Thesis.

Goitre or Derbyshire Neck.

By

George Godfrey Macdonald.
M.B.; C.M.
Crich.
Derbyshire.

ProQuest LLC.
789 East Eisenhower Parkway
P.O. Box 1346
Ann Arbor, MI 48106 – 1346

Goitre.

The true cause and effectual treatment of this very common and largely prevalent disease, in certain well defined localities, is still veiled in much obscurity. A condition of things to be deplored, alike, on public grounds and professional reputation.

In districts where the malady commonly exists, the victims appear to look upon the enlargement, often, as an ornament, at any rate, as a normal condition. Even Shakspere somewhat favours this view in his immortal comedy, The Tempest, when he makes Gonzalo utter,

"Faith, Sir, you need not fear. When we"
"were boys,"
"Who would believe that there were mountaineers"
"Dew-lapped like bulls, whose throats had hanging at them"
"Wallets of flesh, or that there were such men"
"Whose heads stood in their breasts."

With the exception of the Specialist or ~~Scientific~~ Savant, the General Medical

Practitioner, I fear, too often proves this belief by a silent acquiescence or a masterly policy of doing nothing to try and remedy the evil. A result possibly due to the almost alarmingly common prevalence, amongst a certain class of people of this unpleasant disfigurement. Still our apathy is none the less a slur on our science, if we know not the cause, a reproach on our skill, if we cannot remove or remedy the effect.

My effort in this paper is shortly to recapitulate the main facts already known concerning the presumed causes and different remedies employed in the treatment of Goitre, and to add a few remarks, based upon facts deduced from careful observations, made by the write in the practice of his profession in a country district where the disease is very common.

In taking up the study of any great question one is naturally tempted to begin with a historical survey. It is an eminently fit and instructive method,

but the consciousness that I know the literature is so extensive, must compel me to make the historical survey brief.

Under the name of Bronchocele it was known to the Greeks.

It was about the time of Hippocrates attributed to the use of snow water.

Pliny knew that it was common in the Alpine valleys.

Celsus wrote about its removal by the use of caustics.

Albucasis, the great Arabian Physician, gave the first really good account of the disease and compared it to the flap or dewlap of a turkey-cock.

Paracelsus attributed it to the mineral impurities in drinking-water and laid special stress on the Sulphide of Iron.

Prosser wrote an elaborate dissertation on the subject in 1769.

In the present century many Authors have tackled the subject, and the articles written are of great interest, of varied scientific merit, but, I fear, of little real, practical benefit to the mass of the

unfortunate sufferers.

Among these writers, I may mention, Foderé, Quadri, Alibert, Conduit, Straub, Manson, Mc Clelland. Macnamara, Saint-Lager.

In 1848, a Royal Commission was appointed to report to the Sardinian Government on Goitre & Cretinism. Since Sir William Gull in 1873 (Trans. Clin. Soc. vol. VIII) first described and recognised as a distinct disease Myxoedema, many cases have been recorded and much written on the subject by Dr. Ord. Med.-Chir. Trans. 1878 Clin Trans. XIII. 188 Sir Dyce Duckworth. " " "

Dr. John Harley. Med.-Chir. Trans 1884

Dr. Drewett. Clin. Trans. 1884.

Dr. Nixon Dublin Quart. Journal Jany. 1887.

Cases have also been recognised and described by Rees. Erb, Senator, and Landau.

There is an elaborate account published by the Clinical Society as an appendix to the 21st volume.

From that time on the Medical Journals

week after week have been teeming with a record of cases of Goitre, cretinism and myxoedema. To mention only a few,

British Medical Journal		Jany 7. 1892
Joffroy.	Union Med.	May 10 "
Kohler.	Berl. Klin. Woch.	June 13 "
Ellson.	B. M. J.	Jany. 14. 1893.
Jo. Coates.	"	" " "
Kappes	Gaz. de Hôp	Sept. 2. 1893
Victor Horsley.	B. M. J.	" 23 "
Stevenson	"	July 29. 1897
Waters	"	Sept 11. "
Hayes	"	July 19. 1898.

I think this historical sketch is amply sufficient to indicate the great interest which Goitre, Cretinism, and Myxoedema, have at all times raised in the minds of scientific medical men. The views these different writers have expressed, also show the great diversity of opinion in the profession as to the cause and treatment of the affection.

