulty lies in this area, not this area," is one of the best forms of treatment. I have on a couple of occasions had patients in the hospital who were State Compensation injuries with a strong functional overlay. I had them in the psychiatric hospital for periods of months in an experimental attempt to try to reorient these people towards gainful employment, and we have had little or no success with that. After all, who would want to go back to work when you can stay in a very pleasant hospital setting that has movies, games, dances, girls and all the rest?

Well, the point I am making under this group is simply early recognition and firm disposition as being the main forms of treating these problems.

Now, another group that could be included in this are not accident disabilities but simply the psychosomatic disabilities that present the same problem in continuing and chronic pleas for some kind of resolution of the difficulties which, if you could find, they would probably not want removed anyway.

These people present problems again in terms of time and medical expenditures that are very frustrating. Again, I think you have to recognize initially what the problem is, and you can't do anything about these unless you recognize them early, they are impossible but they are a little less impossible the earlier you can get at them, and it's been amazing at times how a direct confrontation and a sitting down with someone in regard to the nature of their illness will shift their focus away from the secondary gain of their medical illness

into something more appropriate. Maybe it isn't [illegible] more [illegible] to [illegible], but at least it's a different direction, [illegible] with the real etiology.

Now, the fourth thing I want to discuss here is returning people to work who have had psychiatric disabilities. As I have already said, it's very hard to predict how an individual will perform in the future and in this case in the future of his work. One of the best methods is to base it on what has already happened, that is, you base the future on the past. And the illness itself doesn't alter that too much. It's hard sometimes to determine how a man will do on the job when you see him in the office briefly or when you see him in the very protective setting of the hospital, so it's always of use to me to get either verbal or written information from his employers, from the people that work with him or from his immediate supervisors.

Now, this can often be misleading because it happens more than once that for many months the people around him, and the supervisors, they won't really face this issue with the man. They are a little hesitant to do this. They put up with a great deal, they don't know what is going on, they become very frustrated with him, so finally the individual commits some bizarre act or does something in such a way that they can't turn the other way any longer and he is sent into the hospital. So when you call the employer and you talk to him, he is liable to have kind of a bad taste in his mouth in regard to this person, and when you send him back to work, you often find that the individual is extremely uncomfortable in the work setting, just as are the people he is working with. So this is a very strange area. It has to be done on an individual basis.

The question of psychiatric medications arises in this context. There is no question that medication can be of great value to these people. It often arises in terms of the use of moving equipment. I think this has to be considered from two aspects, one is the strict medical aspect and the other is the legal aspect of it.

From the standpoint of responsibility, I just don't see any alternative but to be extremely conservative in returning someone to work under the influence of medication, even though the medication itself rather than produce problems, may be more effective in preventing difficulties in the use of this equipment. But from the legal standpoint, I just don't think we are left with any alternative. This is unfortunate in some cases at least.

Now, the question of alcoholism does arise, usually it comes about only when the individual has so far exceeded the limits of tolerance of those around him that they just can't turn the other way any

longer. And I think today there's a lot of tolerance for this sort of thing. If he is willing to make some effort to control the problem, to function in his work, then I think the people around him will go along with him. If he makes no attempt, then the thing comes to a crisis at one time or another. There are some interesting statistics in terms of psychiatric people, patients, from the State Hospital population, and these are not necessarily chronic patients; that is, they haven't been there twenty years, but just the kind of patient that is admitted for three, four months and discharged. Only about 20 per cent of these people hold and sustain employment. Twenty per cent. The rest of them make an attempt, they are very diverse in their work history, go from job to job, never anything too productive. What I have in mind here, though, is this: That when you have had someone who has been clearly psychotic and has been hospitalized because of this, the outlook is pessimistic if their job requirements are fairly demanding, and sooner or later most of these people kind of fall by the wayside in terms of retirement or whatever other disability compensation they receive.

Now, there are a lot of things I have not covered here. Primarily my concern and my interest is in trying to recognize early the functional overlay in the accident and in the psychosomatic problems to really see and try to define, is there any way to treat these people? Is there any effective way to do anything with them besides pensioning them off or putting them on medical disability? And, also, if we approach this early enough, can we make it really not impossible perhaps but much less attractive for the prolonged and expensive suits that are involved in this kind of a situation? I really think that there is some room to move ahead in this area, that with early recognition, with very firm documented psychiatric evidence, some of these cases just would not require such extended legal action. But, after all, when a man has been ill for six or seven years, and the problem has gone in some way, not entirely, but partially unrecognized, this is pretty hard to explain away in a trial situation.

Thank you very much.

MODERATOR SKINNER: Thank you, Dr. Moody.

Dr. Strange, may I ask, has Dr. Morrissey arrived?

DR. STRANGE: He has not come in.

MODERATOR SKINNER: Thank you.

At this time I would like also to thank Dr. Strange for arranging the panel. We are indebted to him for the selection of our experts and we appreciate it very much.

The time has now come to open up the discussion for questions from the floor.

QUESTION FROM THE FLOOR: I would like to ask Dr. Calanchini if he has any idea of the percentage of these people who have ties, tremors and fits that are due to their wife's tranquilizer pills, and let's get alcohol off of him.

DR. CALANCHINI: I am afraid I can't answer that question in terms of percentage. The ties and tremors of course are something entirely different than the fits, but a few, occasionally a few patients do have fits from taking a few too many tranquilizers. They stop these and have a seizure. To tell you what percentage, I couldn't begin.

MODERATOR SKINNER: Thank you.

Another question?

QUESTION FROM THE FLOOR: Is Antabuse of any value in treating alcoholism?

DR. MOODY: I think that it had its heyday some years ago, and it is still used in specific or specialized hospital settings, but it's a very difficult drug to use, as I am sure you know, because it requires the absolute cooperation of the individual, that he has to take it, and if he doesn't take it, no one is going to make him. If he does take it and then can't control the drinking, he is in serious physical difficulty. The basis then for using Antabuse is the motivation of the individual to help himself, and there are other ways that this can be done without the dangers. I guess I would have to fall back on AA as being the group that a motivated individual will eventually find himself associated with.

MODERATOR SKINNER: Another question? Dr. Stockwell?

DR. STOCKWELL: I would like to comment on Dr. Moody's remarks about the hospitalized psychotic and actually the poor prognosis in these cases and I would like to just make the statement that, in my opinion, there is no place in the railroad particularly for train service employees after this situation has developed. That is when they have become psychotic and which required hospitalization. I think they are through as far as running trains in the railroad is concerned.

Dr. Moody might disagree.

I might comment that these are individuals that have the responsibility for train movements, very responsible positions.

DR. MOODY: Let me ask you a question in return. Do you base this on the fact that this illness may recur or that these people are essentially incapable all along, that their basic functioning was not adequate?

DR. STOCKWELL: I think that the thing you said first, it's a recurrent proposition. They have recurrent trouble, and I think are not reliable and not up to assuming the responsibilities of their positions, because of the prognosis I think you mentioned in your talk.

DR. MOODY: The only comment I would make is that I think you have to separate a little more carefully, it's easy to talk in generalities, but when you get down to an individual, you have a specific problem, and it has its own facets to it, and I find myself many times making exceptions to Dr. Stockwell's statement, where I might feel that an individual has had an acute episode of some kind later in life, let's say he is 40 years old by the time he has had something going on, and I find that I am inclined at times to give him the benefit of the doubt. I am not advancing this as a position by any means, I don't think I am as clear on this as many of you who have seen these people over a long period of time, but unless you take a blanket position, you are faced with very difficult individual dispositions.

Would you suggest, then, that a blanket position be taken on this or just a general position?

DR. STOCKWELL: Well, I think there definitely are exceptions to any general rule that one makes, and of course most of us are faced with the situation that if we disqualify an individual for physical reasons or for some psychiatric difficulty, and he decides he is able to work and his physician agrees, that this issue may be decided by a three-doctor panel. So that our decision is not necessarily final in these cases.

DR. MOODY: I think the way I look at this practically speaking is this: That the individual may have recovered very well from his immediate psychotic episode, and that from the standpoint of 99 per cent of his functions he can do very well, but it may well be that the nature of his work, if he is in an operating capacity, is simply out of the question for him because of the fact that he has had this kind of disability.

Now, this doesn't mean to say he is still incompetent or incapable, but it says this: That what has happened to you doesn't fit with what you are required to do and, therefore, in most cases I am sure that they have to find something else to do.

MODERATOR SKINNER: I think here we have a tendency to get lost in terminology. Are we talking about the psychotic patient? This

is a chronic disease, if you will, and I am [illegible] say an episode, are you both meaning the same thing. [illegible] extreme stressful situation where the young [illegible] the end of a bridge, and on their way home the [illegible] his wife has died and so forth? Do you call such reactions [illegible] require vigorous psychiatric care a psychotic episode [illegible] a psychotic patient? What do you mean by a psychotic [illegible] terms of return to work?

DR. MOODY: What I mean is, for example, there was a man of about 40 years of age, who has worked for the railroad for I think 20 years not in an operating capacity, but who has been psychotic or [illegible] phrenic all of his adult years at any rate, but he was able to work and carry on some sort of an existence until some factor at that age, 40, precipitated in him an episode of really obvious and acute disability. That is, he might have been considered a little odd around the office and the supervisor might have thought, "You are never going to get a full day's work out of this guy," because he is staring out of the window, or wouldn't talk to people, or things like this. But when he began to raise cain in the office and scare people, this then I think is what I mean by a psychotic episode. And one of the reasons it's difficult to assess these people afterwards is that they do make a recovery that is almost sometimes at least apparently consistent with their previous level of functioning, and if you think, well, they have been working 20 years that way, and now they seem to be pretty much where they were, is it reasonable to prevent them from working following this acute episode?

MODERATOR SKINNER: Any comments from the floor on this subject?

DR. ROSEN: I think there should be a distinction made between the various types of psychotics you are talking about. I think a generalization is not proper. You might have a manic-depressive psychotic, a hypermanic, or dementia praecox or simple praecox or involutional melancholia, and the prognosis might be quite different in each case. I think the case should be individualized rather than making a generalization.

MODERATOR SKINNER: I suspect that is what Dr. Moody meant when he said he made lots of exceptions.

How far along has the neurological index test gone? Are there any comments on this? Do you have others?

DR. MCAULIFFE: There are others at the hospital. I only brought one with me today.

DR. STOCKWELL: Incidentally, I failed it. (Laughter.)

MODERATOR SKINNER: Are there any comments on the test, if you have seen it?

QUESTION FROM THE FLOOR: Can the test be printed in the proceedings, a copy?

MODERATOR SKINNER: Would it be possible for us to obtain copies so we could distribute it to our members?

DR. MCAULIFFE: Yes.

MODERATOR SKINNER: That would be wonderful.

DR. MCAULIFFE: I would like to add I think at the Southern Pacific one of the reasons that we are able to make such a good evaluation of our neuropsychiatric problems is the degree of communication that exists between Dr. Calanchini and myself, as neurologists, and Dr. Moody, as a psychiatrist. I think this is in part due to the fact that we work up the patients very thoroughly from a neurological and mental status point of view before Dr. Moody sees them. I think that this is a very important thing when you are working out neuropsychiatric problems.

Would you agree?

DR. MOODY: Definitely.

MODERATOR SKINNER: This is very pertinent to the problems of all of us in this room, I am sure. Communications is a big and difficult problem. We have examiners of varying experience and ability in small towns, perhaps hundreds of miles away from the "medical center," as far as the railroad is concerned. There is no question but what a thoughtful and time consuming approach to our applicants as well as our returnees would pay off. However, we need the help and the experience of our neurological and psychiatric consultants.

Something was said about return to work on medication and some worry stated I believe by Dr. Moody about returning them to work on medication. I am wondering if he means--well, we won't define it beyond tranquilizers, as well as sedatives, if there is any difference, and how can the chief medical officer evaluate this in his office, not seeing the patient? How much trouble do you see from tranquilizers? How much does it interfere with people in active occupations around moving equipment?

DR. MOODY: I don't see very much interference or complication

couldn't come up.

Any comments, Dr. Moody?

DR. MOODY: I was going to say that at times I have seen say, and I don't understand what is going on, or more time is often required to get at some of the details. It's in such cases that psychological testing can be useful from a diagnostic standpoint. From the standpoint of assessment, there are several short tests that are used, but I don't know really, that there is any place for them at the moment.

DR. STOCKWELL: Dr. Moody, is there a condition that actually exists of P.T.N. post-traumatic neuroses?

DR. MOODY: It has been used extensively by people, yes, primarily I think it's been used in connection with war neuroses, developed after the First and Second World War, and this is the kind of thing that they ran across in Korea, where they found if they took all these people who were "shook up" severely and moved them farther and farther back along the channels to the hospitals, that they solubilized their illness rather nicely, and these people became ensconced in the V.A system and are probably still there today. But if they got these people and got them back a few hundred yards behind the lines and put them in a tent and gave them a handful of Seconal and let them sleep for a day or two, and then kind of got in there and gave them a little pep talk, and two days later sent them back to the front lines, these people did not develop traumatic neuroses. I think we have to be careful of this sort of thing in handling psychosomatic and accident cases.

MODERATOR SKINNER: I think that is an extremely valuable point that Dr. Moody just made.

Any further comment or question?

If not, I want to thank Dr. Stockwell and Drs. McAuliffe, Moody and Calanchini for giving so generously of their time and ability.

I turn the program back to Dr. Nelson.

CHAIRMAN NELSON: I don't know whether the increasing number psychiatric problems that we are facing are a product of the Great Society or our new social era, or just what it is, but it certainly is getting to be an important factor in our work. We wish to thank you all for giving us your time and an excellent discussion of a pertinent subject.

Is Dr. Grant Morrow here?

To my recollection, it has been some time since we have actually discussed contact dermatitis. I recall a number of years ago that this was quite an active subject. We are all going to be very interested, Dr. Morrow, in having you bring us up to date in contact dermatitis.

I would like at this time to introduce Dr. Grant Morrow, Assistant Clinical Professor of Dermatology at the University of California.

ADDRESS: Grant Morrow, M.D., Assistant Clinical Professor of Dermatology, University of California; Staff Member, Southern Pacific Memorial Hospital, San Francisco, California

Mr. Chairman, members of the Association of American Railroads and guests: Today when we start this program, we are going to show a film made by the Southern Pacific Company called "To Save Your Skin." This film is a method the Southern Pacific Company is using to prevent dermatoses among their employees, and I will discuss this when the film has been shown. It takes only a few minutes, and I think you will get more out of it than you will from what I have to say. It was made in the Southern Pacific repair plant in the Sacramento-Roseville area, where all the main work and repair on engine equipment are done. A pamphlet explaining the film will be given to you at the end of my discussion.

(There followed showing of film.)

Before we start the discussion, I think a couple of definitions would be in order so that we can all understand the conditions we are discussing. An allergy versus a primary irritant: A primary irritant is any substance--acid, alkali, any irritating substance--which when put on a person's hand immediately causes a red rash. It burns; there is no incubation. The dermatitis lasts a few days and then heals. In the case of allergy on the other hand, the substance, although put on the hand of everyone in the room, would cause the rash in only one or two individuals. The rash would not occur right away; it probably would not occur the day after application, maybe not a week later, or maybe not even three weeks later. This situation has a definite incubation period. The best way I can say this is that the subjects have to be sensitized--with any substance you saw here--any kind of oil, poison oak. I want to talk a little about poison oak. Poison oak everybody knows; everybody is familiar with it. Poison oak is a contact dermatitis; you have to be sensitized, usually on exposed parts of the body and the male genitalia. It starts with linear vesicles just where the poison oak leaf or stem touches the skin. Within an

from the use of it. Maybe because I wouldn't use it on someone who was in an operating capacity. Maybe this is a carryover from flight surgeon days when you just couldn't, a pilot couldn't possibly tolerate using any kind of medication, whether it was nose drops or a sperm. My point I think was that there are implications on the use of this type of medication, that is tranquilizers or sedatives, if you are dealing with someone in an operating capacity. How do you explain the fact that the bus driver or train engineer is taking a handful of Equanil every day and then his train gets into some terrible disaster? It may have nothing to do with it whatsoever, in fact, it may have done him and the train more good for many months, but is that really the issue that would be taken up under those circumstances?

MODERATOR SKINNER: Thank you.

Dr. Mishler, did you have a comment or questions?

DR. WILLIAM E. MISHLER (Erie-Lackawanna Railroad, Cleveland, Ohio): Yes. When these patients, and I presume they are all Southern Pacific patients, this group of the psychiatrist and the neurologist, who makes a decision whether the man can work or not?

DR. MOODY: Well, I don't. I make a recommendation which I think is all I can do from the psychiatric viewpoint, which of course is very limited in scope in terms of the other medical difficulties and any other factors involved, so I am speaking of it just from my own.

DR. MCAULIFFE: On the neurological service, the decision whether or not to return them to work is up to either Dr. Calamchini or myself. Dr. Moody functions as a consultant to us if there is a psychiatric problem. When we make the decision as to whether or not the patient should be returned to work, we take into account what his recommendations to us have been. Ultimately, the responsibility of a return to duty or restriction or no return to duty is that of the Chief Surgeon however.

DR. NELSON: I have two questions I would like to ask. First, a lot of the cases that are presented to me are given as simple depressions but they receive shock treatments. I wonder whether some of these might not be psychotic patients. The other question pertains to the effect of shock treatments? How soon after shock treatments can a patient return to work? And are we still running the hazard that Dr. Moody mentioned even if they have had shock treatment?

shock presumes an involutional or a manic-depressive depression. These of course are usually in older individuals; that is, 40, 45, 50.

The effects of shock treatment are: physically the complications are minimal with the use of anesthetics and muscle relaxants. The only problem that sometimes occurs if shock is used intensively over a short period of time is the memory loss, which lasts for approximately six weeks. That is the recent memory will suffer fairly badly in some cases. Other than that, I know of no complications of shock from at least a mental standpoint, and I think that many of these people recover quite well and, again, in general terms, can go back to work, should go back to work.

MODERATOR SKINNER: Does the analytical and calculating ability return to the state of two years before?

DR. MOODY: Yes, it almost always does, unless the individual has had chronic prolonged episodes of shock. Then there will be some definite chronic deterioration, but nine out of ten times you will never see someone like that in a responsible working capacity. This is the kind of a person who has spent most of his life in a State Hospital and has had 268 shock treatments. But, ordinarily, the lady who has her depression at 40 and gets seven shock treatments, and maybe at 50 she gets eight more, there is no chronic loss of function.

DR. STOCKWELL: I would like to suggest that if we are forced to take back an individual who has had shock treatments into an occupation where he faces any physical stress at all, there it might be a good idea to have some re-employment back X-rays.

MODERATOR SKINNER: Any further comment?

DR. JOHN R. WINSTON (Atchison, Topeka & Santa Fe Railway, Chicago, Illinois): I believe they alluded earlier to the use of a clinical psychologist. I wonder if a clinical psychologist has any part in the program that you have talked about so far?

DR. MCAULIFFE: We have had a few selected cases in which we felt that we needed more extensive mental status examination, but this has been really 1 per cent or less of the patients that we evaluate. Some of these have been because of a problem of communications. I refer now to two cases that come to my mind. They were Spanish-

couldn't come up.

Any comments, Dr. Moody?

DR. MOODY: I was going to say that at times I see someone and I don't understand what is going on, or more time is often required to get at some of the details. It's in such cases that psychological testing can be useful from a diagnostic standpoint. From the standpoint of assessment, there are several short tests that are used, but I don't know really, that there is any place for them at the moment.

DR. STOCKWELL: Dr. Moody, is there a condition that actually exists of P.T.N. post-traumatic neuroses?

DR. MOODY: It has been used extensively by people, yes, promiscuously. I think it's been used in connection with war neuroses, developed after the First and Second World War, and this is the kind of thing that they ran across in Korea, where they found if they took all these people who were "shook up" severely and moved them farther and farther back along the channels to the hospitals, that they solubilized their illness rather nicely, and these people became ensconced in the V.A. system and are probably still there today. But if they got these people and got them back a few hundred yards behind the lines and put them in a tent and gave them a handful of Seconal and let them sleep for a day or two, and then kind of got in there and gave them a little pep talk, and two days later sent them back to the front lines, these people did not develop traumatic neuroses. I think we have to be careful of this sort of thing in handling psychosomatic and accident cases.

MODERATOR SKINNER: I think that is an extremely valuable point that Dr. Moody just made.

Any further comment or question?

If not, I want to thank Dr. Stockwell and Drs. McAuliffe, Moody and Calacchini for giving so generously of their time and ability.

I turn the program back to Dr. Nelson.

CHAIRMAN NELSON: I don't know whether the increasing number psychiatric problems that we are facing are a product of the Great Society or our new social era, or just what it is, but it certainly is getting to be an important factor in our work. We wish to thank you all for giving us your time and an excellent discussion of a pertinent subject.

Is Dr. Grant Morrow here?

To my recollection, it has been some time since we have actually discussed contact dermatitis. I recall a number of years ago that this was quite an active subject. We are all going to be very interested, Dr. Morrow, in having you bring us up to date in contact dermatitis.

I would like at this time to introduce Dr. Grant Morrow, Assistant Clinical Professor of Dermatology at the University of California.

ADDRESS: Grant Morrow, M.D., Assistant Clinical Professor of Dermatology, University of California; Staff Member, Southern Pacific Memorial Hospital, San Francisco, California

Mr. Chairman, members of the Association of American Railroads and guests: Today when we start this program, we are going to show a film made by the Southern Pacific Company called "To Save Your Skin." This film is a method the Southern Pacific Company is using to prevent dermatoses among their employees, and I will discuss this when the film has been shown. It takes only a few minutes, and I think you will get more out of it than you will from what I have to say. It was made in the Southern Pacific repair plant in the Sacramento-Roseville area, where all the main work and repair on engine equipment are done. A pamphlet explaining the film will be given to you at the end of my discussion.

(Here followed showing of film.)

Before we start the discussion, I think a couple of definitions would be in order so that we can all understand the conditions we are discussing. An allergy versus a primary irritant: A primary irritant is any substance--acid, alkali, any irritating substance--which when put on a person's hand immediately causes a red rash. It burns; there is no incubation. The dermatitis lasts a few days and then heals. In the case of allergy on the other hand, the substance, although put on the hand of everyone in the room, would cause the rash in only one or two individuals. The rash would not occur right away; it probably would not occur the day after application, maybe not a week later, or maybe not even three weeks later. This situation has a definite incubation period. The best way I can say this is that the subjects have to be sensitized--with any substance you saw here--any kind of oil, poison oak. I want to talk a little about poison oak. Poison oak everybody knows; everybody is familiar with it. Poison oak is a contact dermatitis; you have to be sensitized, usually on exposed parts of the body and the male genitalia. It starts with linear vesicles just where the poison oak leaf or stem touches the skin. [illegible]

of the Rockies. They are kissing cousins. They have one [illegible] common and one not so common. There is a [illegible] poison oak and an alcohol soluble antigen in poison ivy. The [illegible] soluble factor is common to both. A person coming here from the East, who has a history of frequent poison ivy dermatitis, may not get poison oak dermatitis the first year, but the second time he gets it severely. The same situation occurs in the case of a person from the West when he goes to the East. He has a mild [illegible] but when he has become resensitized to the new material, he is off again.

People who react to allergies are usually of a different [illegible] They are always seborrheic individuals; they have oily [illegible] perspire a lot. When the pores open, the toxins get in. The people with the seborrhea are the ones who get poison oak and run into trouble with all the oils, cleaning agents, and detergents.

The worst condition, of course, is an allergy that reacts to almost everything, an atopic dermatitis. People so afflicted are born with the condition; they over-react to everything. In reaction to poison oak and other irritants, there is liberation of histamine in the skin which makes the skin edematous, red, and itchy. Of course, the afflicted person scratches, but his relief is temporary only.

The treatment of poison oak, I think, is something we should discuss a little. If the condition is simple poison oak, I recommend Benadryl or one of the antihistamines at night time so that the patient does not scratch all night, and a lotion which we use consisting of 30 per cent starch, 10 per cent bismuth subnitrate, and 10 per cent glycerine in lime water. This is effective. The dermatitis clears up within a few days. If we have a severe poison oak, however, we have to resort to ACTH, hydrocortisone derivatives orally, hydrocortisone lotions, and sprays or creams locally.

Contact dermatitis from paints, oils, greases, and detergents look approximately the same. The patient first gets an erythema, then pustules and vesicles. The subjects all have to become sensitized previously; they don't get it the first time around. Sometimes the process of sensitization takes weeks, months, or years. As was stated in the film, it is possible for a subject to wash with kerosene or turpentine for years, but the next time he does so he breaks out. Now, paints, oils, and greases are all the same. Once sensitized, the subject remains sensitized probably for life, always months or years. Subjects who are sensitive to paint thinners or greases, oils, or detergents on their hands will not react on their legs or feet unless these areas, too, are sensitized. They will always react more violently on their hands after each contact with the sensitized substance.

Chromates were used by the Southern Pacific Until 1953, when, because of trouble with chromic acid poisoning and dermatitis, they were discontinued in favor of borates and nitrates. For one year, 1957 to 1958, chromates were resumed, with resultant return of the old reactions, and therefore they were again discontinued in 1958. Borates and nitrates have been used ever since, and we do not see any chrome dermatitis anymore, which is fortunate because it is a difficult condition to treat.

Foods can produce similar reactions, either localized or generalized, to those caused by paint, detergent, or poison oak. A person can be sensitive to any food, and if he takes such food into his mouth, he will break out on his sensitized hands.

