cancerous tumours, I need hardly say that in the last few months there have been a number of separate papers containing descriptions of parasites of this nature within the epithelial cells which are the characteristic elements of cancerous tumours. These papers have generally been accompanied by illustrations from which the appearances may be readily gathered. I shall not here do more than enumerate the names of the authors whose papers I have seen and read bearing on this subject. There is Russell, of Edinburgh; Soudakewitch, whose researches are published in the *Annales de l'Institut Pasteur* (No. 3, 1892); Sawtshenko in the *Centralblatt f. Bakteriologie und Parasitenkunde*, July, 1892; Ruffer and Walker in the *BRITISH MEDICAL JOURNAL*, July, 1892; Steinhans in *Virchow's Archiv*, vols. 126 and 127, and there is the complete work by Pfeiffer, which takes up the whole subject of the action of these parasites in all the forms of disease in which they occur. This work, which seems to me to go rather beyond the bounds of certain knowledge, was originally published in 1891; already in 1892 there is a new edition much enlarged. Such is the eagerness with which this subject is being pursued at present.

There is not the slightest doubt that the epithelial cells of cancerous tumours do contain structures which are separate both from the nucleus and the protoplasm of the cell. They were observed long ago by Virchow, who seems to have observed and described almost everything, and by many others since then. These bodies may be visible as clear spaces, especially when fresh cells are examined without special methods of staining, but the spaces are generally filled with structures which are different in their appearance and in their reactions to staining agents from the rest of the cell. It is not difficult in fine sections of cancers to see such bodies, and I show you here two or three drawings of them as seen in cancers of the mamma. These drawings I made with the camera lucida, and you will recognise the resemblance to some of the forms figured by Ruffer and Walker. These bodies are of various sizes, and in their growth they often push aside the nucleus and monopolise the cell.

These structures have not, till quite lately, been looked upon as parasites. They were regarded as arising from changes in the cells, and many of them were taken to indicate a kind of endogenous cell formation. This latter explanation is probably incorrect. In growing cancers one can always plainly see evidences of multiplication of cells by the regular nuclear division or karyomitosis. These bodies in the cells have no connection with the nucleus, which they push aside. Yet in cells which are so rapidly formed as those of cancers are, and which are growing so quickly, there may be internal changes in their economy of which these appearances are the manifestations, without the assumption that the bodies are parasites. The existence of the bodies described, and the accuracy of the descriptions, cannot be denied, but the proof that they are parasites has by no means been furnished.

IX.—CONCLUSIONS.

In what has gone before I have indicated the considerations which have induced me to listen with more favour to the suggestion that cancer is due to an infective parasite introduced from without. It remains as obvious as ever that the minute vegetable parasites are not capable of producing such tissue growth as we observe in cancers, but it does seem possible that minute organisms belonging to the animal kingdom may, by entering into the substance of the cells, and there undergoing their stages of evolution, produce phenomena of a kind similar to those of cancer.

When all is said there is much in the causation of cancers which remains unexplained. We have, for instance, the great varieties of cancers. Are we to suppose a separate parasite for each? There is the limitation to organs—Does each organ have its own form? There is the curious limitation as to age, cancer being a disease of the decline of life, but not of old age. All these are questions which suggest themselves, and call for explanation on the parasitic hypothesis. It is clear that for the development of a cancer a certain preparedness of the tissues must pre-exist. This is usually brought about, apparently, by the changes in the tissues incident to declining years. It may be induced by an imperfection in the tissues, as where a cancer starts in an old scar. It may have its origin again in an abnormality of

the tissues, as in a case which I met with not many months ago, in which a congenital sacral tumour developed a cancerous condition, and, at the time of death, when the child was only 2 years of age, there were already secondary tumours in the liver.

It seems to me that on the whole question we should keep an open mind, ready to admit any light which observers, who are specially working at the subject, may be able to throw on it.

ON DEFECTS IN THE PRESENT MODE OF CERTIFYING AS TO THE CAUSE OF DEATH FOR THE PURPOSE OF REGISTRATION.

By SIR HENRY THOMPSON.

(A STATEMENT LAID BEFORE THE SECRETARY OF THE HOME DEPARTMENT).

No one, I presume, will deny that it is one of the first duties of the State to obtain satisfactory evidence as to the fact and as to the cause of death, whenever it occurs to any one of its citizens, without exception, whatever the class of society to which the individual belongs.

