ditions of the Pleura and Lungs by Means of Palpation." Lancet-Clinic, December 11, 1909.
(5) Pottenger: "A New Physical Sign, Probably a Skin Reflex, Whereby Solid Organs such as the Heart and Liver and Inflammatory Processes Found in the Lungs and Pleura may be Detected by Palpation." Medical Record, Oct. 23, 1909.

THE CANCER PROBLEM*

By ROSWELL PARK, M.D.

Professor of Surgery, Medical Department, University of Buffalo; Surgeon, Buffalo General Hospital. Buffalo, N. Y.

I have always had a feeling of pride in being a member of this association, and that feeling is very much enhanced today in enjoying the privilege of participating in your work.

I regret very much that Dr. Coley is not here to consider the subject which was assigned to him, because what I shall say to you with reference to cancer will be said practically impromptu; but it is such a very important subject that I hope that what is said may provoke some discussion.

This problem of cancer is the most important one before the medical, as well as the surgical profession today. Cancer is certainly on the increase, not only as a disease of modern life, but from other and mysterious causes, and I believe the statistics collected from all over the world establish this fact. In New York State we lose about thirteen thousand people from tuberculosis every year. When I began to especially study this disease there were some fourteen thousand deaths each year from tuberculosis, and about five thousand deaths from cancer. From tuberculosis the mortality has now been reduced to about eleven or twelve thousand per year, while the mortality from cancer has risen to nearly eight thousand. This is not attributable to faulty methods of diagnosis alone.

Our studies have also established the fact that cancer is prevalent in certain localities and in certain houses. A few years ago we made a map of the city of Buffalo, the like of which has been attempted in only one or two other places in the world, in which all houses where the disease had occurred within ten years were marked, and we established the fact that there were certain places where cancer was far more prevalent than in others, and we noted a considerable number of houses in which several deaths from cancer had taken place.

With regard to the matter of heredity, I think it can be stated as a fact that the disease *itself* is not transmitted by inheritance, but I am quite sure that there is a possibility of transmission of predisposition. This is a very important question, not only for the laity but for physicians. For instance, a woman suffering from cancer will come to you and ask if her daughter is likely to have it. And again the daughter, whose mother has had cancer, will come to you and ask if she is likely to have it because her mother had it. Let us suppose the case of a mother who bears a daughter at the age of twenty-five. When the mother is fifty years old and has cancer of the breast is there any reason for the daughter to fear that she is likely to have that disease? I think perhaps there is, *but simply because of the liability of the transmission of a predisposition.* It is not possible to inherit disease which was not present when the individual was born.

With regard to the infectious nature of cancer, when I began to teach the doctrine in this country, some twenty years ago, I was smiled at everywhere, and found very few friends of that theory either here or abroad. Yet now

*Read before the Southern Surgical and Gynecological Association, Hot Springs, Va., December 14-16.

