THE BULLETIN

of

The American Association of Industrial Physicians and Surgeons

THE object of this Association shall be to foster the study and discussion of the problems peculiar to the practice of industrial medicine and surgery; to develop methods adapted to the conservation of health among workers in the industries; to promote a more general understanding of the purposes and results of the medical care of employees, and to unite into one organization members of the medical profession specializing in industrial medicine and surgery for the mutual advancement in the practice of their profession.

VOLNEY S. CHENEY, M.D.
Secretary-Treasurer, Chicago

placed, as far as possible, in those occupations most compatible with their health and welfare on the basis of the physical examinations which they have undergone. Men with normal chests who are past the age of thirty, or those with uncomplicated occupational fibrosis may be employed at any occupation, while young men under thirty should not be exposed to the operations which produce the most harmful dust and should be re-examined fairly frequently.

Those cases of inactive tuberculosis, either with or without occupational fibrosis, should be carefully evaluated and every effort made to provide working conditions such that their health will not be impaired or their ability to earn a living wage interfered with. Men in this group should also be re-examined at frequent

not be employed in a dangerous dust either for their own safety or that of their fellow workmen, and should be encouraged to enter a sanatorium or to place themselves under the care of a competent physician.

The occupational disease problem is now much the same as that presented by industrial accidents when the first compensation act was passed. Disabling conditions created or aggravated by exposure to harmful dust can be prevented or controlled but the final success of any plan designed to accomplish these purposes will depend upon maintaining a broad educational program similar to that adopted in the "Safety First" movement. These policies are not only humanitarian but they are practical, and have been placed in operation in many hazardous industries employ-

Discussion:

PRESIDENT AVEY: In starting the discussion of these papers by Dr. McConnell and Mr. Cummings, I think the fact that we are meeting on Canadian soil is singularly fortunate, because we have available in Canada considerable experience which will be exceedingly valuable, I feel sure, to those foundrymen from the states. I would like to ask Dr. McGhie, Deputy Minister of Health for the Province of Ontario, to lead the discussion.

DR. McGHIE: On behalf of the Department of Health of the Province of Ontario, I wish to express our appreciation at being invited, as officers of that Department, to listen and take part in the deliberations of your Association. The Department of Health of the Province of Ontario is charged not only with the provision of adequate treatment for those who are sick but, what to me seems a far more important task, the prevention of illness. As a result, one of the most important divisions of the Department of Health is the Division of Industrial Hygiene, and closely associated with that is our Division of Tuberculosis Prevention.

I am particularly interested myself in this Division of Industrial Hygiene because, to me, it seems to be one entirely of research. Our experts in that Department, headed by the Director, Dr. Cunningham, do not claim to have the last word to give to you on the solving of your problems, but they are anxious to sit in with you to find out what the problems are and to study them as they appear in the various plants. The officers in that work tell me that the readiness with which the managers and directors of the various industrial organizations place at their disposal the facilities for studying the problem in the plant, facilitates the solving of these problems to a very large extent.

Our organization here, working as it does with the Compensation Board, I think comes close to the ideal, and those members of the staff who are here are far better able to explain its ramifications to you than I am.

DR. J. G. CUNNINGHAM*: Dr. McConnell and Mr. Cummings have given addresses which, to me, are exceedingly interesting. They are full of material which is very valuable and, really, I believe, leave very little to be discussed as far as the work of our Department is concerned. We are interested, of course, as a section of the Department of Health, primarily in the control of silicosis and other occupational diseases.

In the foundry industry, there is silicosis. Molders, for instance, as far as our experience is concerned, average for the development of silicosis nearly 30 years, which is a long exposure and compares very favorably with 10, 11 or 12 years' exposure necessary to produce the disease in certain occupational groups, and even shorter times in certain other small groups with heavy exposures. I think this should be recognized.

In certain other occupations in foundries, the occupational exposure

is shorter but still around 20 years. However, on the other side, certain cleaning operations, particularly sand blasting, without adequate protection, result in the very rapid development of silicosis.

