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Tuberculosis and Industry

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THE past quarter of a century is undoubtedly the most important period in the annals of industrial medicine. It is a period which has wrought changes beyond the ready conception of the industrial physician who performed his task in the first two decades of the century. From the restricted function of traumatic medicine to the broad program of preventive medicine is a long step, and those who have participated in the change may well admit that it has been an arduous one to take. It has been well worth it, of course. It has brought us to a point of vantage from which we see the greater progress which lies ahead and from which, if the mood strikes us, we may view our strange and humble beginnings. The evolution we have witnessed could well be illustrated by what has occurred in the control of tuberculosis in industry.

It was evident long ago, as many of us will recall, that among the younger age groups in industry tuberculosis took an immeasurably heavy toll and that it was by far the greatest threat to the earning capacity of the worker. Management, too, had a painful awareness of this fact—largely through the sick benefit associations. The age at which benefits began, the chronicity of the disease, and the number of cases on the benefit rolls produced a drain on the resources of such associations far in excess of any other individual disease. A recent review of 400 cases on a disability roll of a sick benefit association showed 10.51% of the cases were due to tuberculosis. These represent an accumulation over a period of 10 years in a plant with an average population of 15,000 workers.

It cannot be said that no effort was exerted to meet this problem. To be sure, well planned and persistent programs were in most places conspicuously absent. But, here and there attempts were made to reduce and control this enormous man-hour loss. We began in our own plants to examine workers prior to their resumption of work after absences due to upper respiratory diseases. Occasionally, a patient who had suffered from what had been assumed to be a simple bronchitis was found to be tuberculous. Then, too, in those early days, we placed great emphasis on the factor of weight. Bulletin board posters stressed this point alone. Foremen were instructed to send to the medical department for examination workers who were losing weight. At infrequent intervals these men were found to be victims of the great plague. Obviously, the early efforts were elemental and crude, but they prove, at least, that the threat was recognized and that something was being done about it.

It must be remembered, moreover, that in these early years fluoroscopy and roentgenography were just beginning to enjoy a widespread use. The periodic examination was still largely an unrealized ideal and record systems were more or less haphazard. Inevitably, many cases were detected so late as to preclude the possibility of recovery. Other difficulties were experienced in the care of these patients. The fear and prejudice against the sanatoria were both general and deep. Entrance into these institutions carried a stigma from which the patient had little hope of ever escaping. Besides, the sanatorium was widely considered not as a significant aid to recovery but as the repository of

broken lives about to be ended. Commonly, few people associated hope with sanatorium care; to many it simply meant the close approach of a fatal issue.

Overcoming this prejudice among industrial employees was one of the essential and monumental accomplishments of the early worker in tuberculosis. And it was a real educational effort. Our own plant was made an induction center to the sanatoria. Our contacts with the State Health Department of Pennsylvania were intimate and effective. We were supplied with adequate records for the cases we succeeded in placing in the sanatoria and we were, as a result, in a better position to afford needed help in the rehabilitation of cases which recovered. Our interest in the cases was an all-embracing one. To begin with, we did our utmost to popularize the sanatorium. We were enthusiastic in our commendation of institutional care wherever we discussed the patient's problem with him individually or with members of his family. We prepared literature in which we extolled the virtues of the sanatorium in promoting earlier recovery and in protecting the patient's family as well. We used all the assistance we could procure in the form of publications issued by the National Tuberculosis Association. Photographs of the three sanatoria in Pennsylvania were used to visualize in the employee's mind the advantages of accepting the opportunity for sanatorium care. We followed up this preparatory work by making periodic visits to patients who were institutionalized. We helped, whenever possible, in eliminating some of the vexations which beset the worker suddenly removed from his accustomed routine of living and plunged into the strict regime of enforced rest and prolonged relative isolation. We believe that many workers returned to normal life again because these efforts were made. It also aided us greatly in placing these individuals at suitable work.

