EDITORIAL

THE TURNING POINT

“It seems completely illogical not to treat an infectious disease at the earliest possible moment.” “The tuberculin test serves two important functions: properly used, it tells us not only that an infection has taken place, but when, and perhaps even where that infection occurred.” “Now that we have potent, inexpensive and easily taken antibiotics against the tubercle bacillus, every effort should be made to identify the moment of infection, the time of conversion of the tuberculin test, so that treatment may be started.”

The general recognition of these facts so rightly stated by James J. Waring in this issue of Diseases of the Chest may well be the turning point in the whole tuberculosis eradication movement. This is exactly the principle upon which veterinarians have worked and by which they have achieved such phenomenal success.

When safe methods of administering tuberculin were announced by Pirquet (1907), Mantoux (1908), and Lautier (1908), it was observed that the majority of children and young adults who reacted appeared well, conventional physical examination was unrevealing, and x-ray film inspection, when used, rarely brought to view any significant abnormality.

Only the occasional individual who reacted to tuberculin had manifestations of illness and lesions were located by physical examination, including x-ray inspection. It was promptly deduced that a high percentage of these young individuals were infected, but only 1 or 2 per cent had the disease. Thus, a sharp dividing line was drawn between infection and disease. It was thought that those who had only infection walked within a charmed circle of safety as far as present or subsequent disease was concerned. Indeed, many physicians believed and taught that tuberculous infection “without disease” was an ideal situation for the individual. This concept became so implanted that, despite the subsequent accrual of overwhelming evidence of its erroneousness, it is still quoted and taught.

Ghon's pathological findings alone should have caused complete abandonment of this concept. In the early part of the second decade of this century, he meticulously examined the bodies of 184 persons dead from nontuberculous conditions, and in whom during life there was no evidence of tuberculosis, except the tuberculin reaction. He found tuberculous lesions in every body and commented upon the extremely small size of many of them. The minuteness of primary tuberculous lesions had previously been emphasized by pathologists as early as about 1876 when Hervouet, a student of Parrot, stressed with what care post-mortem examinations must be done as some primary tuberculous foci scarcely exceed the size of a pin’s head. Kuss, in 1898, pointed out that primary tuberculous lesions could not be demonstrated clinically. He described them as varying from the size of a hazel nut to the head of a pin. Thus, there is little wonder that in the past and at present so relatively few lesions of primary tuberculosis complexes are located in the bodies of tuberculin reactors during life.

The vast experience of veterinarians, beginning with Gutman, Russia; Bang, Denmark; Pearson, Pennsylvania; and Russell, Wisconsin, in the early 90's and since confirmed almost four million times in the United States, alone, provided incontrovertible evidence that tuberculous lesions are present in animals which react characteristically to tuberculin.

The concept of a sharp dividing line between infection and disease was again completely broken down when longitudinal studies revealed that an
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An alarming number of infected persons apparently normal in other respects later developed clinical lesions. So many, in fact, that it has been stated that persons infected with tubercle bacilli walk within the circle where all the illness and death occur from this disease.

The only two phases of present day examination whose results coincide are the tuberculin test and carefully done necropsies. Nothing else is sufficiently refined to establish the presence of primary tuberculosis complexes in the majority of persons and animals who have them. Individuals who react characteristically to tuberculin have tuberculosis as certainly as those ill or dead from the disease. The difference is one of evolution of lesions.

Most tuberculosis work in the past has consisted of following the great armies of tubercle bacilli. We have usually been years, and often decades, behind trying to find where they have left contingents and attempting to repair the damage. We have come upon these contingents after their hosts were sick, were liberating new armies of tubercle bacilli or possessed lesions so large as to be demonstrable by x-ray shadows they cast. Infrequently have attempts been made to spearhead the vast armies of tubercle bacilli. Rarely have we been on the job ahead of these armies.

Although in a few places noteworthy accomplishments have been achieved against tuberculosis, progress everywhere has been far too slow. In fact, there now exist vast populations in the world where the armies of tubercle bacilli have met with almost no opposition for the past 7,000 years. Even in areas including Scandinavian countries and the United States, where much has been accomplished, there is no single locality where the workers have travelled one-half the road to the eradication goal.

Requisites for successful control and eradication of any disease are (1) a specific test for its detection soon after it begins and (2) a specific method of treatment. Little progress was made in the control of syphilis until tests were available to find those persons whose tissues had been invaded with Spirocheta pallida. Drugs were produced to destroy those organisms. Although we have had a safe specific test for the detection of tubercle bacillus invasions for almost 50 years and the connotation of such invasions have been well understood for several decades, we have until recently lacked drugs that would effectively suppress and possibly destroy these organisms. Hence, the fatalistic concept pertaining to primary infections and the attempts to brush away their significance and even to regard them as assets to future health.

Now that drugs are available which so well suppress tubercle bacilli and possibly may in combination ultimately destroy them, one finds difficulty in disagreeing with Waring that these drugs should be administered promptly following the initial invasion. At that time, lesions of developing primary complexes are so small and vascular that all tubercle bacilli should be reached by drugs in the blood stream.

The only known method of determining promptly and accurately when invasions with tubercle bacilli have occurred is the appearance of sensitivity of tissues to tuberculo-protein. This important information can be obtained only by testing individuals periodically with tuberculin and finding those who convert from nonreactors to reactors. Except for an insignificant number of babies born with congenital tuberculosis, most of whom are stillborn or die soon after delivery, infants throughout the world are born free from tubercle bacilli and hence at birth do not react to tuberculin.

If the tuberculin test is administered to all babies at the age of approximately one month and every few months thereafter, those who become infected can be found when immediate treatment would be expected to be more efficacious than at any subsequent time in their lives. This applies...
not only to infants, but also to persons of all ages. This simply means that everyone, regardless of age, must be tested with tuberculin and all non-reactors re-tested periodically to ensure prompt recognition of every invasion. In this manner, we meet rather than follow the armies of tubercle bacilli and prevent destruction of tissues and perpetuation of their contingents.

Wherever such universal testing is done, many will be found, particularly in the upper age brackets, who are reactors on the initial test. For the majority of them we have arrived too late, since the lesions of primary complexes as well as re-infection implantations, which may have already occurred, have such decreased vascularity that one could hardly expect to destroy all of their tubercle bacilli with any drug. However, knowing that each tuberculin reactor, regardless of age, may then have or may subsequently develop re-infection implantations, we can watch and wait for their appearance, as manifested by illness or x-ray shadow-casting lesions. Prompt treatment of such lesions is now so effective that many of them can be brought under control and prevented from becoming contagious, while some already eliminating tubercle bacilli when found can be converted. The remainder must be isolated over varying periods of time. Unfortunately such persons are not cured, as other lesions already present may later evolve to demonstrable and destructive proportions. Therefore, all such treated individuals must have continued observation.

With the breaking down of old concepts and their replacement with well-established facts and prompt action has come the brightest future of all time for the ultimate eradication of tuberculosis. This goal is a long way off, but it is attainable.

J. Arthur Myers.