I must not forget one important aid with which Nature has provided us; she has given us a most capable ligature in the elasticity of the lungs. As blood is effused and more blood from the right heart takes its place within the vessel the effused blood distends those alveoli into which it flows, and the elastic walls of these in turn increase the pressure which they had previously exerted, and so press the effused blood with increasing force against the ruptured wall of the vessel. This natural ligature it is evidently our duty to aid by all the means at our disposal, and for this reason I would shun any method of therapeusis which would accentuate the act of inspiration, such as the inhalation of astringent sprays.

The application of an icebag to the præcordium, inasmuch as it is a powerful cardiac depressant, is valuable, but, in so far as it chills the surface of the body, it is undesirable. As ice in some form or other is usually importuned for by the patient, it is, perhaps, well at once to resort to this method of its exhibition, and the bag will be most wisely placed upon the præcordium. As to its local application over the bleeding point, even if we could accurately localise this, I doubt the advisability, owing to our want of knowledge of the effect of cold on the pulmonary vasomotor nerves and of the depth to which the cold of an icebag can penetrate. Experimentally, but not yet my to mind clinically, it seems to have been shown that the cutaneous application of ice to the chest has produced local anæmia of the subjacent lung.

I would conclude this paper with the exhortation, "Above all things let the thought of morphine be kept ever in mind." As a chain's strength is that of its weakest link, so is the hæmoptoic force of a circulation that of its strongest pulse. One strong beat may thrust away the plug which many feeble predecessors have allowed to form. A vascular serenity is, therefore, an absolute essential in the treatment of hæmoptysis.

REMARKS ON THE ETIOLOGY OF CANCER.¹

By C. H. CATTLE, M.D.LOND., M.R.C.P.

I PROPOSE to speak, almost exclusively, of the etiology of cancer in the strict sense of the word—that is, of malignant tumours of the epithelial type. This subject has attained to great prominence during the last few years on account of the alleged discovery of parasitic protozoa in cancerous tumours. No one will be able to adopt a narrow view of the etiology of cancer who has read in Mr. Hutchinson's *Archives of Surgery* the series of admirable clinical records, in which is shown the connection of cancer with other morbid processes, especially chronic inflammatory lesions. While bearing in mind as much as possible of what has been imparted to us by eminent observers, I have no wish to dissemble my personal bias towards a belief in a specific parasitic agent as one factor, and that probably a necessary one, in the causation of cancer. Leaving this for the present, I will glance very briefly at some contributory influences, which have received more or less general acceptance.

Heredity.—Under this head we have to distinguish carefully between diseases in which the disease itself is unmistakably inherited, and those in which a want of resistance or vulnerability of certain tissues is inherited, which may lead to the development of the disease if certain other conditions are favourable. To the first class belong syphilis and hæmophilia; to the second, in the great majority of cases, tuberculosis and cancer. It must also be remembered that in dealing with such a common disease as cancer the influence of heredity may be apparent rather than real; for although the same disease may affect the offspring as affected the parent or grandparent, yet the explanation may be that the individual was in both cases exposed to similar extraneous influences. Among private patients Sir James Paget estimated that a history of hereditary influence could be obtained in one case of cancer in every three. This estimate, high as it may seem, would still leave 66 cases in every 100 to be otherwise accounted for. Well authenticated cases have been recorded of cancer affecting many members of the same family, and extending over several generations.

Age and Sex.—Statistical tables and daily experience inform us that cancer is most commonly met with in persons between the ages of 40 and 60, and not infrequently between 60 and the end of life. The sudden rise between 40 and 50 is due mainly to the liability of the breast and uterus at this period of life to become cancerous. Females are about twice as liable to cancer as males; but if the reproductive organs are left out of account, cancer is much more common in males. Cancer of the lip is a hundred times as common in men as in women, and cancer of the œsophagus four times.² In Continental statistics the stomach is invariably at the head of the list as regards liability to cancer, the position of the uterus, and still more of the breast, being comparatively insignificant. While allowing due weight to the obvious fact that cancer is, in the majority of cases, a disease of the decline of life, it would be a mistake to allow ourselves to be so dominated by this fact as to ignore the occasional occurrence of cancer before the usual age. I think some light may possibly be thrown on etiology by a more careful study of cancer occurring comparatively early in life. I may quote four instances of early cancer which I have come across quite lately without being at any trouble to search for records. The first case, which came under my own notice, was one of cancer of the breast in an unmarried woman of 33. Careful inquiry failed to elicit any evidence of hereditary transmission. The second case, also of cancer of the breast, was related to me by a medical friend. The patient's age was 34, and no evidence of hereditary influence could be discovered. The third and fourth cases have been recently reported. One was a case of cancer of the rectum in a woman of 30,³ and the other of cancer of the cæcum in a girl of 22.⁴ In neither case is anything stated for or against the influence of heredity.

