emaciation; the quantity of sugar taken should be reduced to a minimum, and the patients should partake freely of fresh fruits and vegetables, while such articles of food as potatoes and rhubarb should be avoided. As to the use of stimulants, no definite statement can be made; each case must be judged of on its own merits. In old persons, or in patients with a feeble circulation, alcoholic stimulants are of service; and probably there is no better one than whisky in small quantities, twice a day, in aerated water. Tobacco-smoking is positively injurious in all cases of chronic catarrh.

The only other particulars which I have now to consider are some of the external influences or internal conditions upon which the catarrh may depend. The former I mentioned when considering the etiology of the disease; it is not necessary, therefore, for me to allude to them now, further than to say that, as soon as the immediate cause of the affection is discovered, the removal of the patient from exposure to it is the first thing called for.

There are, however, some constitutional conditions with which the various forms of chronic catarrh are associated, which demand your attention; and amongst these I may mention struma, gout, rheumatism, certain nervous affections, and cardiac diseases, which, by inducing congestion of the mucous membrane, keep up the symptoms of catarrh. Anæmia also is frequently associated with chronic catarrh of the larynx or pharynx.

These conditions must, in all cases, be looked for, and when detected, they should be treated according to their requirements. In the great majority of cases, tonics are called for; and iron, especially its astringent preparations, is of great value, particularly when combined with quinine and strychnia. Cases of dry catarrh are frequently associated with gout, a disease we very seldom see in Glasgow; and in such instances, the greatest possible good is said to be derived from the administration of colchicum and alkalies; whereas, in cases where the quantity of mucus secreted is large, you will find that the patient will derive considerable relief from the use of lozenges containing half a grain of cubebs, one to be taken every three or four hours.

AN ADDRESS ON THE INVESTIGATION OF THE CAUSES OF CANCER.

*Delivered at a Combined Meeting of the East Anglian, South Midland,
and Cambridge and Huntingdon Branches.*

By HENRY T. BUTLIN, F.R.C.S.,
Assistant-Surgeon to St. Bartholomew's Hospital, etc.

ALMOST at the same time at which I received a very kind invitation from one of your secretaries, Dr. Elliston, to speak on the subject of cancer at this meeting, I received a note from Professor Humphry, containing a suggestion that, with a view to restrain the discussion within practicable limits, I should speak "especially with reference to the prevalence of the disease in East Anglia."

I should have been very pleased to have carried out this suggestion, had it been in my power to do so with advantage. But, in truth, it is not in my power; and, had it been so, the chief, if not the only reason for my presence here to-day might have ceased to exist. Of the prevalence of cancer in East Anglia, I know no more than Mr. Haviland's map of the distribution of cancer shows; and, in that map, some parts of this and of the neighbouring counties appear to be very free from cancer, while other parts appear to furnish a very large number of cases. I have brought the chart with me, and hope to hear from the members who are present how far they regard it as correct, with all other information on the subject which they may be able to offer.

But, first, I will ask permission to draw the attention of this meeting to the circumstances which led to this inquiry on cancer, and to what may be the outcome of it.

After instituting several inquiries on subjects chiefly medical, it was thought desirable by some of the members of the Collective Investigation Committee that an inquiry should be founded on a surgical subject; and Dr. Mahomed invited me to propose a subject suitable for investigation. I suggested the subject of cancer, partly on account of the interest which it has ever had for myself personally, partly because attention has on several occasions within the

last two years been directed to the increasing mortality from the disease, which is apparent on the returns of the Registrar-General. Two papers were published during the course of 1883 and 1884, one by Mr. H. P. Dunn, the other by Mr. Bowreman Jessett; both of them pointing out the increase of cancer in the kingdom, both of them resting on the statements of the Registrar-General, both of them containing theories to account for the continual increase. Mr. Dunn says that the increase is due "(a) to the success attending the legislative measures and other means for the preservation of the infant population, by which a large proportion of persons reach adult age, and the general healthiness of the community is increased; (b) to the greater prominence which, in the present day, prevails of the most predisposing causes of the disease—such as the fecundity of women, the prevalence of high nervous tension, and the existence of possibly greater general luxury in the mode of living."