We see many cases of fungus infections. These occur mostly in people who have oily, sweaty feet or thighs, and they are usually contracted from someone else. Such conditions are easily diagnosed by taking a smear with potassium hydroxide and looking for the spores and mycelia. The best treatment, I think, is still the three to five per cent sulphur cream. There are many fungicides advised now, but they are not as effective as sulphur. For severe fungus infections I recommend potassium permanganate soaks 1:3000 and Grisofulvin, 500 mg. twice a day, or 250 mg. four times a day. The prescription is best given twice a day; patients usually forget to follow directions requiring application as many as four times a day.

Now let us consider a condition which the panel discussed earlier. Let us say that a person gets a contact dermatitis from paint thinner, cleaning solution, or whatever. It itches; he scratches and continues to scratch no matter what the physician prescribes. What happens to the skin then? It becomes thickened, and the more it becomes thickened, the more it itches, the more it scales, and the more he scratches it. What is such a condition called? It is called localized neurodermatitis, which can occur for no apparent reason, but can result from a contact dermatitis. Such a condition usually occurs with people who are tense and nervous. I call them "good scratchers," because they never stop scratching.

Now among some 60,000 employees of the Southern Pacific Company and the subsidiary Northwestern Pacific and San Diego and Arizona Eastern, we see very few contact dermatoses in our Hospitals due to oils, greases, and paints. The employees are all protected and washed, and it is good hygiene to keep them that way.

We do see poison oak from out along the tracks. A poison oak spray is used along the tracks, but when employees walk outside the sprayed area they sometimes get it. We can immunize to poison oak with an alcohol and water extract made up into 25 mg. tablets.

These are green. We also make a 100 mg. tablet which is brown. The green tablet is taken three times a day for a week. Then one brown tablet is taken daily for a week, two brown tablets daily for a week, and three brown tablets daily for a week, for one hundred tablets, which is a little over three months. That will immunize for a year or more. We have had good results with these tablets, with only one complication. The tablets are enteric coated so that they do not dissolve in the stomach, and as you know, some unabsorbed material can leak into the perianal area. If employees are very sensitive and cannot take that much antigen at one time, they may break out with little dots all over, like a generalized poison oak. When this occurs, the treatment is discontinued for a while.

Now I can briefly go through a few Kodachromes with you

(Showing slides.)

QUESTION FROM THE FLOOR: Are the cortisones of any value in neurodermatitis?

DR. MORROW: Cortisone, yes. It relieves itching. You mean orally or ---?

QUESTION FROM THE FLOOR: Locally.

DR. MORROW: Locally and orally, yes, they do relieve itching. Any kind of cortisone or hydrocortisone ointment is fine. I like sedation especially at night time. That is the time when people go to bed and are warm and scratch themselves excessively. If you like something else, such as barbiturates, that is all right. I just happen to like Benadryl, which is as good as anything I have found.

DR. MILTON B. CLAYTON: I notice in this film that one man was using a red cloth to dry with. We have had some cases that were sensitive to the dye in cloth. This is apparently the same kind of cloth you used.

DR. MORROW: I think the red cloth was probably put in to show on the film. White cloths don't show up well on colored film. Most of their cloths are white.

Is anybody interested in what these hand cleaners and soaps are?

QUESTION FROM THE FLOOR: What is the name of the cleaner you were using that came out of the container there at the shower? He said it was a universal hand cleaner. Is that the name of it?

DR. MORROW: Vibra-Kleen. V-i-b-r-a- Kleen. It's put out by

the Hanlon Chemical Company in Kansas City, Kansas. Now, you saw two men using a waterless cleanser. This is called Lan-Kleen and is put out by the West Drug Company here in San Francisco. It is probably available everywhere else, too. They were talking about using a hand lotion to oil their hands to prevent drying out after soaping and watering. They put on a cream, and they use a Revlon medicated hand lotion. I think you know who makes Revlon products.

Thank you.

CHAIRMAN NELSON: Thank you, Dr. Morrow. We enjoyed your presentation very much.

Incidentally, some of the railroads in the midwest including the Great Northern and the Soo Line use a preparation called Kaleen, which comes in dispensers. This is a very effective, non-irritating cleanser.

We will now take a coffee break. After the coffee break Dr. Winston will present a new guide for application of medical standards by occupational profile.

We will take a 15-minute break.

(Short recess.)

CHAIRMAN NELSON: Will everybody take their seats again? We will continue.

I think, if anybody knows, I know how much time and effort John Winston has put into the work on medical standards. Some of you, maybe as I, who have seen pre-editions of this have probably been a bit overwhelmed by the size of it. I want to assure you that it is very adaptable, very flexible and very usable. I am looking forward to John's explanation of the guide for application of medical standards by occupational profile.

Dr. Winston.

ADDRESS: "Guide For Application of Medical Standards by Occupational Profile" - John R. Winston, M.D., System Medical Director, Atchison, Topeka & Santa Fe Railway, Chicago, Illinois

When I came on this particular assignment in 1951, I was not without some experience in the railroad industry, having been associated with it since 1933, and we were going along reasonably well until we had a catastrophe down in Los Angeles that brought to my

mind, and I think to the industry's need, and certainly to the Congress of the United States' attention that we should take another look at our medical standards, the medical profile, if you would like to call it, of railroad employees.

I was searching about for some sort of guidance and as a consequence I ultimately ended up after making a few phone calls, numerous calls, so I was appointed Chairman of the Medical Standards Committee. So to those of you, or any of you who want to make particular complaint about what we are about to have recommended, you stood a very good chance of being nominated as Chairman of the Medical Standards Committee for next year.

First, let me call some generalities to your attention. First of all, that this is labeled as a guide. Every time that I read it over, I make changes, so on the way out we were reading over parts of it again and the very label was changed. It is spoken of as a guide, and that is what I hope that it will serve, and will not be a set of regulations, but a guide to help you to establish your regulations. If you want to follow them as they are printed, that is well and good.

Another area is that this guide, as it now stands, is far from complete. As lengthy as it is, it is still far from complete. It will also require much additional editing and modifying, and I think I should, so far as I am concerned, state that it will never be complete and it shouldn't ever be complete, this being a subject that is changing from year to year, and it should be presented in such a manner that it is applicable to change, depending upon the developments in medicine and changes in the occupational requirements.

It is based on a profile system which simply means that we are measuring various areas of this particular employee. We have always had a profile, but it has been a fairly well defined one, meaning we have measured the man as far as vision, hearing, color perception and the great term of "medical."

Another point I would like to make is that in its present form it is quite difficult for a person who is not too well acquainted with it to find his way about. I hope that that will be corrected. Furthermore, the full guide, as it stands, is not designed to be distributed to all medical examiners or to all employing officers, only those parts of the guide listed on the front page of the table of contents that is applicable to that particular office should be distributed to that office.

A lot of the information here is a matter of policy, and that -- when it comes to policy--is something that you are not necessarily interested in presenting to the local surgeon, or to the local hiring

officer, until the policy has been established. So by and large I might sum this up by saying that in its present form it is not acceptable to me, which is another way of saying that this is being presented to you gentlemen here for your consideration, and it is hoped that within due time you will look it over, the medical standards committee in due time will use it as a nucleus on which to base a set of standards that will serve in a more or less permanent way but even then those standards would be subject to change as the medical information keeps and his job duties change.

I might, as just an example, say, well, now, let's try to make a bit of use of this. Suppose we have a prospect for a job as a brakeman and he has had some derangement of his knee and had a cartilage removed. Now, how would we go about using the guide?

The pages, incidentally, have a system to them that I am not too well acquainted with, and I might say that the duplicating department down at the AAR got this together, and I think they did a commendable job. However, I would rather they had used a little different method in identifying the pages. But over on the section having to do with medical requirements, which is about that far over, and on Page 26237.3 there lists quite a number of reasons for medical rejection for employment, and if we turn over to the area that has to do with the extremities, then on Page 27, that is .27, under lower extremities-- Can you find your place?

Then under Paragraph S, these are the causes for rejection.

Let's see what we would get out of this if this happened on the brakeman after he had established seniority. That is an in-service employee.

An in-service employee, according to his job classification, which is 26239, that being a profile of minimal acceptable medical conditions for prospective employees, in-service employees, that is in Section E-- Can you find your way through?

QUESTION FROM THE FLOOR: What page number?

DR. WINSTON: 26239.

It shows the profile of a brakeman. In other words, of these various parameters we are measuring, such as his vision, hearing, color perception, pathology or medical deficiency, strength stamina, dexterity, neuropsychiatric, blood pressure and low back X ray, we find that the brakeman is required to be a Class I, and until he gets to be a blood pressure problem, which is a Class II.

Now, for medical deficiency or pathology, he is a Class III, and if I can find a Class III here, this [illegible] section ahead of this one, Section D. You see the minimum [illegible] medical qualifications as a Class III, and a Class III [illegible] which is about half a dozen pages forward of these [illegible] tected or suspected.

Now, we could measure some other [illegible] like for this man, but that would have to do with Physical [illegible], which is strength stamina and dexterity. There again he is a Class III, and that says he is able to perform selected physical [illegible] under adverse weather and other conditions for 16 consecutive hours and the defects will not restrict full range of function, [illegible], and he can walk one mile at a brisk pace without stopping.

On this we could go on and, for your information or to assist you to understand it and run down several of them, I am not sure that that--

CHAIRMAN NELSON: To clarify this, John, would you take that same man as a pre-employment brakeman, so that they understand what you mean by that?

DR. WINSTON: You see the profile is different under medical requirements, the minimal medical requirements are different for entrance to service or a prospective employee than they are for an in-service employee and, again, back on Page 39, the profile is above the slash, and for entrance to service employees, it is below the slash. That is for in-service employees.

If you feel that this is a bit overwhelming, you should have been with some of us when we were trying to put it together. We have added, thanks to Dr. Nelson's efforts and some others of his committee, a last portion, which has to do with the general duties and responsibilities of railroad employees by occupations. That is the insert at the very last, which describes the various duties and responsibilities, in a rather brief way, of the various occupations of most railroad employees. This should be of particular assistance to those people who are not well versed in the various aspects, various occupational aspects of the railroad's personnel.

I am of the opinion that we could take up entirely too much time by attempting to go into any particular additional detail at this time with this tentative guide. However, if anyone has any particular question that they would like to ask, I will try to answer it.

CHAIRMAN NELSON: John, in response to my question of a brakeman with a cartilage operation, I would understand that in the same classification where he was placed a III, he would be placed a 1, which would make him not acceptable for a job as a brakeman, is that correct?

DR. WINSTON: That's correct.

CHAIRMAN NELSON: What would be your classification of an engineer with a coronary under the guide that you have?

DR. WINSTON: You have selected an occupation of course that has also set by definition meant that he will not be standing an entrance to service examination. That is, in order to be an engineer, he will have already stood the examination quite some time before. We will direct our effort in this particular instance to the in-service employee.

CHAIRMAN NELSON: That is right.

DR. WINSTON: All right. There we are again concerned with two of these areas. First about medical deficiency and the next one would be strength, stamina and dexterity, if that should be applicable. So let's see what that tells us.

Again this is 38.6 and 38.7. Let's look at a measure of pathology, which is Class V, and that says the physical, mental or emotional limitations are such that they do not need the entrance to service medical requirements for the proposed occupation--that is for applicants for service only--or it is not considered medically appropriate to either require or permit the employee to assume all the duties or responsibilities of the occupation in question, or the employee's medical progress would be unfavorably influenced by the exposure that he would receive incident to his occupation, or the possibility of unpredictable adverse medical developments, et cetera.

In other words, the pathology is not correctable to a degree that the public can be assured that the examinee has no physical, mental or emotional condition to compromise the health or safety of the employee or the health or safety of other persons.

We are dealing with coronary artery disease, we are dealing statistically at least with a person who is subject to sudden death. Therefore, this man would be a Class V. A Class V engineer. We will accept only a Class III. We will not accept a Class IV or Class V for unrestricted service as a locomotive engineer.

I would like to again say that this is designed as a guide, it's designed as a guide to assist you in coming to your own conclusions. It's far from complete, it is tentative, but I hope that it will be worth something to you.

Are there any other questions?

QUESTION FROM THE FLOOR: [illegible] 262.18.18, he has jumped from [illegible] have Class II and III listed here.

DR. WINSTON: Yes, that's [illegible] part, in Paragraph 39—that [illegible] have only a two-place profile, [illegible] service you must meet a Class I, [illegible] a Class IV.

QUESTION FROM THE FLOOR: [illegible]

DR. WINSTON: That's to indicate [illegible] that sort of a back. I have con[illegible] ticular area of it.

QUESTION FROM THE FLOOR: [illegible] Doctor, about Class V being [illegible]

DR. WINSTON: It is listed in the [illegible] 39 in Section E.

DR. SKINNER: 219.15.

DR. WINSTON: It stipulates that the [illegible] Class IV. Now, the actual classification, if I perhaps misunderstood the question, is in 18.19.

Did I see another one that we might get into? Did I answer the questions back there?

For the remainder of this particular session, unless someone has a question at the moment, we would like to talk briefly about the various interim meetings that were held. As most of you gentlemen have been in attendance at the interim meetings, meetings at which time all standing committees held their meetings, and as a bit of dessert to the day, arrangements have been made for panels, would composed of local specialists, to discuss various aspects of railroad medicine as it relates to their particular specialty. The last one that we had was held in Minneapolis, and this was arranged by Dr. Nelson, and I would like for him to tell you or make a summary of what developed at this panel on cardiovascular disease.

Harvey?

SUMMARY OF INTERIM MEETINGS
CARDIOVASCULAR SURGERY
HARVEY NELSON, M.D., SOO LINE RAILROAD
MINNEAPOLIS, MINNESOTA

DR. NELSON: Before I discuss the Interim Meeting in Minneapolis I would like to explain a bit about the job duties that I was asked to accumulate.

Duties and responsibilities of railroad employees have always been a consideration in our medical standards, but, curiously, they have never been spelled out. They now become a necessary part of the New Guide for Medical Standards by Occupational Profile that Dr. John has developed.

Section II of this syllabus, which gives the various job duties and responsibilities should be considered to be merely a baseline for further study.

On our railroad, for example, further meetings will include our Vice President of Operations, our departmental heads of the maintenance of way and structures, and maintenance of equipment and stores, as well as labor relations, personnel and the claim department. Job duties and responsibilities have to be rather carefully stated so that they do not infringe on other crafts and so that specific items are not construed to spell out in detail what a certain job involves so that it becomes a bargaining factor or a source of a claim.

Firemen, for example, have been included with engineers. If we have to say anything further, it might be well just to say the firemen assist engineers. The point I am making is that this is a rather delicate subject which each of you ought to bring up with your own railroad.

For your information, the job duties have been classified under three headings: (1) Maintenance of way and structures, (2) maintenance of equipment and stores, (3) and transportation. For uniformity, I have followed the I.C.C. classifications and have included the I.C.C. classification number in the left margin. It is not intended that this should be a finished product, but it's hoped that this might be a baseline for further development.

The following is a summary of the cardiovascular surgery panel in Minneapolis, Minnesota on November 18, 1965:

PANELISTS:

Dr. C. Walton Lillehei, Professor of Surgery, University of Minnesota.

Dr. Yoshio Sako, Associate Professor of Surgery, University of Minnesota; Associate Chief, Surgical Service, and Chief, Cardio-vascular Surgery Section, Veterans Administration Hospital.

Dr. W. Robert Schmidt, Associate Clinical Professor of Surgery, University of Minnesota, and in private practice in Minneapolis in Cardio-vascular Surgery.

Dr. Yang Wang, Assistant Professor of Medicine in Cardiology, associated with the Heart Hospital at the University of Minnesota

MODERATOR:

Dr. Harvey Nelson

Some of the preliminary remarks by Mr. Leonard Murray, President of the Soo Line, are worthy of reflection. (Quote) "It appears that our industry and much of American industry are moving toward a period of virtually guaranteed employment. In view of this situation we must know a great deal more about the people we are hiring--. Medically we have to know more about their limitations and capabilities - - - . We had better hire people who are mentally and physically fit in recognition of this prospective tenure - - - . Changes within our industry result in certain obsolescence among our employees. Moreover we are under certain restrictions in changing positions and in terminating work. In many instances we will have to find new assignments for people whose work has been eliminated by these changes or who have been incapacitated by injury or other causes. - - - So your work is becoming increasingly vital to management."

CORONARY DISEASE

Dr. Yang Wang, a cardiologist, was requested to open the panel with a medical discussion of some phases of coronary disease.

He emphasized that although in the vast majority of cases angina indicates the presence of coronary disease, the two are not necessarily synonymous. He listed five other causes of angina including aortic stenosis and regurgitation, paroxysmal tachycardia and noncardiac causes. It was the Moderator's impression that although diagnostically angina should be thoroughly investigated we had better from an industrial standpoint consider angina to be coronary disease until proven otherwise.

The Master's test is still the most popular test and the correlation between it and clinically significant coronary disease is extremely high. He cautioned, however, that there was no substitute for a good history. He felt that it was not "kosher" to do a Master's test except where the resting electrocardiogram was normal. Considerable research is now being done on the significance of ST and T changes during the course of exercise. In this regard Dr. Schmidt mentioned some new work that is now being done by the use of telemetry and with the patient exercising strenuously to a point where the pulse becomes quite rapid--120 or more--and significant changes occur in the electrocardiogram.

Coronary angiography by rapid fire films and cine angiography was presented and discussed. Selective angiograms of the right and left coronary arteries with both normal and diseased vessels were shown. Dr. Schmidt presented cine angiography demonstrating, first, a normal angiogram in a patient with angina who was thought to have coronary disease and, secondly, an extensive coronary disease in a patient with a gastric resection and a normal electrocardiogram who had angina only on exercise after eating which was previously thought to be due to some disturbance with the gastric resection. He felt that coronary angiography could be used in selected cases for both diagnostic and prognostic purposes.

Dr. Wang stated that it was pretty well accepted that activity, "as long as the individual is carrying out ordinary activities and not extraordinary ones," does not predispose to the development of a second attack. "Neither does keeping a patient in a wheelchair prevent one."

At autopsy 61 per cent of sudden unexpected deaths from coronary disease had severe progressive changes without occlusion and 31 per cent had actual occlusion. In about one-third of these cases of sudden death there was no specific lesion in the myocardium. Death is therefore due to either the knocking out of a large portion of the heart muscle or an unfavorable electrical chain of events which precipitates death.

Regarding the use of anticoagulants he cited three good poll studies. These were the study of Bjerkelund in Norway, the Manchester study in Great Britain and the study of Borchgrevink. These studies indicated that statistically under the age of sixty and especially during the first year there definitely was a decrease in the number of recurrences on adequate doses. After the first year the benefits could not be proven statistically although it was possible there might be further benefit. He stressed that adequate dosage meant a prothrombin time between 25 and 30 seconds. He felt that 18 seconds was only of psychological benefit.

There was no question but [illegible] disease went hand in hand but there [illegible] lows the other. Coronary disease [illegible] in animals by high cholesterol. [illegible] that had been devised at the University [illegible] bulk of ingested cholesterol was [illegible] This procedure, which has a low [illegible] lestered in hypercholesterol cases down [illegible] it was found necessary to give B12 to prevent pernicious anemia because it, too, was largely absorbed in the terminal ileum.

He felt that revascularization of the myocardium in coronary disease was an exciting new field that had not been proven as yet.

In the subsequent question and answer period he said that in the ordinary walks of life "they generally allowed all coronary patients to go back to work if they possibly can." He modified this by saying that people in this category would be in jobs which would not endanger the lives of others or their own. He added the "incidence of a second infarct is only slightly higher than somebody of the same age and sex providing a complete clinical recovery has been effected."

Dr. Lilliehei quoted a study by Dr. George Meneally of the M. D. Anderson Cancer Hospital in Houston which indicated that three-fourths of myocardial infarctions recover and about 50 per cent survive ten years. A factor which was important to jobs was that the incidence of sudden death in people that recovered from a myocardial infarction was much greater than the normal population.

He stated that it was ten times as great in the 30-year age group, eight times as great in the 40's and this decreased so that in the 70's the incidence got closer to the normal population. He felt that it was obvious that a coronary patient should not be piloting a plane, driving a truck on an interstate highway or a locomotive, and it was questionable whether "he should even be driving a car."

Dr. Wang described a study in Portland carried out on suspected coronaries with normal electrocardiograms in which telemetry was carried out with small tape recorders carried like in a handbag and connected up to leads on the chest. The patient recorded everything they did and felt in a diary. Electrocardiogram changes occurred under the most unusual circumstances. In this regard Dr. Schmidt mentioned some new work that had been done by Dr. Samuel Balliett of the University of Pennsylvania and the results corroborated by Reeves of Alabama. This was based on the fact that the Master's Test did not go far enough. Balliett used [illegible] walking

same result by exercising these patients without monitry until a pulse of 151 was obtained, and an electrocardiogram was then taken.

OCCLUSIVE DISEASE OF CAROTIDS AND VERTEBRALS

Dr. Robert Schmidt stated that surgery here was based on the fact that strokes are not often due to hemorrhage but are much more frequently the result of vascular occlusive disease.

He described the symptomatology of carotid and vertebral artery insufficiency as being:

1. Recurrent paralysis.
2. Neurological deficit.
3. Episodes of mental confusion.
4. Episodes of dizziness, tinnitus or headache.
5. Visual disturbance.
6. Tendency to become accident prone due to vertigo.
7. Dizziness on bending the head or looking up.
8. Bruit over carotids.

One of the prerequisites to surgery is angiography of the vertebral, carotid and cerebral arteries. The left vertebral artery is absent or attenuated in about 15 per cent of the cases.

Endarterectomy with an internal shunt and removing the obstructing plaque is the operation of choice at the present time. Results were dependent on the selection of cases and the condition of the resulting vascular tree.

He expressed the opinion that endarterectomy would be a means of salvaging many skilled employees and executives but admitted that these patients could be hazardous in industry because of the presence of other arteriosclerotic disease. Caution should be exercised in employing them in positions which might endanger others.

CARDIO-VASCULAR DEFICIENCIES OF THE LOWER EXTREMITIES

Dr. Yoshio Sako discussed this subject. Occlusive disease of the lower extremities is numerically higher than in other areas. It is primarily a disease which occurs after the 40's and [illegible]

Frequently conservative management of arteriosclerosis may be changes in diet and abstinence from [illegible] the symptom complex to disappear.

A number of pre and postoperative arteriograms were shown of various types of occlusive disease in the superficial femoral, the profunda femoris and the iliacs.

The best results with surgery were in those cases where vein grafts had been inserted. Bypass prosthetic grafts are no longer the method of choice. The saphenous vein, which is used, is described as a tough, muscular vein that would not rupture even with one atmosphere or 760 mm of mercury pressure. The vein graft undergoes fibrosis. Healing between an artery and a vein is good but not between an artery and a prosthetic graft. One of the weaknesses of a prosthetic graft is occlusion at the anastomotic line; another is for it to dehisce. A prosthetic graft should never be placed across a joint unless the joint is fused and this was done at the knee joint in two cases as a heroic measure to save the leg.

Dr. Sako summarized the situation very aptly in peripheral occlusive artery disease when he said: "The difficulty with all of these patients is that an occlusion of one vessel due to atheroma is generally a reflection of the over-all disease. If he has superficial femoral artery obstruction on one side, the chances are pretty good he has it moderately advanced on the other. It is very much like the shoelace; if you snug up one shoelace and it breaks, more often than not in two weeks the other will also break."

POPLITEAL ANEURYSM

A man with a pulsatile mass in the popliteal area is in a potentially hazardous situation and it should be taken care of. It is unusual to find such an aneurysm without a laminar clot. This is why these patients develop sudden ischemic symptoms while they are kneeling, sitting, with effort or even while massaging the mass and the leg because it hurts. These clots may become necrotic, detach and jam down in the lumen of the vessel. Aneurysms may involve both the peripheral and abdominal vessels.

ILIAC ARTERY DISEASE

Here aortograms are not done routinely. If the femoral pulses are present and pulses absent distally, a peripheral angiogram is done to see if there is adequate volume and flow. If there is, functional tests are done on the table using papaverine and strain gauges. When this procedure indicates an adequate inlet the lower procedure is done. If the inlet is inadequate [illegible]

The procedure of choice in complete occlusion of the iliac vessel is a thrombo-endarterectomy. This dissection goes through the internal elastic layer, leaving most of it and a raw surface which endothelizes. Apparently subsequent aneurysm does not occur in the dissected area.

ABDOMINAL ANEURYSM

Patients with abdominal aneurysm have a poor prognosis. Statistically they have other signs of vascular disease such as hypertension, coronary disease or peripheral artery disease. A real small aneurysm may rupture but a large one is more likely to.

Complete physical examination and lateral films of the abdomen are generally more valuable than aortogram because of the laminated clot that is present within the aneurysm which might conceal the aneurysm.

Some symptoms are usually present for about three days prior to the actual rupture of an aneurysm. This is because, as they leak, the massive clot tends to tamponade the opening until it leaks again. Occasionally they rupture suddenly but more often than not the patient has noted some symptoms that he has treated himself until he goes into shock.

Dr. Sako feels that all abdominal aneurysms should be resected. Currently resected aneurysms are replaced by a prosthetic graft. One of the more serious complications of this procedure is erosion of some portion of the bowel, usually the duodenum or ileum as it crosses over the graft. Small bowel studies are of no value in determining the cause of resulting bleeding or other symptoms of this complication and laparotomy is justified.

In response to questions Dr. Sako stated that only 10 per cent to 20 per cent of cases with intermittent claudication were suitable for surgery. He also stated that inasmuch as peripheral artery occlusive disease is a reflection of generalized arterial disease, these patients are at a disadvantage as far as returning to work is concerned.

