

AN ADDRESS
ON THE
EARLY DIAGNOSIS OF CANCER OF THE
CERVIX UTERI.

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By G. ERNEST HERMAN, M.B.LOND., F.R.C.P.,
Obstetric Physician to the London Hospital; President of the Obstetrical
Society of London.

THE early diagnosis of uterine cancer is important for this reason: Secondary growths, either in lymphatic glands or in other parts of the body, occur later and more seldom with cancer of the uterus than with cancer of any other part of the body. There is, therefore, a better prospect, if cancer of the uterus be removed, of freedom from recurrence than in any other form of cancer. Further, modern improvements in operative *technique* have made it possible to remove cancer of any part of the uterus, so long as it is limited to this organ, with little risk. The essential for successful treatment is that the cancer must be limited to the uterus. The obstacle to extensive success in the treatment of cancer is that in most cases the disease is not diagnosed, either because the patient does not seek advice or is not examined—perhaps does not permit examination—until the disease has extended beyond the uterus.

The diagnosis of early cancer is difficult. In the present communication I shall attempt to explain the points which should guide us to the early recognition of cancer.

There are three parts of the uterus in which cancer may begin, and, according to the part in which the growth begins, three forms of cancer. These are:

1. Cancer of the vaginal portion, that is, cancer beginning between the external os and the junction of the uterus and vagina.

2. Cancer of the cervix, that is, cancer beginning between the os externum and the os internum.

3. Cancer of the body, that is, cancer beginning above the os internum.

The clinical differences between these three forms of cancer are these:

Cancer of the vaginal portion begins in a part that can be felt and seen. It can be diagnosed earlier than any other form and therefore ought to be more successfully treated.

Cancer of the body cannot be diagnosed so early as cancer of the vaginal portion, but it remains limited to the uterus longer and therefore is longer amenable to treatment.

Cancer of the cervix, if it begins low down and the os externum has been enlarged by childbirth, can be diagnosed early. But if the os uteri has not been enlarged by childbirth and the disease begins high up in the cervical canal the cancer is seldom recognised early. Cancer of the cervix more rapidly spreads beyond the uterus than either of the other forms, and for these two reasons is less amenable to treatment.

RELATION TO AGE.

Cancer of the uterus occurs chiefly towards the end of the child-bearing period but it has been seen in childhood and in extreme old age. I mention this because I find the patient's age sometimes taken into account as if it were a factor in diagnosis. The patient's age ought not to influence opinion in the slightest degree. It does not follow because the patient is at the age at which cancer is common that therefore her disease is cancer. Nor should one think because the patient has not reached or has passed that age that therefore the disease cannot be cancer.

FAMILY HISTORY.

A tendency to cancer is sometimes inherited. This is known to the public. I have known the family history given as a reason for or against the view that a disease was cancer.

It ought not to have the slightest weight. Only a small proportion of cancer patients inherit the disease, and many persons whose relations have had cancer die at a great age of something else.

SYMPTOMS.

No form of cancer of the uterus can be detected without local examination. The patient allows examination because she has symptoms.

The first symptoms of cancer are usually hæmorrhage and leucorrhœa. Pain and wasting come later. The early diagnosis of cancer is of such importance that I do not hesitate to say that any unusual hæmorrhage or discharge in a woman who has had children is a reason for vaginal examination, for it may be the first symptom of cancer.

Cancer of the vaginal portion and cancer of the cervix are common in women who have had children, less common in sterile married women, rare in the virgin. Therefore I only urge local examination for hæmorrhage or leucorrhœa in the case of married women. The examination by the vagina of every virgin with a little leucorrhœa or hæmorrhage would be a number of wounds to female delicacy, so rarely atoned for by the discovery of cancer of the vaginal portion in a curable stage, that I think it is wiser, unless for some other reason vaginal examination is called for, to spare the patient's modesty, and let her run the very slight risk that cancer of the vaginal portion may be left too long untreated. Cancer of the body attacks virgins as often (in proportion to their number) as married or parous women; but this disease remains amenable to treatment for so long that, if it be present, we shall not do harm by postponing examination until the existence of serious local disease is clear to the patient.

