An Address

ON

HIGH BLOOD PRESSURE, ALBUMINURIA, AND
GLYCOSURIA IN THEIR RELATION
TO LIFE INSURANCE.DELIVERED BEFORE THE JAMES MACKENZIE INSTITUTE
FOR CLINICAL RESEARCH, ST. ANDREWS,

BY

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THE duties of a doctor in ordinary practice and in insurance work are entirely different. In the former case the patient pays the doctor to diagnose and treat his ailments, to support and comfort him; in the latter the insurance office pays the doctor to make certain scheduled inquiries and investigations into the case of a proposer who regards himself generally as a healthy man, and to express an opinion as to his present health and his prospects of living to a good old age. The doctor's only duty to the proposer is to treat him with courtesy and consideration; he must never tell him in what sense he proposes to report, because that report is the property of the insurance office. The medical examination forms of different companies differ slightly, but not in any important particular; they are nicely gauged to extract the maximum of information from the proposer and the maximum of diagnostic observation that can be expected from the doctor in general practice. Cases that are known, either before or after examination, to present special difficulty are brought, if possible, before someone in whom the office has special confidence.

HIGH BLOOD PRESSURE.

Judging from the syllabus of the Institute the scientific side of high pressure, and a good many of its practical bearings also, must already have been thrashed out.* I need not, therefore, dwell on theoretical considerations; my remarks will be severely practical.

In the medical examination papers of most life offices a question is now inserted asking that the blood pressure be taken in all proposers over 50 years of age, or where there is any reason to suspect that it may be abnormal. How is the pressure taken? I think we may assume that in ninety-nine cases out of a hundred it is taken with one of the aneroid sphygmomanometers. These are accurate instruments enough provided that they are checked from time to time by a mercurial instrument, and provided that the ordinary rules sent out with them are observed. One doctor recently reported that the pressure in a man of 35 was 150; he made no comment on this, and recommended the proposer as an average life. When he was asked to repeat the observation he wrote apologizing that he found his instrument when at rest was standing at 15 instead of at zero. Another experienced examiner gave the systolic pressure as 100, without remark. When asked to comment on the bearing of this figure on the eligibility of the proposer he replied that he had had his instrument calibrated since the examination, and it had been found to be out of order. The pressure was really normal. One has to remember that the practice of pressure estimation has been introduced comparatively recently, that many established practitioners have had to teach themselves to do it, and that too great accuracy must not be expected. Some men take a keen interest in pressure estimations, others approach them either with fear and trembling or with an unfounded confidence. Some go the length of reporting figures such as 170 or 180 without commenting on them, or apparently without regarding them as of any importance. Of course, a chief medical officer who has had some experience gets to know his examiners and what may be expected of them.

It is generally left to the examiner whether he uses the method of auscultation or palpation. Personally I practi-

cally always do both, but prefer auscultation as on the whole more correct. It is generally stated that the systolic figure from auscultation is higher than that from palpation, but I can often get readings exactly equal, and in a large proportion of cases the palpation figure is the higher. I am not yet able to determine why or in what groups of cases this difference occurs. In insurance work we have to depend on the maximum systolic figure. The diastolic is hardly ever given, and I do not think that our knowledge of the normal diastolic pressure and the meaning of its variations is as yet sufficiently great to allow us to make much use of the figure if it were given. The diastolic pressure can practically only be measured by auscultation—and I am pretty sure that palpation is more often used—and there is not yet a definite agreement whether the minimum diastolic is to be measured by the total cessation of all sound or by one of the changes in note which precede that. I find that these changes vary so much in different people that I regard cessation as the only safe reading. Unless the method used is stated in each case the reading is therefore valueless. The estimation of the pulse pressure looks as if it might be made to give indications of value in ordinary practice when a great deal more work has been done upon it. At present the wide pulse pressure of aortic incompetence and the narrow one of chronic interstitial nephritis are the only indications of much service.