The work continues, to be sure. Both through formal study and in casual contact with our workers, the attempt at prevention and at the restoration of health goes on. The periodic examination is one of the forms which this effort takes. At our East Pittsburgh plant about 5,000 employees are examined annually on a compulsory basis from an occupational standpoint, and early cases are at times detected. The recognition is becoming more general among our workers that the periodic examination hides no ulterior motive and that it constitutes a vital health measure which conceals no threats to job security. But, before terminating our discussion of our earlier work, we should mention a survey made in 1933 of some 450 foundry workers, since this study touched upon a question whose interest and importance remain undimmed. The time when this investigation was made was, as you will recall, a period of silicosis hysteria, when the foundry was considered by some a rather effective route to a state of silico-tuberculosis. It was of great interest, therefore, that not one of the 450 men studied showed any evidence of active tuberculosis. Some 14% did show evidence of arrested tuberculosis infection but none had to be removed from his work. We explain this experience on the basis of (a) careful pre-placement examinations, (b) education on tuberculosis prevention, and (c) the placement of cases in sanatoria or at home for treatment at the earliest possible moment.

Our present efforts in tuberculosis control may be briefly discussed under the headings of the pre-placement examination, the periodic and transfer examination, the care of cases actually found, the study of the sick case resuming work, the casual examination requested by the interested worker, and our program of health education.

The pre-placement examination opens to us what is probably the most fruitful opportunity to control the hazards of tuberculosis in industry. Here the suspected case is either thoroughly studied and carefully placed or he is haphazardly placed into a type of work in which latent tuberculosis lesions will flourish into full activity. Here, also, is the point of entry for the frankly tuberculous undetected by a hasty and incomplete examination, or here we find the protective wall which the industrial physician interposes between the workers already employed and the tuberculous individual seeking admission among them. We must insist, at this point, that we are not unmindful of humanitarian considerations. But it is a regard of dubious worth both for the healthy worker and the tuberculous applicant to place the two together. The tragedy of such misguided sentimentality is too clearly recognized to warrant even mention. To be sure, the arrested case must be dealt with on its peculiar merits, and every consideration given to proper and safe placement as well as to systematic follow-up after employment.

The periodic examination I consider second in importance in the discovery and proper disposition of the tuberculous case. While it is true that frequently such examinations are limited to those forms of employment where the menace of toxic hazards obtains, it is likewise true that among the thousands of workers subjected to this examination an appreciable number having active tuberculosis may be found. These cases are foci for the dissemination of the disease not only among workers at the place of employment but also among the many inevitable community contacts. We have ourselves found in the past several years an incidence ranging from one and one-half to two cases per 1,000 employees. Since the periodic examination is performed at regular intervals, these cases are generally found while still in the early stages of the disease. Hence their discovery has both great importance for the individual affected as well as for the group exposed to his presence. This is one of the reasons upon which the general provision of periodic examinations for all workers might be urged. For, important though it is in the control of the hazards of toxic exposures, it is equally valuable in the control of the health hazards which generally plague mankind whatever the character of its vocational pursuits might be.

THE transfer examination, though far more limited in scope, represents another opportunity for the discovery of the disease. Such examinations are usually limited to a survey of the particular physical requirements of the job to which the worker is transferred. Yet, it can be readily extended to include some inquiry into possible pulmonary pathology. If this approach be indirect and largely unsystematic it need nevertheless not be without significant value. Whatever the circumstance leading to the discovery and adequate care of the tuberculous might be, the importance of such discovery and such care remains the same. We should, in fact, urge it as a principle worthy of general adoption that any opportunity which presents itself for the physical examination of any worker should be considered an opportunity to find tuberculosis and to exert every possible effort against its spread. So strongly are we committed to this principle that we advocate careful examination—not excluding x-ray films if they appear necessary—in every case of absence due to severe upper respiratory infections. For it is well known to all of us that many an apparently innocuous case of bronchitis on closer scrutiny has revealed its tuberculous nature.