Sometimes hæmorrhage is first, sometimes leucorrhœa. The hæmorrhage caused by commencing cancer has about it nothing distinctive, either as to time, duration, or quantity. The leucorrhœal discharge has no definite character that is useful in diagnosis. It is more watery than ordinary leucorrhœa. But we are dependent upon the patient for information upon its characters; it is not wise to rely upon the indefinite data that she can furnish. The leucorrhœa does not become offensive until the cancer has begun to break down and fragments of decomposing dead tissue are contained in the discharge. Pain is of no importance as an indication of commencing cancer. Some cases of cancer run their whole course without any pain. Pelvic pain is a symptom common to many diseases, and there is nothing peculiar about the pain of cancer.

Cancer causes wasting. This is not important for early diagnosis. To do good in cancer we must recognise the disease before it has lasted long enough to produce great wasting. Slight loss of flesh may come from many causes other than cancer. Sometimes during the progress of cancer patients for a time gain weight. Hence in doubtful cancer nothing is gained by postponing treatment in order to ascertain whether the patient's weight is altering.

In brief, therefore, hæmorrhage and leucorrhœa are the symptoms which in cancer first denote the presence of local disease, but the nature of this disease cannot be determined without local examination.

LOCAL CHANGES PRODUCED BY CANCER.

Before considering the local signs, remember the features which distinguish cancer in any part of the body from benign growths. Cancer, wherever it occurs, displays the following broad features:

1. It is a new growth, therefore the part it attacks is swollen. The degree of enlargement varies, and in the later stages the destruction effected by cancer may make the part smaller, but in the beginning there is always enlargement of the part attacked.

2. It is a new growth which breaks down. This always happens sooner or later.

3. The new growth affects all tissues; so does the breaking down. It is never limited by any anatomical boundary, nor has it any sharp and clear limit.

Apply these general statements to the uterus. Consider first the case of cancer so advanced that there can be no question about the diagnosis—a period at which unfortu-

nately there is also no doubt of the uselessness of treatment:

1. The cervix is enlarged from the new growth. If the body of the uterus is affected it is enlarged.

2. It is ulcerated because the growth breaks down. The ulceration differs from that caused by a wound or a slough in this: the ulceration which follows an injury is a reparative process; it tends to fill up breaches of surface; at its edge granulation cells are being organised into fibrous tissue, which contracts and tends to pull the edge down to the level of the surface. That of cancer is caused by breaking down of tissue, and the edge of the ulcer is the place at which the breaking down is going on. Hence its edge is everted, often undermined.

3. The cervix is fixed because the growth invades all tissues.

These are the signs of cancer beyond the reach of treatment. We have to apply the first two of these criteria before the third has had time to develop. A new growth on the vaginal portion which tends spontaneously to break down is cancer. The problem is to identify these features as early as possible.

THE CHARACTERS OF THE HEALTHY CERVIX.

In the healthy multipara the cervix is obtusely conical, the thickest part being at the attachment of the vagina. In parous women it has generally been torn, so that the external os is enlarged, the conical shape of the cervix less distinct, and it may be split into two or more lobes. These lobes are often everted by the pressure of the vagina. If the cervix is healthy they are not swollen, so that when they are pressed together the cervix is little if at all larger than the virgin cervix. The mucous membrane is everywhere smooth, and pale pink in colour. When the cervix is split so that the lower part of the cervical canal is everted, the epithelium of this part becomes changed into pavement epithelium like that covering the vaginal portion, so that it becomes smooth and pale in colour, like the vaginal portion. If these characters are present there is no cancer of the vaginal portion.

CANCER OF THE VAGINAL PORTION: I.—OUTGROWTH FROM THE SURFACE.