We recognize these conditions and undertake to deal with them as they exist. It is perfectly possible to do this and without any great disruption in the industry, either from the expense necessary for the use of special equipment or on account of legal complications arising out of claims. The very fact that it takes molders and grinders and some of the others a good many years to develop the disease suggests that even a moderate reduction in the amount of dust exposure would cause the disease to develop only after so many years that it would not be a practical problem. We, however, feel that dust production in foundries should be reduced wherever it is possible to do it. Admittedly, it is difficult to carry on foundry operations with no dust production, but if we can make a substantial reduction in the ordinary processes I am sure that this would have a real influence on the disease produced as a result of these longer exposures. The dangerous short exposures, such as occur in connection with sandblasting, demand a specific program for dealing with the dust.

Now, a word with reference to tuberculosis. As has already been indicated, tuberculosis is the main problem in relation to dust inhalation. It has been stated that silicosis on its own account, except in certain exposures—and they are few—would not be a serious problem were it not for the development of tuberculosis. It should be recognized first of all that tuberculosis occurs in foundry workers the same as in every other section of the community, quite apart from dust exposure, and, indeed, that fact is recognized in workmen's compensation legislation in Ontario.

On the other hand, there is an impression abroad that silicotics with tuberculosis do not spread the disease in the way that ordinary individuals without silicosis and with tuberculosis spread it. Studies, even locally, do not support that idea and, when we come to the control of tuberculosis, which has already been indicated as the main problem, we must recognize the value of physical examination. It becomes so much more important when one realizes that individuals exposed to silica are more susceptible to tuberculosis, so that one man with tuberculosis in the plant, whether it arises partly as a result of dust inhalation or not, is a menace to all the rest of those exposed to dust in that plant. Therefore, one of the main functions of the physical examination to which reference has already been made, is to see that that individual is not allowed to continue under those conditions.

Physical examination gives us information with which to start a man on employment; it assists us to control the tuberculosis problem as these men are examined from time to time; and finally it enables us to arrive at some sort of rational method of handling or dealing with the individual who perhaps has silicosis but has as Mr. Cummings says, it does seem to us very important that a reasonable disposition should be made of those individuals who are found to be affected but who are still able to do their work.

G. W. CANNON: I have listened with keen interest to these able papers and the discussion, for as a foundryman, I am intensely interested in the rapid engineering advance being accomplished in the problem of dust control and disposal. I have been in the foundry industry all my life and in the years gone by we never heard of any foundry workers dying from the effects of dust. They did not seem to die from any cause, —they just dried up and blew away, —we were a pretty healthy bunch of mechanics as a class.

The modern production methods now used in our industry have, however, changed the conditions under which our employees must labor. Speed in production has brought about a concentration of effort in such operations as pressure blasting, whether it be pneumatic propulsion or mechanical projection. Speed at the shakeout has also greatly increased the generation of dust, heat and noise and it is in this hot, dust-laden atmosphere of these and other similar operations that it is necessary our workmen perform their labor; a condition which did not maintain in foundry practice in the years preceding the introduction of continuous and high speed equipment.

The problem of dust control and disposal is one in which we (I am speaking as a member of a firm employing 2,000 men) feel is a tremendous responsibility and one which cannot be thrust aside with indifference. In fact and to the contrary, we feel it must be met and conquered as soon as possible and that, with the aid of the best knowledge that can be procured through scientific research carefully analyzed and engineered by technical men skilled in this particular line of endeavor.

It is my opinion, however, that the successful solution of the problem cannot be achieved by the individual foundry and I suggest that within our own Association there be fostered an organization of men trained in this highly technical subject who would be compensated properly for the time and attention that must be devoted to the effort necessary to bring about a dustless foundry plant; such a set-up would pay big dividends. I appreciate, as must all of us engaged in the foundry business, that satisfactory results in conquering the existing dust conditions and associated evils which militate against healthful conditions in which to work will involve large expenditures of time and money. It is not improbable that the larger foundry organizations can undertake this work independently with success, but the smaller foundries also have the same conditions to correct. The large and small units of the industry are interlocked in competition and expensive equipment installation has its reflection in competition. Successful correction measures in one plant will be of benefit in another so I would urge that our Association get into action in an orderly way, through proper organization processes to assist us in creating the best possible working conditions for the employees of the foundry division of American and Canadian industry.

In our plant we are only at the beginning of a program of betterments and we have a long way to go. We are undertaking the correction of the greatest evils first. Suitable designs for our mold shakeouts and core knockouts, one of our worst dust and heat producing sources, are being considered and it will involve the rebuilding of the molding units to gain the desired results; the cost will doubtless be high but we will have to stand the pressure.