CARDIAC SURGERY

The availability of techniques for open heart surgery has been the big break-through for the dramatic changes that have occurred in the field of cardiac surgery in the last decade, Dr. Liliehei stated. This allows the surgeon to empty the heart of [illegible]

cardiac structure. Whereas up to three or four years ago about two out of three of the open heart operations were for congenital lesions, now it has just about reversed to where two out of three are for acquired defects. Two of the most important problems facing the cardiac surgeon and the cardiologist, are, first, coronary artery disease and, secondly, valvular heart lesions.

Another important development is the availability of Pacemakers which can also be used in non-surgical heart block. Tracheotomy is another important factor in the outlook for individuals not only with surgery but with many other types of serious cardiac disabilities. Lastly, the use of constant monitry is important not only in cardiac surgery but will also be more and more in the next few years in the management of coronary artery disease to prevent and treat arrythmias that lead to cardiac arrest.

Dr. Lillehei did not dwell on the surgery for correction of congenital defects, probably because he felt that the methods of correcting acquired valvular defects would be of more current interest. Slides showing replacement of aortic, mitral and tricuspid valves and, in fact, all three together were shown. He stated that from 1961 to 1965, 499 prosthetic replacements by ball valves had been done which did not include the earlier use of leaflets, cusps and certain other types which were not as satisfactory as the ball valves. He then presented a movie showing the technique of the replacement of an aortic and a mitral valve with ball valves. The ball valves he is now using are made of silastic, a very durable synthetic rubber. A skirt of woven teflon, a nonreactive, durable, loosely woven material, is sutured into the patient's valve so that the connective tissue of the annulus grows into it.

In response to questions, Dr. Lillehei stated that these cases of acquired valvular disease with valve replacement were subject to emboli and this would preclude their returning to work in an occupation where they might endanger the lives of others and probably should prevent them from doing such work as around machinery where they might injure themselves. In this regard Dr. Schmidt mentioned the occurrence of fainting spells.

From the standpoint of a pre-employment examination the panelists were specifically asked whether there were certain types of congenital heart lesions which could be considered to be completely normal after an adequate operative procedure. The consensus of all four appeared to be that completely repaired and uncomplicated patent ductus and atrial defects came in this category. Dr. Lillehei mentioned the importance of recatheterization and the finding of normal hemodynamics as indicating a normal life expectancy. In this latter group he said was a high percentage of operated ventricular

septal defects. Insurance companies apparently are now insuring with normal rates some of the simpler corrected congenital defects after five years. Some insurance companies have begun to look favorably on operated coarctation. Dr. Wang cautioned about the possibility of vulnerability to bacterial endocarditis in corrected Tetralogy of Fallot, in corrected coarctation with the bicuspid valve remaining or in an ostium primum with a corrected atrial septum defect. He added that very rarely late heart blocks develop in repaired ventricular septal defects and Tetralogy of Fallot.

CONCLUSION

The evening's program was concentrated and quite informative as to modern concepts of both coronary disease and cardio-vascular surgery. The panelists were experienced in their field and dedicated to improving the lot of cardiac patients. They were also concerned with the rehabilitation of these people to some sort of productive work. This is undoubtedly the feeling of other cardiovascular centers. We will have to critically review these viewpoints and evaluate those which will concern us in the railroad industry now and in the future.

The following highlights have been selected by and are the impressions of the moderator.

It would appear that the Master's Test is losing favor and the trend will be toward evaluation of coronary disease by telemetry with a much more strenuous exercise testing than heretofore. This could not only be diagnostic but a probable factor in determining at what level an employee is employable.

Coronary angiography will likely have its place in certain cases to assist in diagnosis and prognosis. With present techniques morbidity and mortality are already quite low.

Death in coronary disease is due to either knocking out a large segment of the heart muscle or due to an unfavorable electrical chain of events which precipitates death. In about one-third of the cases of sudden death there was no specific lesion in the myocardium at autopsy. One can see here the implication from a medicolegal standpoint of so-called excessive exertion if sudden death occurs while an individual is at work.

In people who have had myocardial infarction the incidence of sudden death is much greater, as much as eight to ten times greater, than the normal population, particularly in the 30 to 50 or 60 age group. This could be important in a number of our job categories.

Statistically there appears to be a benefit in the use of anti coagulants during the first year and probably beyond that time in people under the age of 60 years. However, it was stressed that adequate dosage meant a prothrombin time of 25 to 30 seconds. This would suggest obvious precautionary measures in industry.

One of the impressions derived from the discussions on occlusive disease of the carotids and vertebrals was the simplicity and the importance of prodromal symptoms. Our group should be alert to the significance of episodes of dizziness and mental confusion and the tendency to being accident prone from vertigo. Such symptoms deserve more than a cursory investigation.

Although results from operations on the peripheral arteries, either with endarterectomy or with grafts are brilliant, they should be considered very critically from the point of view of our industry because, as Dr. Sako stated, "the local situation is only a reflection of the over-all disease." This would be even more true in aneurysms.

In occlusive disease of the lower extremities we should be cognizant of the importance of intermittent claudication and absent peripheral pulses. In these cases, there is also the hazard of serious consequences from simple injuries.

The two phases of cardiac surgery which at the present time seemed concerned with the railroad industry were, first, our approach to applicants who have been operated for congenital defects and, secondly, those cases at the other end who have developed an aortic lesion. I would presume that acquired mitral and tricuspid lesions would not be hired in the first place. Some consideration might be given, in certain job categories, to employing successfully operated patent ductus and atrial defects. I doubt anyone of us would want to take the responsibility for qualifying an aortic, or any other valve, replacement with a ball valve in view of all the implications that go with the acknowledged complication of emboli.

DR. WINSTON: Last September they had an interim meeting at Denver. At that time Dr. Longeway arranged for a panel on hearing.

Walter, would you tell us about it?

REPORT OF INTERIM MEETING ON HEARING
WALTER J. LONGEWAY, M.D.,
COLORADO AND SOUTHERN [illegible]

belief.

A meeting of the Medical and Surgical Committee of the Association of American Railroads was held at the Brown Palace Hotel, Denver, on September 24, 1965, concerning hearing problems in the railroad industry. The conference was opened by Chairman Olson of the Advisory Committee, during which time he introduced and thanked Mr. J. W. Terrill, Vice President of the Colorado and Southern Railway Company, for being in attendance, indicating management's interest in railroad medical problems. Mr. Terrill gave a few remarks and welcomed the group to Denver, Colorado.

A tape recording was made of the proceedings. Twenty-two doctors and ten men from management and claims were present.

The panel consisted of four outstanding men from Denver: One, Dr. Garth Hemenway, Chairman of the Department of Otolaryngology, University of Colorado; two, Dr. Herman Laff, Dean of Otologists and pioneer in otic surgery; three Dr. Sidney Fleman, Otolaryngologist, Colorado and Southern Railway Company; and four, Dr. Robert Waldman, Otolaryngologist, Gates Rubber Company and the Colorado and Southern Railway Company.

It was explained to the panel that this was an exploratory program, the membership was a policy-making group, and that we were seeking help and advice. Realizing that we were not versed in otology, each panel member gave a ten-minute paper on specific topics and then a question and answer program followed.

Dr. Laff led off with an excellent discussion, using colored slides, his topic being on auditory tests, old and new. He gave a good review of the anatomy of the ear. He described the speech test, speech reception threshold, speech discrimination test. He stressed that a Puretone audiogram may show good hearing but that unless people can discriminate the words, their difficulties for understanding conversation becomes much greater. It is very important in connection with sensorineural losses. Recruitment test was discussed adequately. The involuntary tests, such as psycho galvanic skin response as usual in children was mentioned.

Next, Dr. Fleman gave an excellent talk [illegible]

stressed the fact that the dry has come [illegible] hearing tests as important as any eye test, [illegible] III Puretone audiometer was brought into [illegible] of finding the so-called acoustic trauma. [illegible] induced hearing loss is a greater fact [illegible]

All the panel agreed that the only acceptable method [illegible] ing hearing status is by audiograms. [illegible] such as Try Tone and Amco were discussed. Hearing aids were discussed and it was brought out that the important factor was discrimination and not just volume.

Ear plugs and muffs were passed around and [illegible]

Many, many questions were asked and answered and time does not allow me to be specific. You can read about it further in the brochure you received.

The social side was not forgotten. After cocktails at the moderator's home, we adjourned to the Red Slipper for fun and food. I am sure I speak for those in attendance, that this was a very worthwhile, instructive, interesting meeting.

DR. WINSTON: The first one of the interim sessions was held in Chicago. I find that I don't have the names of the doctors who attended this. Dr. Hammatt's consultant was there.

What is his name, Walter?

DR. LONGEWAY: Dr. Roper.

DR. WINSTON: Roper and Henry. I remember Henry, he is from the Illinois Central. Dr. Culver from the Air Force Academy. The Air Force Research Center in San Antonio, and, Ben, your consultant was there, wasn't he?

VOICE FROM THE FLOOR: Dr. Lauppe, Wayne University.

DR. WINSTON: This session was a question and answer period. The panelists were presented questions. It was very well received by the panelists. The audience participated quite remarkably, I thought.

Perhaps the first area that was explored had to do with visual testing. It was the general consensus, I believe, of that group that the wall chart was still the most acceptable and readily available method of testing distance vision. Some of the panel members were quite specific in that they did not like the orthorator type of machines.

The next area had to do with our standard as it relates to uncorrected vision. It was generally brought out by these people that if this person has a correctable vision to 20/20, and if his problem has to do with myopia, which the great majority of them have, that requiring persons to have a 20/20 vision uncorrected, or even permitting him to have a 20/70 vision corrected to 20/20 was not quite realistic. It was their thinking that the person whose vision corrects to 20/20, even with as much as 20/100 uncorrected, stands a very little chance over and above the average person of later on developing complicated factors incident to his myopia, such as a retinal detachment, progressive myopia or retinal degeneration.

This is reflected, incidentally, in the guide, where we have been considerably more liberal in the person's uncorrected visual requirements.

And then we explored the problem of binocular single vision, and depth perception. It was brought out that depth perception is applicable largely to distances closer than 20 feet as it relates to binocular vision.

Beyond a distance of 20 feet other factors other than binocular vision come into play, so that beyond that distance binocular vision becomes less important.

We talked at some length about cataracts, the development of cataracts, and particular cataract surgery and the postoperative eye, the aphakic eye.

It was described that the single aphakic eye is extremely difficult to correct with even a contact lens, so that you get binocular vision. That is, to get adequate or satisfactory image fusion. With the use of ordinary spectacle correction, of course, this is said to be impossible to achieve.

We talked at some length about the use of contact lenses. It was pointed out that although the contact lens gave certain people, particularly the unilateral aphakic person a much better perceptive vision than he could get by any other means at the present, that the contact lens also carried some undesirable features. The contact lens in the aphakic eye still permits, unless this is shaded, an overabundance of light to hit the retina inasmuch as the filtering mechanism of the normal eye lens has been removed. The contact lens is subject to displacement, the displacement might be within the conjunctival sac or it might be dislodged from the eye completely. In that event, the effectiveness of the vision in that eye is practically negated, and in addition to that, then the man is confronted with trying to find his contact, and especially if the contact is lost within the

conjunctival side. So it is a disturbing feature to [illegible] and distracting from his duties, and particularly if they are [illegible] duties.

It is also shown that it would be extremely rare for [illegible] foreign body that we encounter almost hourly, that [illegible] blinks a couple of times and go about our business. It seems that the very small particle has an affinity for crawling under the [illegible] lens and as one of my friends says, it feels as if someone has his heel in your eye.

Well, by and large they felt the contact lens had a very definite place, but for certain areas of certain occupations at best, certain those who are exposed to dust, inclement weather and whose jobs must be uninterruptedly good, they are poor candidates for the use of contact lenses.

That in general pretty well describes, as I have it here, the subjects that we discussed at the meeting in Chicago concerning vision. This also concludes the remarks that I have to make insofar as the report of the Committee on Medical Standards.

Mr. Chairman, I will return to you.

CHAIRMAN NELSON: Thank you, John.

Are there any questions about any of this? In the proceedings these things will be covered in a little more detail than what we have given here.

I would like to call to your attention that tonight there will be a social hour in the Walton Room for ladies and men. That is on the first floor and near the elevators. It will be followed by a dinner. The social hour is at 6:00, the dinner has been scheduled for 7:00.

Just so that you plan accordingly, tomorrow we will attempt to get through by 12:00. I believe that's correct, isn't it?

DR. OLSON: Yes.

CHAIRMAN NELSON: We are going to make a trip to the vineyards, and we will have lunch on the way. It's important that we get through promptly at 12:00 o'clock noon.

If there is nothing further, we stand adjourned.

(Whereupon, at 4:45 o'clock p.m., the meeting was adjourned, to reconvene at 9:00 o'clock a.m., Thursday, February 21, 1968)

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Thursday Morning Session
February 21, 1968

The General Session of the Forty Sixth Membership Meeting reconvened in the Comstock Room, Sheraton-Palace Hotel, San Francisco, California, at 9:00 o'clock a.m., Chairman Ernest C. Olson, presiding.

CHAIRMAN OLSON: Good morning, gentlemen. I hope you all had a pleasant evening last night and you are feeling real fit.

As you know, we have scheduled a trip to the vineyards today, through Dr. Strange's efforts, and it is important that we adhere to our schedule closely because we must leave here at 12:00 o'clock. There is some special arrangements with the restaurant on the way where they are keeping it open for us, so that, since it takes some time to get there, it is important that we leave on time.

Before we begin, I want to again acknowledge all of the work that Dr. Strange has done to set up the program here, and I want also especially to thank Mrs. Gerald Estes and Mr. Earl Smith and Mr. Butler for their very fine assistance in making this program go. We appreciate your efforts very much.

This morning we have another imposing array of talent which is going to be headed by Dr. Aram Glorig, who is the Director of the Callier Hearing and Speech Center at Dallas, Texas. He is also a Professor of Otolaryngology, Southwestern Medical School, University of Texas, at Dallas.

I am going to ask Dr. Glorig to introduce his panel to you and he will carry on with his portion of the program.

PANEL SYMPOSIUM - NOISE

MODERATOR ARAM GLORIG, M.D.: Thank you. I certainly view it a privilege to talk to you people this morning. I have long wanted to talk to the railroad doctors because I feel that the railroad has been a bit slow in getting to the problem of noise. Although they have known that they had noise for a long time, they have sort of pushed it into the background. We have a term for this, we call it the "ostrich syndrome." If you don't talk about it, nobody will know about it, consequently you won't have to worry about it.

But I think that you are discovering that there are other people who are interested in noise who are paying a lot of attention to it. I think it is a timely subject with which you should be quite concerned.

The panel this morning is made up of several men who are specialists in their subjects. I will introduce each of them before they speak.

I would like to open the discussion with one categorical statement with respect to the effects of noise on people. The only real health effect that we can support with valid data is the effect on the ear. Despite all of the talk about health problems and nervousness and insanity and loss of libido and most everything else that you see in some of the literature, we are sure only that noise will produce a hearing loss.

It is possible that noise adds additional stress and adds to the total stress. There is some work in Germany which we don't think is very well substantiated that claims that the men who are exposed to noise are showing an increase in hypertension, also gastric ulcers and mucous membrane problems. Now, I don't believe this as yet because I feel if it were true the industrial physicians would be aware of it from examinations of workers who spend their lives in noise. On the basis of this lack of evidence, I am not convinced that these effects are related to noise.

There are three main problems with respect to noise: (1) the effect on the ear, (2) annoyance, and (3) speech interference. We are not going to talk about speech interference or annoyance this morning. We will talk only about hearing loss.

Figure 1. This slide shows you an overall measurement of noise, which I believe, is useful to you, since it does give you a range of noises that the human ear is exposed to during a lifetime. Noise can be measured as total energy with a so called sound level meter (SLM). Notice the numbers on the left of the scale. These are in decibels - which is a logarithmic scale to the base 10. Number increases are not in units, but indicate an increase by a factor of ten. The higher the numbers, the greater the energy per decibel. This is important to you.

For example, if you have one engine whose sound level is about 100 decibels and you start a second engine, which is also producing 100 decibels, you don't increase the total level to 200 decibels. You only increase it by 3 decibels. The rule is, every time you double the source of energy, you increase the sound pressure by 3 decibels. This means it will take two more engines to produce another 3 dB. Another factor we are interested in (Figure 2) is the spectrum of the noise. Just where is the energy located with respect to pitch: is it high frequency, low frequency or what? The reason we need to know this is because the ear is more sensitive to some frequencies than others. Therefore, we should know more about the distribution of

the energy as a function of the spectrum of the noise. Figure 2 illustrates an octave band spectrum of a propellor engine bomber. The reciprocating engines produce low frequency noise - you can tell this by listening. All the energy, or most of it, at least, is in the low end of the spectrum. That's why many of the people who rode the bombers didn't show very severe hearing losses after several years of exposure. We now have two factors, the overall level of the noise, and the distribution of the energy as a function of its spectrum. Now let us look at noise as a function of time. Time is extremely important. If an ear is exposed for an instant it can be exposed to very high levels, but if it is exposed for a period of years, the noise level must be much lower to be safe. Therefore we must account for time not only as total time, but in terms of its distribution during any single exposure period as well. Is the man exposed all day long for five to eight hours, or is he exposed a half hour at a time, three or four times a day; or is he exposed for one or two seconds or one or two minutes with periods of silence in between? The intermittency of the noise must also be reckoned with.

Now, look at Figure 3, which demonstrates temporary hearing loss as a function of constant and intermittent exposure. For example, consider the line marked 106C. This means that the people were exposed to 106 decibels of a flat spectrum noise (that is a noise that had equal energy in all frequencies) for the number of minutes indicated by the open circles. At the end of 50 minutes of exposure, the group average shows 40 decibels of hearing loss. If we shift from the 106C to a 100-50%, which means that instead of being exposed continuously for 50 minutes, he was exposed one minute on, and one minute off for 100 minutes, notice that a great deal more loss accrues with continuous exposure than for interrupted exposure. This is an equal amount of exposure energy with very little increase in hearing loss, which means that when the ear goes through a rest period once a minute, it can take a lot more noise exposure. This illustrated the importance of time - the overall time - that is, the number of years people are exposed and the distribution of exposure time during a single day.

Figure 4: We've discussed noise briefly, let us now look at the ear. The ear has three main divisions - the external ear, which you can see, the middle ear, and the inner ear which is encased in a bony shell. The important part of the ear, as far as noise is concerned, is the inner ear. We need not go into the rest of it, except to say that ordinary industrial noise exposure has no effect on the middle ear. If you are in an explosion, it may rupture the drum head and dislocate the middle ear bones. But ordinary noise exposure affects only the inner ear.

Figure 5: This shows what a cross section through the inner

ear looks like. The damage to the inner ear is to the hair cells. In time these cells completely disappear. This means that once the cells are damaged, there is no way that it can be repaired or regain their function. My point is, since you cannot cure or repair the damage, it must be prevented.

Figure 6: The ear is a very sensitive organ. It will respond to frequencies from about the lowest note on the piano to approximately 16,000 - 18,000 cycles per second, which is about 2 1/2 octaves above the piano. Note the top ordinate showing 500, 1,000 and 2,000 cycles per second. These are the frequencies which have to do with hearing and understanding speech. If these three frequencies are not damaged, the person hears perfectly well as far as understanding the English language is concerned. Now look at 3,000, 4,000 and 6,000 cycles per second. The mid-frequencies are important because they are monitoring frequencies. They are good indicators of beginning ear damage, particularly 4,000 cycles. For some reason or another, (we are unable to explain it), the ear always loses hearing first at 4,000 cycles per second. If a hearing test shows no change at 4,000 c/s, you may be sure the noise is having no significant effect on the ear. If this frequency begins to show a loss, it is very likely that the ear may be a sensitive ear and should be watched. These six frequencies are the standard audiometric frequencies which we use when testing hearing, particularly for industrial hearing conservation programs.

Figure 7: Let us discuss how we have gone about setting up standards for the protection of hearing. It is difficult to get the kind of data we need from general industry. Obviously it would be nice to be able to go into a large plant where one finds a few thousand men who are exposed to a particularly constant noise of a particular character. But, it is equally obvious that we can't find such samples in industry. Therefore, we could not use industry to determine realistic criteria for hearing conservation. Consequently we went to the laboratory and exposed normal hearing young students to tailored noises resembling industrial noises. The data obtained from the temporary hearing losses these people sustained, furnished us with the necessary information.

We have established over the past 10 years that one can study temporary loss and relate it to permanent loss found ten years later in the same individual. It is almost a one to one ratio. When we exposed these subjects to anything under 80 decibels no change in hearing was seen even at the end of eight hours. As we increased this above 80, we began to get hearing loss as indicated by Figure 7. At 105 dB the subjects showed 60 dB of hearing loss at the end of the day at 1,000 c/s, which means that in 10 years, they show an average loss of 60 decibels at the same frequency (4,000 cycles). So, how

loud must a noise be before it will cause a hearing loss? From these studies we know that the 1, 200 - 4,000 cycle bands must be above 80 decibels before significant damage will occur over a lifetime.

Figure 8: shows what happens to individuals exposed over a long period of time. The lower line shows the amount of loss sustained as a result of aging alone. The upper line shows the amount of loss at 4,000 cycles per second in 2,000 men when the noise level is about 80 decibels. Notice that there isn't much difference. But when the level is 88 decibels, the group shows a severe loss in the first 10 to 12 years, after that it sort of levels off. Unfortunately the leveling off after 12 years applies only to 3,000, 4,000 and 6,000 cycles per second.

Figure 9: illustrates what happens with aging alone. If one studies professional people who have had little or no exposure to noise one finds the data shown in Figure 9. By the time they are 65 and 70 years of age, the frequencies that are important for speech have dropped about 15 decibels. The higher frequencies have dropped as you see, 3,000 to 25, 4,000 to 15, and 6,000 to 45. From these data, it is apparent that aging alone affects mainly the upper frequencies. Those frequencies important for speech show only a slight change.

Table I - shows some statistics taken from a recent U. S. survey on the health of the U. S. population. These data are the first really reliable statistics on hearing loss in the general population. If you look at those who have difficulty hearing loud speech (1.4%) in the general population and a comparative number of people working in a noise environment, this percentage triples for each 10 years of exposure. Such figures indicate that noise is causing a lot of damage to hearing. Since most of it can be prevented, industry must do something about it or suffer the consequences.

Figure 10: shows percentage of compensable workers in three groups. One group has had no noise exposure and by the time they are 40 to 49 years of age, 10% of them will have a compensable impairment according to the laws in many states. Notice those who are exposed to about 88 decibels, which is not a very loud noise, you find that by the time they are 47, the number has doubled. Notice further the third group exposed to only 91 dB and you find that by the time they are 47 years old the number who are compensable has more than tripled. These figures are based on thousands of men that we have measured over the past 10 years.

Figure 11 - shows permitted continuous exposure times for each of three octave bands whose center frequencies are 500, 1,000 and 2,000 cycles per second and A Scale sound levels. Time is shown

on the abscissa and permitted level on the ordinate.

Figure 12 - shows what to do when exposures are intermittent. The solid curved lines indicate noise level, the "on time" of the noi is shown on the abscissa and the necessary off time (noise level below 80 dB) between bursts is shown on the ordinate.

Figure 13 - shows several kinds of ear protectors. One with a hard center. We don't think that anything should be put in the ear that is made of hard material. It can injure the ear. Another with a rim close to the end. This rim has been moved up toward the top and is now a very good plug. This one is the V51R that was developed during the war. Another is the Flent. It is cotton impregnated with wax. For temporary use, where someone is going to be exposed for a few minutes or so, the Flent is very acceptable, but not for continuous use over long periods of time. They become soiled and friable very easily. If they are worn in an area where grit abounds, the grit may become imbedded and will scratch the ear canal wall, which may cause infection. The small round metal plug is said to have a little butterfly valve which knows the difference between a bad sound and a good sound. It lets the good sounds in and keeps the bad sounds out. That is exactly what the ad says, but it really doesn't work.

Figure 14 - shows a gadget that has just recently been developed. I think it will be the answer to the hard hat problem. This can be worn and the hard hat can be put on over it. It is designed so safety glasses or regular glasses can be worn without interference. It does not enter the canal. It is a canal cap, not a plug. It weighs about an ounce and a half and costs about three to four dollars.

Table II - shows the amounts of protection afforded by plugs, muffs and cotton. Notice that cotton gives very little protection. If someone asks me which is the best plug, my answer is, "The best plug is the one that is worn." Wearing the plug is the important thing. It's important to get the plug in the man's ear and if he'll wear one plug over another one, give him that one. If he will wear a muff rather than a plug, give him a muff. It is readily apparent that we have a problem. We know a lot about it. We have enough information to recommend standards. Now all we need is cooperation from industry to get hearing conservation programs started. I can tell you that if you do not, you are going to be confronted with a landslide of claims. It is happening in various states already, not to any great extent yet, but if 10 per cent of the men who are eligible for hearing loss claims in the age bracket of 50 to 59 years were to file, the cost would be half a billion dollars. Noise induced hearing loss can be a tremendous economic problem. I don't think I need to say more about the importance of this problem. Fear of claims is a

poor excuse for not starting a hearing conservation program. I have personally given hundreds of lectures to unions, workers and management. I have yet to see a claim filed as a result of initiating a hearing conservation program. This seems strange, but nevertheless it is a fact. This means measuring hearing, measuring the noise and issuing ear protection.

Don't delay your program because of a "head in the sand attitude." I will quit there and introduce our next speaker.

The next speaker will be Mr. Daniel H. Callaway, who is Western Regional Vice President of Industrial Acoustics Company in Santa Monica. Mr. Callaway and I have been known to this noise problem for many years. Mr. Callaway will talk about noise control but, in my opinion, there is no one any better fitted to give you a talk on this subject. Thank you.