When cancer begins as an outgrowth from the surface it may look like a growth of warts, or papillæ or granulations, on the vaginal portion. The surface is not smooth; it feels uneven, or even rough.

DIAGNOSIS FROM "GRANULAR EROSION."

Adenoma.—The only other new growth that is seen on the surface of the vaginal portion of the cervix is the so-called "granular erosion." The adjective in this name is good, because the erosion is granular; but the word "erosion" is a relic from a time when this condition had not been examined microscopically, and it was supposed that the epithelium was absent. The condition really is a flat adenomatous growth. This may quite surround the os externum, covering a space the size of a florin. It may be smaller than this, and may be limited to one lip of the os uteri. Its edge is not sharp. There is no abrupt change in the level of the surface. A line defining the edge of the growth would have to be wavy, and interrupted in places, for within the scarlet new growth we find islets of healthy mucous membrane, and we find dots of scarlet new growth outside the main patch. An erosion is deep scarlet in colour, and its whole surface is of the same colour. An erosion is soft, and easily made to bleed, either by the contact of the finger on digital examination, by the friction of the end of the speculum against it in bringing it into view, or by rubbing it with wool to clean it. Where it bleeds it only shows a broken surface; there is no ecchymosis, no excavation, no sign of sloughing.

The warty growth of commencing cancer is harder than the soft velvety erosion, and has a sharper edge. It soon begins to show signs of breaking down. The granulations of an erosion are separated from one another by sulci uniform in disposition; and it never presents any appearance suggestive of sloughing. When a cancerous growth is beginning to break down it looks as if it had been scratched, perforated, or worm-eaten. It is not uniform in colour, for there are ecchymoses here and there;

and if there are parts at which breaking down is rapidly going on, small spots of greyish slough will be seen.

An erosion forms a swelling which is most raised close to the os uteri; and slopes off gradually into healthy tissue. Cancer beginning as a flat growth, such as may be taken for an erosion, is more abruptly defined, raised and warty at the edges, and breaking down in the centre.

"CAULIFLOWER EXCRESCENCE."

If the cancer has so advanced as to form a growth comparable to a mushroom or a cauliflower, the diagnosis can scarcely be doubtful. No innocent growth from the vaginal portion in the least resembles either of these vegetables. But if we are to treat cancer effectively, we must recognise it before it has grown to dimensions which make such comparisons appropriate.

II.—INGROWTH BELOW THE SURFACE.

Cancer may begin as an ingrowth below the surface. The first evidence of its presence which the senses can detect is an angry livid red spot, the surface of this spot being at first quite smooth.¹ The angry livid colour depends upon the vascularity caused by the new growth, and upon its tendency to break down, which leads to minute hæmorrhages into the growth before the breaking down is extensive enough to make a breach of the surface. When the smooth livid surface of the cancer spot is rubbed it bleeds. A smooth dark red spot, bleeding on contact, is very suspicious of cancer. This is the earliest stage of cancer that has been observed. If there is not merely a patch of altered colour, but a nodule that can be felt, the suspicion is still stronger.

DIFFERENTIAL DIAGNOSES.

There are conditions which are not cancer, but may be suspected of being cancer.

Red Patches on the Cervix.—Sometimes the mucous membrane over a defined area round the os externum is of a darker red than the rest, but is smooth and glistening, not granular, and does not bleed when it is rubbed. My guess is that these red smooth patches in the vaginal portion are the remains of erosions which, unassisted by treatment, have slowly got well; so that their colour remains, although the granular surface has disappeared. When an erosion is cured by treatment it is replaced by a smooth surface differing little in colour from the rest of the vaginal portion. I cannot from the nature of the case offer evidence that this guess is correct, but I have examined such patches, and found that they were covered with pavement epithelium, and that beneath this epithelium were remains of glands such as are seen in granular erosions. These red patches, unlike early cancer, are red only, not livid; and do not bleed on contact.