In the Cleaning Department, we are confronted with an equally serious problem, that of taking the operators out of the blasting rooms. This will require the building of special fully automatic machines to handle, not just one design of a cylinder block or head, but a large variety of sizes and shapes. In this particular department we have progressed to the stage of selecting the most desirable design. The disposal equipment handling the disintegrated abrasive from grinders and the dust from our few remaining tumbling mills is also being revamped. We feel keenly that our responsibility in the betterment of working conditions is by no means finished if we are successful in the elimination of the dust-health menace. We are constantly engaged in battling with a problem that goes hand-in-hand with it—the education of the men to take care of their own health.

Years ago the majority of our employees were foreigners. They dressed well from a health standpoint at least, they fed well on good food from the old-fashioned dinner pail prepared by the old-fashioned wife who took good care of them. Today the young men in the foundry are high school boys. They are tenderfeet; not strong enough of body to withstand the abuses that the old-timers were used to. In this campaign, our director of personnel is posting a new placard each week, advising them how to dress and what to eat as the seasons change and in general how to care for themselves. The work of the personnel supervisor does not end with the posting of placards; he sees that the messages which they carry are read and absorbed. We have even gone so far as to provide woolen undershirts—the good, old-fashioned, perspiration-absorbing kind that many of us here present wore and found comfortable in the years gone by.

Successful operation means that conditions must be bettered from every standpoint in order that we may give our employees better places in which to work. Better working conditions will induce a better and higher grade product—better products create greater profit.

PRESIDENT AVEY: That discussion is very pertinent, and it is one of the purposes, of course, underlying this general assembly, that we have here tonight. The whole problem is too large for the individual, and it is a rather large one for

consideration and the best brains of the best leaders we have in the industry.

JAMES MURPHY: We all know that dust is the principle cause of silicosis and long before I ever heard of the word "silicosis," I took measures for the elimination of the extreme amount of dust that was in the foundry that I was operating at that time. That was back in 1907.

The workers themselves have a knack for creating a lot of dust that good management could avoid. In the cleaning of castings, it is far easier for them to stick an air hose into the casting and blow the dust all over the place than it is to dig it out by some other means. To eliminate that dust, I adopted a method of cleaning castings by means of a water blast. Casting that had formerly taken six or seven days for two men to clean, we cleaned in 35 minutes by this water jet. This method can be used in a great many foundries for the elimination of dust, particularly on large castings. Certain parts of the foundry, such as the shakeout, of course, cannot be reached that way, but they can be reached through dust arresters.

I believe that the State of Wisconsin has recently adopted some regulations for the use of water sprays. The sprayer can be used to keep down dust in a very good way, being a much better method for spraying gangways and keeping them moist than by taking a pail and sprinkling water over them, which may make them too wet. The use of sprayers for gangways is getting to be quite common. The principal thing is to keep the foundry damp.

MEMBER: We were faced with the same dust problem. Our foundry is a brass foundry. We started by washing the whole foundry from the ceiling down to the floor, taking all the dust off the beams, making a general clean-up. We had had our cleaning room on one side of the foundry but not separated from it. We moved that and closed it and separated it entirely from the foundry, with a partition, with swinging doors between, and the doors are always closed when the room is not in actual use.

We do a little barrel sandblasting. To overcome a big dust trouble there, we built a room outside of our foundry so that the operator has to go through two doors to get into the sandblast room. The valves that control the air are on the inside, so that at no time is anybody in the sandblast room while it is in operation. Besides the exhaust fan on the sandblast, we put an exhaust fan on the room, so that any dust that comes from the sandblast—and it does come from all of them, no matter how good they are—is pulled out of the room, or at least a good portion of it is.

We have cement floors and we sweep our floors at least three times a week and we sprinkle them all down before they are swept. The one problem that we do not think we have solved satisfactorily is our shakeout, because we do not have a conveyor and the shakeout is done between the molders. We are seriously considering a conveyor, not so much for protection, but from the fact that we believe we could bring our shakeout operations into one room and have two or three men only around that operation.

A. B. ROOT, JR.*: It may be that the members will be interested in our experience in Massachusetts. Reference has been made to the necessity of keeping in contact with your state legislature and I suggest that it might be perhaps equally as important to keep in touch with your Commissioners of Insurance.