MR. CALLAWAY: Good morning, gentlemen, Dr. Glorig, panel members and guests. I add my pleasure at the opportunity to talk to you, even though we are going to keep it brief. Aram, if you will give my coat-tail a tug in about 12 minutes, I will wind it up one minute after that.

As physicians and surgeons, I don't presume that you are automatically charged with responsibility in your companies for reducing noise in the various places it may exist in your organization. On the other hand, from my contact with industrial organizations, I know that in many cases the surgeon or the physician, does work very closely with the safety engineer, the safety department who in turn, have the basic responsibility for noise control and noise reduction. So, if I try to make rudimentary acoustical engineers out of you in about ten minutes, perhaps you will carry the message home to those who are directly concerned.

Generally in a discussion of noise control or noise reduction the rather broad, sweeping statement is made at the start that the thing to do is to reduce the noise at its source. Obviously this is an axiom, and the best way to solve the problem. If you can eliminate or reduce the energy content in a noise by selection of equipment, by redesign, by proper maintenance, by proper balance of rotating equipment, then no noise reducing treatment is needed. This is simply a modification of the device that generates the energy in such a way that its noise output is reduced. It is the ideal starting point and the first line of approach.

As is so often the case, however, this, while ideal, is often difficult. Now, I am not going to talk about rolling stock or equipment, but industrial operations in plants. Right at the outset, in building new facilities or in planning new facilities before they are construc-

ted, a great deal can be done to minimize both noise levels and the hazard of noise to the people who must be in the area by proper planning and layout of the plant.

In large open areas where high level noise is generated in a large, reverberant area often only a small percentage of the people who must work in the area are involved with the machinery or equipment that makes the noise.

Obviously, with just a little planning at the outset, those people not involved in the generation of the noise could by partitions, by proper arrangement of building layout, be permitted to work in a quiet area and the hazard can greatly be reduced by limiting the exposure to a much smaller number of people.

These are general approaches that are certainly worthwhile in many situations. But if we have a plant which is working and producing, we must deal with it; we can't always tear it down and start anew. So I want to cover briefly some specific ways we can deal with noise problems that do exist now in operating plants.

I will divide this discussion into two general areas, (1) the amount of noise reduction we can expect from use of acoustical, absorbant materials, materials you probably think of this sort you see on the ceiling here, but generally of the type that soak up or absorb sound and (2) the second area we will discuss is how we can use other heavy, massive materials to block the passage or spread of sound from one area where it is permissible to another area where it is not wanted. We will talk about those two general approaches separately. Actually, they interrelate and can be used in combination, as we will see at the end when we tie it all together.

In this slide I have shown sort of schematically an acoustical tile, which represents the whole family of sound absorptive devices. This sort of material will characteristically be of a light weight, fluffy and porous, with very small interconnecting pores in the inner parts of the material itself.

Now, what does a material like this do as far as sound is concerned? If a sound wave approaches it from one side, a portion of this sound, because the material is light weight and porous, passes on through to the other side and does not return. This does not bother us. A very small percentage, depending on the efficiency of the material, is reflected back toward the source, so we have a high ratio of transmitted sound through the material to reflected sound back. Materials of this type are called sound absorbers. They reflect very little of the sound incident upon them.

The mathematical expression of the performance of a material is in terms of an absorption coefficient, not decibels as Dr. Glorig mentioned earlier which is ratio of levels of the sounds. If a material is rated as having an absorption coefficient of 0.90, this means that 90 per cent of the sound is not reflected back in the general direction from which it came.

Now, acoustical tiles are not the only materials that are sound absorbent. Many are acceptable for industrial use in terms of cleanability, durability. Next slide.

Some of the more conventional materials that you see in commercial spaces and offices also serve the same function. Carpets, drapes, acoustical tile and plaster, and heavily upholstered furniture are obviously not so applicable to an industrial situation.

Now the question is how much can an absorptive material of this type help in a noise reduction situation? We have a little picture up here showing a man operating a noisy machine, and another man nearby working at a quiet task. As far as the man running the machine is concerned, the noise he hears progresses directly to his ears from the machine itself. Obviously, acoustical materials of any kind on the surfaces of the room in which he is working are not going to help the machine operator because almost all the sound reaching his ears comes directly without reflection. As we saw from the previous slide, the absorbent material beyond the operator can work only on that portion of the sound which is reflected back toward the source. On the other hand, a man at a distance hears the sound of two components. There is sound which radiates directly from the machine over to this person. There is another total component of the reflected sound from all surfaces which also reaches his ear.

We cannot then give a very simple answer to the question; "How much sound can absorbing material help?" We can say that if the room is very live, with very little absorption in it, then adding sound absorption makes the sound follow this kind of path as we progress away from it and this man at a distance can actually be helped a great deal by adding sound absorbing material in the space. On the other hand, the man close to the machine will get relatively very little help because the percentage of direct sound he hears is so high compared to the reflected sound.

The other class of materials that have application in noise reduction are entirely different in structure--heavy, massive, non-porous materials such as brick, concrete, etc. These materials let very little sound pass through. But they have the disadvantage of reflecting a great amount of sound back toward the source

The performance of this kind of material is rated in decibels and the name we give to the performance of this kind of material is Sound Transmission Loss.

Suppose we have a situation where we want to prevent some loud noise generated in one location from annoying those in another quiet. Obviously, the thing not to do is to surround the noise source with light weight, fluffy material that lets the sound pass through. Rather, we use a heavy, massive material, such as solid concrete, and by doing this, reduce the amount of sound passing from one area to the next. However, this is not without its disadvantages, one of them being that the man in the area where the sound is being generated is worse off than ever because he now hears not only the sound reaching his ears directly from the noise source, but a complete total noise pattern including the reflected sound from all the room surfaces. We can, however, help that situation by adding inside the heavy massive structure now some of this light weight, fluffy material which reduces that reflected sound component so that at least the man in the noisy area receives only the direct sound, not a buildup of reflected sound as well. At remote locations the acoustical material helps reduce the sound that comes through the wall or partition.

In the remaining slides, the captions almost tell the story. If we put a heavy, massive enclosure around a machine with an operator nearby, this helps everybody else, but the poor operator is worse off than ever because he now gets the reflected sound as well.

We help solve this problem by adding absorptive material to the inside surfaces of the enclosure. We must usually have openings to get material in and out, to let people in and out, for ventilation, for access, and so on. This slide shows that the general construction of the enclosure be capable of sound reduction, but also that the various appurtenances that go with it, windows, vents, and so on be properly designed.

All of the slides that have been shown have been total enclosures designed to give large amounts of noise reduction. This is often difficult for practical reasons. So, a question is, how much can noise screens and partial enclosures help? They begin to look more practical for use, so if they are helpful they should be considered.

I would say a great deal, and I would say don't be discouraged because this sort of thing cannot be called soundproof. Dr. Glorig pointed out noise levels below 80 decibels are considered safe. In many situations in industry we have noise levels of 95 and levels of 100 decibels [illegible] Even [illegible]

[illegible] some will help.

This is a plan view of that same sort of simple screen. It provides a zone of quiet, but only in some directions.

A V-shaped to sort of gives a little larger angle to the zone of quiet. A deeper, but still with an opening is still better. And now we have a large zone of quiet. If we put a partial roof on the enclosure it does still better. Here we closed it all but a door.

Here even the door is partially closed by a separate wall erected across the opening and by a turn to enter the enclosure which prevents the high frequencies from being radiated outward or at least reduces them.

I think that is the end of the slides. By way of quick summary, I will say that a commonsense approach to industrial noise reduction can often be very fruitful. Acoustical consultants are well qualified to guide industry in solving their noise problems and there are a number of reputable firms, like the one with which I am associated, who offer numerous products for reducing industrial noise.

I thank you kindly. (Applause.)

MODERATOR GLORIG: Thank you very much, Dan.

Now we have another Dan coming up, we seem to have lots of Dans here, Mr. Dan Adair, who is Safety Director for the Pacific Coast Association of Pulp and Paper Manufacturers. Dan and I have been working in this business of hearing conservation for some time, and I don't think there is any better man on the West Coast to tell you how to start and carry out a hearing conservation program. Dan.

HEARING CONSERVATION PROGRAMS IN INDUSTRY
DAN ADAIR, COORDINATOR OF SAFETY ACTIVITIES
PACIFIC COAST ASSOCIATION OF PULP & PAPER MFGRS.
PORTLAND, OREGON

MR. ADAIR: It is a pleasure to meet with you - the Medical and Surgical Officers of the Association of American Railroads - to discuss hearing conservation programs in industry - more particularly, the hearing conservation program in the Pacific Coast Pulp and Paper Industry. We have tried to make our hearing conservation program a model one - and telling you how our program developed, how it works, and the results achieved should be more meaningful to you

is composed of 17 pulp and paper mills located in California, Oregon and Washington that are owned by 18 companies. Our best known members are - and some of the names are well known to you: Weyerhaeuser Company, Scott Paper Company, Crown Zellerbach Corporation, International Paper Company, Georgia - Pacific Corporation, Boise Cascade Corporation, Kimberly-Clark Corporation, Rayonier Incorporated, Fibreboard Paper Products Corporation and Northwest Paper Company.

The association was formed in 1933 to bargain with the industry labor unions. In 1956, at the request of the unions, a joint labor-management safety program was agreed to negotiations. This joint program, built around state labor management safety conferences, recently celebrated its 20th anniversary. We are proud to report that during these twenty years our injury frequency rate was reduced 86 per cent.

In 1957 labor contract negotiations, after several years of union pressure, the companies agreed to create the job I have and to start a hearing conservation program.

After careful checking, we decided that Dr. Aram Glorig was the top authority nationally in the hearing conservation field and early in 1958 a small committee called upon him. Dr. Glorig, of course, agreed to work with us and further expressed an interest in doing research in a number of member mills.

Our hearing conservation program developed as follows: (1) We felt that it was important to fully inform the people who must do the job. So we set up four one-day meetings - at Los Angeles, San Francisco, Portland and Seattle - for Dr. Glorig to lecture to company executives, mill managers and company engineers and give them the facts about industrial noise and hearing conservation. Certainly there were fears concerning opening Pandora's box, but we don't usually fear what we understand. These lectures, and Dr. Glorig was assisted by a member of his staff, Dr. Summerfield, built the foundation of understanding that was needed to develop the willing cooperation that a successful voluntary program requires. (2) Next our Executive Committee recommended that our member mills employ a top acoustical consultant, Mr. William B. Snow, to make noise surveys of the mills, even though two companies owned sound measuring equipment and had done some work in their mills. It was felt, considering the labor union and workmen's compensation implications, that there were advantages in employing a well-known impartial consultant whose findings would not be questioned. Mr. Snow spent some six or seven months surveying the mills with noise problems.

3. We arranged for member mills to get good audiometers and accurate, legally acceptable service and calibration. All mills except one use IAC No. 400 hearing testing rooms. The exception had a suitable room built into their new plant.

4. We scheduled eight one-day schools for audiometric technicians, plant nurses and members of mill personnel departments. These schools, taught by Dr. Glorig, trained legally qualified technicians. As a service to other industries in the area, we invited them to send people for the lectures and training. Also, the technicians were trained in fitting ear plugs.

5. Mills then scheduled people working in areas with harmful noise levels (above 85 decibels in octave bands) in for hearing tests in addition to persons newly hired. Follow-up hearing tests are scheduled approximately every eighteen months.

6. Within the limits of present knowledge and within the limit of reasonable cost some plant noises have been reduced to safe levels. Enclosures have been put around some machines, snubbers or mufflers have been installed on some vacuum pumps and exhausts, and couch and suction rolls on paper machines, have been fitted with silencers and/or replaced with rolls having a quiet drilling pattern of holes. Some of these rolls cost about $50,000 apiece and machines usually require three or more of them. Naturally mills prefer to replace them when worn out, and even then many times the noise is not reduced to safe levels so that ear protection is still needed. Some machinery such as refiners and hammermills have been isolated by putting them in sound proofed rooms where no one works regularly. At the present state of the art, frankly, we do not know how to reduce many of our noises to safe levels.

7. So most of our hearing conservation program revolves around an ear protection program - requiring the wearing of ear plugs or muffs in areas with harmful noise. This program was developed as follows:

Mill managers met with all their supervisors and told them the results of the noise surveys made by Mr. Snow, what could be done about reducing noise to safe levels and what must be done about ear protection. Then the managers met with union officers and committees to explain the noise survey and to discuss the wearing of ear protection in certain areas. A film, Ear Protection in Noise, produced under Dr. Glorig's direction by the Subcommittee on Noise, was shown to them as part of a selling job. Then meetings of employees effected were held, the program explained, the film shown, ear plugs were passed out [illegible]

forcement of ear plug wearing was delayed until they were thoroughly tried, fitting and adjustment problems worked out, and accepted by the majority of employees effected. Enforcement has been a continuing minor problem but has not given us much trouble. Since then mills have given ear muffs a try, mostly to have an alternate type of ear protection for those who had, or thought they had, trouble with ear plugs. Ear muffs are increasingly popular with more of them worn in some mills than plugs. Incidentally, over a several year period, there does not seem to be a great deal of difference in cost between plugs and muffs. Also, as a matter of interest, the film I referred to - Ear Protection In Noise - had all production costs paid for by the Pacific Coast Association of Pulp and Paper Manufacturers so prints could be sold for print costs only. Our member mills have purchased 20 plus prints for showing to their employees.

8. In order to further educate our people we arranged for Dr. Glorig to speak at our three-state labor management safety conferences - the subject, ear protection and hearing loss due to noise. Dr. Glorig was authorized to answer all questions fully and honestly.

9. At our next labor-management safety conference, one of our member mills put on a one hour skit relating to selling ear protection to employees - and including in it the sound reasons for and the ridiculous reasons against. No problems at all have resulted from our wholly honest forthright approach.

10. I have served as a consultant to member mills and meet with both management and union people upon request to advise them. Dr. Glorig has been retained by one of our major members as their hearing conservation consultant.

Our program is routine now - just a minor part of our overall association program.

How it has worked - from the advantageous position of hindsight - Very well! We would do nothing different if we were starting now.

Before our hearing conservation program started some two or three hearing loss claims had been paid among member mills. Since it started not one such claim has been paid. One is in process now and will probably be allowed. Several thousand employees have compensable hearing losses and have not filed claims - and most are acquainted with the law. In Oregon three mills rejected the State Workmen's Compensation Act - and with the Employers Liability Law, liability is much the same as on the railroads - and not one cent has been spent paying for hearing loss claims.

Employees are wearing ear protection where needed without

complaint. Today our hearing conservation program is routine, functioning as a part of everyday operations. Most of the people wearing ear protection would not work in noise without using ear plugs or muffs.

I appreciate the opportunity to meet with you and share our experiences. Thank you very kindly. (Applause.)

MODERATOR GLORIG: I notice some consternation on your faces when he said they had had no compensation cases since then.

I would like to add one more statement to that before I introduce the next speaker. We have introduced conservation programs into industries throughout the entire United States and, as yet, over a period of 15 years, there has not been one single case filed as a result of introducing these hearing conservation measures, not one single case.

Now, the next speaker is one who is well able to speak on his subject, Mr. Ell Welch, who is with the Compensation Commission here in California and he is the rating expert. I have asked him to talk to you about compensation on the West Coast. Ell.

MR. E. P. WELCH (Chief, Permanent Disability Rating Bureau, Industrial Accident Commission, San Francisco, California): Thank you, Dr. Glorig. Ladies and gentlemen:

There are over fifty workmen's compensation jurisdictions in the United States, and no two have entirely identical laws. This summary of the California Compensation Act relating to noise and hearing loss does not necessarily reflect the statutes of other jurisdictions.

The workmen's compensation field throughout the country became abruptly involved in noise related hearing loss nearly twenty years ago when a sudden rash of unexpected claims were filed in Wisconsin and two or three of the other states. Insurance companies were more or less caught off guard since they did not anticipate these cases and were not properly reserved to meet them. The claims were, in a sense, latent, and when benefits were awarded, employer and insurance groups became quite concerned about the problem. Their concern had widespread ramifications and noise control techniques was one of them.

Exposure to noise under certain conditions can produce a permanent hearing loss, as Dr. Glorig has explained to us. This poses an important question in compensation cases as to the date of injury. This is the key date in a compensation case since it brings significant legal factors into play and may determine

ganization by the legislature last year. The agency is now designated the Division of Industrial Accidents. Responsibility for the Permanent Disability Rating Schedule is that of the Administrative Director of the Division, while judicial functions are performed by a section of the Division called the Workman's Compensation Appeals Board.

In any event, once the percentage of hearing loss is determined, it must be applied to a schedule. The type of schedule used in other jurisdictions provides payment for a specified number of weeks for loss of hearing, though the number of weeks, and the amount of the weekly payment varies from jurisdiction to jurisdiction. If a schedule provided 200 weeks of payments, and the employee sustained a fifty per cent hearing loss, he would receive payments for half of the 200 weeks, or 100 weeks.

California, however, has a Schedule which differs from Schedules in all other jurisdictions. Very briefly, it is a multi factor schedule which correlates the employee's physical impairment with his occupation and age at time of injury, and produces a rating expressed as a percentage of total permanent disability. Loss of hearing has a standard rating of 65 per cent, which is increased or decreased by the Schedule as the demands for hearing acuity are relatively greater or less than average in a given occupation. This adjusted percentage is then modified for age, the older employee receiving a higher rating than the younger. Thus, a surgeon would receive a higher rating than a boilermaker. If both sustained a 50 per cent hearing loss at age 50, the boilermaker's award would be 31 1/2 per cent, and the surgeon's 38 per cent, since hearing acuity is less important to the boilermaker than the surgeon.

For permanent disability, four weeks of payments are provided for each 1 per cent of permanent disability at a current maximum rate of $52.50 per week. (A life pension is included in cases of 70 per cent or more.) Thus, the boilermaker would receive 138 weeks (31 1/2 per cent X 4) at 52.50, or $7,245, while the surgeon 152 weeks (38 per cent X 4), or $7,980. This is in addition to any temporary disability payments either may have received.

Now just a few words as to our experience with regard to costs. Over the last ten years California has had practically no change in the number of claims involving the inner ear or hearing. I cannot tell you exactly how many of these claims were due to noise only. They could be due to trauma as well, or from an ear infection.

At no time in the last ten years has the number of Commission decisions in which impaired hearing was claimed as at least part of the disability exceeded 1 per cent of our total caseload. In the fiscal year ending last June 30, there were 296 original decisions in this

area out of a total number of decisions of 45,308. You can see it is an insignificant figure when compared with the total number of original decisions. Of the 296 decisions, 34 were dismissed, which reduces the number of awards to something in the neighborhood of 250.

I cannot give you an exact figure on costs. However, making certain assumptions I believe valid, I doubt that the compensation paid in California last year for hearing loss was ever $750,000, out of total incurred compensation costs of perhaps 220 to 230 million. This is merely my own personal opinion and is not to be construed as an official statement.

Now, I recognize that you do have these sleepers. Since hearing loss due to noise is a progressive disease, there may well be latent cases which will be presented in the future. Only time will tell. This is a matter of considerable concern to both employer and insurance carrier, and perhaps is an inducement to employers to accept and promote noise conservation programs.

Again I must say this is only the California experience. I cannot project these figures nationally.

I very much appreciate having been here. (Applause.)

MODERATOR GLORIG: Thank you very much, Eli. I would like to add one word to this, and that is just recently the Puget Sound Naval Shipyard had 185 cases filed against them for which the cost would be close to a million dollars. I know this to be a fact because I am serving on every one of the cases myself. I think the shipyard company is about as close to the railroad as far as noise similarity is concerned. I don't want to scare the hell out of you, but I would like you to do something about the noise problem in the railroads.

The next speaker is one who is probably well known to all of you, Dr. Graham from the Pullman Company. Dr. Graham will make a few remarks on the hearing problem as it relates to the Railroad profession.

R. M. GRAHAM, M.D. (Director, Department of Medicine and Sanitation, The Pullman Company, Chicago, Illinois): I don't want you to miss that bus. We have several other important things to discuss, so I will make this very brief.

As a youth, I had the opportunity to work in a large railroad shop. The boilermaker foreman was practically deaf, and several others in the group had considerable loss of hearing. I think most of us, if we stop to realize and think of our past experience, have a pretty good idea that noise is one of the accepted causes of loss of

California establishes the date of injury [illegible] disease and hearing loss due to noise [illegible] category as the date on which the employee [illegible] sonably have been expected to know, that [illegible] noise environment in his employment. [illegible] normally be made within one year of this [illegible] by the statute of limitations.

The employee assumes the burden of [illegible]. Whether or not the noise exposure produced his hearing [illegible] is a matter of expert medical opinion. Evidence [illegible] a relationship between employment and the disability [illegible] ference can award benefits.

Industry, of course, is responsible only for that degree of hearing loss it has caused. Hearing loss caused by conditions not related to employment is not the responsibility of the employer.

In this connection, hearing loss due to age is often an issue in these cases. California does not make an automatic allowance for hearing loss resulting from the aging process. Should an employer or insurance carrier feel any part of the disability is due to age or causes other than employment, he has the burden of proving this by producing whatever facts he may have. In other words, whether or not a portion of the claimed hearing loss is due to presbycusis or to other causes not related to employment is a question of fact to be established just as any other fact must be established--by competent evidence.

Frequently employees work for a number of different employers over a long period of years, and if noise in each employment contributed to the hearing loss, each employer must share in the ultimate liability to the extent of his responsibility.

The facts necessary to make this apportionment between employers may require lengthy investigations and many months of litigation. However, in California the employee need not wait until this aspect of the case is decided. He may pursue his claim against any one of his past employers and obtain a full award against him. Then in a later proceeding the liability of each employer is determined and the assessed employer is reimbursed by the others.

A number of formulas for calculating percentages of hearing loss have been developed over the years. Until 1963 the Industrial Accident Commission used a formula of its own creation for this purpose. The exact origin of the formula is lost in antiquity, but in all probability it was developed in the late 1930's. It evaluated losses for seven frequencies, the lowest being 250 cycles and the highest 8000

cycles. It assumed that at 1000 cycles, for example, 133 decibels was the level at which hearing was lost.

It became apparent to us that our formula had become outdated, and in the early 1950's we began looking for a more realistic one. In time we found the formula of the American Academy of Ophthalmology and Otolaryngology (AAOO) which stressed hearing loss in those frequencies primarily concerned with speech--that is, 500, 1,000, and 2,000 cycles. It contained a so-called "low fence" of 15 decibels--meaning that a loss of less than 15 decibels is not a disability--and considered that a loss of 82 decibels was total loss of hearing. The average loss between these two levels is multiplied by the factor 1.5 to obtain the percentage loss.

In 1959 the Rating Bureau recommended that the Commission amend its Schedule by adopting the AAOO formula. Certain groups then asked that an automatic allowance for presbycusis be included together with a six month waiting period between exposure to noise and evaluation of the hearing loss. Following considerable controversy, the Commission rejected all three suggestions.

About two years later some carriers petitioned again for adoption of the AAOO formula. This time the Commission adopted a modification of the AAOO formula, in that 3,000 cycles is included. Therefore, the California formula evaluates losses at 500, 1,000, 2,000, and 3,000 cycles, but in all other respects follows the AAOO formula. Consideration is given to effective use of a hearing aid. This became effective March 1, 1963.

Testing of auditory acuity is done by pure-tone air conduction audiometry. Until the last year or so, audiometers in this country were all calibrated under criteria of the American Standards Association (ASA). Recently calibration of some audiometers has been changed to criteria of the International Standards Organization (ISO), so that today some audiograms are based on the ASA reference point and others on the ISO reference point.

In the frequencies with which we are concerned, the ISO readings are about 10 decibels lower than the ASA. Therefore an identical hearing loss could read 20 decibels on the ASA scale and 30 decibels on the ISO. Conceivably inequitable ratings could be awarded. To prevent this from happening, the Commission last July adopted a conversion factor to insure that benefits will be identical, whether the audiometer is ASA or ISO calibrated. It is essential, however, that we know which standard was used.

In passing, I might mention that after 52 years, the Industrial Accident Commission ceased to be last January 15 following a reor-

hearing.

Some of you recall Dr. Tom Crowder, my predecessor, had been a good internist but had to give up this specialty and go into industrial medicine because of marked nerve deafness.

The different social philosophy between States workmen's compensation laws and the provisions of the Federal Employers Liability Act, under which most railroads operate, requires some consideration. Under the workmen's compensation laws, there is liability for injury without fault on the part of the company. While, under the Employers Liability Act there is liability only if negligence is evident. My experience has been largely under the compensation laws of the several States, including those of New York.

There is also the differentiation to be made between acoustic trauma or sudden hearing loss due to individual accident, and the recognition of gradual hearing loss occurring as the result of excessive occupational noise and may be considered an occupational disease.

Most States recognize acute acoustic trauma in their compensation laws. Only a few provide compensation for this gradual loss of hearing. New York was one of the present four or five States to promulgate laws and regulations with relation to occupational hearing loss. Others have such regulations under consideration.

We had a repair shop in New York State employing about 600 men and had gotten along quite satisfactorily for about 50 years without a recognized noise hazard. The plant was surveyed periodically by representatives of the State Labor Department for occupational hazards and no adverse comment as to excessive noise was reported.

Shortly after closing the plant in 1958, due to reorganization, we had three claims of partial occupational hearing loss in old employees, two of whom were brothers, and which were settled for several thousand each.

After seven years, there are still several more questionable cases pending. We have had a noise survey made in a similar repair shop and found some noise levels around and occasionally slightly over 85 decibels, which level is considered by some to be the limit of safety for prolonged exposure.