Shotty Follicles in Cervix.—When the cervix has been split into lobes during labour, is also swollen by chronic inflammation, and has on it stopped up follicles filled with retained secretion, and feeling like shot imbedded in the surface, we have a condition that I have known to be taken for cancer. A lobe swollen by chronic inflammation may be thought to be enlarged by new growth, and the shot-like retention cysts may be suspected of being nodules of cancer. But these blocked up follicles, when looked at through the speculum, are, if their contents are unaltered, pearly grey in colour. If the retained secretion is inspissated they are yellow. The only elevations they form are slight smooth convexities. There is no warty growth, no lividity, and not the slightest appearance of any breaking down. The mucous surface around them is not altered in colour.

Fibroid.—A small fibroid of the cervix might, perhaps, be taken for cancer. When a large fibroid of the cervix is present, it will at once strike the observer as inconsistent with cancer that so large a growth should be present without fixation, breaking down, or wasting of the body. But a doubt is conceivable when the tumour is small. A fibroid is distinguished by its smoothness, its hardness, its rounded outline, its circumscription, and by the fact that it does not break down, nor bleed on contact. It does not, like cancer, invade all tissues, but has its own circumscribed capsule. It may be congested, livid, and mottled, showing visible vessels

¹ Williams, *Cancer of Uterus*, p. 9.

on its surface; but there is no breaking down, no excavating ulceration or warty outgrowth.

"Herpetic Erosion."—There is a morbid change sometimes seen on a thickened cervix called the "herpetic erosion"—namely, little vesicles, like miliaria, which leave red spots when the raised dome of epithelium is wiped away with a piece of wool. These vesicles may be taken for commencing new growth, but they do not denote any such thing. I have never seen them except on a thickened cervix. I agree with Scanzoni, that they have nothing to do with herpes, and, therefore, the name "herpetic erosion" is a bad one. They are quite unimportant.

Spiegelberg's Sign.—There is a tactile sign which Spiegelberg pointed out. It is that the growth of cancer beneath the mucous membrane alters the consistence of the tissues, and makes them less pliable, so that when the finger is pressed on and moved along the affected part, the superficial tissues follow the movement imparted to them less easily than in the normal condition. Hence the feel of the cervix is peculiar; it has been compared to that of passing the finger over wet india rubber. This simile is the best that I know of. This peculiar feeling is not present in every case, nor present throughout the whole course of each case; and, therefore, its absence is no proof that the disease is not cancer; but, when present, it should cause suspicion of cancer.

Dilatation by Tents.—A test of cancer has often been quoted in textbooks on the authority of Spiegelberg,² which consists in the different behaviour of cancer and of a healthy cervix under the expanding force of a tent. He said that a healthy cervix would always yield, while a cancerous cervix would not. I am sure this is wrong, and in saying so I am in agreement with Winckel and Olshausen. I have often found a cancerous cervix dilate easily, and a non-cancerous cervix so resist even a laminaria tent, that the tent was removed with difficulty, and, after removal, showed a groove where the internal os had prevented its expansion.

Lacerations.—Another sign that has been pointed out as a distinction between cancer and a cervix split into lobes by lacerations during labour is that the fissures from tears during labour run from the canal outwards; while the fissures between the nodules of a cancerous growth are irregular in their course. This is quite true, but of little use for early diagnosis, for when a cancer of the cervix is so big as to consist of nodules separated by fissures there will be other evidence putting the diagnosis beyond doubt.

CANCER OF THE CERVICAL CANAL.