What are we to regard as the normal blood pressure? I have looked up all the authoritative textbooks on the heart and vessels, and am amused to find with what unanimity a direct answer to this question is evaded—and wisely evaded. The truth is that it varies so much in different people, and in the same people at different times, that it can only be said that the normal limit ranges between 110 and 150, with the proviso that, other things being equal, young people tend to have a pressure nearer the lower figure, old people nearer the higher. The ordinary age rule holds only approximately. A child of 10 may have a pressure of 110, a man of 40 one of 140, but a man of 70 should not have a pressure of 170 if his heart and vessels are normal. A pressure of 120 is sometimes found in men of 60 or so, with normal hearts, soft arteries, and quite efficient circulations; but, on the other hand, if the pressure has been known to be higher at some previous time, a low pressure may be an early indication of cardiac failure. This will, however, generally be evidenced in some further way—by a rapid pulse, dyspnoea on exertion, or some alteration in the size or sounds of the heart. A writer, signing himself "Sphygmus," in the *Post Magazine*, December, 1922, makes a useful suggestion. He proposes that the rule should be:

Standard systolic pressure equals 120 plus half the age. Thus:

Age.	B.P.	Age.	B.P.
20	130	50	145
30	135	60	150
40	140	70	155

This suggested rule is a much closer approximation to the truth than the time-honoured addition of the age to 100, and is probably as near the actual facts as any rule can be.

I do not propose to catalogue the causes of high pressure; they are well known. I would only recall that, in addition to the organic causes, such as arterial and renal disease, obesity, worry, sleeplessness, and recent or prolonged physical or mental strain all tend to raise it, and must be inquired into by the examiner. But the commonest temporary difficulty is the excitement of examination. Offices generally require, for obvious reasons, that a proposer shall be examined by someone who is not his own doctor. An unbiased opinion is more easily got from a stranger and given by him, and there is the further advantage that in doubtful cases, or in proposals for large sums, a report from the private medical attendant can also be obtained, so that the proposer is seen from two angles. But examination by a stranger always increases a proposer's nervousness. I constantly find in patients that the pressure which I get is 10, 20, or even 30 mm. higher than those got by their own doctors. One can sometimes get this excitement-rise down by waiting and repeating the observation, but by no means always. I find pressures of 150 not

* Professor MacWilliam's address on "High blood pressure from the physiological aspect" was published a few weeks ago (January 22nd, p. 125).

uncommon in nervous young men whose hearts and arteries are quite normal. Anything above that figure I always regard with suspicion; for some reason, not always discoverable, that man is not quite normal, and it is not wise to accept him *at that time*. A repetition later, when the man is more at his ease with the examiner and the novelty of the procedure itself has worn off, may give a lower figure and the case may be accepted. But repetition may give information in the other direction. Recently a man was examined who was suffering from a cold, and whose pressure was just over 150. He was delayed for both these reasons, and it was found that the pressure had risen to 180, which made him ineligible. The wisdom of re-examination was brought out forcibly in another recent case, a proposal for a very large sum by a man of 60. The blood pressure was at first 164, it was known to have been 135 two years before, and the urine was normal. A later examination gave a blood pressure of 170, with a trace of albumin, and the case was declined.

Rejections for high pressure are apt to cause more than the usual amount of discontent among proposers and consequent worry to agents and officials. The proposers feel in perfect health, and it is of course often a matter of years before any symptoms arise. We all know people with pressures of, say, 200, who are leading active and useful lives, but naturally their tenure is precarious. Little is gained in insurance work by trying to distinguish between hyperpiesis and organic arterial change; in any case continuance of the former will certainly go on to the latter.

There is no room for doubt that people with high pressure are worse lives than those whose pressure is normal. Statistics are plentiful; a recent table published by May (BRITISH MEDICAL JOURNAL, 1925, ii, p. 1166), part of which I annex, is sufficiently convincing. It gives the experience of the Prudential office in 1920-24, and shows the ratio of actual deaths to expected deaths, the figure 100 being taken as the ratio.

1. Systolic B.P. not recorded	...	...	...	97.1
2. " " under 140	...	...	...	102.8
3. " " 141-170	...	...	...	133.6
4. " " over 170	...	...	...	219.6
5. " " 200 and over	...	...	...	827.3

ALBUMINURIA.

It is a truism that albumin is present in the urine in many cases in which the kidneys are normal, and absent in many cases in which the kidneys are seriously affected. But just as a cardiac murmur is evidence that there is something wrong with either the heart or the man himself, so is albuminuria evidence that there is something wrong either with the kidneys, the urinary passages and their adnexa, or with the man generally. It is, in fact, the most valuable single indication of genito-urinary disturbance we have.