Now as to the incidence of hearing defects, Dr. Glorig showed that one slide of the survey at the Wisconsin State Fair about 1951. We have had reports, of course, from [illegible]

Dr. Saloloff, Philadelphia, and his associates, reported in February of 1966 in this past month's Archives of Industrial Health on their findings in consecutive audiograms of 412 male applicants, most under 30 years of age. Two per cent had hearing loss of compensable degree under certain State regulations, namely, a hearing loss of 15 or more decibels in the 500-1,000-2,000 cycles per second range. An additional 2 per cent had a slightly lesser impairment or approximately 4 per cent in this one group of 500. Interestingly enough, some years ago I made a comparative study of our periodic annual examination of 8,200 car service employees and, with the gross testing that we were using at that time, we found an incidence of 1.71 per cent of ear and hearing defects, that is a little over 20 years ago.

In an average population of about 9,000, an average of one or two car service employees each year are disqualified or retired from train service because of marked defective hearing.

Now, the methods of testing, of course, have become much more refined in recent years with the improvement of the electronic devices. Beginning forty years ago, in screening tests of employees, I used an Ingersol watch tick. We laughed about this at a meeting in Denver some months ago. But actually, your watch tick was a standardized test.

Your audiometer is a much more effective test, of course. And more recently, for screening purposes, we have used the conversational word test at 20 feet. For screening purposes, this test appears to be sufficient to pick out those with marked defective hearing. When a questionable defect is found, further analysis and study becomes indicated, including standardized audiometric examination.

Of course, if you are going to use an audiometer, there are several technical requirements. The audiometer has to be a standardized instrument, properly calibrated and checked. You have to have a competent technician or doctor to supervise the test and a reasonably quiet space in which to conduct the test.

Now I recently proposed the use of a small screening audiometer. I just discovered this morning that Dr. Glorig, and I suspected as much, Dr. Glorig was in the perfection of this some years ago. I first saw the instrument in Los Angeles at the AMA Conference on Occupational Health in 1957.

It is a small audiometer using pitches of 500, 2,000, 4,000

If the defect is more marked and further diagnosis or placement appears indicated, a further complete audiogram and further study, of course, becomes indicated.

These instruments, Tritone, manufactured in California, sells for around $95. A similar instrument, the Otoscheck, sells with the individual earphone for eighty-five. With the double earphones, it is around $120.

Of course, as most of you know, the regular pure tone audiometer runs from a couple hundred on up to four or five hundred.

As to the testing, Dr. Glorig did not mention this, in certain locations a soundproof room has been advocated. Dr. A. L. Knight reported at the 1963 International Congress on Industrial Health the results of his study of double testing of 400 applicants using a sound proof room, and then office space in the clinic or vice versa, using the double earphone. With double earphones, he found little difference in relation of the two environments to the results. He found at the 4,000 cycle per second frequency a hearing loss of greater than 15 decibels in 139, or approximately 27 per cent of the applicants. Of course it is recognized that the loss at 4,000 cps is usually an early sign of nerve loss which may be occurring.

The Committee on the Academy of Ophthalmology and Otolaryngology--Dr. Glorig, I think, had his finger in this, also has recently published or revised the 1965 Guide for Conservation of Hearing in Noise. Possibly Dr. Glorig can advise us how we can get it. I have a copy and I think it is quite an important summary of the whole subject.

Many of you are familiar with the Guide to Evaluation of Permanent Impairment of Eye, Ear, Nose Throat and Related Structures by the Committee on Rating of Physical Impairment, published by the American Medical Association in 1961.

The American Industrial Hygiene Association has just published a second edition of their Industrial Noise Manual, 1966, covering the various aspects and methods of the problems involved. Copies of this may be obtained for $15 from the Secretary of the American Industrial Hygiene Association, 14125 Prevost Street, Detroit, Michigan, 48227.

Now, to start the ball off, there is one problem I would like to have Dr. Glorig give us some comment on. Incidentally, Dr. Glorig wrote for the Zenith Company several years ago a very fine summary of the defective hearing problem. If you can get hold of one of those statements, it is quite worthwhile.

Many doctors and examiners in small communities and plants do not have ready access to an audiometer. Although I realize this audio testing is becoming a more popular method of screening in industry, I would like Dr. Glorig's opinion as to whether, in a screening examination, the conversational word test at 20 feet is a valid method of determining gross defective hearing or effective hearing. (Applause.)

MODERATOR GLORIG: Thank you very much, Doctor. We have about seven minutes left and there will be some opportunity for questions from the audience.

First, let me take care of Dr. Graham's question with respect to conversational voice. There are few men in this world who get mentioned in the Time Magazine and I was mentioned in Time Magazine some 20 years ago because of what I had said about the conversational voice test.

At that time I compared it, because I was in the Army, with the use of bow and arrows instead of our modern weapons, with respect to using conversational voice and the audiometer. Now I still believe this. And I have plenty of evidence to show it.

There are several things wrong with the conversational voice. First of all, a man cannot hold his voice constant. So, if the source of the word is inconstant, extremely inconstant when he tries to say this in a conversational voice. Secondly, the distance involved, 20 feet, shows no change in level even with a constant source until you get down to about eight feet, because of this inverse square law where it says that as you halve the distance, you increase the level by 6 db. So, you get very small changes in the first 10 or 15 feet and after that you get very large changes. So you really don't get a good evaluation of this person's hearing at all even for screening purposes.

Now a better test, if you will go and must go to something that is subjective like this, is the whisper test, because the whisper test can be better controlled than the voice test because you do it on an exhaled condition of lung and therefore you have a question mark controlable output as far as whisper is concerned.

But all of these kinds of tests have been shown and have been thrown away and one of the most important developments in this is that the Army and the Air Force and the Navy used to use the watch test and the conversational voice test. If you will go to any induction station in the United States at the present time, you will find that they have an audiometer and a soundproof booth, and this is because of the work that I did for 20 years. It took me 20 years to get the

conversational voice test changed in the army to an audiogram.

Now I know what the reason is. The reason is that every doctor in the little community who examines your people does not have an audiometer. But to me this is no excuse. Audiometers are as acceptable now as it would be to have an otoscope or to have a stethoscope or to have any other medical instrument. You don't need, for your purposes, if you are looking at it from the standpoint of what you want to know about your men without regard to the legality of your test, a standard audiometer. The three tone test, which is a concept of mine built first by the Amco people in Los Angeles, where you test at 500 and 2,000 and 1,000, or there is another that tests just at 2,000 and 4,000, if these tests are within a reasonable range, that is to say if 1,000 is no greater than 10 db and 2,000 is no greater than 15 db, you have no worry about this man because you know he has hearing within normal limits and can carry on his duties without any problem.

If this case however becomes a compensation case, I don't know yet just how the compensation commission would accept two frequencies versus six frequencies. So, the legality of this thing comes along now. And I know the Commission won't accept conversational voice because you have no record that is worth anything. I hope this answers Dr. Graham's question. I know it doesn't solve, give the solution how you get audiometers into the hands of these people to solve the problem, but I think with an $85 instrument you can do this properly and you should do it to be on the safe side.

Yes, sir?

DR. WINSTON: Would you make some comment about the social adequacy index?

MODERATOR GLORIG: Well, the social adequacy index is familiarly called "SA" by those of us who started to use it and has to do with using speech rather than pure tones. And you use a combination of two kinds of words for test purposes. And then you come up with a formula that tells you that this person is socially adequate or inadequate. Now it is nothing however, that has been accepted, as a matter of fact, no one hardly ever uses it any more. It was a nice idea to begin with, but it didn't work out very well.

If I had had time, I could have gone into these things in my lecture.

If, for example, you are hiring an individual and you want to know should you hire him, the thing to decide is does this man need to hear conversational voice over the telephone or at a tete a tete situation such as we have here. If he needs to hear this, his

hearing must be, in the three frequencies, 500, 1,000 and 2,000, better than 20 decibel average. If it is greater than 20 decibel average, he will have difficulty under ordinary circumstances. And if you are going to hire a man that has to do this, then you should not hire him for that job if he has that amount of hearing loss.

However, this has not to do with his ability to hear warning signals, and so on, while in the cab of an engine. Because the noise of the cab of the engine is so high that it doesn't matter whether he has a hearing loss or has a reasonable amount of hearing loss because the normal hearing man also has an artificial hearing loss while in the cab of an engine. And hiring a man with normal hearing because he is going to drive an engine is nonsense, with certain reasonable conditions attached to a person who has a hearing loss. Because I am sure that you will find that your engineers do have hearing losses and they are doing this job well. So this is something you should think very carefully about before you talk about normal hearing levels in order to be an engineer.

On the other hand, if you are going to hire a young engineer who is going to be a career man, now is the time to look at this man to see that he has normal hearing because over the period of time he is going to work for you he is going to lose hearing and you want him to start with fairly good hearing to begin with if he is a young man.

Any other questions? We still have about one minute.

I would like to suggest sometime, if you have another one of these meetings and are more interested in the hearing angle of this as far as railroad engineering is concerned, that you ask someone who is knowledgeable about this to speak to you at length about the hearing loss involved and the hearing problems involved with respect to this kind of an operation.

Thank you very much. (Applause.)

CHAIRMAN OLSON: I am sure that there is perfect agreement on the excellence and the value of this panel discussion. I think one very important thing that has come out of it has been the statement about claims as a result of bringing this problem out into the open. And I think we all know that there has been a reluctance to do something about this condition. The statement has been made, "Let sleeping dogs lie."

Well, in the past year, we have felt that it was important enough so that we should bring this question to the attention of our group, and I am sure that each of you will, in turn, bring it to your management for action.

Dr. Glorig just said if any of you are interested in the Guide, if you will write to him, he will see to it that you will get it.

There has been a great deal of information here to digest and we are fortunate that it has been recorded so that you will be able to study it when it comes out in the annual report.

I want to express for all of us our gratitude and appreciation for your presence and your participation in the meeting here today. Thank you, gentlemen, very much.

If you will refer to Page 2 on your program, you will see that there are a number of terms of memberships in the Medical and Surgical Advisory Committee that expire at this time, and we have appointed a nominating committee which has submitted a list of nominations, and when you get it, you will note that in the first group, the Eastern territory, there are four names. And the instruction at the top says "Vote for 2, one for a three-year term expiring in 1969, and one for a one-year unexpired term expiring in 1967."

The representative receiving the highest number of votes will serve the three-year term. The next highest will fill the one year unexpired term. That unexpired term is the one which Dr. Ralph Johnson filled. The others are for one in the Southern territory and for three in the Western territory for the regular three-year terms.

Now I should also tell you that the ballots which you will receive are to be voted only by the regular membership of the organization and no others.

In order to get our program completed at the proper time, I would ask you to have your coffee and fill your ballot and try to get back here in five minutes, if that is possible. And just one moment: I would like to appoint Drs. Mahoney, Stack and Winters as the Tellers.

(Short recess.)

CHAIRMAN OLSON: Gentlemen, will you please take your seats so we can adhere to our schedule. And we will ask that the Tellers pass the ballots out and remember what I said about only the active members of the Association voting.

If you have completed filling the ballot, I would like to ask the Tellers please to collect them and retire and count them. Mr. Todd will assist you in the process.

MR. TODD: Be sure you put the name of the railroad on the envelope, too.

CHAIRMAN OLSON: I think we shall get underway.

Our next speaker is going to talk to us on the subject of "Miraculous Recovery and Estoppel." He is Mr. John A. Risendal, the Director of the Claims Research Bureau of the Association of American Railroads. Mr. Risendal.

MIRACULOUS RECOVERY AND ESTOPPEL

JOHN A. RISENDAL, DIRECTOR
CLAIMS RESEARCH BUREAU
ASSOCIATION OF AMERICAN RAILROADS
CHICAGO, ILLINOIS

MR. RISENDAL: Thank you, Doctor. Gentlemen: Members of the medical profession are credited daily with performance of near miracles. In what they themselves may regard as routine procedures physicians and surgeons accomplish the nigh impossible to rescue others from death's door and return them to productive lives.

Not infrequently, word reaches us of a case in which an individual stricken with an injury or disease appears to be beyond all hope. Eminent medical specialists have exhausted the resources of their immense knowledge with no apparent success. Then, for some reason beyond the comprehension of those of us unsophisticated in medical matters, the patient rallies. The physician instantly steps in and calling upon his training, knowledge and experience, brings forth a return to a normal life. It was as though some higher power had interceded at the opportune moment. Such developments may be in many instances readily explained by the medical practitioner, but are beyond the understanding of the average citizen.

But it is not such recoveries with which we are involved in this discussion. In the railroad industry, other forms of miraculous recovery concern us. How frequently have we observed an employee who has suffered an injury during the course of his employment, who is off duty for some time, who files suit against his employer alleging that the employer's negligence caused his accident, who testifies at the trial of his case that he has been informed and believes that his physical condition resulting from the injury will not permit him to resume work in his normal capacity; who hears physicians so testify on his behalf at his trial; who hears his attorney argue at length that his client has been deprived of his livelihood and must be compensated by adequate monetary damages; who has heard the jury return from its deliberations and announce they have found in his favor for $50,000 or more; who later meets with his counsel to divide up

the spoils of that payment, who thereafter purchases a large automobile, takes a trip to some exotic spot, and then suddenly one day appears at the office of the railroad and demands his job back stating that he is then ready and able to return to work.

Now only a few days or weeks previously, this same man had convinced the jury of his peers that he was beyond hope of physical salvation, and who within that short span of time has regained all the abilities he possessed prior to his accident. It is that type of miraculous recovery with which we are confronted on so many occasions.

What should be the attitude of the railway toward that individual employee? Now assuming that he had sustained a legitimate injury during the course of his employment, the carrier was undoubtedly prepared to adjust his claim on an equitable basis. In some of these cases the company may have had an opportunity to submit a settlement offer before suit was instituted; in others, not.

Today, practically all injured men, beginning immediately following an accident, are subjected to tremendous pressures to employ counsel. The injured is told that only through such action can his interests be properly protected. He is reminded that he cannot be discharged for engaging counsel. This, of course is correct, as his rights in this area are protected under federal law.

But once the case is turned over to counsel, the injured man has two alternatives. He can claim merely that he sustained an injury, received treatment, incurred a wage loss and other related expenses and he expects to resume work within a period of time. If this course is followed, he has not prejudiced his rights to further employment. But, at the same time, he is unlikely to reap a substantial financial harvest. He would actually be better off had he accepted the offer the carrier made or was prepared to submit.

The second alternative is to attempt to influence the jury to return a much larger verdict. To do this, he must magnify the seriousness of his injury. Understandably, the jury when faced with such contentions supported by medical testimony has a difficult time. But they must resolve the issue and, in most cases, will be more generous in their award than they would be in a case of no alleged permanency.

Many other elements are considered, or should be, by the jury in arriving at its decision, but in today's litigation, particularly in the FELA field, the medical aspects of a case are at least as important as the liability questions and other factors involved.

But, the trial is over, the verdict has been paid, and we now find the employee knocking on the door demanding his job back. What is the railroad to do?

This employee has failed to bargain in good faith with his employer. If he is now permitted to renounce his prior contentions and resume the status he enjoyed before his accident, justice has been denied. As a matter of equity to the parties, the man and his employer, this cannot be permitted to occur.

In the early 1950's, our host for this meeting, the Southern Pacific Company, was faced with a series of these situations. Action which they took at that time established certain precedents for the handling of future similar cases. When faced with demands for reinstatement, the Southern Pacific refused to accede and took the position that the men involved had already been compensated by juries for permanent loss of ability to work.

The employees then filed suit to recover their prospective loss of wages and loss of their seniority rights.

Deciding the issues in several cases, the courts ruled in favor of the defendant railway. In its opinion, one court said: "It would be unconscionable for plaintiff to recover a second time for the same loss for which he had been paid in a jury verdict."

Another stated; "A party to litigation will not be permitted to assume inconsistent or mutually contradictory positions with respect to the same matter in the same or a successive series of suits."

In still a third, the court ruled: "A plaintiff who has obtained relief from an adversary by asserting and offering proof to support one position may not be heard later in the same court to contradict himself in an effort to establish against the same adversary a second claim inconsistent with his earlier contention; in other words, the plaintiff will not be permitted to play fast and loose with the courts."

All such cases, however, did not follow the same route. In a number of them, after the railway had paid judgments granted in the trial courts, the names of the employees involved were removed from seniority rosters. The employees then, instead of returning to the court in actions for alleged wrongful discharge, progressed their claims through appropriate channels of the company and, when finally turned down, appealed to the National Railroad Adjustment Board. Last year at your Chicago meeting you heard Chick Horsley, who represents the interests of the carriers on the first division of that Board, describe its workings.

Several early decisions of the Board upheld carriers' position. In one such case the referee said, "The recovery of damages for total and permanent loss of working ability must be deemed therefore to constitute a termination of the employment relationship. Consequently this claimant is not entitled to be retained on the seniority list."

In another, the referee stated: "This was not a disciplinary matter. The claimant clearly was not assessed discipline. The carrier relied upon the position of the claimant that he was forever unable to perform engine service. The payment for the same created a form of estoppel. In other words, this claimant is now estopped from maintaining his right to work for the carrier by virtue of his seniority and engine service. He elected to seek recovery of damages from the carrier because of continued disability, and the recovery of a substantial amount of damages in the form of a money judgment indicates the jury considered this question in arriving at its verdict."

In still a third, the referee commented: "To permit an employee to assume contradictory positions in two proceedings would be against public policy."

In preparing their cases for submission to the referees in these proceedings, union representatives had labored long and hard on their briefs. Generally speaking, they contended estoppel principles should not be applied in proceedings before the Adjustment Board, which is an administrative tribunal established to interpret labor agreements; that the removal of the name of an employee from the seniority roster without formal investigation is a breach of the labor contract; that referees have no power to review records of the court; that in any event it is impossible to establish from a verdict what the jury decided as to the man's physical condition; that in many cases there is a conflict in the medical evidence adduced at the trial; that statements of lawyers to a jury are not evidence. They assert that seniority status is not effected by suit and that the only thing which prevents return to work is physical disability; that an injured man has the right to a leave of absence and protection of his seniority rights during the period he is unable to work, and also has the right to have a medical board of three doctors decide a dispute over his actual physical condition.

Now inevitably in proceedings before the Adjustment Board, labor and carrier members deadlock, and the [illegible]

panels have been ordered to determine physical fitness.

Under these circumstances, it is readily apparent why matters of this sort are of great concern to railroad managements, and in view of the uncertainty of obtaining the desired result before the Adjustment Board, they have sought other solutions.

One of these was an action taken by the Jacksonville Terminal Company. A trainman named Kirkland collected a judgment for a permanent disability, then 17 months later demanded the restoration of his seniority rights and his job. As he was then claiming full recovery from his injuries, the railroad initiated a proceeding in the same court in which the earlier case had been tried, to seek a declaration by the court of the railroad's obligation and liability to re-employ Kirkland, in view of his evidence at the earlier trial. The court agreed that Kirkland need not be reinstated, citing the estoppel principles previously mentioned.

This has been regarded as a significant decision, as it represents the first case in which a declaratory judgment was sought by the carrier on the estoppel question.

The same procedure was later successfully followed by the New York Central in the case of Rials, a yard switchman.

On the Central of Georgia, Ezra Jones, a switchman, successfully prosecuted a claim for injury as a result of a service connected accident. His name was then removed from the roster. Two years after the trial, he sought reinstatement of his name on the roster, although he was not then able to work. His request was denied. A year later, after undergoing surgery, he attempted to actually resume work but was withheld from service. He submitted the matter to the Adjustment Board where he was more successful and a referee ordered his reinstatement. When the railroad refused to comply, Jones filed an action in Federal District Court seeking enforcement of the NRAB award. As the award included an allowance for back pay, it was considered a "money award," thus subject to a complete review by the court. The court, however, denied Jones' claim, stating that he had presented proof of the permanence of his injury in the original suit, that the substantial verdict was obviously intended to compensate him for the permanent or protracted loss of opportunity to work as a switchman and, having once recovered for this loss, it would be unconscionable for [illegible]

Diego and Arizona Eastern. This decision is well known to our Southern Pacific friends, and perhaps many of the rest of you are also familiar with it.

I must stress that Gunther is not an estoppel case. But the wording of the court's opinion in that case is such that we might be exposed concern in the future handling of estoppel matters. Gunther in 1971 was a 71-year old locomotive engineer who was removed that year from service on the basis of recommendation from the carrier's physician. The physician reported that due to Gunther's heart condition, he would likely suffer an acute coronary episode. Gunther obtained a contrary medical opinion and requested a three-doctor panel, which the carrier refused. The Adjustment Board to which the dispute was referred ordered a panel. This time the railroad complied. The panel was selected and the majority of the three reported Gunther as physically qualified to serve as an engineer. His claim for reinstatement and back pay was thus granted by the Board, but the carrier again refused to comply.

Gunther then brought an action in the Federal District Court to require enforcement of the Board's award. Following hearings, the District Court ruled that the Board's award was erroneous and refused to enforce it. Upon appeal by Gunther, the Circuit Court agreed with the District Court but, upon further appeal to the United States Supreme Court, they reversed, stating that the Adjustment Board has jurisdiction to decide the propriety of a discharge for physical disability, which is construed as a minor grievance or dispute under the labor contract. They also said that the Board has jurisdiction to appoint and follow the opinion of a three-doctor panel, a procedure commonly used in the railroad industry. In other words, the Supreme Court accepted as final the Adjustment Board's decision and sent the matter back to the District Court, but only for determination of the compensation to which Gunther was entitled.

Now this case, as I have said, is not an estoppel case. It is not in the true sense a discharge case as characterized by the Supreme Court. Gunther was not discharged. He was merely withdrawn from service due to his physical condition.

By its opinion, however, it might appear that the Supreme Court has conferred jurisdiction in all cases involving physical conditions solely to the Adjustment Board. How this would affect our right in the procedures of declaratory judgment in the courts is not yet clear. We may have an answer within the near future as there is a rather involved case presently pending before the Fifth Circuit Court of Appeals. This is the claim of one Hodges, an Atlantic Coastline employee, and although it previously involved decisions by both the Adjustment Board and the Federal District Court, it now rests be-

fore the Circuit Court solely on the issue of estoppel. We are anxiously awaiting that ruling and expect it will be handed down shortly.

It has been suggested that even if questions of physical disability must be resolved by the Adjustment Board, this could not be applied to estoppel cases, since the Board is empowered only to adjudicate disputes arising under the labor contract, and in estoppel cases the employee cannot invoke the contract agreement since, by his testimony in the trial court, he has acknowledged his physical inability to work in the future, thus no employment relationship exists.

This question, gentlemen, of estoppel will continue to be of prime concern to railroad claim, law and personnel departments. The legal problems must be studied thoroughly by those trained and experienced in this field, and also in light of their own company policies. There are many complicating factors and it is impossible for me to recommend procedures to be followed in future cases.

I would offer only one suggestion: As Chief Medical Officers of your respective companies, you are aware of the status of litigation involving employees. You know which cases go to trial. In those cases in which trial is conducted and in which a plaintiff employee subsequently reports to you or one of your subordinates for an examination required prior to resumption of service, I suggest that you immediately notify the head of your claim department and defer the examination until the matter has been thoroughly considered. By so doing, you would be acting in a manner which could not later prejudice the interests of your companies.

We appreciate that the estoppel question is important and interesting to most of you. And we will endeavor to keep you fully informed as to future developments in this field.

Thank you. (Applause.)

CHAIRMAN OLSON: Thank you, Mr. Risendal. I am sure there is a great deal of food for thought in his remarks. It occurs to me that a doctor could unwittingly examine a patient under these circumstances and it would seem then that he would compromise the position of the railroad. Is that correct?

MR. RISENDAL: We don't say that it is absolutely correct. It might be correct. This field is so involved and now is in such a chaotic state that I don't think we can lay down any ground rules at this particular moment.

I would merely suggest that in all of those cases, you get your

claim and law department interested and be certain they are notified before you take any action to conduct a physical examination of one of these employees. They will have to decide procedure in the light of their own policies.

CHAIRMAN OLSON: Does anyone wish to direct a question to Mr. Risendal?

DR. CLAYTON: I would like to make one comment. I know that you said that you referred your cases to the claim and legal department. And I also discuss our cases with them. But I first handle with our labor relations department, because I think that they are a little closer to this problem.

MR. RISENDAL: Doctor, I agree that ultimately the matter will be handled by your labor relations department in all probability. I suggest that the claim department be notified for this reason. The claim and law departments know what the testimony was at the trial. They then can consider whether or not this might be an estoppel proposition and can suggest whether or not the examination should be conducted or can then refer the matter to your labor relations department who will ultimately make the decision.

CHAIRMAN OLSON: Any further comment?

DR. MISHLER: Yes, I have one.

CHAIRMAN OLSON: Dr. Mishler.

DR. WILLIAM E. MISHLER (Erie-Lackawanna Railroad, Cleveland, Ohio): I think it is almost primary that the legal department in the case of a trial at the conclusion notifies the Chief Medical Officer the results and what was testified to.

MR. RISENDAL: Doctor, I think that is a good point well taken. We assume that this is done or should be done on every railroad properly.

Likewise, we would think that the claim and legal departments would probably notify the Chief Surgeon that if such and such an employee reported for a physical examination, the claim department should be notified and the examination should not be conducted until the matter is further considered. In other words, we must have this liaison between claim-law-medical departments and personnel departments, so each knows what the other is doing.

CHAIRMAN OLSON: I can't see who that is. Doctor.

MEMBER FROM THE FLOOR: I would like to ask a question about when the railroad doctor is called upon to testify in the trial and in all fairness states that the man can go back to work, and then the jury in their decision gives the man a large award on the basis that he can't go back to work. Then, as time goes by, this same employee is referred back to that doctor for a back to work examination. What position are you in then when you have already testified that the man can work?