Cancer may begin in the cervical canal. If it begin high up and the os externum is not much enlarged it cannot be recognised early unless the cervix is artificially dilated. If it begin low down and the external os has been so enlarged by tearing during labour that the lower part of the arbor vitæ uterina is visible, then cancer can be recognised here as early as when it begins on the vaginal portion. The condition which here causes difficulty in diagnosis is that in which the cervix presents the dense fibrous rounded elevations to which Dr. R. Barnes has given the name of "hypertrophic polypi"³—a condition of the lower part of the cervical canal which Matthews Duncan described in the words "hardness with big-grained roughness." In this condition we have red nodular growths at the lower part of the cervical canal; and if, in addition, the patient has symptoms which go with cancer—hæmorrhage, leucorrhœa, pain, wasting—the diagnosis of cancer may suggest itself. The macroscopical differences of this condition from cancer are: That a simple hypertrophic polypus does not bleed on contact; that it does not show any tendency to break down; there is no ulceration, no points of sloughing anywhere; and that this condition of "hardness with big-grained roughness" extends over an area of the cervix so considerable that cancer, if advanced enough to occupy such an extent, would certainly have begun to break down.

THE MICROSCOPE IN DIAGNOSIS.

I have not yet spoken of the microscopical diagnosis of cancer. I have postponed this part of the subject because I think the value of the microscope in the clinical diagnosis of cancer has been overestimated. The only use of the micro-

scope is to confirm suspicion aroused by the evidence of the unaided senses of sight and touch. A diagnosis based on the microscopical examination of sections of tissue must be accepted with great reserve, for the following reasons.

First, only an expert familiar with the microscopic appearances of the different parts of the uterus both in health and in disease can form an opinion on the question at all. The opinion of one not accustomed to microscopic work, or not acquainted with the normal and also the morbid microscopical examination of the uterus, is valueless. Secondly, the judgment even of an expert on a scraping, or a broken-off bit, is of no value unless it be decisively in the affirmative. Cancer may be present, and yet a bit scraped or broken off may not be cancerous. Before we can be sure that a diseased part is not cancer, sections from every part of it must be examined. Now if we have to remove a large piece of a cervix in order to see whether there be cancer present in it or not, I think it is better to go further, and remove the suspicious part altogether. There is little, if any, greater danger in removing the whole disease with a margin of healthy tissue beyond it, than in removing a part only. Thirdly, there are growths occasionally met with in the uterus, called malignant adenomata, which resemble cancer as to their clinical history, but which microscopically present none of the characters of cancer. Further, in simple erosions in women, and in erosions on the cervix uteri in monkeys, Bland Sutton and Gordon Brodie have found structures exactly like those regarded as characteristic of cancer.

In short, to rely upon the microscope in the diagnosis of cancer is to open the door for many mistakes. The microscope may now and then reveal cancer in a doubtful case, but negative microscopical evidence should never be trusted. The naked-eye characters and the behaviour of the growth should always be taken into account as well as its histology, and if the two conflict the behaviour of the growth is the more trustworthy.

EFFECT OF TREATMENT.

In case of doubt, the behaviour of the suspicious part under treatment is the best test. Erosions and chronic inflammation of the cervix are local diseases very amenable to treatment. An erosion or a thick inflamed cervix may bleed on contact; but if one of these conditions is the only morbid change present, one or two applications of strong carbolic acid will so far improve the local condition that the diseased part will cease to bleed on contact. If the disease be cancer these applications will only stimulate its growth, and the local changes will be more pronounced after such treatment than before it.

CANCER HIGH UP IN THE CERVICAL CANAL.

In this situation the beginnings of cancer often cannot be seen or felt, and therefore it is sometimes impossible to diagnose it early. It may begin in two places at once; there may be commencing cancer at the upper part of the cervical canal and oedematous growth lower down. Cancer beginning high up in the cervical canal may assume various forms; it may be a papillary growth protruding into the cervical canal and through the os externum; it may form a solid mass, which presents at the os externum like a polypus; it may begin in a mucous polypus; it may thicken the cervix, and then break down and excavate it, so that the whole thickness of the cervix may be eaten away, while there is very little disease discoverable by the vagina. I have seen the cervix so broken down that it tore in half when it was pulled upon for the purpose of removal, and yet the slight ulceration visible at the os externum could be covered by a threepenny bit. It may extend superficially upwards and downwards, and break down quickly, so that it forms a conical ulcer, which enlarges the external os, and extends up to or beyond the internal os. When it presents these forms the diagnosis is clear, but then, unfortunately, the disease is by this time usually beyond the reach of treatment.