Only part of our work is done with the discovery of

cases. The mere cataloguing of records is an academic gesture if proper care for the cases found is wanting. Reference has already been made to the receding prejudice against institutional treatment. Sanatorium treatment will unquestionably gain progressively in popular esteem and provision for such care will be greatly increased in the future. However, in those cases where treatment is carried out at home, there should be a well-planned program of supervision in the conduct of such treatment. Medical management is basic, of course. But some supervision of the physical setting of the household coupled with actual demonstrations of procedure should be an excellent adjunct to medical care, and can well be considered a legitimate phase of public health nursing. Already, such nursing aid is available to some degree. It should undoubtedly be extended so as to become a part in the management of all cases which are confined to their own homes.

No plan for tuberculosis control is complete unless education on the subject is continuous and has been made a large part of the program. There is much skepticism in some of the workers as well as in management of the value of educational measures. Yet no one is willing to deny the insurmountable difficulties which obstruct efforts to prevent disease where ignorance of the dangers and of the protective possibilities exists. We should probably divorce education as we think of it in industry from the purely scholastic training exercises which do not always bear an obvious relationship to practical needs. Our concept of health education is one closely allied to tangible and widely recognized need. The objective of such educational effort is to impart information which will function practically in the immediate routine of our common daily life.

There are many forms which the educational program may take in addition to individual contacts. Posters, lectures, films, articles in plant publications and other literature may be utilized. It has been our custom for a great many years in our yearly Health Education Program to bring to the attention of our workers the necessity of early diagnosis of tuberculosis. And in this respect we have taken advantage of the help which has been given to us by our local Tuberculosis Association which has provided us with literature and displays during the period of Early Diagnosis Month each year. On the whole, it appears that brief, simple and attractively illustrated leaflets meet the criteria of acceptability and feasibility. Many formal approaches—such as films and lectures—entail great difficulties among which time loss, special personnel, equipment, and place are among the more serious. On the other hand short publications which are interesting, readable and scientifically accurate may be effective in conveying to the worker a vital health message. To the criticism that many workers will not thus be reached because of neglect of these publications or indifference to them, we may reply that any disinterested person would be difficult of approach regardless of the means used. Moreover, repeated issue of such material will gradually find a place in the reading of a substantial portion of the recipients. Despite the fact that any educational procedure will never be more than partially effective it is necessary to continue to educate if any improvement in general health practices is to be attained.

Because we are committed to this philosophy we published last year a series of eight leaflets on the subject of tuberculosis. The topics covered were:

1. What is Tuberculosis?
2. War and Tuberculosis.
3. Do I Have Tuberculosis?
4. How the Doctor Diagnoses Tuberculosis.

5. Infected Sputum Spreads Tuberculosis.
6. Hygienic Living Protects from Tuberculosis.
7. Good Nutrition Helps Prevent Tuberculosis.
8. The Modern Treatment of Tuberculosis.

The issuance of these leaflets at a time when the stresses of war threaten even more than the usual ravages from this disease lends the quality of timeliness and pertinency to our health education program. The number of requests we have received for the material attests to a widespread recognition of the desirability of health education for the laity.

Tuberculosis is only one subject out of many which demand treatment. A well coordinated and continuing program is necessary. It may well be assumed that the results will be well worth the effort and the cost even if a measured monetary value cannot be accurately attributed to the ensuing good.

SO FAR OUR discussion has dealt with practices as they affect large groups and we may well be reminded that the problem of tuberculosis is one of individual as well as of social concern. It would, therefore, be of interest to review an illustrative case or two of recent origin picked from our files to indicate the fate of other similar individuals in whom the disease was found.