We must, of course, be sure that we really are dealing with albumin. The most reliable test, to my mind, is cold nitric acid, and if I am in doubt I supplement it by saturated solution of salicyl-sulphonic acid, a test which deserves to be used much more than it is. My reason for preferring nitric acid is that while it is a delicate, but not too delicate, test for albumin, valuable information is often obtained from the pigment rings and other deposits found, so that the very fallacies of the test are really an advantage, if you know how to use them. But many, probably most, practitioners use heat and acetic acid—a test not so delicate as the other but quite satisfactory provided they remember that boiling brings down a deposit of phosphates and carbonates, which is cleared up by the acid, and which is not albumin. We have a rule in the Scottish Widows Society that doubtful urines are to be sent to the head office if possible, and recently a urine was sent in with a note that the doctor could find nothing wrong with the case except the albuminuria. There was no albumin; the urine when boiled deposited phosphates, and he had either forgotten to add acetic acid or did not know that he ought to do so. It is not always appreciated that the acid added should be weak and just enough to acidify the urine. Strong acid or too much of it will convert a real precipitate of albumin to an acid albumin and render it soluble.

Let us now turn to the daily recurring difficulties. Many cases are fortunately simple enough. The man of 50 with albumin, a raised pressure, and an unsatisfactory heart is turned down at once. So is the youth with a recent history of scarlet fever, or the woman who had eclampsia two years ago, and still has albumin. Among the adult cases the most difficult are those in whom albumin is found—say, in a man of 40; the cardio-vascular system is declared to be quite normal, there is nothing in the history to suggest a kidney lesion, and no story of violent exercise just before examination. These cases have to be delayed and referred to their own doctors for investigation and report. If the examiner or the doctor would condescend to use the microscope occasionally, the explanation of many of these cases would probably be found at once in accidental additions—spermatozoa, oxalate crystals with red blood corpuscles, and so on. The most curious finding of that sort that I remember was the discovery of bilharzia on the day on which I examined a candidate, while it did not reappear, and there was no albumin in the urine of any of the seven following days. If casts other than hyaline casts, especially epithelial casts, are found, the case should be regarded as a kidney case and delayed until ample proof can be afforded that the kidneys are normal. It is misleading to say, as Maclean does, that "the presence of albuminuria with a few epithelial casts is no proof that we are dealing with defective kidneys," and to press the view that only renal efficiency tests give evidence of defective kidneys. As I shall point out later, they are often wildly misleading themselves, while the test tube and microscope give definite evidence that the person whom we are examining has a desquamative catarrh of the kidneys. This may be quite trifling or extremely serious, temporary or permanent, associated with grave deficiency of the kidneys or with practically none at all. The point is that albuminuria with epithelial casts means that the kidney is not normal at that moment, which is enough for the insurance examiner. I have not a doubt that slight degrees of nephritis are vastly more common, and more commonly recovered from entirely, than is believed; one proof of this was the complete recovery of such a large proportion of the cases of trench nephritis, and the fact that so few of them have slipped into chronic disease. An albuminuria of this sort is very much like an ordinary bronchitis—usually of no permanent importance, and clearing up completely; but it has to be remembered that an ordinary bronchitis is capable of killing the patient by bronchopneumonia, or, after repeated attacks, going on to chronic bronchitis, emphysema, and the rest. The association of ideas here reminds me how often albuminuria occurs with ordinary colds, either in the head or chest. This is obviously a toxic condition of the same kind as that occurring in the fevers. We have always found that it had disappeared on later examinations.

It is undeniable that albumin occurs with fair frequency in the presumably healthy. As far back as 1887 I took part in Grainger Stewart's investigations into this point; and, as you know, there was a collective investigation of 60,000 men during the war in the course of the research on trench nephritis. These statistics are absolutely valueless from the insurance point of view; indeed, the larger the numbers used the less valuable do they become, because it is impossible to find out the cause of the albuminuria in individual cases, or to follow them up. A study of ten or twenty cases from the time when albumin was first discovered till their deaths would be a piece of work of real importance.

But all the other albuminurias are cast into the shade by the problem of adolescent albuminuria. Probably these cases are in the proportion of 4 to 1 of all the other albuminurias put together, especially in offices which deal with large pension and superannuation schemes into which come large numbers of young clerks or teachers. The condition occurs most often in growing weedy youths in whom the circulatory apparatus, of which the kidneys form a part, is not yet "set"; but it is by no means confined to that class, and may occur in youths quite normal in every other way. The condition is also known to occur in girls, but they so seldom insure that no serious difficulty arises.