What is Goitre? commonly called in England "derbyshire neck", sometimes "thick neck", in Scotland "Lithgedale neck". Other synonyms used at different times and by various writers for this affection are "Bronchocele", this word is not merely derived from the Greek, but was used by the Greek writers in the same sense in which the English employed it. Bottium is applied to it in Edwds Study of Medicine.
Thyrophraxia, Thyrocele, and Tracheocele have all been used to denote Goitre.

Goitre is a simple hypertrophy, or cystic, fibroid, or fibro-cystic enlargement of the Thyroid Gland. (Quain Vol ii 538.)
It is an exaggeration of its natural structure, with augmentation of its volume. The texture of the gland becomes coarser, its blood vessels grow larger and more numerous, its cells are magnified and filled with a thick viscid secretion. (Sir Thos Watson Vol i Page 796.)
In the last edition of Pagge & Dr Smith's Medicine, it is said not to be a simple

hypertrophy of the Thyroid, but a disease of that organ. Vol. I Page 860.

I shall restrict the use of the term to a simple enlargement of the whole gland, or of a single lobe of it, or isolated tumours consisting of the gland tissue. In all of these cases there may be and often is secondary changes, all are prone to undergo colloid degeneration, caseous degeneration, and calcareous infiltration and ultimately gross diseased conditions may exist. But the primary Goitre is a simple hypertrophy of the already existing glandular tissue.

To elucidate the causes and treatment of the affection, I think it wise to look at the salient features in the structure and the function of the gland. The thyroid gland consists of two lateral lobes situated on either side of the trachea and larynx, and joined by an isthmus which crosses in front of the trachea at the third and fourth rings. It is a soft, reddish and highly vascular organ,

and weighs from one to two ounces, is larger in the female than in the male and at the menstrual period increases still more. Structure. It is invested by a layer of fibrous tissue which connects it with the surrounding parts. It is composed of a number of closed vesicles, which are from $\frac{1}{500}$ th in. in diameter to the size of a millet seed. Each vesicle is lined by a single layer of epithelium and is surrounded by a plexus of capillaries. They normally contain a clear, yellow, viscid fluid, and some white corpuscles and degenerated red corpuscles sometimes. It has a large blood supply and is very vascular.

Specially note its coarsely granular texture, its great vascularity, the frequent and free anastomosis of the arteries as well as their large size. It is important to remember that it is always larger in females than in males, and appears in many of the former to undergo a periodical increase about the time of menstruation.

Function a few years ago all the information obtainable from a text book on physiology concerning the function of the thyroid body was "nothing definite is known".
The older physiologists classified together a number of ductless glands and called them "blood glands", for example, the thyroid, thymus, and suprarenal capsules. The glands so grouped were supposed to be concerned somehow or other in the formation or elaboration of blood, but their modus operandi was not known. The results of a number of recent researches on these and other glands show that several glands in the body, with or without ducts, exert an influence on the blood's composition in a manner not previously suspected.
The interesting and curious symptoms following complete excision of the thyroid gland in man, and some other animals, namely, the appearance of myxoedema, with all that this entails in the altered chemical constitution of the blood, the condition of the subcutaneous tissue and salivary glands, and the effect upon the nervous system, point to

the profound influence which this gland exerts on the blood, and the general metabolic phenomena of the body.
But when we look at the equally remarkable fact that the injection of the juice of thyroid glands of sheep greatly ameliorates the symptoms of myxoedema, we have another evidence of the important part played by some substance elaborated by or manufactured in the thyroid.
It may be that this gland discharges something into the general blood stream, an internal secretion which is absolutely necessary to the maintenance of a proper composition of the blood and some of the tissues. On the other hand, it may be that this gland prevents an auto-intoxication either by transferring the toxic products of metabolism into easily eliminated bodies, or by its secretion directly neutralising these products
Albertoni and Tizzoni have shown that the thyroid does not seem to contribute directly to the production of red blood corpuscles.