Chronic Irritation.—It has been said that parts which have long been in a state of chronic inflammation or irritation are liable, under the influence of heredity or senility, to become cancerous. The well-known records of "lupus cancer" are a case in point. The cancerous process is something so specific, so different from ordinary chronic inflammation, that I cannot bring myself to believe in the evolution of the one condition from the other, without the superaddition of a specific cause. To my mind such influences as heredity, senility, local damage to parts, and the involutional changes in organs whose functional days are overpast, are so many predisposing causes to a specific disease, which prepare the way for the entrance of a specific poison to the tissues. While saying this I must, however, admit that Mr. Hutchinson's records of warts and moles in the aged becoming malignant appear to afford strong ground for a belief in the evolution of cancer from simple and innocent modifications of structure. Some rare cases are on record in which cancer has followed the long-continued administration of arsenic.

The Seat of Cancer, etc.—It is a well-established observation that those parts which are frequently the seat of primary cancer are little liable to secondary deposits and *vice versa*. While these propositions will be generally admitted, it would be no easy matter to give reasons for all the observed facts on which they rest. For instance, in the case of mammary cancer, why is the liver so often affected by secondary growths while the lungs may escape? If cancerous emboli can get lodged and grow in the capillaries of the liver, why does the same result occur but seldom in the case of the stomach, spleen, intestine, and kidney, which are nourished by the same cancer-laden blood? Auto-inoculation has been observed occasionally where a healthy surface has lain in contact with a cancerous one. Cases are also known in which inoculation of the stomach or intestines has been effected by means of fragments detached from growths higher up the alimentary canal. I may just mention, without comment, the liability to cancer of orifices, the narrowings and flexures of hollow organs—in short, parts exposed to friction and other local damage.

Geographical Distribution.—Cancer is said to be more common in Europe than in any other continent. By some authors it has been thought to be more common in low-lying districts, especially near river banks, than in elevated re-

² BRITISH MEDICAL JOURNAL, February 3rd, 1894, p. 271.

³ BRITISH MEDICAL JOURNAL, February 10th, 1894, p. 299.

⁴ *Ibid.*, EPITOME, January 27th, 1894, p. 14.

¹ A contribution to a debate at a meeting of the Sheffield Medico Chirurgical Society, March 1st.

gions. It has also been stated that in France cancer is more common in the country districts than in towns.

Cancer a Specific Disease. Cohnheim's theory of the origin of new growths does not, I think, carry us very far towards explaining cancer. It is more applicable to the case of simple tumours, and, perhaps, sarcoma. The epithelial cells of cancer have undergone a specific metamorphosis. Normal epithelium transplanted to an abnormal situation, as may occur accidentally in surgical operations, does not grow into a cancer. A piece of scirrhous cancer transplanted into a rabbit disappears; the thyroid gland of a sheep transplanted into a man is in like manner absorbed. What, then, is the specific force which not only causes cancerous epithelium to proliferate, but also enables it to maintain its existence against the disintegrating action of the invaded tissues? Sir James Paget has made an interesting comparison between cancer and the group of diseases which we are accustomed to call specific. He points out that the members of this group differ from one another quite as much as any one of them differs from cancer. If we compare the characters of syphilis, tuberculosis and cancer we shall find they present certain rough and general analogies; objection may no doubt be raised to points of detail. In each, for instance, the initial lesion is often solitary and local. This is followed by general infection of the system, effected primarily by means of the lymphatics and afterwards by the blood vessels. The tendency of each disease, if unchecked, is to destroy life. In each, again, after a prolonged struggle, the disease may die out and the patient survive. In only one of these diseases has a specific parasite been conclusively demonstrated as the cause, but can there be reasonable doubt that, in the case of diseases so similar in their course and development, a similar cause will eventually be demonstrated for all three?