Our practice is to regard albuminuria in youths up to

25 as probably functional unless there is something in the history or examination to suggest organic disease; to delay the case and refer the proposer to his own doctor for investigation; to lay stress on the presence or absence of albumin in the urine passed in the morning on rising, and, if it is consistently absent then, to regard the case as functional and take it without an extra. In some cases, where large sums of money were involved, we have asked for the performance in addition of the ordinary renal efficiency tests—urea concentration, blood urea, phenol-sulphone-phthalein excretion. All the cases investigated gave normal figures, as have others which I have investigated independently. I am inclined now to think that these tests are hardly worth the time and money expended on them in this particular class of case, because in mild nephritics of early age, which are the only kind of case comparable with the adolescents, these tests practically always give normal values also. To tell the truth, I am not greatly impressed by the value of any of these tests of renal efficiency. They generally merely confirm by an arithmetical figure the fact that kidneys are not efficient when we know already for other reasons that this is the case. Sometimes they actually tend to lead us astray. I saw the other day a lady whom I know to have chronic parenchymatous nephritis which has passed into the secondary contracted stage. She has a small amount of albumin, practically no casts, is anaemic, the heart dilated, systolic blood pressure 200, and so on, but is able to concentrate urea to the high figure of 4.2 per cent. I have often seen the same sort of difficulty with blood urea estimations, though perhaps they are a little more helpful. The point is, however, that in the mild symptomless cases, which alone are likely to come up for insurance examination, these tests will seldom help us and may sometimes mislead.

In adolescent albuminuria the quantity of albumin passed is of no importance. It is usually slight, but I have seen it large with no effect on the diagnosis or the ultimate result, which is that they always clear up. Towards the end of the war I saw a man in the forties whom I had known as a youth of 20 with albuminuria of very considerable amount, which persisted to my knowledge for three years. When I saw him in 1918 he was in charge of a munition factory and had been working practically day and night for three years, was a man of extraordinary vigour, had a perfectly normal heart and vessels, and perfectly normal urine.

GLYCOSURIA.

Everyone knows how often glycosuria is discovered for the first time in the routine of insurance examination, and has followed up these cases until the condition was found to be unimportant or serious. I need say little about the true diabetic. His life has been made much more comfortable and useful by the better understanding of his diet and by the use of insulin, and in very many cases it has been prolonged. But his disease is not cured, and he is nearly as much at the mercy of septic complications, using the term in its widest sense, as he was before. He is not, and possibly never will be, a proper case for insurance. Can we take proposers suffering from the symptomless or nearly symptomless diabetes of elderly persons, the cases in which the hyperglycaemia and glycosuria depend, not on defective oxidation of glucose in the tissues as in true diabetes, but on defective storage in the liver? I think not. We all know that these cases often reach advanced age with glycosuria of many years' standing, but they are no more safe risks because of that than people with pressures of 200, who also often go on for many years. They may develop the more serious form of diabetes at any time, they are very apt to suffer from arterio-sclerosis, gangrene, eye lesions, neuritis, and they are bad subjects for operation and for intercurrent disease.

Fehling's solution is a quite satisfactory test for sugar, provided the two component solutions are kept in separate bottles, that equal parts of urine and the solution are used, and either heated together to boiling, or brought to boiling point separately and then mixed. The mixture should not be further heated after boiling. The clear olive-green discoloration which may occur with concentrated urines is disregarded, and only a definite precipitate is considered

to be due to sugar—green, yellow, red, or intervening shades according to the amount present—and only if it occurs while the mixture is still hot. Almost any urine will precipitate if allowed to stand till it is cold. In doubtful cases there are always the yeast and phenylhydrazine tests to fall back upon.

If sugar is found to be present, it is customary to delay the case and refer the proposer to his own doctor for investigation and report. Of course, there may be other factors present, such as undue obesity, high blood pressure, loss of weight, etc., which may lead to the case being declined at once. The examiner should always inquire into the nature of preceding meals. The man who comes to examination after a tea of sweet cakes and four cups of tea each with four lumps of sugar, or after mixing champagne and port, is of course riding for a fall. The former case, which used to be called alimentary glycosuria, is probably generally an example either of mild renal glycosuria with a medium threshold or of rapid intestinal absorption of sugar, and a resulting "lag" curve of blood sugar; the latter is due to the toxic effect of the alcohol and other substances contained in the wines.