MR. RISENDAL: Well, I would say that if you have testified at the trial that the man can work, and later, following conclusion of the trial, the man is referred to you for another examination, you would conduct the examination and report the matter as you found it at that time. You are already on record at one point in stating that the man can work.

Under the estoppel principle in these cases it is not what the company physician may have testified to or defendant's physician testified to at the trial. If the plaintiff alleges permanent disability, testimony is adduced on his behalf, his attorney argues this fact. He has taken a position. Theoretically he should not be permitted at a later date to take a contrary position. And this is just another area, Doctor, in which this whole question is up in the air at this moment. We hope that it will be clarified soon.

CHAIRMAN OLSON: John, I believe what the Doctor said is precisely the message you are trying to convey. At the time this plaintiff comes back to have the examination, before he examines him, he should notify the claims-law departments of his railroad because it is then a legal question, not a medical question.

MR. STRAUB: That is true. At that particular point, it is.

At that particular point and if, for example, the doctor conducted the examination, you may interfere with the estoppel principle because, by the mere fact that you examine the man, you have acknowledged there being an employment relationship, whereas, the legal position you are going to take subsequently is that the man's employment relationship ceased during trial when he testified that he could no longer do his work.

MEMBER FROM THE FLOOR: That is correct.

CHAIRMAN OLSON: So if you permit the man to be examined, you may be actually acknowledging the fact that there is employment relationship existing after the trial which is inconsistent with the position you are going to take in court.

MR. RISENDAL: Thank you. I did not understand just what the Doctor meant by the time the man reported for an examination. If after full consideration of this question, he was then ordered to make an examination of the man for the carrier to determine the man's ability to resume work at that time, of course, he would do so and report his findings.

MEMBER FROM THE FLOOR: This brings up a rather serious question, I think, of the company doctor who is the railroad surgeon actually participating and testifying in the trial. I think it is a very prudent thing to have good consultants whom you would have examine these men and testify at the trial, not just the treating doctor, but have an outside consultant go in and testify in court. It removes you from the position of stating your opinion and then having to stick with it later when the man comes back in your office.

MR. RISENDAL: I believe it will be found that in most cases the defendants will arrange for specific examinations by men with specialties in the area in which this man is claiming disability and the specialist will be called. However, it is also important in many cases to have the treating physician testify.

CHAIRMAN OLSON: Thank you, Mr. Risendal, thank you very much.

Our next subject on the program is the report by the Medical-Legal Committee, Dr. Isadore Kaplan, who is the Medical and Surgical Director of the Baltimore and Ohio Railroad, and by Dr. George E. Dimond, who is a consultant in Cardiology to the New York Central System. Dr. Kaplan is going to talk on matters which pertain to his area particularly, and Dr. Dimond will follow with the work that he was engaged in with Dr. Ralph Johnson in the cardiovascular study. I will turn the meeting over now to Dr. Kaplan, Chairman.

REPORT OF MEDICAL-LEGAL COMMITTEE

CHAIRMAN KAPLAN: We have been blessed with wonderful speakers, both lay and professional, and this morning we have with us an additional member of the medical profession. He is an internist, and very willingly, on short notice, prepared a paper which he is going to present to the group on the cardiovascular phase of medical-legal problems.

You will recall that approximately three years ago Dr. Ralph Johnson, now deceased, started this program. He obtained questionnaires from various railroads, processed them, but unfortunately at the time of his demise much of this material was carried with him. Some of the records were left behind. Mr. O'Connell of the New York Central [illegible]

and he, in turn, will very briefly acquaint you with some of this information.

The gentleman to whom I have been alluding is Dr. George Dimond, an Internist and Consulting Cardiologist for the New York Central System. He has written numerous publications and I would like to mention a few to you. One is "Prognosis of Men Returning to Work Following Recovery from the First Myocardial Infarction," published and circulated March 1961.

Another is the "Assessment of Functional Recovery of Men Surviving First Myocardial Infarction," American Heart Journal, 1963.

"Hypertension, Body Weight and Coronary Heart Disease," Archives of Internal Medicine, 1963.

So you see we have an expert who is trained not only in the cardiovascular field, but as it applies to railroad employees. This is really one of the shortcomings in many of our speakers in that they are not familiar with railroad medicine. Although the information has been culled from other railroads, is certainly applicable to our type of work. And now he will take approximately 15 minutes to discuss the compensation claims for coronary heart disease in the railroad industry. Dr. Dimond.

DR. GEORGE E. DIMOND (New York Central System, Dearborn, Michigan): Thank you, Dr. Kaplan, Dr. Olson. I appreciate the opportunity to be here.

This report is concerned with 97 compensation claims for coronary heart disease, with or without infarction, which were settled by member railroads during the years 1953 through 1963. These 97 cases are perhaps not the total for this period but are surely a representative sample.

All of the litigants were male employees of the railroads or their immediate survivors. In all, 59 of the episodes were the first clinically diagnosed manifestations of CHD, 23 were exacerbations of the disease in men with known old myocardial infarction or angina pectoris, and another 15 were the onset of CHD in men with known hypertension.

The episode was fatal within two months of its onset in 25 men, a mortality rate of 26 per cent. Only 18 of the 72 survivors eventually returned to full-time railroad work, a full rehabilitation rate of 25 per cent. Reports from the general population indicate that of [illegible]

return to work. It can be concluded that men who become involved in litigation are among a group least likely to be fully rehabilitated.

The age groups in which the alleged insults occurred are given in Table 1. The average age was 52. Of the 13 men age 40 or below, 9 had well verified acute infarction, one had a questionable contusion of the heart, and in 3 the diagnosis of CHD was quite doubtful. All of these 13 young men survived the acute episode by two months or more but one died 6 months later of recurrent infarction. Of the 25 fatalities, 6 occurred between ages 41-50, 14 between ages 51-60 and 5 in men over 60. In this study the mortality rate was highest in men during their fifties.

The occupations of these men are listed in Table 2. The types of employment from which these claims arose were diversified. Many came from classes of employment not usually subject to routine periodic medical examinations.

The types of alleged insults are shown in Table 3. The attorneys of 54 plaintiffs claimed unusual or mighty physical exertion as the precipitating factor. Review of these allegations indicated that in 46 men the exertion, although vigorous in many instances, was not more than these men encountered daily in the routine performance of their duties. The exertion of 8 men was extreme and unusual, and was expended in emergent situations or severely adverse weather conditions. An example is a man, age 44, who sustained an infarction the day after working on a derailment in a heavy snow storm.

Of the 18 men attributing CHD to general body injuries incurred at work, 5 were injured in train wrecks, 6 were falls, and 7 happened under a variety of circumstances. In all, 5 of these general injuries were considered major, consisting of single or multiple bone fractures; and another 13 were considered minor, consisting of single or multiple sprains, contusions, burns or abrasions. The types of alleged CHD were aggravation of pre-existing disease; the precipitation of angina or acute infarction off duty, usually many weeks or months after the original injury; or the discovery of non-specific ST-T changes in electrocardiograms taken after the injury.

Of the 9 men allegedly suffering blows to the chest, all of the injuries were considered minor, although two had uncomplicated rib fractures. Again the manifestations of CHD usually developed weeks or months after the injury.

The total cost for coronary heart claims during the decade of this study was $810,000. This figure includes 5 cases that were tried and found for the defendant. The range of settlement costs was from 0 to $40,000. The average cost per settlement was $9,131, Table 1.

The mode of settlement is known in 91 cases and is given in Table 5. Considering the usual legal fees, those few employees who chose to settle directly with the railroad companies fared about as well financially as did those who settled through attorneys.

Adventurous railroad lawyers, taking their cases to trial had half a chance of facing a high jury award and half a chance of winning their case.

The annual total cost, the range of costs, and the average cost per settlement is shown in Table 6. The table is based on 92 cases where the figures are available.

The annual incidence of 97 settled cases is charted in Figure 1, and the annual total cost in 92 claims in Figure 2. The mounting total costs in recent years is due to a progressive annual increase in the number of claims rather than greater expenditure per claim. However, reports received thus far of claims settled after 1963 indicate the cost per settlement is probably rapidly escalating. A jury decision on a claim in 1965 resulted in an award of almost $90,000.

The 97 claims were classified according to the clinical manifestations of CHD that precipitated the litigation, Table 7. Sudden death was defined as death occurring within 1 hour of onset of known symptoms. The acute myocardial infarctions were well documented by clinical and electrocardiographic evidence.

In the group designated as "angina or ?" 14 men had a rather clear symptomatology of angina but without ECG evidence of recent infarction. The other 10 men in this group were either free of chest pains or had vague chest distress, and the diagnosis of CHD was usually based on non-specific ST-T changes in the ECG, most often minor in degree. All of these 10 men had come under medical observation because of general body injuries or alleged blows to the chest at work. Not one of the 10 had previous ECG's for comparison with the record taken after injury.

Some of the characteristics of the differently classified groups are listed in Table 8 through Table 12. Of the 24 men sustaining acute infarction off duty, 12 had been off work many weeks or months because of injuries incurred at work. A few of these cases were settled largely on the basis of the original injury, but in most instances the heart attack became the major contention. The plaintiff's attorneys successfully argued that the discomforts following the original injury precipitated acute myocardial infarction many weeks or months later.

The group with angina pectoris only or questionable CHD is notable in that the men were about a decade older, all survived [illegible] months or more, and a goodly number returned to full-time railroad work. The question of myocardial contusion arose in 1 of these men. It is confounding that these men with the lesser or questionable manifestations of CHD did better financially than did the families of men who died suddenly.

Of the 9 autopsies performed, 5 revealed acute thrombosis and 1 severe coronary artery disease without recent thrombosis.

The clinical features of these 97 cases reflect rather closely CHD as it occurs in the general male population. The spectrum varies from sudden unexpected death to a group in which it is difficult to be positive that any disease exists. The possible exception in this study is the scant representation of men dying suddenly off duty. Reports from the general male population indicate a disturbing frequency of this disaster. It can be concluded that during the decade under observation this form of CHD was the least likely to lead to litigation.

The concept that acute clinical myocardial infarction can be induced by strong emotional upheaval, by almost any physical exertion or trauma, or by chronic anxiety is popular in this nation. This record is being played daily in the decisions of juries and Workmen's Compensation Boards. There is not scientific evidence to support this concept, but neither is there good evidence to refute it.

The incidence and prevalence of CHD in our people has been exhaustively authenticated. Of the young healthy males in our society, at least one in three can expect to develop some manifestation of CHD, usually acute infarction, before he is buried. With such a high rate of prevalence, it is probable that the relationship of trauma, emotion, and exertion to clinical myocardial infarction is coincidental rather than causal in almost all cases.

TABLE 1. Age at Time of Alleged Insult.

AGE	TOTALS
31 - 40	13
41 - 50	24
51 - 60	39
Over 60	21

TABLE 2. (Continued) Occupations of Claimants.

OCCUPATION	TOTALS	OCCUPATION	TOTALS
Non-operating employees - 62			
Section laborer	17	Crane operator	1
Carpenter	6	Pullman porter	1
Laborer	5	Dining car waiter	1
Machinist	5	Car repair man	1
Boilermaker	4	Car oiler	1
Car inspector	4	Welder	1
Electrician	3	Mail handler	1
Signalman	3	Janitor	1
Car cleaner	2	Stower	1
Baggage man	2	Pipe fitter	1
Truck driver	1		

OCCUPATION	TOTALS
Operating employees - 46	
Brakeman	16
Engineer	10
Conductor	7
Fireman	5
Switchman	2
Telegrapher	1
Tower man	1
Car hearder	1

TABLE 2. Occupations of Claimants.

TABLE 4. Settlement Costs for 92 Claims for CHD 1953-1963.
(Includes 5 tried and found for defendant)

COSTS	DOLLARS
Total cost	840,100
Range of costs	0 to 40,000
Average cost per settlement	9,131

TYPE	CLAIMS
Usual physical exertion	46
Trauma - non-chest	19
Noxious fumes	10
Trauma to chest	9
Unusual physical exertion	3
Nervous strain	1
Complication of surgery	1
Overtime hours	1

TABLE 3. Types of Alleged Insult.

TABLE 6. Annual Total, Range of, and Average Costs of 92 Settled Claims for CRD 1953-1963.

YEAR	NO. OF CLAIMS	TOTAL COST $	RANGE OF COSTS $	AVERAGE ANNUAL COSTS $
1953	0	0	0	0
1954	1	2,600	2,500	2,600
1955	4	41,000	0 - 17,000	10,250
1956	2	9,000	0 - 5,000	4,500
1957	12	75,000	2,000 - 20,000	6,200
1958	7	62,800	3,000 - 25,000	8,970
1959	9	103,700	0 - 25,000	11,520
1960	6	54,300	0 - 21,000	9,050
1961	17	195,180	450 - 36,900	11,480
1962	14	95,750	500 - 21,500	7,200
1963	20	153,100	0 - 40,000	7,650

TABLE 5. Mode of 91 Settlements and Relation to Average Cost of Settlement.

MODE OF SETTLEMENT	TOTALS	AVERAGE COST OF SETTLEMENT, DOLLARS
Settled through attorney	69	9,590
Tried - jury decision for plaintiff	5	20,950
Tried - jury decision for defendant	6	0
Direct settlement with adjuster	4	5,550
Settled during trial	3	7,350

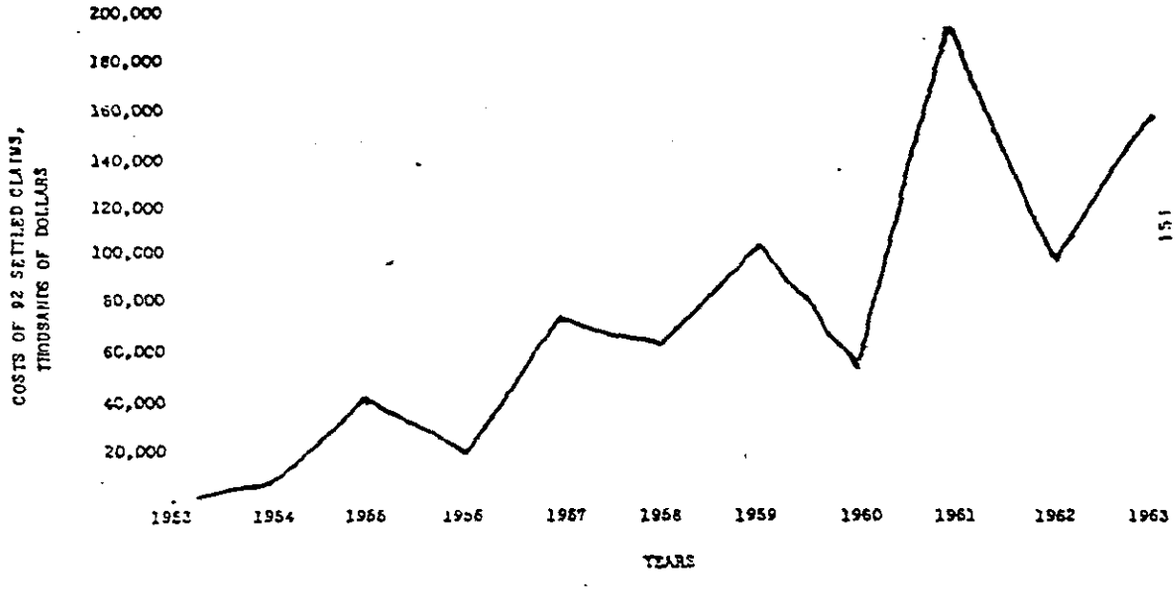

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FIGURE 6. Annual Total Cost of 92 Settled Claims for CBD 1953-1963.

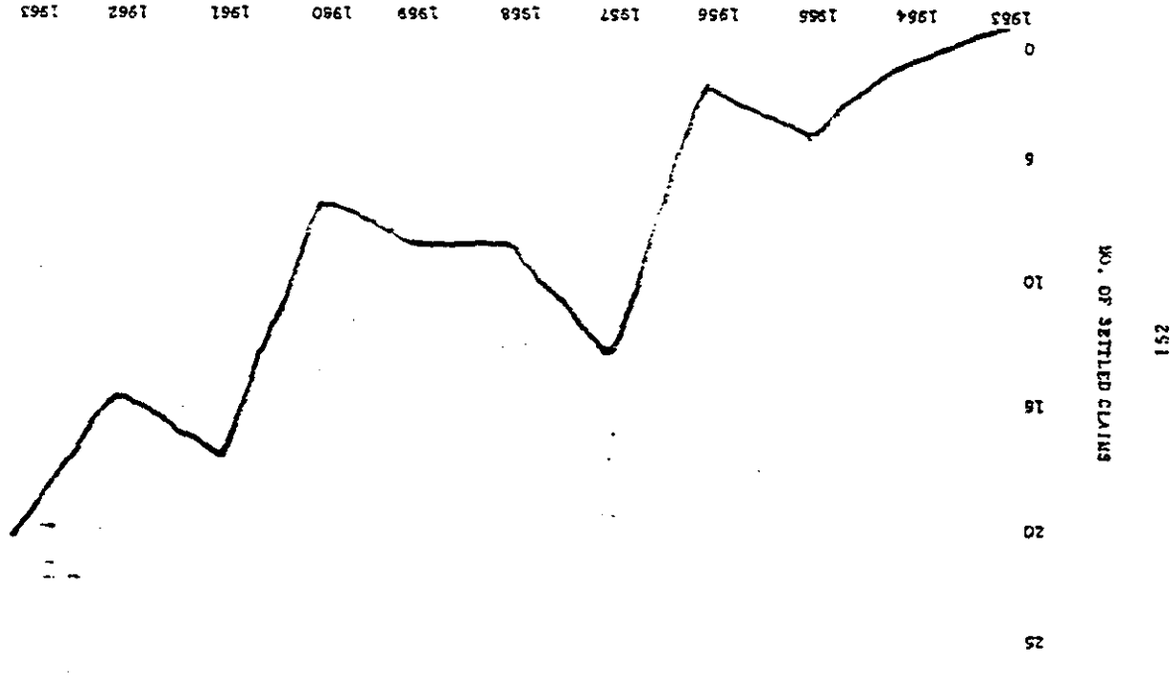

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FIGURE 7. Annual Incidence of 97 Settled Claims for CBD 1953-1963.

TABLE 8. Characteristics of 34 Cases of Acute M-I with Onset at Work.

CHARACTERISTIC	
(1) Average age	49
(2) Previous C-V history	
None	25
Angina	4
Old M-I	2
Hypertension	2
Diabetes	1
(3) Survived 2 months	29
Died	5
Autopsy	2
(4) Returned to service	3
(5) Average cost of settlement	$7,110

TABLE 7. Clinical Manifestations of CHD in 97 Selected Claims.

MANIFESTATIONS	NUMBER
Acute M-I -- onset at work	34
Acute M-I -- onset off duty	24
Angina or ?	24
Died suddenly at work	12
Died suddenly off duty	3

TABLE 1C. Characteristics of 24 Men with Angina Pectoris or Questionable CHD.

CHARACTERISTIC	
(1) Average age	60
(2) Previous C-V history	
None	10
Hypertension	6
Angina	6
Old M-I	4
(3) Survived 2 months	24
(4) Returned to service	10
(5) Average cost of settlement	$10,690
(6) Type of alleged CHD	
Angina	14
Non-specific ST-T changes	9
Elevated SGOT	1

TABLE 9. Characteristics of 24 Cases of Acute M-I with Cases Off Duty.

CHARACTERISTIC	
(1) Average age	52
(2) Previous C-V history	
None	16
Old M-I	3
Hypertension	3
Angina	2
(3) Survived 2 months	19
Died	5
Autopsy	2
(4) Returned to service	5
(5) Average cost of settlement (2 cases and found for defendant)	$12,250
(6) Time from last work to onset of infarction	
24 hours	4
24 hours to 1 week	5
1 week to 1 month	3
1 month to 1 year	3
Over 1 year	6

TABLE 12. Characteristics of 2 Men Dying Suddenly Off Duty.

CHARACTERISTIC	
(1) Average age	52
(2) Previous C-V history	
Old M-I	1
Hypertension and old M-I	1
(3) Autopsy	2
(4) Average cost of settlement	$8,000
(5) Time from last work to onset of symptoms	
4 hours	
12 hours	

TABLE 11. Characteristics of 14 Men Dying Suddenly at Work.

CHARACTERISTIC	
(1) Average age	49
(2) Previous C-V history	
None	7
Hypertension	5
Old M-I	1
(3) Autopsy	8
(4) Average cost of settlement	[illegible]

Thank you. (Applause.)

CHAIRMAN KAPLAN: Thank you, Dr. Dimond. And perhaps if you gentlemen have questions, we can hold them and Dr. Olson may give us a few moments in the morning session to catch up with them. By the coming season we anticipate exploring the cardiovascular phase of the railroad problem because, as time progresses, with State legislation becoming more and more cardiac-minded and certain States already classifying attacks of coronary thrombosis as being work induced, I anticipate that claims on railroads for such disabilities will continue to rise and may eventually approximate that of the low back problem.

We will now go to the low back problem and I wish to take this opportunity to thank all you gentlemen, both in the claims, legal and medical sections for the cooperation that you have given in allowing me to complete this study. Phase I of the study has been completed. We have a total of 445 bonafide cases. By saying this, I mean that almost 700 cases were screened originally, and we deliberately removed any case that had a stigma of not being a low back problem, with specific reference to the disc. This study only includes bonafide herniated disc cases confirmed by operation or suspected by medical diagnosis.

The low back strain and the fracture have been discarded. Even one case with a settlement of $175,000 was eliminated because it did not have the appearance of being a true disc case. So there has been no padding and the figures are honest. Each case has been set aside, is in the records of the AAR and can be examined.

The second phase of the study entails a questionnaire which you gentlemen have been issued for the control study. As you know, it is essential in all medical research to have factual data compared to control studies. We already have 445 cases of accidents produced on duty. Now we want to attempt to get a corresponding group of cases which have sustained their injuries off duty.

You all are familiar with these cases, they come across your desk, especially if you are a medical or a surgical director. We are interested because we are of the opinion that the time lapsing between date of injury and date of resumption of duty is much smaller in the non-duty injury group than the injury on-duty group. However, you need a statistical study to prove this assumption.

We are imposing on you once again with this simple questionnaire. There is no settlement involved and there are only perhaps four or five items that you have to locate. As an example, the nature of occurrence--very frequently they will injure their backs stooping

in front of the refrigerator, have a laminectomy or herniated disc removed and three or four months after date of occurrence will be anxious to resume. This is in contrast to injuries on duty where we get periods ranging anywhere from one, two, three and four years duration.

The nature of treatment, either conservative or surgical, is very simple. We also want to know the results of surgery and disposition.

It is realized that some railroads may be able to furnish us with as much as 30, 40 or 50 cases. Others may have access only to three or four. But we are very anxious to get the information, and if you can just send us a few cases, the larger railroads will be able to send their reports in voluminous numbers, and I am quite confident that once we get the four to five hundred cases of non-duty incurred low back problems that the information culled from it will be most revealing to us.

Also I have supplied you this morning with a piece of propaganda as to occupational classifications of these various injuries, which you can take with you. It is quite evident that our problems are centered around specific services, as in road and engine services you have 14 engineers, 14 locomotive firemen involved. In train service, 179 employees as brakemen, switchmen, yard conductors combined as a group. Freight and baggage, 15, which is not too great an amount, and a surprising thing, but two cases to stevedores or dock handlers. Some of the eastern railroads have quite a few stevedores and dock handlers. Patrolmen, five. Dining car, almost negligible.

The car service is rather interesting because we see that there are 42 carmen and 16 car inspectors or a combination of almost 60. This is contrary to the general belief that most of the problem is in the shop group area or crafts such as electricians or pipefitters and blacksmiths. Actually, the pipefitters, blacksmiths, welders as an entire group only have nine cases. So this would indicate that attention has to be directed toward furnishing some means of relief for the groups in the car services.

Stewards have but four cases, not significant. Track forces, as we would expect, were foremost with 51 representative cases. Most of them in the track labor or trackmen group, 42.

Signalmen had seven. And linemen, which are seen more on the Western railroads, had five. This is rather high for a limited occupation of communication services.

Bridge and building, 16. Eight carpenters, four laborers and

one miscellaneous.

The fourth group was the other departments [illegible] clerks six, crew caller, miscellaneous dispatcher and elevator operator, indicating that you do not have too much of a problem in other departments and that actually concentration has to be on your CT or operating department.

The 445 cases were divided into 328 surgical and 117 medical.

Sixty-four railroads participated and furnished anywhere from one to 70 cases. The majority of railroads furnished individual cases, whereas one railroad did furnish us 70 different cases. This was the highest, and the closest to it was 34. So this, of course, brings up a question as to why one railroad should have 70 and a similar railroad which is almost as large in number of employees should have 34. Perhaps geographic distribution near litigation centers might be the answer.

The total personal injury claims for 445 cases was $10,047,268. That is over $10 million for 445 cases, or an average of $22,566. This is an overall average because we have some cases with zero payment and we have others that go as high as $185,000. But this is a cross-section, mean study.

The study is continuing on and I have innumerable calculations giving the analysis of the medical cases as far as disposition, the same with the surgical, what happened to them, how many went back to the same occupation, how many resigned, how many did not resume, analysis of the type of surgery, the results of surgery, the surgical diagnoses, the total amounts paid through direct settlement, through litigation, through no payment or hung jury.