Taking the second of these propositions first, there is absolutely no proof at present that very fruitful women and highly nervous people are peculiarly liable to cancer; nor is there any reason to believe that the offspring of the very fruitful and the highly nervous are more susceptible than other persons to the disease. The answer to the first proposition lies on the face of it: the success with which infants are reared is no certain index to the general good health of the community; and it might much more reasonably be maintained that the bringing to adult age of vast numbers of delicate infants is far more likely to lower than to raise the general standard of health throughout the country. The large number of cancers which are registered in many of the most populous towns is surely not consistent with the theory that cancer is a disease of persons in robust health; and a very limited experience of cases of cancer suffices to prove that it is not partial in its attacks, but affects the weak and delicate as frequently as the strong and healthy.

Mr. Jessett is more cautious in the conclusions he deduces; but he is a strong believer in the inheritance of cancer, and in the predisposition to the disease caused by mental strain and worry. He does not, however, furnish any proofs of the correctness of his views; and when he asks the question, "Do not the statistics which I have placed before you (namely, those of the Registrar-General) tend also to prove that cancer is passed down from generation to generation?" the reply must unhesitatingly be "No, they do not tend to prove the inheritance of cancer; they tend to prove that cancer is increasing, and that the causes of cancer are either increasing, or are acting with continually increasing vigour."

But, while I am not content to accept the views of Mr. Dunn and Mr. Bowreman Jessett, or the conclusions which they draw from the statements of the Registrar-General, I must thank them for having pointedly drawn attention to the increasing mortality of cancer manifested in the Government returns. On that account their papers are very valuable, for they have been in the hands of many persons of our profession who would not be likely to study attentively the Government statistics, or even to read the remarks by which the statistics are prefaced by the Registrar-General.

Of course, it is always possible to object to the Government returns on the ground that it is impossible they should be absolutely accurate, that even careful medical men are liable to error in diagnosis, and that many cases of reported cancer are not truly cases of that disease. The Registrar-General himself appears to consider that a part at least of the increased mortality observable in his statistics may be attributed to causes of such a kind, but rather to improvement in medical knowledge than to the reverse; for in 1881, he says: "The death-rates from cancer were at their maxima, doubtless owing to increased accuracy of diagnosis, by which the deaths ascribed to definite causes are always increasing at the expense of the indefinite class."

I am quite ready to admit that the Government returns cannot be absolutely accurate, nay, that they are probably, necessarily, far from accurate; and I am quite ready also to admit that a better knowledge of diagnosis may enable practitioners to classify under the head of cancer a certain number of cases which were formerly left unclassified, or placed under some other head. But it must not be forgotten that increased accuracy of diagnosis may act in the opposite direction, and may lead to the classification under other headings of a certain number of cases which were formerly classified as cancer.

Thus, of external affections, cases of tuberculous ulcer of the tongue are far less likely now than formerly to be confounded with cancerous ulcers. Even admitting that the returns are larger than they ought naturally to be, by reason of some such causes as these, it can scarcely be maintained that the large and continuous increase which is manifested is wholly fictitious.

It occurred to me some time ago that the surest method of discovering the truth would be to compare the returns of some of the

cancers of external parts of the body at intervals of ten years. Taking, for example, cancer of the breast, and comparing the returns of 1863 with those of 1873, and again of 1883, and allowing for the increase in the population at the end of each ten years, it would be easy to ascertain whether the disease had increased out of proportion to the population, and whether the increase bore a direct relation to the general increase of the death-rate from cancer of all parts of the body. There are so few chronic diseases of the breast of which persons die, that it is scarcely possible to err in the diagnosis of fatal cases of mammary cancer. The returns, too, would certainly be below rather than above the actual number of cases; for women often die of secondary affections which are not traced to their connection with the primary tumour of the breast, either because the primary disease has been overlooked, or because it has existed many years, and has been for a long time quiescent, or has even shrivelled, or because the secondary affection has not taken the form of definite tumours, and no *post mortem* examination has been made. Although the intention has long been in my mind, it was only during the course of last month that I carefully examined many volumes of the Annual Reports of the Registrar-General, and, to my surprise, discovered that the Government statistics of cancer are not made up for the cancers of each part of the body. With very few exceptions, all the cancers are included under the general head of cancer; and the deaths are arranged for males and females in several columns, according to the age at which the deaths occurred. Remembering that Dr. Walshe's work on *Cancer* contained the relative proportions in which the cancers of different parts of the body were observed forty years ago, I took down the book, and found, to my great disappointment, that the statistics were founded on the Paris returns. I therefore wrote to Dr. William Ogle, of Somerset House, feeling sure that, if anyone could tell me whether such statistics as I sought existed, it would be he; and also feeling sure that I should learn from him whether the Government possessed any material from which it might be possible to frame them. In a letter containing some very interesting remarks on the frequency of chimney-sweeps' cancer, which will, I trust, ere long be published, Dr. Ogle replied: "I am sorry to say that the statistics you ask for are not to be had. The deaths from malignant disease are only abstracted in the aggregate; that is to say, without any distinction either of organ affected or of precise character of the disease. In a very considerable proportion of the cases, the medical man simply gives 'cancer' as the cause, without further particulars; so that it would, to say nothing of the labour, be quite useless to attempt to discriminate between the several kinds or the different sites."