The after-history of the delayed cases depends on their own intelligence and that of their doctor, their social position, and whether they are really anxious to be insured or not. Some let the whole thing drop; some are willing to take any trouble to find out what is the real state of affairs; many take the middle course of going to their doctor at irregular intervals through the course of three or four months, so that we get a report on half a dozen examinations, in perhaps two of which sugar has been present, without any statement as to the length of time after a meal at which the specimen was taken, or the kind of meal which preceded it. The doctor is left much where he was before, except that probably he can be sure that the patient has not a true diabetes, though there is no guarantee that the findings may not represent a pre-diabetic state. If these cases are taken at all it is with misgiving and a heavy extra, in the hope, which is often fulfilled, that they will not be taken up. Sometimes we come across cases in which a man's own doctor reports a long series of negative examinations, which there is no reason to consider incorrect, but where the proposer passes sugar every time he comes to the society's examiner. Possibly in this case the glycosuria is due to suprarenal overactivity induced by excitement. I have never had an opportunity of examining one of these cases personally. The proper course in doubtful cases, if the circumstances permit it, is to have a full blood sugar curve taken. It is only in that way that renal glycosurias and "lag" curves can be distinguished and true diabetes excluded. We are told by some of the metabolic experts that renal glycosuria is of no importance, and that these cases ought to be taken at ordinary rates. I always put on an extra, and shall continue to do so. One reason for this is that I have seen cases of renal glycosuria pass into true diabetes. Another is that the differentiation of these cases is so recent an affair that the life-histories of very few cases have been completely studied, and we really do not know what becomes of them in the long run. The metabolic expert usually knows nothing about insurance, and while he is thinking of the present, or at most of the next few years, he forgets that the man of 25 with renal glycosuria ought still at the age of 65 to be paying his premium. How can he tell us what the carbohydrate metabolism will be after forty years? Incidentally it is pretty certain that the passage of sugar irritates the kidney at last. The same conclusions probably apply to the "lag" curves, the knowledge of which is even more recent than that of renal glycosuria.

Occasionally we come across cases of glycosuria which are very difficult to understand or explain. A few months ago I had a lady under observation for some time who told me that eighteen months before she had been in a nursing home in London under one of the best known diabetic experts there for the treatment of diabetes, and was discharged on a diet on which she was told she would remain sugar-free without insulin. The blood sugar curve taken at that time was certainly a mild diabetic one. She tired of the diet after a time, went back to ordinary things, and when

I saw her was sugar-free; nor, though I encouraged her for other reasons, as she was miserably thin, to take large quantities of starches and sugar, did she ever show sugar in the urine, while her blood sugar curve was perfectly normal. Another recent case was that of a man who at intervals of a few months passed large quantities of sugar for a few days at a time without making any change in his habits, and with no discomfort except the polyuria.

I might multiply these out-of-the-way cases indefinitely from my experience and probably from yours. Many of them occurred before blood sugar curves were dreamt of. They are of little general interest, but they serve to prove that we do not yet know all there is to be known about the production of glycosuria, and that until we do know a good deal more it behoves us to be cautious, especially in insurance work.

A Lecture

ON

MULE-SPINNERS' CANCER:

CLINICAL FEATURES AND TREATMENT.*

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It is only within a very recent period that cancer of the scrotum and skin has come to be recognized as being associated with the occupation of mule-spinning in cotton mills. The subject was brought into prominence by an article on cancer of the scrotum published in the *BRITISH MEDICAL JOURNAL* in 1922.¹ Since that date numerous cases have been reported to the Factory Department, and through these notifications, through the mortality records of the Registrar-General, and from other sources the department has been able up to the present to trace 667 cases—570 in spinners and 97 in ex-spinners who passed into other employment.

Following the publication of the above-mentioned paper the Federation of Master Cotton Spinners and the Association of Operative Cotton Spinners and Twiners, with the co-operation of the Factory Department, drew up a warning leaflet in 1923. This was distributed among the workers to direct the attention of the industry to the prevalence of the disease. The importance of cleanliness was urged, and the danger of delay in securing early medical treatment, as soon as symptoms show themselves, was emphasized.

On March 27th, 1925, the Home Secretary appointed a Departmental Committee to inquire into the question; its report was published in February, 1926. In the opinion of the committee the evidence was strongly in favour of the view that this form of cancer was due to the prolonged action of mineral oils.