the infectivity of cancer is quite generally established. Last year at the meeting of the International Society of Surgeons, held in Brussels, this question was under discussion for three days, and of some three hundred surgeons present out of a membership of six hundred, I found a large majority in attendance there believed in the infectivity of cancer, although there are naturally still some doubters. By that theory it is just as easy to explain all the phenomena of cancer as it is by any other. It is proven every day by clinical evidence. What stronger evidence can there be than the numerous instances of cancer following the use of the knife or trocar? Numerous instances have occurred in tapping for ascites due to intra-abdominal cancer, and it has been subsequently found that a track or streak of cancerous tissue follows the path of the trocar. What other inference can one draw except that of infectious character of the fluid which leaks out or oozes along the path of the instrument? That has been noted by numerous observers and many times in my own experience. It is known to follow the knife as well, and we have more and more frequently noted instances of rapid dissemination of cancer after the removal of a small piece of tissue for microscopical examination. I think it can be shown that this is a dangerous procedure unless the microscopical examination is completed within a few moments after the removal of the section and the operation made practically continuous with the examination. How else can you explain contact infection? And such contact infection can be seen in almost every case of intra-abdominal cancer, as well as intrathoracic cancer. How else can it be explained except as an autoinoculation? How else can you explain cases of malignant ovarian cysts, papillomata or dermoids, with infection of every bit of peritoneal surface which has come in contact with the disease, the infection leading to adhesions or to the development of papillomatous or carcinomatous outgrowths at thousands of points on the interior of the peritoneum? How else are you to explain the rapid dissemination of cancer after incomplete operations, as every one of you has seen? How else explain the phenomenon of metastasis? Is there any other disease, known to pathologists anywhere, characterized by metastasis as is cancer, in which you are not profoundly impressed by the very fact that metastasis furnishes the most indisputable feature of the infectiousness of the disease? The very fact that metastases occur during cancer is the best demonstration of its infectivity, and for me every instance of metastasis in a given case is an expression of a re-infection from the original source. If that does not mean that it is an infectious disease, what does it mean? You cannot explain it on any cell theory except the distribution of the *contagium vivum*, or whatever you would like to call it, from the original source and its being scattered all over the body. How else can you explain the horrible phenomena of malignancy, such as the general dissemination of medullary carcinomata or sarcomata as you may witness in serious cases?

What shall be said about the influence of trauma in connection with the theory of the infectivity of cancer? It may be that there is a predisposing cause; or it may be that it opens up pathways or ports of entry for infection just as it does in tuberculosis. I think whatever we may say with regard to the relation between trauma and tuberculous disease, we may say as to relations between trauma and carcinoma.

What about the results of inoculation? Well, they are extremely successful, particularly in certain animals, but we have found so far scarcely any exception to this fact that the transmission must be between animals of the same species. Here has been a great stumbling block for those men who do not wish to see the contagiousness of cancer. In our laboratory in Buffalo thousands and thousands of instances in small animals have been furnished, and recently in fish we are seeing these same evidences, and they have

been reinforced by many thousands of instances in the other laboratories of the world. The great trouble is that, cancer being transmissible only between animals of the same species, we are not at liberty to make experimentation in our own race. But that which we are not at liberty to do intentionally is done for us constantly in operations where knife or contact infection follows. It is done by accident. It is done by the ordinary process of disease. It is done many times unintentionally, and we see the same results. Nobody makes experiments deliberately, nor publishes his work showing that cancer can be transmitted from animals to man, nor from man to man, and here is where I make a plea for the scientific use of criminals for the purpose of legitimate investigation. (Applause.) There are a certain number of individuals who are worthless, who are useless, who are antagonistic to society, who have no proper purpose in this life, but who might be made useful under proper rulings of the courts. Under proper precaution if they could be made available for purposes of investigation, I feel confident that experiments on individuals of this class would be followed by startling revelations, and it is the only way by which I can see that some of these criminals can ever be made in the slightest degree useful to mankind.

The contagiousness of cancer is no longer uncertain. We have far more proof for its contagiousness than we have for that of leprosy, or some of the other diseases that are considered more or less contagious. But this is certainly true of leprosy. There is not one one-hundredth part the danger attending leprosy that there is cancer. But we are met with the statement that the infectious organism of cancer is not yet known. That is true. But neither is it in rabies, neither is it in scarlatina, nor many other diseases whose contagious or infectious nature we do not hesitate to accept. It is no argument to say that it is not yet identified. We know it by its results, although we do not yet recognize it face to face.