It appears, therefore, impossible at the present moment, and for many years to come, to discover whether there is a steady and continual increase of cancer of every part of the body, or whether the increase which is apparent on the returns is due to a large increase of the cancers of one or more parts of the body, while the relative numbers of cancers of other parts remain stationary, or are actually diminishing. This is the more to be regretted, because a knowledge of such facts as these is of vast importance, not merely in estimating the general increase in cancer, but in assisting us to discover to what extent some of the alleged causes of cancer act, or, indeed, whether they really can be regarded as causes of cancer. In the presence of a disease which we believe to be continually advancing in our midst, and against which we can claim no medical, and only a very partial surgical success, it is impossible to estimate too highly the importance of discovering, as thoroughly as possible, the exact nature of the causes which tend to its production, how far those causes may be assumed to act singly or in combination, and how far it is possible to diminish or remove them.

It has been said that statistics may be made to prove anything, and certainly our national statistics have been used to support the wildest and most improbable theories. But it is quite conceivable that statistics prepared from materials furnished with a certain definite object, may be used with the happiest result in discovering the etiology of cancer.

There is one cancerous disease which we believe to be, more certainly than any other, due to the presence of a local irritant, soot-cancer or chimney-sweeps' cancer. It occurs so frequently in sweeps, and so rarely in men of any other calling, unless they be exposed to the continual contact of soot or some similar irritant, such as tar, that the reasons for regarding it as a disease of essentially local origin, due to the actual contact and action of the soot upon the skin of the scrotum, appear at first sight to be incontestable. But suppose for a moment that inquiries were made in every part of the kingdom on the subject of soot-cancer, and that the result of those inquiries was to show, not only that soot-cancer is almost limited in its occurrence

to sweeps, but that it occurs only in the sweeps who inhabit certain localities, or that it is limited in its occurrence to certain families of sweeps, there would then be a strong presumption in favour of the view that the effect of the local irritant is highly favoured by the conditions existing in those localities, or by certain local or constitutional peculiarities derived by inheritance; and, on the other hand, it might fairly be assumed that the local irritant is powerless to induce cancer of the scrotum in the absence of these predisposing conditions.

If we look at what has already been done by statistics, chiefly drawn up by the profession, it must be confessed that they have added largely to our knowledge of cancerous diseases. We have learned from them that, although women are far more often than men the victims of cancer, yet men enjoy a monopoly, or almost a monopoly, of cancer of the lip, and are many times more liable than women to cancer of the œsophagus and tongue; and it appears that, if the generative organs of the two sexes be left out of the question, more men than women die of cancer.

We have learned that cancers of epithelial origin (that is, true carcinomata) are almost unknown in persons under adult age; and that they increase in frequency as age advances, becoming proportionately more numerous during each decennial period of life.

From our knowledge of the relative liability of the two sexes to the disease, we may assume that occupation and habits of life have something, perhaps much, to do with the production of cancer; but that there are still more powerful predisposing elements in the female generative organs—the breast and uterus. And, in the continual search for the conditions which attract cancer so frequently to these organs, we are led to attribute much to the great and frequent changes which they undergo in the course of the life of a woman—changes not merely in their size and in the quantity of blood which they contain, but in their intimate structure, and particularly in the structure of their epithelial elements.

From our knowledge of the increasing liability to the disease caused by advancing age, we are led to believe that the degeneration of our epithelial tissues which, as a part of the universal degeneration of the body, belongs to the later period of our lives, renders them more and more liable to become the seat of cancer.

Knowing thus much, or believing we know thus much, of the etiology of cancer, we might be disposed to accept, as a part of the lot which we derive from nature, a certain liability of the female generative organs and of some degenerating tissues to cancer. But, happily, a continual desire to increase our knowledge of the laws which regulate the occurrence of disease, and the constant hope of discovering some remedy for diseases which at present defy the utmost we can do against them, stimulate us to renewed exertion.