The Specific Agent.—It is hardly likely that cancer is caused by a bacillus, for its characteristic structure is very different from that of the lesions occurring in those diseases which we know to be caused by bacilli; but it is quite conceivable that protozoa living in the cancer cells might determine their proliferation, and by means of their toxic products exercise a more extended influence than the actual number of parasites would account for. I shall be told, I know, that the secondary deposits of cancer are all grafts from the primary one, and that the supposed parasite, if it be a *vera causa*, ought, acting by itself alone, to excite the disease in whatever situation it becomes implanted. The criticism is perfectly just. Let me try and state the parasitic theory a little more explicitly. It assumes that the association of the parasites with the epithelial cells, having once taken place, becomes permanent, both as regards the primary and the secondary manifestations of the disease; that epithelial proliferation alone does not constitute cancer; and that protozoa do not excite cancer in epithelial tissues unless favoured by a certain preparedness of soil. These assumptions, if proved true, would explain much that is obscure in the etiology of cancer. The theories of cancer are not few, and we may fairly ask: Does any of them give a better explanation of the cardinal features of the disease—of its pertinacious growth, its widespread generalisation, its inexorably lethal tendency? I do not assert that the bodies which have been found in cancer during the last few years by many observers, and described as protozoa, are the cause of the disease. But a disproof of all connection between these bodies and the origin of cancer would not weaken the force of the general argument in favour of a specific parasite. Microscopic evidence alone will not settle the questions at issue. There is reason to believe, however, from evidence gained from the examination of specimens while still quite fresh, that some of the bodies described as parasites are at least living. What is necessary to make the evidence convincing is that the supposed specific cause should be shown to be capable of exciting cancer in an animal previously healthy, either acting alone or in presence of certain known concomitant conditions.⁵

THE ELEVENTH INTERNATIONAL MEDICAL CONGRESS.

Held in ROME, March 29th to April 5th.

[FROM OUR SPECIAL CORRESPONDENTS.]

AN ADDRESS ON NON NOCERE.

Delivered before a General Meeting of the XIth International Medical Congress, held in Rome, 1894.

BY DR. JACOBI,
New York.

[ABSTRACT.]

THE medical profession suffers injury in various ways. By the possible preponderance in International Medical Congresses of the social over the scientific elements, by the excessive number of specialists insufficiently grounded in general medical knowledge and practice, and by the excessive modesty of some practitioners who send to these specialists a large number of the cases which come into their hands, and thus teach the public to prefer an almost empirical method of practice to true science; by the manner in which medical men persuade themselves that manufactured products (medicines and foods) are preferable to the *Pharmacopœia*; and, lastly, by an excessive tendency to follow new fashions and customs (tuberculin, elixir). The cause of all this is the desire to do good and this also explains the eager hunting after new products of organic chemistry, which too often are employed in excessive doses. The reproach which has been brought against the medical profession of always wishing to do too much in the way of operative interference and medication is certainly not without some foundation. But the administration of remedies in insufficient doses is even more injurious than giving them in exaggerated quantities.

Many chances of saving human life are thrown away by too great delay in interfering medically, and this occurs especially in inflammatory and infective fevers. The so-called "expectant" method is frequently a most pernicious proof of indifference or ignorance.

Side by side with exaggerated or insufficient medication goes exaggerated or insufficient nourishment. Sugar of milk, if used as the sole food of infants, is injurious to them. Cow's milk, even if sterilised by boiling, cannot acquire the physiological properties of woman's milk, and if used alone is unfit for the nourishment of infants. Infants suffer greatly if they are treated too late or injudiciously. Asphyxia of the newborn impairs for ever both bodily and mental health, and therefore necessitates prompt intervention on the part of the medical practitioner. In such cases, however, electrical treatment is not to be recommended unless it is applied with care, and with the necessary interruptions. The perils of infective lesions are also frequent, but can easily be avoided. The cause of the obstinate constipation described by the author (even if the only food given is woman's milk) consists in abnormal length of the sigmoid flexure in the newborn infant and baby. In such cases purgatives must be avoided; daily enemata must be given until in five or six years a normal condition has been brought about.

Interference by tracheotomy in diphtheria is pernicious except in the case of children of a certain age and of a sub-missive disposition. The struggles of infants cause exhaustion, cardiac paralysis, and death. Nasal diphtheria necessitates frequent injections; glandular abscesses of the neck, if they tend to become very large or to be the seat of a necrotic process, should be freely opened and disinfected.

⁵ The paper was illustrated by lantern-slide photographs by Dr. Millar, of Nottingham, and by coloured drawings made for the author.