Now, the problem of attack upon cancer from the practical side, as it were, is, of course, of scarcely lesser importance than its pathology. But in order to make the attack effective we must make it at an early diagnosis. What shall be said about the early diagnosis of cancer? It is most difficult, undoubtedly in many instances, impossible. Under every means of investigation and exploration the diagnosis is sometimes impossible. Why is that true? Is it our fault? Here is a question the laity put to us very often; they say, "Why are you unable to recognize this disease?" The answer is found in this, and it is surprising that it has not been more generally recognized, for so far as I know, except in my own work, there is scarcely any allusion to it in English literature; yet it is a fact, namely, that *cancer as such has no distinct symptomatology*. That is not our fault. It is our misfortune that it has not a distinct symptomatology of its own. When you can *feel* it you may recognize it, but there is not one symptom produced by cancer either early or late which may not be produced by some other disease. Therein we find our excuse for failure to recognize it early, and therein we find our difficulty in coping with it. The more you think of this statement the more it will impress itself upon you, and the more anxious you will become to get nearer some early symptomatology. Possibly Dr. Crile has come as near to it as any one yet with his studies of hemolyses, yet these are not absolutely reliable nor available, because such work requires technic and skill of the highest order.

There are a few words I would like to say with regard to the possibility of cure of carcinoma or cancer in general. As yet the knife is the only remedy in the hands of the profession generally which offers any certainty, and not even that unless we get at these cases relatively very early.

Here is a general thesis which I think you will accept: *If* cancer could be early diag-

nosed or recognized, *if* it were accessible to our present means of attack, and *if* it were thoroughly removed, it could be cured; but there are *"ifs"* standing out in tremendous proportion and they are now apparently insuperable. We cannot often recognize it early; it is not always in an assailable position, nor is it possible to make a radical removal, which should be made in order to cure it; and yet when these conditions can be fulfilled then the disease is curable, but it will require that we get at the disease much earlier than we do at present. Delay in operating on these cases is partly the fault of the patient and partly the fault of the profession. It is a horrible reproach to our profession that some of its members make excuses for putting off operations on these cases when early operative interference would do much for many of them. Some members of our profession rather encourage delay for the purpose of an alleged study which is futile. They encourage delay at a time when action is most desirable. What we need to do is to practice it ourselves, and then preach by precept and example the earliest possible attack upon cancer. A well founded suspicion of internal cancer justifies the earliest possible exploration for its recognition, while such exploration should be followed by radical operation if it be possible to make it. It is a sad mistake to take a case of suspected cancer of the stomach and test it for weeks, and treat it for months, until all hope of doing good has passed. We should impress the desirability of an early exploratory operation, and no man should be trusted to do this unless he is both prepared and competent to go on with the work and make a radical removal at the same time if indicated or permissible. In other words, in every case in which there is a suspicion of cancer an exploration should be made at once, and no time should be lost or wasted in the use of drugs. I think it may be generally stated at an early date whether an operation should be done or not. That certainly is true of cases of uterine cancer, of cancer of the tongue, or the rectum and of many other organs, and I do not know but what this statement should be broad and general enough to cover every instance. If doubt arises as to what one ought to do it is practically too late to do anything, except to make a palliative operation. That may be worth while, but it is mighty late and it is usually too late to offer a prospect or promise of cure.

What can be done with non-operative measures, such as are held out by quacks and charlatans, and perhaps still by a few honest men? I do not know whether there really is much or anything in the so-called Alexander treatment, or in methods of that kind, but we read of selected and occasional instances in which apparently good has been done. I believe there is such a thing as the spontaneous retrocession of malignant growths. They cure themselves, but I do not think that this occurs once in several hundred cases. It is barely possible that in the administration of some non-operative remedy, spontaneous relief in a way may follow, but X-ray, for example, rarely cures in those cases where operation ought to be thought of first. Just as a practical hint in connection with the use of the cathode rays, I will say that their efficacy can be enhanced by the use of the thyroid extract. In other words, we get better effects by giving the thyroid extract internally while using the cathode rays than by the latter alone.

I know that what I have said without time for preparation has formed a desultory presentation of this most important subject, but I simply wanted to put before you a few thoughts in reference to cancer, and am very much obliged to you all for the marked attention with which you have listened to me.