A little over a year ago, the insurance companies through their rating bureau requested the Commissioner of Insurance in Massachusetts to approve an occupational assessment rate of $4.00 per hundred dollars of payroll, in addition to the manual rate for industrial accidents. That request was made without any contact with the foundries or with the foundry organization that was known to exist there and had it not been for the fact that our Insurance Commissioner was very well acquainted with one of the foundry executives, it might very easily have gone through. Fortunately, the Insurance Commissioner called one of us up and said, "D o you know anything about it and will you come over and see if you think this is a reasonable request on the part of the companies?" As a result of the negotiations which started from that beginning, the rate, instead of being $4.00, was made $2.00.

bureau, and, through them the insurance carriers, had no statistics from their experience on which to base any request for an increase in rate.

We were going it simply to prevent a backlog on which to fall in the way and cases of silicosis to settle in the future.

As a result of that, our Association appointed a committee to confer with the rating bureau on what might be done, first to reduce that below the $2.00 rate and, if it could be done, on what basis it might be done. We suggested to the rating bureau a rating plan of credits by which the carrying out of certain dust prevention features would entitle the foundries to credits on that $2.00, and the plan which they submitted to us was the most terrific thing you ever saw, such suggestions, for instance, as ventilating a portable sand cutter moving up and down the shop. They were the most impracticable suggestions, I believe, that were ever put out.

I think there is where our danger lies, through the insurance companies requesting increases in rates through the Commissions.

I would like to ask a question as to how the foundry interests of the country can best coordinate their efforts for the protection of their own interest through preventing unusually heavy increase in rates. The insurance carriers are organized. How can the foundries organize so as to have some common basis on which to protect their business interests against unusually heavy or unnecessarily high rates?

Another question I would like to ask of our two guest speakers tonight relates to the question of analysis of these cases. I have understood that the method of analysis was to take a sample of the rafter dust, make the dust count from the air-floated dust, and to make their analysis for the silica content from the rafter dust. I have understood that there is a great deal of difference between the silica content of such rafter dust and the dust collected from air-floated samples. Is there any basis or any agreement that the chemical analysis of the silica content should be taken of that same air-floated dust from which the count is made?

DR. McCONNELL: The chief reason for using the rafter dust for analysis is because of the difficulty of collecting a sample in the impinger apparatus. One of the Westinghouse engineers has developed a method, I think, of electrical precipitation, which is capable of collecting a sample sufficiently large for a silica determination. On the other hand, while we have been considering using this method, I still believe that we should have, at least in addition, an analysis of the rafter dust, for the reason that the dust on the rafters has been accumulating for over a period of years and you get a fairly representative sample of dust that has been arising from the various processes over a long period of time.

In collecting a sample at any one time, it is quite possible that the silica content may be extremely low during that particular process or that particular location, whereas on another day under similar conditions the dust may contain a much higher percentage of free silica. Therefore, I feel that we still should determine the amount of silica in the rafter sample.

At this time, I wish to mention some of the general protective measures that foundries are using, enumerating them only in a general way. Some foundrymen are substituting less harmful substances for harmful substances. A good example of that is in parting compound. I was told that foundry workers are very temperamental and at first it was said that it would be impossible to get them to use a non-silica parting compound. I have had some foundrymen tell me that they had to disguise the non-silica parting compound to get the men to use it and, when they did not know that it was different, they found it very effective.

Another method is the isolation of processes where it is possible to do so. One example cited here this evening was that of removing the cleaning room to one end of the foundry and separating it by partitions and exhausting the room. Where the dust concentration is high, it is always possible to protect the men working in that particular location, but you also protect a large number of men in the general foundry.

Another method is that of hydraulic cleaning. We have taken a number of dust counts during this hydraulic cleaning process and have found the counts to be extremely low. Wherever it is possible to clean castings with water, I believe it is an excellent method of control.

Another method is, of course, that of local exhaust ventilation. Where it is possible and practicable, all processes should be exhausted.

Some foundries are using a combination of air and water for cleaning the foundry. I think the apparatus is called a ginny and it is very effective.

In some foundries, it is found practicable to do the shakeout operations at night. I think wherever it is possible and practicable to mount your castings on a moving platform to one section of the foundry that may be isolated and protect the men doing that particular operation, it is an excellent method; but where that is impracticable, I believe the shakeout operation can in many instances be done at night or at least at the end of the shift, thereby exposing many less men.