Individual research and observation have during the last ten or fifteen years been successful in discovering what may be regarded as almost a new series of relations of cancer, conditions to which the term "precancerous" has been applied. Two of the most characteristic of them are leucoma of the tongue and a diseased condition of the mammary areola. The former is a frequent precursor of epithelioma of the tongue; the latter an occasional precursor of carcinoma of the breast. The precursory or precancerous condition is in both cases inflammatory, is characterised by long duration and a very slow and chronic course, and is very little influenced by constitutional treatment or local applications. Neither the leucoma nor the affection of the areola inevitably leads to cancer; but the number of instances in which epithelioma of the tongue has been preceded by a chronic inflammatory condition is very large, and the number of observations of cancer of the breast preceded by an affection of the areola is increasing; so that the relationships already assume much greater importance than they possessed five years ago.

There are several questions in the etiology of cancer, respecting which either very little is known or there exists a wide diversity of opinion, and which can only with great difficulty be worked out by individual research. Of such a kind are the questions which have been raised in the inquiry on cancer now issued by the Investigation Committee. It has for many years been taught, on very high authority, that cancer is a disease largely due to inheritance; and the impression that it is possible to inherit the disease has gained even a stronger hold on the public mind than on the mind of the profession. If the theory be correct, and there is grave reason why the children of cancerous parents should be regarded as peculiarly liable to cancer, the sooner and more clearly this is recognised the better shall we be able, in a certain number of instances, to advise and treat our patients. But the evidence on which it rests is not conclusive.

The mere circumstance that two members of the same family, perhaps not very nearly related to each other, and both belonging to a family consisting of many members, die of cancer, is not a family

history of cancer; and I quite agree with Mr. Cripps that, where only two members of the same family are attacked by cancer, they ought to be nearly related, and that we ought to be cognisant of a very large proportion of instances of such a kind, before the theory of inheritance is accepted on that ground. Even then it would be necessary to discount the evidence by a careful investigation into all the circumstances by which the cancerous members of the family were surrounded, particularly with respect to the locality in which they resided, and the existence of other possible predisposing causes of cancer.

I have, on more than one occasion, pointed out the peculiarities which have been noticed in the transmission of cancer by inheritance. The cancer derived by inheritance is not necessarily of the same variety as the cancer from which it was inherited. It does not necessarily or usually affect the same part of the body; it may arise in widely different tissues; it may attack a person of the opposite sex; and it may occur at a very much younger age in the offspring than in the parent. If it be urged that the same objections may be made against the inheritance of other diseases regarding which there is far less doubt, and gout may be given as an example, the reply must be that the evidences of the inheritance of those diseases is far stronger than that on which the inheritance of cancer rests; and, were it not so, I suspect we should not be so ready as we are to accept their hereditary character. I have no intention of denying that cancer may be inherited; but the evidence which is at present before us is not satisfactory. On that account, we are seeking information on the subject from a source which has not hitherto been used, and are trying to gain, from those who are acquainted with the families of cancerous persons, facts which may tell largely in favour of or against the theory of inheritance. I have written letters to a large number of men, residing in different parts of the country, begging for information particularly on this subject, and asking those who have been many years in practice in the same town or village whether they can give us an account of any family in their practice in which cancer has been very prevalent.

It has been pointed out, in the statement by which the cancer-cards are accompanied, that Mr. Haviland, who has paid great attention to the geographical distribution of disease, considers that the high and dry localities are unfavourable to the occurrence of cancer, and that the disease flourishes particularly in those parts of the country which are low and flat, are covered by alluvium, and are watered by many streams which frequently overflow their banks and flood the surrounding country. Mr. Haviland's statements and statistics have attracted hitherto comparatively little attention, doubtless owing to the circumstance that they have not been brought very prominently before the profession. The intention of the Investigation Committee is that they shall be much more widely known; and it is hoped that the Committee may be able, with the co-operation of medical men in all parts of the country, to extend his observations, and to confirm or correct them in accordance with the facts which it collects.

The result of the present inquiry, so far as locality is concerned, will, I trust, be to obtain more detailed information respecting the habitations of the cancerous, and a better knowledge of the parts of the country which are least favourable to the development and growth of cancer; but it is hoped that the inquiry will not end here. Some of the letters I have received make it probable that cancer of certain organs is far more prevalent in some districts than cancer of other organs which may be said to be almost equally predisposed to cancer. I am not sure how far the present inquiry will elicit that fact, if, indeed, it be a fact; but it has already raised a suspicion of it, and has, therefore, laid the foundation for other and more extended investigations on cancer.