Occupational status has been thoroughly exploited as far as the disposition of the cases. And also as to mode of settlement and what happens to these various occupations as far as surgical operations are concerned, as far as their return to [illegible]. And within the next 30 days, all this information will be completed and once I can get the Phase 2 data (control studies) it is anticipated that the medical-legal committee as such, will be called to a meeting somewhere in the East to finalize this paper for presentation to the general claims division which will be held in New York in May of this year. I have information which was done on the computers of the B&O-C&O System, and any railroad can find out anything it wants about any of its individual cases if it just so advises me.

So, if any of you gentlemen would like to get individual information as to what it costs your railroad or how many cases you had in any given year, write me a note or you can address me on the way

to the vineyards and I will be glad to mail you the information once we have given it to our computers.

Thank you, Doctor. (Applause.)

CHAIRMAN OLSON: Thank you, gentlemen. Are there any comments?

MEMBER FROM THE FLOOR: I would just like to make the point that this Phase 2 questionnaire he is sending out ought to be sent to the doctors rather than to the claim department.

DR. KAPLAN: It has been sent to doctors exclusively. But some claim agents may know a few. We will be glad to get those also.

MEMBER FROM THE FLOOR: In a small town, in the small community, the claim agent knows more about the people than the attending physician, and many cases they know everything about their friends and co-workers and your doctor may be 400 miles away from the actual community, whereas your local claim agent can direct this information to the doctor and have it processed to us. So we are looking for all sources.

CHAIRMAN OLSON: Any other comments?

I am quite sure that we all agree that this represents a considerable effort in both departments, and that it will be of great value when the final results are tabulated. I want to thank both you and Dr. Dimond very much.

We are now ready to receive the report of the Tellers.

Dr. Winters, do you have that report, please?

DR. WINTERS: I do.

REPORT OF TELLERS

DR. WINTERS: The following men have been elected. In the Eastern territory, we voted for two, one for the three-year term expiring in 1969, elected Stanley J. Cyran, and one to fill the unexpired term of one year, W. E. Mishler.

In the Southern territory, vote for one, for three-year term expiring 1969, elected Southgate Leigh.

In the Western territory, vote for three, three-year terms, expiring 1969. Elected: V. M. Strange, W. J. Longeway and

Abbott Skinner.

CHAIRMAN OLSON: Thank you, Doctor, very much.

To you gentlemen, congratulations.

Because of the press of time, we will defer the meeting of the new Advisory Committee until 8:15 tom[illegible] and if you will all assemble as quickly as possible [illegible] the Montgomery Street side, we will, those of you who intend to go, embark for the train to the vineyards.

Thank you very much.

(Whereupon, at 11:50 a.m., the meeting was adjourned.)

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Friday Morning Session
February 25, 1966

The General Session of the Forty-Sixth Membership Meeting reconvened in the Comstock Room, Sheraton-Palace Hotel, San Francisco, California, at 9:00 o'clock a.m., Chairman Ernest C. Olson, presiding.

CHAIRMAN OLSON: Good morning, gentlemen. I trust everybody had a good day yesterday, such a delightful trip we had at the vineyards. Those of you who took it, I am sure will remember it a long time.

This morning, we have a little different kind of topic for discussion. It is going to be formally conducted by Dr. Winston and a group of some of you. But because of the nature of the subject, I hope that many of you will participate in the discussions. I think that it sort of crystallizes a lot of the ideas and thinking that have gone into the formal presentations that we have had and should make for a practical application of the information that we have received.

So, our topic this morning is "The Return to Work of Employees with or Following Major Disabilities." This will be followed by a discussion on sudden incapacitation, strength, stamina, agility, dexterity, and particular working conditions, adverse weather, derailments and other emergencies.

I might also say that this presentation is going to serve as a rehearsal for a meeting to be held in Chicago in April when the American Association of Railway Surgeons meets and this same group then will present this same subject.

I will now ask Dr. Winston to take charge of his portion of this meeting.

PANEL SYMPOSIUM - RETURN TO WORK OF EMPLOYEES WITH OR FOLLOWING MAJOR DISABILITIES

MODERATOR JOHN R. WINSTON: We have been speaking of this as being a rehearsal panel. Perhaps that is not exactly the correct word. What we have had in mind is to try to get the information to the local surgeon, the local surgeon who is attending the meeting of the American Association of Railway Surgeons at Chicago, Illinois in April, to try to get across to him some of the particular problems that concerns the Chief Medical Officer insofar as returning a person to work who has been incapacitated for some medical reason to work.

The people who have been selected to serve on this panel, more or less arbitrarily by some of us, will take the next three hours investigating certain areas of the medical field and be in a position to answer certain questions that you gentlemen, I hope in today's session, will present as questions that should be answered.

I am not certain that it is going to be my particular privilege to have Dr. Kaplan, Dr. McEwan, Dr. Mueller, Dr. Stack and Dr. Vaughan up here right now. What we want to know is, what is the biggest problem that you have with your local surgeon in the field of is this man able to return to his job?

Now, there are a lot of factors that have to be considered. Some of them have to do with the man's agility, strength, stamina, and of course that is determined by a lot of other things. And I think that perhaps Jim might give us a little bit of a synopsis of the various factors that he considers when he is measuring a person's ability to do the job. Could you do that, Jim?

DR. JAMES K. STACK (Chicago & North Western Railway, Chicago, Illinois): Gentlemen, we will start the ball rolling. John Winston made a statement a day or two ago to the effect that he would not employ someone who had a meniscectomy. Now, this is in my field. I am interested in the neuromuscular skeleton system. Other people on the program are interested in other systems.#

When you talk about the return to work of a person who has had a meniscectomy, then you have to divide this into many phases. Now I would hate to think that the 17-year old high school boy who tears a medial meniscus, a bucket handle tear, and has it removed, is unable to do what he wants to do for 25 or 30 years.

On the other hand, the man who is 50, and is showing wear and tear of his menisci, just as we show the wear and tear of our intervertebral discs, and tears that, then this is another story.

The youngster who has a torn meniscus and has an arthrotomy and his meniscus removed with or without the rim has a perfectly fine knee in every other respect. He has no chondromalacia of the articular surface of the patella, he has absolutely no changes in the articular surface of his medial femoral condyle. The medial collateral ligaments are intact.

Now the machinist age 50 who does a squat one day in your machine shop and can't get up, the knees lock, this is another story. He has a worn meniscus and it was just waiting to give way and it finally did. And it happened while on the job, instead of in his basement or in his yard or on the golf course or some place else.

Then he has the arthrotomy, you take out the torn portion of his meniscus, with or without the rim, and you find that he has considerable degenerative change on the medial femoral condyle and, as you feel the undersurface of the patella, he has considerable degenerative change there, chondromalacia of the patella. This is another story and this is equally true of the switchman or the brakeman in this particular age group. So I am not at all sure that we should turn down for employment a person with a scar on the medial or lateral aspect of the knee, or refuse to let him return to work as a lineman or a switchman, because it depends upon his motivation.

Now, I am going to continue with this subject, because it deals with the things we are talking about, strength, stamina, agility. We have people after an arthrotomy in the knee, the simplest kind of a thing, and it will be a week before they can raise their straight leg. And we have other people who will be operated on in the morning who will raise their straight leg in the afternoon, who will be walking that evening and who will go home the next day, after a meniscectomy. And I am not sure that I know the answer. I don't think this is all the fault of the patient.

I think this goes back to just like our polio people, there is an alienation between here and here (indicating), they lose the hookup between the quadriceps and their, whatever motivates the quadriceps here in the head. Until you can set your quadriceps, you can't walk safely because it means that if you inadvertently bear weight on the bent knee your knee is going to buckle and down you go.

So we use, as an indication of when we permit a person to return to walking, the ability to raise the straight leg and set the quadriceps.

Now, the other thing that I would like to bring up is the matter of the forearm. Again, this refers particularly to agility and dexterity. Many parts of the skeletal system are expendable, the outer aspect of the clavicle is expendable. Many, great amounts of the fibula are expendable. The upper end of the radius is expendable and also the lower end of the ulna is expendable.

The ulna at the elbow is concerned with matters of strength, and if you have an intact ulna, then you can get along very well without the head of the radius.

On the other hand, at the wrist end, the radius is concerned with matters of dexterity, and unless you have a good supination and pronation, you just simply can't have a dexterous hand.

Now, you can have a dexterous hand [illegible] inch, up to say the middle of the pronator quadratus, [illegible] stabilize the lower end of the ulna, you can do very well. And so this is important to people who must be dexterous [illegible] have to hang onto box cars and people who [illegible] at the elbow and must have dexterity at the [illegible] things that I had in mind just to start this thing [illegible]

CHAIRMAN OLSON: What about a man's weight

DR. STACK: Now if I have any trouble on the [illegible] way, it is about obesity. Now what is obesity, [illegible] measured, who has a small frame, who has a medium frame, who has a large frame?

Perhaps the best measurement of obesity is not the matter of weight, it is the matter of the triceps fold of skin, or the fold of skin here over the latissimus dorsi. But there is no question but what people who are fat just do not do well following injury and they don't do well following surgery. They usually are more prone to accident than the thin fellow who is in shape and handles himself well and we have I must say a good deal of difficulty.

The engineer is five feet eleven, he is 42 years old and he weighs 217 pounds. There is a minor collision of some kind and he falls off the stool on which he is sitting and hurts his back. Four months later he still isn't working because his back hurts. You have told him one week after the accident that he, as a matter of treatment, simply has to take weight off because the less his back has to carry the better he is going to be and the sooner he is going to get well, and he doesn't do it.

Finally, three months later you take him out of service on the basis of obesity, and then your troubles begin. The low back, the degenerative changes on the medial surface of the knee, the ankle, the bunion, all of this. We see these things in people who are overweight and we don't see them necessarily to the same degree in people who are not overweight.

So, I will be glad to hear what the others have to say on this same subject.

MODERATOR WINSTON: The purpose again of this group appearing before the local surgeons groups is to answer questions that you want answered. Dr. Clayton, what particular medical problem would you like to have the panel tell the local surgeons, what is the one that causes you most trouble, either the local surgeon puts the man back to work when you think he shouldn't, or else he doesn't let him go

to work when you think he should. What medical problem could we discuss? I will ask others the same, and I would like others to be thinking of the same question.

DR. CLAYTON: One of the most disturbing problems which confronts us in the Southern Railway is rehabilitation, i.e., getting back to work the personal injury case who resists returning to duty yet does not have valid disability.

It is very difficult and trying to get adequate and understanding physical eye and ear examinations of applicants and employees.

I have tried to simplify and help in the solution of our problems by preparing a Manual of Information of the Medical Department which is distributed to all of our staff members and to department heads. This has been and is a great help.

MODERATOR WINSTON: How about yours, Vence.

DR. HOLLO: Our basic, most serious problem I believe, is still a subject which I have brought up many many times, is our local people or internists see a postcoronary and after this patient has stabilized then we get a letter that this man has made satisfactory recovery, that he may resume work in the occupation which he has carried out previously. And after seeing this report, then I write the local physician and ask him whether they did an exercise tolerance test.

Well, the doctor will write back that he does not think that it would be safe to do so. However, he still expressed the opinion that this man may return to work. Of course, our issue is carried a little further and we state that our policy is that we will not return the man to work until such time that this man had a definite work tolerance test performed, and also he has had a negative master test.

MODERATOR WINSTON: I gather that each of you gentlemen are having just the same trouble that I have, the No. 1 problem has to do with the cardiovascular disease and the greatest one of those has to do with coronary artery disease, and secondly, has to do with deficiency in the blood supply to the brain and inadequate brain function. So, if we can answer some questions that are pointed toward explaining to the local surgeon why this man is not permitted to go back to a certain job and why we might let him go back to another one, it might be worthwhile.

Any other comments? Vance.

DR. STRANGE: We have actually taken this responsibility away from our local physician. There are often so many factors in a

situation that he is placed in a rather awkward situation sometimes. Perhaps he belongs to the same church, same organizations. It may be that he is delivering the man's wife at this time. For many years we have had a definite rule that these people have to come back to us and clear through our own office. This has worked very well.

I would say that before we instituted that system we discovered that one man had been "lost" for two years in the northern part of the state and had been collecting compensation, with the local doctor for extending his leave. Under our present system we feel we have good control, and I would be much averse to turning the decision over to the local doctor. Even in a city the size of Tucson it becomes a problem at times, and we feel that if we can bring the employees in and have the decisions centralized, we are better off.

MODERATOR WINSTON: I hope that we do not conduct this panel in such a manner that we will have a local surgeon feel that he has the sum total responsibility for this man's return to work. It is hoped that it will be presented in such a manner that we can explain to the local surgeon why the Chief Medical Officer makes certain decisions. Yes, Dr. Winters.

DR. WINTERS: It is a problem, a problem not only from disease itself, but it goes back again to its effect on the blood vessel, particularly the coronaries and the peripheral vascular regulations in the extremities. Again you have a man that, I say it is like examining a car in a garage. A car needs road testing and it is just extremely difficult in examining a man in the office to tell what he is going to do when he gets back to work.

The problem of course of insulin also arises, but particularly the coronary, insulin shot. We don't see so much of that, we don't bother so much with, it seems most people are taking pills now. But to me the peripheral vascular disease of the extremities, where an engineer sits and it interferes with the circulation of his legs or he bumps his leg and develops gangrene, these are my problems.

MODERATOR WINSTON: Those are the problems that you would like to have this panel tell the local surgeon about.

The information we are kicking around here today is not for our enlightenment, I might add. It is, we are trying to find out what questions you people want answered before the body of local surgeons.

DR. WINTERS: I am in a peculiar position because I am not only the Chief Surgeon, I am the local surgeon. I examine all these people myself. I think that so many of these things fall into a gray area, they aren't black and they aren't white, but it is extremely difficult

to take a piece of paper with the answers and the date on it and come to a conclusion about it. I am sorry I can't help you. I have these problems and I try to solve them myself.

MODERATOR WINSTON: What is your biggest problem, Bill, Dr. Mishler, what would you like to tell the local surgeons?

DR. MISHLER: I agree with Dr. Strange that there is only one man responsible, and that is the Chief Surgeon. The local surgeon can't make these decisions, and shouldn't, because then you are going to have 700 Chief Surgeons.

The Chief Surgeon, I think, has an advantage. First of all, he can establish uniform standards that he is going to apply to all locales on his railroad, to all different people. And he is not going to vary because of one circumstance or another.

Secondly, the Chief Surgeon has an advantage over any other doctor on the railroad because he is getting a second look at the situation. The man who stumbles and causes his accident could well be a multiple sclerosis if you just had a little longer time to look at it. We had such a case here recently of an excellent man who is taking care of an engineer who fell off of a stool who did not even break a rib, but his disability was a little prolonged. And, in spite of initial negative X-rays, we had X-rays repeated at the end of three weeks and then he had a pleural effusion. We had that looked into and it was inoperable carcinoma.

Now that I think is a major disability, but I think I had an advantage over the local man. He was blinded by the fact that he thought the fellow was malingering a little bit.

There is one last thing that I think should be emphasized to these, well to us and to the local surgeons. You always have the man who is a fine individual, invariably with nine or ten children, management loves him because he is cooperative and he is willing to settle with the claim department, and you are tempted and you are also pressurized to make an exception for this man, to put him back in his occupation which you know he shouldn't be back into. That is a very hard situation for a Chief Surgeon to resist, but if you don't resist it and if you do give in, you are in trouble the rest of your life with management and labor. That is a situation I think that has to be examined.

MODERATOR WINSTON: I hope that can be brought out.

How about you, Dr. Kaplan, what causes you the most problems?

DR. KAPLAN: Probably the biggest problem is medical-legal aspects of this situation, because, first of all, the problem is compounded at its original source when the employee presents a return-to-duty notice from his family physician. In many cases, this may be a bonafide statement. In other cases, it is not worth the paper it is written on. However, it is presented to management and management invariably will refer the employee to the company surgeon and the company surgeon will, in turn, issue a return-to-duty notice authorizing the employee to go back to work. Then, it ultimately gets to the Chief Surgeon or the Chief Medical Examiner and he disagrees.

It is a very fine procedure to follow and automatically say that this employee cannot resume duty. However, from a medical-legal standpoint, it is not that simple. The labor relations department will probably get a claim from either the craft or the committee's representative for all time lost, and it will be very difficult for the labor relations department to deny this claim because he has been authorized by two persons, by his own physician, and by his attending company surgeon who is a legal representative of the company, to return to work. Therefore, you have two statements against one.

If the Chief Surgeon remains adamant in his statement that the man cannot resume duty, then you are going to ultimately enter into a three-panel-doctor discussion or, if you eventually get together and locate a position for this employee that is satisfactory to all concerned, the labor relations is going to pay him for the time lost because you have already committed yourself.

This doesn't necessarily hold true in all cases, but I know on our railroad we cannot keep an employee out of service just on the hypothetical assumption that he might get hurt or he might have a coronary attack. The NRAB has repeatedly denied such claims. You must show actual pathology. It has to be present in order for them to substantiate a claim that this man is not able to go back to work.

One of our biggest problems, is the short interval where a man may lose a week or ten days in which we are deciding whether we are going to permit him to resume duty. Many surgeons do not realize that the company is paying three or four, five days on some claims just to get the employee back to work without having a large claim presented.

MODERATOR WINSTON: Would the medical release the doctor furnishes you, could you expand on that a bit?

DR. KAPLAN: You mean the family doctor?

MODERATOR WINSTON: Yes. You said in other instances they are not too valuable. How could they be made more valuable?

DR. KAPLAN: If the family physician or the company surgeon could be better indoctrinated in the functions and actual work of a railroad worker. For example, a brakeman or trainman, in some railroads may have as high as 10 or 15 different various functions to perform during an eight-hour day. On some railroads a brakeman can work as an operator in a tower (towerman) since all they do is push buttons. Even though the man may be partially disabled as with an amputation, he can still get into the tower, push the buttons and operate the car retarders.

You have hump operators where the assignments are not too great. There are also bleeders where the employee just stands on the side of the road and bleeds the car occasionally. There is not too much responsibility attached to it.

In some railroads, switchmen perhaps throw only two or three switches a day, and certainly you can take a little gamble on an injured employee or one who has had a coronary. Suppose, as Dr. Winters says, you have someone with peripheral vascular disease who is working on the Buffalo District. He has just had a sympathectomy and his circulation has improved a little but you know if he gets out in the cold and doubles, works 12, 14, 20 hours a day in the extreme, bitter cold snow and ice, that he is going to get in trouble again. Yet, if your company surgeon would be alerted to this and would at least advise the employee to wait until springtime before he considers going back to work, this would be a tremendous help to the Chief Medical Examiner.

MODERATOR WINSTON: You feel that if the company's surgeon would give you a more accurate and fuller medical report that you would be in a much better position to make a judgment about the propriety of returning a man to work?

DR. KAPLAN: Yes, I agree with Dr. Strange, that if this thing would be centralized and if you could limit your return-to-duty notices to, well, as we do, to the full-time medical examiner, who is familiar with all our assignments, that the railroads would have less problems than when delegated to four or five or six hundred company surgeons over the system.

MODERATOR WINSTON: Dr. McEwan.

DR. MCEWAN: We have a policy if a man is off sick 60 days or more for any cause, he has to submit to a regular company physical before he returns to work. These are all reviewed by the Chief

Surgeon before the fellow is allowed to go to work. So, the decision is not by the local surgeon, even though he does the examination.

MODERATOR WINSTON: What problem do you have with your local surgeons that you would like to have them have a better understanding?

DR. MCEWAN: I am like Dr. Kaplan, everywhere. But our local surgeons vary pretty widely in their competency. We have one man who is coroner of his county. He is the city physician, he is the physician for the boxing commission, attending staff in all the hospitals and this man's word I would take for anything.

We have some local surgeons who are practically without judgment when a man should return to work. This I have gotten to know over a period of a few years by the type of report they send me.

MODERATOR WINSTON: What is your biggest problem, Dr. Skinner?

DR. SKINNER: I think I can reflect appreciation and agreement with almost everything that has been said here this morning. Briefly, I am glad Dr. Stack mentioned obesity. If you can only catch those kids when they apply. Most of the jobs are not terribly strenuous nowadays, and if they come to us with say 20 per cent over the so-called standard at the age 21 or 22, very well, by the time they are 35 or 45, they are going to start getting a problem. You can't do much about those who are already employees. There are a good many comments about the Chief Surgeon and decisions. I think you all agree that one of the jobs of the Chief Surgeon is to be the fall guy, the personality is out of it. He doesn't play golf with them, he isn't at the same church. So that is the responsibility of the Chief Surgeon.

If you are talking about how are you going to approach the local surgeon next month in a meeting, we have got to be careful to show this fellow that he isn't doing everything all wrong. One of our problems is stimulating their loyalties. They are busy practitioners in their towns and I think we have to encourage as well as point out their problems.

The thing I would like to have them do much more about than they do, this applies to the routine examinations as much as return to work, is just put on one sentence alongside your form that can clarify so many things. "This fellow has a medical problem but he is under the care of a competent physician." Or, "I talked with his doctor whom I know and he says the fellow is okay to go to work."

Don't put down "hernia." It may be an umbilical hernia that he

had at the age of two and it is that big. But as it comes across the Chief Surgeon's desk and all he sees is "hernia."

So, I encourage them to look at it the way we do, as a blank piece of paper, we are not looking at the individual, and two sentences added to the routine form will solve many of our problems.

MODERATOR WINSTON: Dr. Hammatt.

DR. HAMMATT: I find that there is no problem involved with the local surgeons in regard to their returning to duty, all on duty injuries. An individual will not go back to work if he has had a back operation or any on duty injury in a normal convalescence period for his particular illness or injury.

I have circularized all my local surgeons if the employee may have or has had diabetes, cataract extraction, strokes, cerebral thrombosis, heart attacks or any serious injury which requires them to be off duty more than 6 months, that they must be examined before they return to duty and the results referred to this office for final approval of their return to duty.

But so many of the local surgeons will put the circular in the vertical file, and I have to recircularize them every couple of years because they forget all about the fact that they can't put a heart attack back to work without my approval.

MODERATOR WINSTON: Would it help them if they knew why you don't want that done? Would it help your local surgeon to know why?

DR. HAMMATT: I have talked to many of my local examiners and surgeons personally and have explained the circumstances basically on account of the Federal Liability Act. I have tried to explain to the examiners that we have had bad luck in the past by putting so many of these employees back to work with just their own personal physicians statement that "they are satisfactory to be returned to duty." The statement of the employees own personal physician is usually controlled by the individual himself, who is the patient. I have received reports from the employees physician reporting that they should be off at least another 1 - 2 months and the following week I may receive a report from the same physician stating they are perfectly capable of returning to work at that time. I have talked to these patients and they advised me that they had their own personal physician make that statement because they felt in their own mind that they could return to work. It was not the opinion of their own personal physician, but it was their own opinion that they wanted to return to work.

we have solved them is through a meeting of our local surgeons every year. We have a breakfast meeting of all of the examining surgeons and we go over these problems at that meeting. To stay on the list of examining surgeons, these local surgeons have to attend one of these breakfasts every three years. So they understand the problems that we have, these little things come up about getting a letter from the doctor before they examine them and, as was brought out here the other day on our estoppel case, a man will go on, he will be given a slip to be re-examined to go back to work, and he has collected a big chunk of money from the railroad. That has come up two or three times with us. Fortunately, they have gone to a local surgeon who realized the problem from our little breakfast meetings, and they refused to examine him until they got permission from our office or from the claim department. So this coordination is very good and I think this program, Dr. Winston, that you are going to put on in Chicago is very helpful.

MODERATOR WINSTON: Dr. Nelson.

DR. NELSON: One understanding that we have with our local surgeons is that in a case of a serious condition, such as a coronary or disc operation, they are not to commit themselves as to the employee's ability to return to work. That decision is to be made in Minneapolis.

If this is not done, occasionally the local surgeon will return an employee to work and then a week or ten days later when we get all the information we have to pull him out of service. Such delayed action on our part understandably creates all sorts of trouble as well as a psychological impact on the employee.

MODERATOR WINSTON: One more, then we will close. Dr. Olson, do you have a particular subject that you might ask us to explain to the local surgeons?

DR. OLSON: Well, the expression was made that it would be good to have full-time medical examiners taking care of all the railroad people. I agree. I think this would be mighty fine, but I think economically it would be almost impossible.

On our railroad, we find that it is not easy to get part-time examiners. So that the big problem is to inform these men who give a very small part of their practice to the railroad work. For that reason, all of the subjects and many more perhaps that have been brought up today need to be discussed thoroughly. It seems to me that if there could be some reasonable unanimity of opinion about subjects like diabetes, its severity, the degree of medication that is required, and correlation between the disease and the occupation

that the man has, we would avoid much difficulty.

Also, some expression about the various categories of work that would permit a man with a coronary occlusion to return to work. We see many expressions that work is a good thing and undoubtedly it is, but I think that there are many men who feel that you cannot be too liberal in your thinking about how severe the effort is to be allowed to the man who has had a coronary. There are others who feel that you can do almost anything. I can recall the article in the Wall Street Journal where a man who had suffered what was said to be a severe coronary occlusion was permitted to ride on the hoist that was taking beams up to the top of the building. I think it is rank foolishness to do a thing like this. I think that if we could give some kind of a unified expression on problems of that sort, it might make it easier for the local man to arrive at a decision about what to do with the patient.

MODERATOR WINSTON: Harvey.

DR. NELSON: A common problem for us is that often the local surgeon will merely send a note to the effect that an employee is now able to return to work. The local surgeon should be instructed to give enough information regarding a disability to enable the Chief Surgeon to arrive at a decision. Neuropsychiatric cases for example almost invariably are "cured." Yet it seems difficult to obtain information regarding the diagnosis and treatment.