This being so, I have to show that the means employed in this country, although evidently framed to fulfil that duty, are defective, and fail in doing so to a serious extent. This I have at various times endeavoured to point out.

The method at present adopted is to obtain a written certificate from the medical man who has personally attended the deceased; for it is necessary to possess certain facts concerning the death such as can only be determined and testified to by a qualified medical man, together with the inference which he draws therefrom. This is the design and scope of the present medical certificate.

Now, the evidence regarding the working of this plan is accessible and complete. I believe it produces a satisfactory result in in the great majority of cases; at the same time, not a few exceptions must be admitted. Moreover, in many of those cases where no doctor has been present and evidence is most needed, no provision for any special medical examination and testimony is made, and registration is accepted without it unless some obviously suspicious circumstance becomes known to some one who will demand a coroner's inquiry.

I ask your attention, Sir, to the last Report of the Registrar-General of Births, Deaths, and Marriages in England and Wales (for the year 1890). Let me say that it is the most favourable in regard of this subject yet issued; these reports, showing during the last few years very gradual improvement in the care with which the mode of certifying is performed.

The measure of defect most apparent at first view, may be thus set forth:—

In 1890 there were registered	562,248 deaths;
And of these were buried without any certificate	15,947 or 2.8 per cent.
But besides these a much larger number is reported by the Registrar-General as so "inadequately certified" as not to be classifiable	25,683 or 4.6 per cent.
Making a total of	41,630 or 7.4 per cent.,
of which the cause cannot be stated.	
Besides these it should be added that the coroner certified after inquiry in no less than	31,581 or 5.6 per cent.

The remainder, about 87 per cent., were medical certificates of the average kind.¹

It is thus clear that about one death in every thirty-six is registered without any certificate, and that one in every twenty-four certificates is without value. I may add here that uncertified deaths are far more numerous in Scotland. In Glasgow they form 4 per cent. of the entire number; in Edin-

¹ Let me point out an illustration of the "slight improvement" referred to at the outset, that in 1885 the uncertified cases were 3.5 per cent., while in 1890 for the first time they are as low as 2.8 per cent.

burgh no less than 8 per cent., and in the remoter parts of Scotland from 25 to 45 per cent.

These results are not surprising. I think it should be borne in mind that the medical profession is called on to accept the duty and responsibility of certifying without any sort of recognition or acknowledgment of service rendered. Although this fact does in no way make that duty less important either in the view or in the practice, as I believe, of the great body of the profession (and I speak with a large experience in this matter after forty years' considerable and intimate acquaintance with my brethren both in town and country), it is impossible to deny that a duty so lightly regarded by the State is apt to become lightly regarded by some of the executive also, so that in course of time the certificate is treated as a matter of form, or at most one of small importance.

In order to remedy these defects, it appears to me to be necessary, first, to ensure a somewhat more detailed inquiry for the certificate in all cases; secondly, a searching medical examination should be made compulsory in every case which has not been attended by a qualified medical man in connection with the illness or injury which has caused death; this to be as complete as circumstances demand, or, if necessary, to be conducted by the coroner. Relative to all examinations, whether for the ordinary certificate or any other, the body should be identified as that of the individual named, a duty not recognised by the present certificate, and it is rarely done, although very rarely, of course, does it prove to be necessary. Nevertheless, for obvious reasons (in connection with known assurance frauds, for example, etc.), it ought to be the first act in the examination made.

Then the certifier should be desired to state in every case as accurately and distinctly as possible the nature, duration, and complications of the disease which has been fatal, for the purpose of those statistical records which are so valuable an index to the condition of the public health and to the dangers which threaten it.

Lastly, in every instance the examination should be made as soon as possible after death; and especially when the case is an exceptional one, the history of which is unknown, it should be made by an expert, probably a resident in the district designated for the purpose. For it must be borne in mind in relation to the use of poisons that, with the spread of intelligence, a poisoner will be able to avoid those which are easily identified by tests, and will seek agents of more subtle quality, which decompose quickly in the body afterwards, leaving little or no trace of their presence there. And whatever be the destination of a body, whether burial or cremation, it is necessary to obtain the evidence respecting poison in doubtful cases while the body is above ground. You may be told, Sir, that certain modes of burial accomplish disintegration and dissemination of its natural elements much more rapidly than other and older modes. Equally, then, will the traces of such poisons likewise disappear from the remains so buried. Thus also marks of violence manifest on a dead body are rapidly lost as decomposition advances. Everything points to the importance of the principle: In all cases ascertain the cause of death if possible while the body is within reach and before marked putrefactive change occurs.