It is also possible under certain conditions to substitute steel shot for sand. Here again, however, a number of foundrymen believe it is impracticable. On the other hand, we must remember that there are different types of sand. Some sands fracture more easily than others and those sands are much more of a hazard than those which do not fracture easily. So that, with your isolation, your substitution, your local exhaust — and we must not forget general ventilation, but we must also be careful that the general ventilation does not interfere with the local exhaust systems—your combination of water and air for cleaning purposes, and the removal of unnecessary equipment, or, in other words, good order in your foundries—you have all these very valuable methods in reducing

MR. HYDAM: I believe we have instituted at the Falk Corporation some things that will prove interesting for they have proved effective in removing or at least minimizing the dust hazard.

The spray which was referred to a while ago is a home-made gadget. We use a welding tip for the tip of the spray. Water is fed to this device by means of a little manifold body to which the welding tip is attached. It is discharged through the small holes around the periphery of the tip, and air from the air line through the center hole. This atomizes the water. Quite a spray can be shot up into the air to help bring down dust. Also it can be used for spraying castings that are in the process of chipping without getting them too wet. In those cases where the chilling effect of water on the casting would be detrimental, one can still dampen them without chilling them seriously.

Our silica wash problem, I feel, has been quite well met in that we have gotten away from the old idea of mixing the dry silica flour with molasses and water in order to produce our silica wash. We buy a prepared compound which is rather pasty in substance, put it into a mechanically operated agitator, add enough water to it to give it the proper consistency, and the men can draw it out of a tap at the bottom of the agitator as they need it.

Perhaps the most outstanding thing that we have done is putting dust arresters and exhaust equipment on our sand mixers. We have tried two different types of housing on our sand mixers, and both have been quite efficient and effective. One of them goes up vertically from the top edge of the sand mill and terminates in a very flat conical top which has an air exhaust fitted to it. The other goes up in about a 45° to 50° cone from the rim of the mixer and also is connected with an exhaust fan. The dry ingredients are fed to the mixer through batching hoppers which have double compartments or, rather, double traps to them. The first trap opens from the bins to a compartment which contains or can contain just so much of the ingredient; and then a trap opens from that compartment into the mixer. The housings are equipped with sliding doors that can be closed once the batching has been completed and mixing proceeds. But we have found, in testing them, that even with the doors open, there is a sufficient draft to keep all dust from getting out into the foundry.

We have gone through the usual cleaning up and painting up process. We have used a lot of white paint and aluminum paint, largely with the idea that dust will show up more readily on light colors, and in that way we know just where to concentrate our efforts in order to keep down the hazard. Our big problem is still shakeout control.

MR. CUMMINGS: I would like once more to re-emphasize the importance of physical examinations in preventing the occurrence of occupational diseases. A young man who enters a dusty industry, with a small lesion of tuberculosis, may develop a larger lesion in a relatively short

time. He may develop disability or may die and in all probability it will be necessary to assume that the course of the disease has been unfavorably influenced by his occupation. On the other hand, one may find many men past 50 years of age who have worked in high concentration of dust in foundries or other industries throughout their lifetime and who are still capable workmen in spite of the large amounts of dust which they have inhaled, because they were properly qualified for their tasks from the onset of exposure to dust.

The significant thing for you to consider is the fact that you must select your employees in order not to offer them an unusual risk. No matter how safe your foundry appears, it may still have enough dust in it to injure the man whose chest has already been damaged by an infection. If you will carry that one thought away with you tonight, you will have carried more valuable information than all of the engineering suggestions that could possibly be offered for the control of occupational disease.

H. S. WASHBURN: On this question of examination before employment, which, of course, I believe we all think is necessary, how frequent re-examinations should be made of employees in order to be effective? Mr. Cummings speaks of having a later examination.

MR. CUMMINGS: That is a difficult question to answer. Tuberculosis is a disease which may be contracted at any time. A man may be examined today and contract tuberculosis tomorrow and he may work in your employment during the time he is contracting it. There is an opinion that tuberculosis is usually contracted in the early age groups. I do not wish to imply that the disease manifests itself at early ages only. One may become ill with tuberculosis at 50 or 60 or any other age period, but present information indicates that if one does become ill at 50 or 60, the disease was probably present at 20 or 25. I believe that young men are more likely to contract tuberculosis than others and, for that reason, they should be examined rather frequently.