Our first case is that of a young woman of 26 who had been employed by us in a clerical capacity. This employee presented herself to the medical department in October, 1941, with the complaint of severe pain in the right chest. An x-ray was taken at once but no pathology was detected. She was sent home with instructions to consult her family physician and the latter hospitalized her for study. No diagnosis was reached even after a period of two weeks during which she was observed under controlled hospital conditions. She returned to work and again later we took chest x-rays. On these films there was evidence of a peripheral involvement of the right upper lung, and a diagnosis of minimal A tuberculosis was made. In January, 1942, she was admitted to the State Sanatorium where she was confined for 14 months, the first six of which were spent in complete bed rest. Following her sojourn at the sanatorium she was considered a healed case of tuberculosis and she was permitted to return to work. She performed the duties of her job without difficulty and decided, one month after her return, to apply for membership in the Women's Army Corp. She passed her physical examination and was accepted. Among the noteworthy facts in this case is the establishment of a diagnosis of tuberculosis only through careful study and observation. A superficial survey of this case would certainly have failed to reveal her true condition until such time as her lesions would have advanced to the point of frank and total disability. Should diagnosis have been delayed so long, obviously, the course of this case might have had an unnecessarily tragic termination.

Our second case is that of a young man who reported to the medical department for a routine periodic examination. Chest examination revealed a questionable area at the upper left apex. A detailed history was obtained and among the salient facts disclosed was a progressive weight loss amounting to about 20 pounds in a period of approximately three months. The general physical findings with the exception of a temperature of 99° were largely negative. Chest x-rays, however, revealed an incipient tuberculosis. He was advised to enter a sanatorium and was admitted a few weeks following the original examination. He remained at the sanatorium for six months at the end of which time he was declared healed. Upon advice of the at-

tending physician he remained at home, virtually at complete rest, for two additional months. Shortly thereafter he was well able to resume his work without symptoms or signs of the disease and a gain of 22 pounds. Recently he was inducted into the army and is now in service. Again we illustrate the desirability of early and thorough study.

It would be possible to cite cases found in the advanced stages of the disease in which the outcome was far less favorable. But it seems appropriate to emphasize unremittingly what is possible of accomplishment with adequate and early medical care.

In any attempt to outline the major procedures in the tuberculosis program of an industrial plant some details must always be evolved on the basis of the specific needs and potentialities. Thus it has been considered more logical to discuss the general problems that may well arise anywhere. There are certain conclusions which we may draw from this discussion and, inasmuch as they constitute the essence of this paper, they may be mentioned at this point by way of summary. These conclusions are submitted, at the same time as recommendations of procedure.

1. The pre-placement examination should include a careful study of the chest. Fluoroscopy and roentgenography should be done routinely on all applicants.

2. Periodic examinations should repeat the complete study of the pre-placement survey and should also include x-ray films of the chest.

3. Systematic health education programs should be conducted giving due emphasis to the subject of tuberculosis at regular intervals so as to maintain the worker in a state of alertness relative to the disease. Health education material should be so distributed as to reach the family of the worker.

4. Careful and adequate follow-up of all cases, by competent agencies, should be insured. Industry should assist in the placement of cases discovered among its workers, and should aid in pursuing the follow-up measures required.

5. The rehabilitation of the arrested case should be an important objective of industry in its follow-up. Thorough job analyses should be made available to aid in the proper placement of the many cases which return to employment. It is the one indispensable measure in the prevention of recurrences.

We are not in the realm of untested theory when we propose these recommendations. They have been tried and found to constitute our most effective approach to a solution of the problems of tuberculosis in industry. Perhaps, as health measures and as health knowledge improve, the battle against tuberculosis will bring nearer the victory which mankind has sought so long. We are undoubtedly contributing to the defeat of this ancient enemy when we continue the assault against him according to the strategy we have just described.

Endocrine Disorders

— and Low Back Pain —

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IT IS SAID that endocrinologists are prone to study endocrinopathies *per se* and that they sometimes overlook other disorders that may at the same time victimize the patient. The converse of that idea is undoubtedly true. Workers in other fields of medicine tend to overlook endocrine disorders or to recognize them only after treatment of some other syndrome has failed to bring relief to the patient. Perhaps all of us would do our jobs better if we kept in mind the very