I once saw a case with Dr. Power, of Poplar, which much resembled cancer; a fibroid protruding far enough into the cervical canal to expand the cervix, but not coming down low enough for the finger to get round it, so that the finger entered a cavity with uneven walls (the cervical canal) with a rounded outgrowth projecting into it at the top. The patient

² Arch. für Gyn., Bd. iii, S. 233.

³ St. Thomas's Hospital Reports, 1872.

complained of hæmorrhage and leucorrhœa. When the cervix had been dilated and the polypus removed, the nature of the case was clear.

If cancer beginning within a cervical canal the lower end of which is not open enough to admit the finger is to be diagnosed early, this can only be done by dilating the cervix. If the symptoms suggest cancer, and nothing is perceived by finger and speculum to account for them, the suspicion can be confirmed or verified only by dilatation of the cervix. This done, the finger in the cervix will either feel the firm, smooth ridges of the arbor vitæ, or there will be at some part of the canal a nodule, a warty growth, or a ragged ulcer.

The remarks I have made as to the liability to error of conclusions based on the microscopical examination of broken off bits apply to this form of cancer more strongly than to cancer of the vaginal portion. If we scrape off bits it is not possible to be sure where they come from. There may be cancer at one part of the canal, and a villous erosion, or an ordinary mucous polypus at another. But this form of cancer advances so fast, and its initial symptoms are so slight, that it is seldom we have the opportunity of diagnosing and treating it early.

A NOTE ON AUDITORY VERTIGO.

By SIR WILLIAM B. DALBY, M.B., F.R.C.S.,
Consulting Aural Surgeon to St. George's Hospital.

If I venture to say that Dr. Stephen Mackenzie's paper on "Aural Vertigo" in the *BRITISH MEDICAL JOURNAL* of May 5th covers the whole area (so far as it has been usefully occupied) of previous observers, whilst it gives his own valuable suggestions, I am sure that he will acquit me of any attempt to pay him a compliment. Both he and the readers of the *JOURNAL* will perhaps, in consideration of the interest which I take in the subject, permit me to offer a few remarks upon his arrangement of the subject and upon some of his observations.

In studying this subject, what we all want and what we must have, if our knowledge of it is to advance or become in any sense accurate, is a determined line of division in these cases. On one side of this line must be placed those cases in which the external and middle ear are healthy. On the other side of the line those cases in which one or both of these two divisions of the ear are unhealthy. Until this is done there will remain, as there now is, endless confusion. The next point is that the term "Ménière's disease" must either be dismissed (it always was indefinite), or, if it is to be retained, it must be clearly understood that it can be only applied to those cases in which there is no disease of the conducting media, and then only used to express a certain train of symptoms, which, beginning by vertigo, nausea, sweating, perhaps vomiting, tinnitus, and deafness on one side, continues by permanent deafness, a long, lasting, and varying tinnitus, a gradual subsidence in frequency, and severity of vertigo and unsteadiness of gait. The very words of Dr. Mackenzie—"In the great majority of cases, in my experience, some disease is found in the middle ear"—show the necessity of this division and exclusion. My own experience not only accords with his remark, but it has become to me an ordinary and daily matter to regard in middle-ear disease vertigo as so common a symptom that it ranks amongst other symptoms, such as pain, deafness, and tinnitus, although it is not so prominent. It is also true that at one time it is of no great importance, whilst at another it is a symptom of the gravest significance. Thus, when it accompanies long-continued and profuse discharge from a perforate membrane, it often marks the advent of cerebral complications. In the course of many affections of the middle ear it is not of great consequence.