Men in your employ who have tuberculosis which may be arrested or which may not be active enough to justify their being removed from the industry should also be examined rather frequently.

The general conclusion is that where men of all age groups are employed and are working full time, they should be examined at least annually, and that specific cases may need examination more frequently. In any event, men should be examined at least once every two years to learn against those possible cases of tuberculosis which may have developed since the last examination. The physical examination is intended to discover tuberculosis rather than silicosis, and experience in each plant or industry will soon dictate how frequently examinations must be made. If examinations are made annually and no new cases of tuberculosis are found, a decision may be reached to examine every other year but in the end, examinations should be made often enough to pick up cases that may be developed particularly among the younger men who enter your employment.

The Industrial Doctor

OFFICIAL SECTION OF THE NEW YORK STATE SOCIETY OF INDUSTRIAL MEDICINE

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MEMBER: In examination of these employees, on our first examination we find three or four cases of silicosis. What do we do with them? Should an x-ray examination be made?

MR. CUMMINGS: Dr. McConnell can probably answer that question better than I can, but we have both had experience with examining thousands of men. At the present time we are conducting a general survey of a rather large industry employing somewhere between five and six thousand men, all of whom have been examined, many of whom are silicotic, some of whom are tubercular. We try to do what I outlined in my paper. We separate these men into three main classes: those who have normal chests, those who have evidence of occupational fibrosis, and those men who have some evidence of tuberculosis. The men who are young and who have normal chests, we try to initiate into the industry by placing them in the less dusty positions where we still have them somewhat under observation. The men who have silicosis, obviously have it already, are good workmen, continue at their work. We do everything we can to improve the conditions under which they are working, obviously.

Men who have tuberculosis are dealt with as individuals through the medical division in the industry. Each of those men is judged on his merits. If he has active tuberculosis, we would simply suggest that he must be immediately removed, and there is generally no question about that, because it is realized that he is endangering his own health and that of his fellow workmen.

A man who has inactive tuberculosis, which may be a small lesion or it may be rather an extensive one, is dealt with on the basis of his physical condition. If he is rather badly affected, we suggest a job such as a night watchman or some such thing as that. If his lesion is small and not regarded as active, he is given a place of selected employment.

There is not enough tuberculosis in any dusty industry that I have encountered to make it impossible to place a number of men who are found in that industry at selected jobs. It is rather surprising to find that with slight improvement in the conditions under which these men work, their subsequent examination inevitably, or almost inevitably, reveals improvement in their condition rather than retrogression.

We do not discriminate against

and we find in the most instances that such men have what we regard as some complicated condition.

We make the most careful x-ray examination that we are permitted to do. We use the best equipment. We think that is essential. We ask for competent interpretations. The diagnosis of silicosis or tuberculosis is in the realm of the medical expert and I think it will have to remain there for some time. The ordinary practitioner, capable as he may be, is generally unfamiliar enough with this particular field to qualify, originally at least, for that work.

MEMBER: Are there any authentic published negative reproductions that would guide, not the amateur in x-ray but a physician who has pursued it beyond the experimental stage, in differentiating between silicosis and tuberculosis?

MR. CUMMINGS: Yes, I think there are. The question of differential diagnosis of silicosis is one that is difficult and though one might get reproductions of cases which were typical for any given industry, it would be quite possible to bring forth films which simulated the appearance of the films that were used for demonstration which might consist of quite another pathological process, and hence I would still suggest that this particular field be left in the realm of experts, much as Ontario has delegated its authority to people who have made a special study of it.

What is Industry?

INDUSTRY does not support people; people support industry." Many read that motto in the rotunda of the Ford exhibit at the Century of Progress. Today it has a new significance, because government officials are demanding that industry employ at once the 11 million persons who Washington says are unemployed, or take the consequences. If this demand is based on truth, certainly the motto is not; both cannot be correct.

The general impression is that this nation earns its living in industry. The facts make quite a different picture. Of all the people who work for pay in this country, 10 million are attached to agriculture. Another 10 million are employed in public and personal service—teachers, lawyers, doctors, nurses, public officials, entertainers, cooks, waiters, hired housekeepers, and so forth. Wholesale and retail trade engages between eight and 10 million more — among them two million sales clerks and four million in other clerical positions. Four million people earn their living in transportation and communication, and another four million in construction of buildings, streets and highways. A million and a half engage in forestry, fishing and highways.