MODERATOR WINSTON: I am not certain that I was able to get my thinking across that this proposed panel is for the enlightenment of the local surgeon and not for our own enlightenment. I am not certain that we really found out the main problems that we should tell the local surgeon. Dr. Vaughan tells me that he will not be able to serve because of a conflict with another meeting, so it will be necessary to appoint someone to fill his place.

In the next few weeks, if you have other questions that you feel would be well worth discussing before the AAIT's group, I would be very much obliged if you would write me a note about them.

I believe our time has run over, Mr. Chairman, excuse me.

CHAIRMAN OLSON: Well, I am sure you all enjoyed this discussion. Certainly it gave you a good opportunity to state your positions.

We will now take a short break and will resume with a report by the Committee on Trauma.

(Short recess.)

MODERATOR WINSTON: How about you, Dr. Vaughan?

DR. VAUGHAN: Yes. Well our problem in Canada is a little bit different. Of course we have problems as you have been talking about with the local doctor making a decision that the man can go back to work and then we have to rescind that decision.

We don't have similar medical-legal problems; the decision of the Chief Surgeon or his deputy is final. There is no [illegible] doctor panel, no FELA liability in Canada. So we are in a fortunate position that way.

However, we have to be very careful about the decisions we make because we are in a powerful position and we want to remain there. As was brought out here today, I think the job of the Chief Surgeon, one of his chief jobs, is to make these decisions. That is what he is there for. And, in order to make the decisions, of course he has to have a good knowledge of the railroad operations, the job that the man is going into or working at. And also, of course, he has to have a good knowledge of medicine.

Now it was stated I think by Mr. Jaekle two or three days ago, that railroad operation procedures have changed a great deal in the last 15 years. Certainly in my own railroad they have changed tremendously. We have few local freight trains. Most of our traffic now is fast intercity passenger traffic and through fast freight trains. Many of our procedures have become automated. The brakeman don't do the same type of work that they did 15 years ago, and that applies to many other occupations, too. So that as Dr. Kaplan was saying, we can often return a brakeman to brakeman's duties after a coronary, for instance, or other serious illness or injury.

With centralized traffic control and other automated procedures, radio-telephone, et cetera, there is lessened hazard in allowing a brakeman to return to duty after recovery from a serious condition.

I don't know whether I have anything else to offer on this particular subject. I will wait until I hear some other views.

MODERATOR WINSTON: Dr. Cyran.

DR. CYRAN: We have similar problems on our railroad. The adequacy of the medical evaluation by what we call the contract medical officer leaves a lot to be desired in some cases. I can think of two recent examples. One was a contract medical officer returning a trainman to duty with evidence of peripheral vascular disease with the remarks "Not to do any climbing or excessive walking." This was impractical. How could he be a brakeman without doing that? We are fortunate, however, in that we review all the return-

to-duties, in our divisional, regional or medical director's office. We can nullify any of the return-to-duties, bring the man to any of our full-time offices for examination, for further evaluation.

One of the problems I think that has been mentioned is how to get these men in some cases to leave the final decision to the local, divisional or regional medical office on our railroad. They tell the employees a little too much. They will say, "Well, in my opinion, you can go back to work, as far as I am concerned there is nothing wrong." But they really don't have the knowledge of the operation. They don't know the problems that exist, and there is where we get into trouble, when the local contract medical officer will say, "Yes, you can go back to work as far as I am concerned," many times without an adequate examination and many times only because the family physician has released the employee for work.

Fortunately, on our railroad, employees are examined only after having been off more than six days, and they can be sent in even after one day's absence by the employing officer.

MODERATOR WINSTON: Dr. Leigh.

DR. LEIGH: Dr. Winston, this time claim thing is one that has been bothering us recently. A man will go into the local surgeon, he has had a hernia repaired three weeks before. The local surgeon feels that three weeks is too short a time for him to return to throwing switches in the yard. So, he leaves it to my decision. By the time it comes to my desk, why, it is about six weeks, so I say it is all right for him to go back to work. Then he wants three weeks' pay that he has been held off.

Now one of the things that we ask the supervisors before they give them the slip to go to the local surgeon is to get a letter from the doctor who has actually treated him for his hernia, for his coronary, or whatever his trouble might be, and that usually accompanies the examination.

Now when I see something of that kind, I ask the local surgeon when he is leaving it up to my decision to state definitely how he feels, whether he is ready to go back to work after his hernia operation in three weeks or whether he should wait another three weeks. Lots of times they will not do it. So then when I get it on my desk, I put a definite time on it, "This man will be all right to go back to work on such and such a date." Then the personnel department will not get that time claim. But it is a coordinate operation between the local surgeon and our office.

There are several other problems that we have. The way that

we have solved them is through a meeting of our local surgeons every year. We have a breakfast meeting of all of the examining surgeons and we go over these problems at that meeting. To stay on the list of examining surgeons, these local surgeons have to attend one of these breakfasts every three years. So they understand the problems that we have, these little things come up about getting a letter from the doctor before they examine them and, as was brought out here the other day on our estopped case, a man will go in, he will be given a slip to be re-examined to go back to work, and he has collected a big chunk of money from the railroad. That has come up two or three times with us. Fortunately, they have gone to a local surgeon who realized the problem from our little breakfast meetings, and they refused to examine him until they got permission from our office or from the claim department. So this coordination is very good and I think this program, Dr. Winston, that you are going to put on in Chicago is very helpful.

MODERATOR WINSTON: Dr. Nelson.

DR. NELSON: One understanding that we have with our local surgeons is that in a case of a serious condition, such as a coronary or disc operation, they are not to commit themselves as to the employee's ability to return to work. That decision is to be made in Minneapolis.

If this is not done, occasionally the local surgeon will return an employee to work and then a week or ten days later when we get all the information we have to pull him out of service. Such delayed action on our part understandably creates all sorts of trouble as well as a psychological impact on the employee.

MODERATOR WINSTON: One more, then we will close. Dr. Olson, do you have a particular subject that you might ask us to explain to the local surgeons?

DR. OLSON: Well, the expression was made that it would be good to have full-time medical examiners taking care of all the railroad people. I agree. I think this would be mighty fine, but I think economically it would be almost impossible.

On our railroad, we find that it is not easy to get part-time examiners. So that the big problem is to inform these men who give a very small part of their practice to the railroad work. For that reason, all of the subjects and many more perhaps that have been brought up today need to be discussed thoroughly. It occurs to me that if there could be some reasonable unanimity of opinion about subjects like diabetes, its severity, the degree of medication that is required, and correlation between the disease and the occupation

that the man has, we would avoid much difficulty.

Also, some expression about the various categories of work that would permit a man with a coronary occlusion to return to work. We see many expressions that work is a good thing and undoubtedly it is, but I think that there are many men who feel that you cannot be too liberal in your thinking about how severe the effort is to be allowed in the man who has had a coronary. There are others who feel that you can do almost anything. I can recall the article in the Wall Street Journal where a man who had suffered what was said to be a severe coronary occlusion was permitted to ride on the hoist that was taking beams up to the top of the building. I think it is rank foolishness to do a thing like this. I think that if we could give some kind of a unified expression on problems of that sort, it might make it easier for the local man to arrive at a decision about what to do with the patient.

MODERATOR WINSTON: Harvey.

DR. NELSON: A common problem for us is that often the local surgeon will merely send a note to the effect that an employee is now able to return to work. The local surgeon should be instructed to give enough information regarding a disability to enable the Chief Surgeon to arrive at a decision. Neuropsychiatric cases for example almost invariably are "cured." Yet it seems difficult to obtain information regarding the diagnosis and treatment.

MODERATOR WINSTON: I am not certain that I was able to get my thinking across that this proposed panel is for the enlightenment of the local surgeon and not for our own enlightenment. I am not certain that we really found out the main problems that we should tell the local surgeon. Dr. Vaughan tells me that he will not be able to serve because of a conflict with another meeting, so it will be necessary to appoint someone to fill his place.

In the next few weeks, if you have other questions that you feel would be well worth discussing before the AAIT's group, I would be very much obliged if you would write me a note about them.

I believe our time has run over, Mr. Chairman, excuse me.

CHAIRMAN OLSON: Well, I am sure you all enjoyed this discussion. Certainly it gave you a good opportunity to state your positions.

We will now take a short break and will resume with a report by the Committee on Trauma.

(Short recess.)

CHAIRMAN OLSON: Our first item is the report of the Committee on Trauma, Dr. Southgate Leigh, Chairman.

REPORT OF COMMITTEE ON TRAUMA

DR. SOUTHGATE LEIGH, JR.: Thank you, Mr. Olson. We started to have a panel up here this morning, but we figured that we could give you a report. We have four subjects that we have covered and talked about. The first one is cancer. We can't find any cases of trauma as a cause of cancer. Only thing we can say is that the Plaintiff's Attorneys are still going to try to see what trauma can cause it.

The second one is tetanus. We are urging the immunization against tetanus as far as possible with the Board.

The third subject is the eighth nerve damage from noise. We will get into that in a minute.

And the fourth one is iatrogenic or medicinal trauma, the amount of injury we are getting from medication. In regard to this I talked with Mr. Sherman in Chicago. He has reviewed a few cases. He has found that these mental tattoee type of accidents usually occur within 24 or 36 hours after the man has been off from work. We have asked him if he would make a trial study of some of these cases and find out how many of them actually are occurring. In the services he went through, of this type of case, close to 80 per cent of them occurred within 36 hours after the man had been off from work. Whether that is alcohol, whether that is the Anacin, Standbac, BC, or whether it is our Miltown tranquilizing group, I don't know.

I had the opportunity the other day of talking with some of my friends up there at NIH in Washington. They have been playing around with these tranquilizers. These drugs work on the thalamus, your reflex center of the mid-brain, not the reflex that goes into your spinal cord and back out, but the automatic reflex where you take your foot and stick it on the brake when someone comes out ahead of you before you really see him, or the reflex where you take your hand off a hot stove before you feel it burn. That type of reflex is severely curtailed with the use of these drugs.

I notice that on the autobahns, in Germany they have not allowed anyone to drive who is taking even Miltown. Of course they, the germans, have a different name for it.

I think that we can come up with some very definite information along the line of this damage, the lack of reflex type of thing. And I hope that Mr. Sherman in Chicago can give us some information on it.

If nothing else, we can talk with our supervisors. I have done it on my railroad. They have been checking on these men, especially on Monday morning or after a big weekend. They get into the brakemen's shanties, they get into the different places, and a large number of them are cramming some form of pill down their throat. They are trying their best to curtail that as much as possible.

You know, on television now most of the female attraction shows have something to do with doing something to your head or face or something of that kind. The one that appeals to the men is "pain, pain, pain." Or you come home raising hell and you take two Anacins and everything is lovely. It is not as fine as it is cracked up to be.

Now to get to the eighth nerve damage, we have had two sessions on it. We have had a very interesting time. We have been through a lot of material. I can't understand, for instance, why you can go into one of these nightclubs with the Beatles playing and all of this noise going on. You can take a decibel meter in there and it registers 125 decibels of sound, which is supposed to hurt like the mischief. This crowd can keep it up for five hours, six nights a week. Yet, if we get somebody working around a shop and it goes up over 85, we are told they are going to get nerve damage. I haven't seen one of these Beatles yet that was deaf! I have a paper that was written by someone in Switzerland. In checking over their dentists in one of their big cities, they found that those that had these high-speed drills, the kind that goes so fast that they have to put water on them, over 50 per cent had hearing damage or hearing loss, not the patients, but the dentists themselves. And yet the cycles per second of the sound is at that same 4,000 level that we heard so much about yesterday, that coming from the drill. Any of you who have had your teeth drilled on recently, that is not a loud sound, and yet these dentists are getting damage to the ear.

Personally, I am not an ear man, but I can't help but feel that it is not the number of decibels, but the high frequency, the high pitch, that causes damage. All of this has come about with the aircraft industry, the wearing of the muffs and so forth that they have to use in the presence of these sounds.

However, our Committee decided that we have got to do something about it.

I have one here that I asked Dr. Glorig about yesterday and he says that it is a very good summary and that he helped write it. It is "The Background for Loss of Hearing Claims." It is put out by the American Mutual Insurance Alliance of Chicago. It covers the claims under the State industrial levels all along. Dr. Glorig gave

you also the one that is referred to in here, "Guide for Conservation of Hearing and Noise." I think that we should recommend these to the Chief Medical Officers of all the railroads to confer on and see what they think they need to do in their particular locality.

There is one other one and that is the "Guidelines for Noise Exposure Control." It is a joint treatise here of eight, ten pages, by the American Industrial Hygiene, I guess it is the Hygiene Association and the Industrial Medical Association subcommittee. Any action that we can recommend to the railroads should follow along the line of this pamphlet. It covers the subject completely. I am sure that we can get all we need from the Industrial Medical or from the American Industrial Hygiene Association. It follows almost identically almost everything that was said yesterday by Dr. Glorig and his panel.

Gentlemen, there are the four recommendations of your Trauma Committee. If you have any questions, we shall be glad to answer them.

CHAIRMAN OLSON: Thank you, Dr. Leigh. Are there any comments or questions from the floor? Dr. Graham.

DR. GRAHAM: I am not clear as to exactly what that recommendation on hearing is. Those pamphlets were mentioned. The one on claims, the cause of claims, which was put out in '61 is out of print.

DR. LEIGH: This one, by the American Mutual Insurance Alliance of Chicago.

DR. GRAHAM: That is out of print. I tried to get one within the past two months.

DR. LEIGH: Last one in November.

DR. NELSON: We are about to start a noise level and an air pollution survey. We happen to be in a situation where one of our main shops has just recently been renovated and plans are being considered for a new facility.

It will be of interest to see what labor's reaction will be to these studies. This is something which the rest of you are going to run into, too.

CHAIRMAN OLSON: Dr. Leigh.

DR. LEIGH: Dr. Nelson, we have just acquired a small D. C. meter, weighs a pound and a half, you can put it in your pocket, take it into the plant. It does have a little nozzle that you have to hold out and you can walk around. We walked all around down there in Hamlet, North Carolina with one, and no one even knew we had it. We wanted to take readings. We would pull it out long enough to look at it and go on. This one did not have the attachment for the pitch, the high frequency. That we hope to get soon. But, a little pound and a half meter, is better to use than the tremendous big one that is larger than a portable television set.

CHAIRMAN OLSON: Dr. Graham.

DR. GRAHAM: The manual that I recommended in the paper yesterday is a rather complete coverage of this whole subject from the industrial engineering, the noise engineering, the audiology standpoint. And if anyone is considering a study of this kind, I think this investment of $15 in this manual would be well worthwhile because it is a complete summary on the subject such as we know at the present. It is something that of course the American Industrial Hygiene Association, which is primarily a group of industrial hygiene engineers are interested in. There are quite a few [illegible]

We are a small committee and we have a very short report. We are quite satisfied that the first aid instructions are still as they should be, that was last revised in July of 1961, and we have had no suggestions for revisions at this time.

I do have something that I brought up with me from Philadelphia. This was presented to me by an engineer from Camden. I didn't want to see him at first because he was trying to sell me a new car. However, I was asked to see him, so I did, and I thought I would present to you something that is being developed for the Armed Services.

First of all, they are trying to develop a space-saving first aid kit and he presented me these little cylinders, which are something that the females use, I have never seen them before. They are little sanitary napkins all compressed into a little lipstick type container. However, this will be modified and this will be the type of carton they will use for compresses to be able to put these into space-saving first aid kits. I thought I would try to open one here to see what they are like. If I can open one.

There it is. It opens up and we can see that the whole napkin is actually compressed into this little cylinder.

CHAIRMAN OLSON: It is a parachute.

DR. CYRAN: Now they are going to make this into a little larger size than this, probably another inch or so, and these will be, I think, three by threes or four by fours, which will be put in first aid kits, as I say, because they are interested in saving space. But you can see how big this is and how they are able to compress it into a small little packet. The cost? I don't know. I didn't ask, but they are developing these for the Army to use in first aid kits because they want to save space and it is quite an amazing thing.

One other thing he showed me was something they have developed for the people out in the field to be able to apply themselves and to be able to keep pressure bandages in place, supposed to be one handed tourniquet, or since they don't like to call it a tourniquet, they call it a pressure bandage. It has a sticky tape on it and you are supposed to be able to put it on your bandage and then just with one hand do this (demonstrating), give it a tug and that is it. It holds it in place, no tying, and it stays tight. This is also being developed for the Army to put out in the first aid kits that will be used by the men in the field if they ever have to apply bandages for themselves. I will keep in touch with the engineer and see if this is developed into an actual compress that can be used. This may be of interest to people who are interested in putting up small space saving first aid kits of their own.

Other than that, that is all that I have at this time.

CHAIRMAN OLSON: Thank you, Dr. Cyran.

This comes to the end of our program. I would like to repeat at this time the advice that Dr. Winston gave about the use of the volume of medical standards. Will you please take it with you, study it, confer with management, and let Dr. Winston have any comments that may come as a result of both your study and your conferences.

For those of you who may not know it, both Dr. Wight and Dr. Houk have been on the sick list and they have suffered illnesses which are incapacitating to the degree that it was not possible for them to come to this meeting. I have been advised through Dr. Vaughan that Dr. Wight is doing very well. I talked with Dr. Houk a few days before the meeting and he was back in his office and seemed to be doing all right.

Because of the increased activity of the Medical and Surgical Officers Association, we have been utilizing the talents of outside people. It seems to me that while it has drifted into a didactic kind of program, the subject material has been so channeled that it has been applied to railroad medicine and for that reason I think it is proper and useful and advantageous to all of us. Certainly there have been new fields of medicine that have opened up and the men who are familiar with it and work in it have been able to give to us in interim meetings, and in this meeting, information which I think we can correlate with our own ever changing problems in our railroad medical practice.

This has involved some costs, and there have been some difficulties encountered in meeting these costs. Some of them have been borne personally by the various members. We rather feel that this is not quite fair. It is quite possible that our status with the General Committee may be altered, but I don't think it will affect our financial position in any way.

I think that at this time it would be proper for us to assign a committee to study this problem. There may be some areas that may be difficult to overcome, but I believe that a serious effort should be made to develop some means whereby we can be sustaining enough so that we can conduct these meetings to our best advantage and in turn to the advantage of the railroad. So that during the coming year I would like to appoint several of you men to work on this problem. I would like to ask Drs. Winston, Nelson, Leigh, Graham and Sharpley if they will get together at convenient intervals and see if they can work out some sort of a plan which can be pro-

perly applied.

Is there any other new business that anyone has to bring before this organization? (No response.)

INSTALLATION OF OFFICERS

CHAIRMAN OLSON: Gentlemen, this meeting has achieved such success as you feel it has attained by the concerted efforts of many people. I feel greatly indebted to you for all of your participation and support; to the Southern Pacific Company for its contributions and support; to Mr. Todd and his office for all the detail work and arrangements; to all the panelists and speakers; to all who have assisted in the preparation of the programs throughout the year, and to the Steering Committee for its unstinting help and advice, and finally, to Dr. Strange and his associates and assistants for the great amount of work and effort that he has been put to in securing so much of the talent that has appeared on this program. I feel that we owe him a vote of thanks. (Standing applause.)

DR. STRANGE: We were glad to have you, first of all, and next I have had mighty good help to do it.

CHAIRMAN OLSON: This organization is unique and occupies a very important place in its sphere of influence. To have been privileged to hold the office which you have so very graciously conferred upon me has been a great honor. I am very appreciative of it.

As you know, the Chairmanship changes hands every year, except when circumstances which are unavoidable prevent the assembly. This year, the Advisory Committee has chosen a man who is an erudite, scholarly, perceptive, suave, polished academician and an indefatigable worker and who will without question lead this organization to new heights of achievement. I am privileged to present to you our new Chairman, Dr. John Winston. Will you stand, sir. (Applause.)

[illegible] meeting earlier this morning, the [illegible]

Thank you again, gentlemen, very much. (Applause.)

(Gavel turned over to newly elected Chairman, Dr. John H. Wheton.)

CHAIRMAN WINSTON: I only hope, gentlemen, that I can do half as well as my predecessor.

I would like to have a meeting of the Advisory Committee within the near future, perhaps sometime during the AARS meeting in Chicago in April.

At the earliest convenience I hope we will consider a place for our meeting next year. I hope we can decide on the general format of that meeting, and also as to whether or not we should continue to have the interim meetings at approximately three-month intervals for the benefit of the standing committees and at which time all the membership is invited to attend and listen to the deliberations.

Also consider the advisability of continuing the symposia or panel discussions at that particular meeting.

I am indeed honored to represent this group. I am going to need all of your help.

Is there any other discussion to come from the floor before we adjourn?

If not, we will declare the 1966 meeting adjourned.

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ATTENDANCE

ATCHISON, TOPEKA & SANTA FE RAILWAY
H. F. Grundeman, Chief Clerk - Medical Division - System, Chicago, Illinois
C. D. Hoover, Claim Agent, San Francisco, California
L. A. Ketring, General Claim Agent, Los Angeles, California
J. R. Winston, M.D., Medical Director, Chicago, Illinois

BALTIMORE & OHIO RAILROAD
I. Kaplan, M.D., Medical & Surgical Director, Baltimore, Maryland

CANADIAN NATIONAL RAILWAYS
Peter Vaughan, M.D., Chief Medical Officer, Montreal, Canada

CENTRAL OF GEORGIA - SAVANNAH & ATLANTA RAILWAY
J. G. Sharpley, M.D., Chief Surgeon, Savannah, Georgia

CHESAPEAKE & OHIO RAILWAY - BALTIMORE & OHIO RAILROAD
R. A. Straub, General Trial Attorney, Detroit, Michigan

CHICAGO & NORTH WESTERN RAILROAD
J. V. Stack, M.D., Chief Surgeon, Chicago, Illinois

CHICAGO, BURLINGTON & QUINCY RAILROAD
H. W. Hammatt, M.D., Chief Medical Officer, Chicago, Illinois

CHICAGO SOUTH SHORE & SOUTH BEND RAILROAD
F. J. Pilecki, M.D., Medical Director, Michigan City, Indiana

CINCINNATI, NEW ORLEANS & TEXAS PACIFIC RAILROAD
R. G. Carothers, M.D., Chief Surgeon, Cincinnati, Ohio

COLORADO & SOUTHERN RAILWAY
W. J. Longeway, M.D., Chief Surgeon, Denver, Colorado

ERIE-LACKAWANNA RAILROAD
W. E. Mishler, M.D., Chief Surgeon, Cleveland, Ohio

FERROCARRIL DEL PACIFICO
Edvardo Contreras Reyna, M.D., Chief Surgeon, Guadalajara, Jalisco, Mexico

GRAND TRUNK WESTERN RAILROAD
H. W. Stockwell, M.D., Chief Surgeon, Detroit, Michigan

GREAT NORTHERN RAILWAY
A. Skinner, M.D., Chief Medical Officer, St. Paul, Minnesota

ILLINOIS CENTRAL RAILROAD
E. C. Olson, M.D., Chief Surgeon, Chicago, Illinois

JAPANESE NATIONAL RAILWAYS
Katsumi Kaneko, M.D., Chief of the 3rd Clinic of Internal Medicine, Tokyo, Japan

JERSEY CENTRAL RAILROAD
F. W. Mahoney, M.D., Medical Director, Jersey City, New Jersey

KANSAS CITY TERMINAL RAILWAY
G. Owens, M.D., Chief Surgeon, Kansas City, Missouri

LAKE SUPERIOR & ISHPEMING RAILROAD
H. C. Bennett, M.D., Chief Surgeon, Marquette, Michigan

MISSOURI-KANSAS-TEXAS RAILROAD
R. S. Kieffer, M.D., Medical Director, St. Louis, Missouri

NATIONAL RAILWAYS OF MEXICO
Antonio Reynoso Cordoba, Chief of Mexican Medical Service, Mexico
Louis G. Ibarra, M.D., Head of the Rehabilitation Service, Villalongin, Mexico

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George E. Dimond, M.D., Consultant, Detroit, Michigan
E. A. Hamilton, M.D., Chief Surgeon, Chicago, Illinois
A. W. Nickels, M.D., Chief Surgeon, Detroit, Michigan

H. H. Ray, General Claims Attorney, New York, New York

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Ball Lawrence, M.D., Regional Medical Director, Roanoke, Virginia

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PULLMAN COMPANY
H. M. Graham, M.D., Director of Medicine & Sanitation, Chicago, Illinois

ST. LOUIS-SAN FRANCISCO RAILWAY
V. W. Hollo, M.D., Chief Surgeon, St. Louis, Missouri

ST. LOUIS SOUTHWESTERN RAILWAY
H. A. Causey, M.D., Chief Surgeon, Texarkana, Arkansas

SEABOARD AIR LINE RAILROAD
Southgate Leigh, Jr., M.D., Chief Surgeon, Norfolk, Virginia

SOO LINE RAILROAD
Harvey Nelson, M.D., Medical Advisor, Minneapolis, Minnesota

SOUTHERN RAILWAY
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E. R. Anderson, District Claims Agent, San Francisco, California
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S. H. Burton, Assistant General Manager, San Francisco, California
N. O. Butler, Photographer, San Francisco, California
S. L. Chapin, Assistant Superintendent of Safety, San Francisco, California
E. A. Chow, M.D., Resident in Medicine, San Francisco, California
P. J. Deaknon, M.D., Resident - Internal Medicine, San Francisco, California
J. R. Gandy, M.D., Chief Surgeon, Houston, Texas
H. B. Hoyt, Assistant General Claim Agent, San Francisco, California
W. M. Jackie, Assistant Vice President Optns., San Francisco, California
H. Kaufman, M.D., Medical Superintendent, San Francisco, California
J. Lourgets, M.D., Intern, San Francisco, California
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E. L. Smith, M.D., Administration Assistant to Chief Surgeon, San Francisco, California
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