Let, then, all cases where the external and middle ear are involved be put on one side in considering the pathology and treatment of aural vertigo. Also let some others be put aside, such as those where the intelligence of the physician at once detects the state of affairs, as when Dr. Mackenzie writes: "I think one of the most practical points in warding off attacks is to keep your finger on the pulse—if one may use the expression—that is, to watch and keep down arterial tension. A dose of calomel, taken in such circumstances, patients have assured me, has averted attacks which they be-

lieve would otherwise have occurred." I shrewdly suspect that Dr. Mackenzie has occasionally, with a very full knowledge of the possible danger, averted an attack of apoplexy. I am reminded at the moment of a man, aged about 60, who, having no disease of his external or middle ear, used to become at times almost completely deaf, with furious tinnitus and considerable vertigo. By my advice he took a strong purge in the shape of calomel and colocynch pills when he had such attacks, and twenty-four hours after always recovered his hearing. The order of events—deafness, pills, and recovery—occurred six or seven times a year for three years, and after then no recovery. I can recall many instances resembling this. The number of persons with obvious arterial tension, consequent vertigo, tinnitus, and deafness that I have placed under physicians is very large indeed. They have not only been relieved by treatment and diet, but, later on, I have known several to illustrate the cause of these symptoms by dying of apoplexy. It is, therefore, also necessary to severely put aside these cases of arterial tension and atheroma as well as the middle-ear cases if we are to get at the root of true auditory vertigo—the vertigo which does not shorten life by a day. We shall then, so to speak, start fair. Persons who suffer from vertigo arising from all sorts of causes are very naturally alarmed, and at the present time they seem to find consolation in the term "Ménière's disease," which they glibly announce they suffer from, so that I cannot but think that this state of things must arise from a somewhat too loose application of a term which, I submit, so far as its accurate pathology is concerned, is almost meaningless.

Under these circumstances, I think the most we can do for it, and possibly the least, will be by common consent to insist upon its being confined to the class of cases I have indicated. All the theories which have been held by various observers at various times have been enumerated by Dr. Mackenzie, and the very variety of theories shows how uncertain is the exact state of the lesion. My own views are referred to by Dr. Mackenzie, so I need not repeat them.

ON CROUPOUS PNEUMONIA IN LONDON DURING 1893.

By W. P. HERRINGHAM, M.D., F.R.C.P.,
Medical Registrar to St. Bartholomew's Hospital; Physician to the
Children's Hospital, Paddington Green.

THE past year, 1893, was remarkable for the very large number of cases of croupous pneumonia. Wishing to see whether any explanation could be found for this, I tabulated the cases admitted at St. Bartholomew's. The results were so striking that I thought it worth while to test them by larger numbers. I therefore applied to the physicians of Guy's, of the London, and of St. Thomas's Hospitals, who were kind enough to allow me to use their records to the extent required for my purpose. To them, to the physicians of St. Bartholomew's, and to the Registrars, Dr. Box, of St. Thomas's, Dr. Bryant, of Guy's, and Dr. Schorstein, of the London, who have been most courteous in assisting me, I am glad to return my hearty thanks.

I need not discuss in detail the etiology of croupous pneumonia. My purpose was to discover whether its prevalence varied with atmospheric conditions; but whether these are predisposing or exciting causes, and whether they act by weakening men, or by strengthening microbes, are questions beyond the scope of my inquiry.

I will first explain my tables, and then point out what they prove.

I have taken all cases of acute croupous pneumonia admitted during 1893 to the above four great hospitals, except inpatients under 5 years of age. These I have omitted owing to the great difficulty of diagnosis at that age between croupous and catarrhal pneumonia. The cases so obtained, 922 in number, I have divided into fortnightly periods, according to the date of admission. The numbers are not large enough to allow of weekly periods, for such statistics as these are but rough guides after all, and if numbers are small, are not only useless but misleading. The date of onset would have been better than the date of admission, but I could not,