The work which the Collective Investigation Committee is undertaking on the subject of cancer is thus far quite within its capacity, and the capacity of the Association, to carry out; but there are other questions in the etiology of cancer which ought, in the interests of the public, to be investigated, and which, if they be not beyond the strength of the Association, are matters rather fitted for the attention of the Government than of an association of the profession. Of these, the first and most important is the classification of the cancers of different parts of the body, with a view to discover which of them are increasing, or whether they maintain, year by year, the same relation to each other, and to the total returns of cancer. As far as can be seen, the Government is not likely to undertake such an investigation unless the necessity for it be pressed repeatedly and forcibly upon it.

Now this is a matter in which the profession may very properly, and to the great advantage of the public, act. Nor do I think that any body of the profession can do more to promote such a project

than the splendid and powerful Association of which we are members. Memorials proceeding from its several Branches, from the Investigation Committee, and from the Association as a whole, cannot fail to produce an impression upon the Local Government Board. But the part which the profession can and must take in this matter, does not end with a mere suggestion to the Government. In order that such an inquiry should thoroughly succeed, it is essential that each individual member of the profession should lend his assistance to the Government by furnishing such accurate death-certificates in cases of cancer as lies within his power. Even if this entailed a much greater amount of labour on every medical man than it is at all likely to do, I feel sure the labour would be cheerfully borne; for our profession has justly gained the reputation of great readiness to sacrifice much for the public good; but, in truth, in most instances, a word added to the certificate usually given would suffice for all the purposes of the inquiry; and, in a vast proportion of cases of external cancer, there is no difficulty in supplying the desired word, for the original seat of the disease has long been known to the patient or the medical attendant.

A LECTURE ON BOUGIES, THEIR USE AND ABUSE.

By F. SWINFORD EDWARDS, F.R.C.S. Eng.,
Surgeon to the West London Hospital, etc.

THE use of urethral bougies and sounds dates back to the earliest days of surgery. Apparently in those days, stricture not being known, they were used only for pushing back impacted calculi and other foreign bodies which obstructed the outflow of urine. Guaynerius, who wrote in 1440, mentions the use of wax bougies for this purpose.

Ferri, in the middle of the 16th century, described various kinds of bougies for breaking down caruncles; but it was not till Hunter by his writings directed the attention of surgeons to the permanent obstructions of the urethral passage, that bougies came into general use for dilating purposes, (see Voillemier, *Dictionnaire des Sciences Médicales*, vol. x).

The varieties of bougie which are employed at the present day may be classified thus:

For Diagnostic Purposes.—1, *Bougie à boule*, metal or gum-elastic; 2, the urethrameter, designed by Otis.

For Treatment.—1, Steel; 2, silver; 3, pewter bougies or sounds; 4, French gum-elastic: *a*, olivaire; *b*, coudée; *c*, bicoudée; 5, English gum-elastic; 6, filiform of gum-elastic, whalebone, or catgut.

For Guide Purposes.—The pilot or guide bougie.

Besides these, we have Lallemande's *porte caustique*, a bougie or catheter for applying nitrate of silver to the deep urethra; also soluble bougies, by means of which medicaments are applied to the urethral surface in a base of gelatine, cacao-butter, or wax.

Let us take the consideration of these various varieties in the order in which I have enumerated them, and first we come to the *bougie à boule*. This is made either of gum-elastic or of metal, and is used purely for purposes of diagnosis. The shaft is thin, and terminates in a bulbous head, which may be made cone, pear, olive, or acorn-shaped, the last two varieties being the ones I usually use. The metal bougies have this advantage over the gum-elastic. They are more durable, and can be used possibly with more precision. The soft instruments are, however, more comfortable to the patient.

By the aid of these instruments, we are able to determine the exact situation and extent of any strictures, inequality in the mucous membrane, ulcers, or tender and inflamed areas. If we examine an average sized healthy urethra, with one of these *bougies à boule* whose bulb measures No. 22 of the French scale, we shall find that it will probably pass, without any difficulty or much discomfort to the patient, for about six inches.

Here one usually meets with a slight resistance, but not enough to impede the passage onwards of the instrument into the bladder. Now, if the bougie be gently withdrawn, as the bulb leaves the prostatic urethra, two distinct catches may be felt, about half an inch apart; the first not so marked as the second, and sometimes indeed scarcely discernible. These catches are due respectively to the posterior and anterior layers of the triangular ligament. In a healthy urethra, on further withdrawing the bougie, no other obstruction is experienced until one reaches the meatus, where another catch may occur. These