As the occurrence of the disease has only been recognized for a few years the premonitory signs and clinical course of the condition have not yet been fully studied. It is proposed to describe shortly the clinical features of this form of cancer as it occurs amongst mule-spinners, and to show how the disease can be diagnosed at an early stage after its commencement. At the onset it is a relatively benign type of malignant growth, and early operation for its removal offers a good chance of cure.

The lesion on the scrotum is a cutaneous epithelioma similar to that arising elsewhere. It is commonly seen in men between 40 and 60 years of age, though it may occur earlier, or at an age considerably older. The first manifestation is a wart-like excrescence or a flat plaque due to local hyperplasia of the epithelium. This wart or papule is usually single and about the size of a pea; it is raised above the surface and may be covered with scales, which the man removes by scratching, leaving a small bleeding surface over which the scales soon re-form. The only symptom which troubles the patient at this stage may be itching about the growth. In other cases there may have

been several small papillomata present on the scrotum, and one of these takes on the above characteristics whilst the others remain benign. Later the growth sloughs and definite ulceration follows in six to twelve months, when the patient seeks medical advice on account of the irritation and discharge.

Until quite recently it was uncommon to see cases in the early stages, for three reasons. First, for reasons of modesty, owing to the position of the growth; secondly, because the men did not pay any attention to these slight symptoms; and thirdly, because both the spinners and their doctors failed to recognize their significance and to realize the importance of early treatment. Owing to the wide publicity given to the disease in the last four years the men themselves are now beginning to understand the meaning of the initial signs and to seek medical advice if symptoms appear.

When fully developed the tumour is proliferative, of the cauliflower type, with a raised everted and indurated edge surrounding an ulcer. The ulcer is often the size of a shilling; it is of relatively slow growth and rarely involves the deeper structures. This is due to the fact that the lymphatics of the scrotum and testis are quite separate and there is no anastomosis between the superficial and deep systems.

It may sometimes be difficult to determine when the lesion has become malignant, but from the very first it should always be regarded with grave suspicion. The disease is usually seen on the scrotum and on the left side; in approximately 25 per cent. of cases the growth may be found on other sites, chiefly the head, neck, and forearm.

The tendency for this type of cancer to form metastases is at first slow and its malignancy is not great. In the initial stages the enlarged inguinal glands do not necessarily contain carcinomatous deposits; the enlargement may be purely inflammatory, due to the infective processes taking place on the surface of the ulcer. Sooner or later, however, malignant invasion of the glands is bound to occur, and with the progress of the disease the most conspicuous feature is the breaking down of the glands in the groin. Finally death follows from exhaustion due to septic absorption or haemorrhage from the femoral vessels, whilst occasionally internal metastases in the abdominal glands, liver, or peritoneum give rise to abdominal symptoms or pain from pressure on nerves.

It is important to remember that the disease at first and for a considerable time is purely local, and there is ample time both for diagnosis and treatment before it has spread to other parts.

TREATMENT.

Cancer of the scrotum should be one of the most favourable types of malignant disease for surgical treatment, as it can be discovered at a very early stage. The cure of the disease depends on its early diagnosis and radical removal.

In considering treatment, it is essential to have a clear understanding of the lymphatic vessels of the scrotum and the glandular areas into which they drain.² The superficial lymphatic system consists of a fine network of lymph capillaries covering the whole scrotum, lying beneath the skin and external to the dartos muscle. There is a free anastomosis of this network across the two sides of the scrotum. The collecting channels from this run above and below Poupart's ligament to reach the superficial inguinal glands. The trunks coming from the anterior surface of the scrotum may pass direct to a gland which lies just internal to the anterior superior spine of the ilium, and is the most external gland of the horizontal set. This point is of considerable importance, since mule-spinners' cancer is commonly found on the anterior aspect of the scrotum. The lymph channels run both superficial and deep to the saphenous vein. No channels appear to pass the inguinal glands to reach the iliac glands direct, and primary lymphatic infection is therefore only found in the inguinal glands.

The treatment of this disease is essentially surgical. Any other form of treatment can be merely palliative. All forms of radiotherapy have proved disappointing and appear to be of doubtful value. We know of no case improved after x-ray treatment, in spite of the fact that

* Delivered in the Post-Graduate Course of the Manchester Committee on Cancer.