These lines of business are not classified by the government as industry, although with other smaller groups they account for about 40 million of our normal 48-million jobs. And no official has suggested that these employ the alleged 11 million unemployed. That is left for industry proper, which, at its highest peak, in its busiest time, never employed (in round numbers) more than 8,800,000 persons—the highest industrial employment in our history.

These figures for industry are given in Table No. 737 o. the Statistical Abstract of the United States published in 1934 under authority of the Secretary of Commerce. In this report industry is comprised under the 16 main branches of production which supply the nation's basic commodity requirements, ranging from food and wood and textile products to the iron, steel and transportation equipment industries, including the automobile. Having at no time employed as many as nine million persons, these 16 branches are asked to employ immediately an additional 11 million persons, "or else."

Two things are clear: first, that any group which normally employs less than nine million persons, of whom probably seven million are now at work, cannot possibly be said to have 11 million of its people out of work. It never had that many people. And second, any group whose highest peak of business was never sufficient to employ more than nine million persons cannot, even at government command, arbitrarily increase that number to 20 million. There never has been that much purely industrial work to be done.

This misconception of the comparative place of industry in the national fabric has lasted a long time—like the mischievous statement that the rich 2% of the people own between 80 and 95% of the wealth, when as a matter of fact 72% of the wealth and 88% of the income are owned by people who have less than $5,000 a year. It is true that industry is important and that it affects all other lines of work, just as all other lines of work affect it, but four-fifths of American workers always have been employed at something else. The nation could hardly exist otherwise.

Industry earns its living by making the tools and utensils which the rest of the people use in earning their living—shovels for diggers; plows and trucks and cream separators for farmers; ovens for bakers; hammers and saws and nails and lumber for carpenters; leather for shoemakers; motor cars and electric cars and railway cars and locomotives for transportation; machines for all sorts of mechanical work; cloth and sewing machines for clothiers; paper and ink and presses for printers, and so on.

Industry has never supported all the workers and never can—it can only equip workers with the things they use to support themselves in the infinitely diversified forms of daily work.

Industry alone has led in efforts to start the wheels of employment turning. In one year it has spent above its income more than the enormous emergency expenditures of the government itself. Its efforts have succeeded to a remarkable degree. This morning's newspapers (December 15) carry a Washington complaint that employment is not increasing as fast as production. Here is the same old error again—measuring the entire employment situation against one-sixth of the nation's work.

Industrial employment has kept pace with production. If industry could give work to those 11 million unemployed (if there are that many) it would have done so long ago in its own interest without being asked. But these are in a very small part the workers of industry. They belong mostly to the other groups that perform five-sixth of the nation's work. And all of these groups depend on full employment for their existence.

The matter is too serious to permit misleading statements to pass, and we submit these facts in the interest of straight thinking and common sense.

* William J. Cameron, Ford Motor Company, in *Industry*, January, 1936.

Eradication of Hernia by Injection

THE treatment of indirect and direct inguinal hernia herein described* is quite different in procedure from the first paper I wrote in 1914 on the treatment of femoral hernia. In reviewing the literature it was discovered that Valpeau[1], in 1835, injected hernias with iodine. This method acquired very little popularity until 1927, when Mestra[2] of France and Mayer[3] of Detroit reported their many years of experience with the injection treatment of hernia.

As a result of experimental work done in this field by Hall in 1929, he concluded that, following the injection of a sclerosing solution, there was a "vigorous proliferation of endothelial and connective tissue cells" forming a foreign body granuloma. He also mentioned that after three or four injections, sufficient plastic tissue was produced to obstruct the orifice of the hernial sac.

In the past thirty years Mayer claims 98% cures in more than 2,000 cases of hernia treated, and in this series he included umbilical, femoral and inguinal hernias. Wolfe[4] of Brookyln, New York, reported 86% satisfactory results on a small series of 64 cases treated with the injection method, and reported 62 cures.

Wolfe also reported that the injection of a sclerosing solution directly into the cord of experimental animals did not produce obliteration of the vas deferens.

Rice,[5] instructor in the Surgical Department of University of Minnesota Medical School, reports that Bratrud[6] and McKinney have used

* Roy C. McDaniel, M. D., Portland, Ore.: read before the Sixty-first Annual Meeting of Oregon State Medical Society, Gearhart, Ore., Sept. 19-21, 1935; published in *Northwest Medicine*, January, 1936.

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