It is no part of my duty here to suggest any new system in order to remedy the defects complained of; but I may perhaps be permitted to say that I do not think more is required to accomplish the object I have described than a certain effective extension of the arrangements for ascertaining and registering the cause of death which are at present adopted in this country.

NATIONAL LEPROSY FUND.—It will be recollected that the Government of India undertook the printing of the report of the Leprosy Commissioners in India. Sir Somers Vine, the honorary secretary of the fund, has just been informed by the Surgeon-General to the Government of India that a few "advance" copies of the report may be expected to arrive in England this month. These will be distributed to the members of the Committee of the National Leprosy Fund in England, who will prepare an introductory memorandum for insertion in the copies of the Commissioners' report, which, it is hoped, will reach this country for sale and distribution before long.

THE FUNCTION OF THE THYROID GLAND, WITH OBSERVATIONS ON A CASE OF THYROID GRAFTING.

*Being Notes read before the Third Intercolonial Medical
Congress of Australia.*

By JOHN L. GIBSON, M.D., C.M.EDIN., M.R.C.S.ENG.,
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My work in writing the following notes on the function of the thyroid has been made comparatively easy by Victor Horsley's latest paper.¹ This, while furnishing an account of recent work on the subject, which otherwise in Brisbane it would have been impossible to obtain, has also made it unnecessary for me even to refer to the work of others except where necessary for the special elucidation of any point. My paper, therefore, is based upon observations of my own on the function of the thyroid, and will have the special purpose of recording the case of a child in whom I believed the thyroid to be at least functionally absent, and into whose body I have twice grafted the thyroid of a lamb, first under the skin of the chest, and afterwards into the abdominal cavity.

In a paper² on the blood-forming organs published in 1885-86 I recorded observations on dogs directed to ascertain whether or not the thyroid gland had, as regards corpuscular elements, any blood-forming properties. From these I felt justified in concluding that it possesses no blood-forming properties. I was at the same time able to disprove its alleged function as compensatory to the spleen. Both of these functions I note that Victor Horsley³ is still inclined to support, and has for that purpose included in his paper evidence from Crde to Zzas, whose work I showed to be unreliable in this matter.

Surely we can ascribe no blood-forming function to a gland whose excision is followed by no reduction in the number of coloured cells in the blood, and by no important alteration in the number of colourless cells. In two of my dogs such was the case, in spite of the fact that the effect of the excision was lethal, and of the additional fact that it was also minus its spleen. In a third dog, which showed a reduction in the number of hmocytes, this could be ascribed to voluntary starvation, preventing, by its depressing influence upon the blood-forming organs a recovery from the initial reduction of corpuscles due to the operation. I do not deny—in fact, I assert, that if animals live long enough after excision of the thyroid they become anemic, but this can be ascribed to the very serious effect that the absence of the thyroid has upon the nervous system and upon the general body metabolism, exercising a depressing influence on blood formation. The case of a dog whose spleen was excised with a resulting slight reduction in the number of red cells, which seemed to reach a maximum as in other dogs at about two months after the excision, is sufficient to disprove any compensatory function of the two glands as well as any blood-forming function of the thyroid. For from this dog I subsequently removed first one lobe of the thyroid without any ill effect on the animal, and without its absence having prevented the red corpuscles from reaching within a month the number which had existed in the blood previous to the excision of the spleen, that is, the hmocytes increased in numbers during the month subsequent to the excision of the first thyroid lobe, in spite of the fact that the animal was also without a spleen. The remaining lobe of the thyroid was then removed with a lethal effect fourteen days after, but with so slight an effect upon the number of the coloured corpuscles, that two days before its death they were equal in number to those in the blood previous to the excision of the first lobe. This animal, also, be it noted, lived without spleen and thyroid practically as long as the other two dogs from which the thyroid alone had been excised at one operation.

Victor Horsley has objected to the results of enumeration in the cases of these three dogs that they are negative, and,

¹ BRITISH MEDICAL JOURNAL, January 30th, February 6th, 1892.

² *Journal of Anatomy and Physiology*, vol. xx, Part iv.

³ BRITISH MEDICAL JOURNAL, December 10th, 1890.