This view of the use of the internal specific secretion of the thyroid vesicles is further corroborated by the fact that whichever way the secretion is introduced into the animal economy it is capable of exciting a marked effect on the tissues generally. The effect is produced when introduced as in health, through the lymphatics of the thyroid, or whether it be introduced through the subcutaneous tissue, or the gastro-intestinal canal.

Victor Horsley who has done much work in connection with the thyroid, gives adherence to the following

"(1) That it is directly a blood forming organ

(2) " " " indirectly " " " "

(3) That it modifies or destroys substances which circulating in the blood are harmful to the general economy."

This he considers its most important function, and he adds to it the very important corollary, that is, "that it secretes some substance useful to the general economy."

Pathology. I consider the first step in the morbid anatomy of Goitre is an increased action of the heart, consequently there is sent to the large and easily dilatable blood vessels of the highly vascular thyroid an increased supply of blood, this causes hyperaemia of the gland. This hyperaemia frequently repeated, or continued in action, leads to exudation into and swelling of the tissue.
There is an exaggeration of its natural structure and an increase in its volume. The texture of the gland is coarser; its blood vessels are larger and more numerous; its cells are magnified and filled with a thick viscid secretion, the gland is soft and compressible.
You may have cystic, fibroid, or fibro-cystic enlargement.
Cysts are formed from the normal follicles of the thyroid by their distension with colloid material, the epithelial lining degenerating as the cysts increase in size The cyst wall is formed by the inter-lobular

septa and capsule of the gland.

Pure cysts: The serous fluid which is secreted from the walls replaces the colloid contents.

Fibroid: The connectin stroma increases at the expense of the follicles, and tough bands of nucleated fibrous tissue traverse the organ in all directions, the change generally commencing centrally and extending peripherally.

Fibro-cystic: The follicles mostly atrophy, but some persist in the form of small cysts.

Gilbert states that the right lobe is more frequently enlarged than the left. In rare cases an extra lobe is present and becomes enlarged.

The isthmus is rarely affected by itself.

A point of great importance in the pathology, to my mind, is the initial increased action of the heart, this, I have always found, plays a great factor in the etiology.

Dr. Jo. Coats in his manual of pathology says. "A goitre may consist

in a simple enlargement of the whole gland, or of a single lobe of it, or it may be due to the formation of isolated tumours consisting of gland tissue.

In the case of apparent simple enlargement the vesicles may be found greatly increased in size, and many of them filled with colloid material. In the same case the various stages of colloid metamorphosis, as it affects the epithelium, may be observed. These colloid vesicles may coalesce and form considerable cysts. In other cases there is a distinct new formation of glandular tissue, the tumour consisting largely of vesicles of normal size. But the new formed vesicles are also prone to undergo colloid degeneration.

Where distinct isolated tumours exist, there is of course a great new formation of gland tissue, and here also there is often colloid change.

In all the forms secondary changes are frequent.

We have already seen that cysts form. Then blood may be extravasated into cysts or into the interstitial tissue, and though

subsequently absorbed the pigment remains. Caseous degeneration may affect the extravasated blood, or even the glandular tissue, and calcareous infiltration sometimes ensues, so that great changes may occur in the characters of the tumour.

The relation of the colloid goitres to tumours is very distinctly evidenced by the observation of a case by Cohnheim in which secondary tumours developed by metastasis, the tumours occurring in the lungs, lymphatic glands, and elsewhere having the structure of the thyroid with colloid degeneration.

A remarkable confirmation of this metastasis of ~~the~~ thyroid tissue tumours was supplied by Dr. Coats in the B. M. J. Jany. 14. 1893 In that paper he relates a case of a woman who in the first place was affected with an ordinary goitre for sixteen years, Whilst the original goitre was thus of old standing, there appeared about a year and a half before death a soft tumour in the occipital bone. This tumour grew till, at the time of death, it had destroyed

The bone in a circular area nearly two inches in diameter, the gap being filled with tumour tissue, which during life, projected both outwards under the scalp and inwards towards the brain and formed externally a prominent pulsatile swelling at the back of the head. Besides this there were several other tumours occupying the bones of the skull, and causing destruction of the bone, but this was the largest. Dr. Coats further says, It was a fact astonishing to me to find that this tumour in the skull presented the structure of the thyroid gland. There were the usual saccules lined with epithelium, and these presented in many instances the colloid contents so characteristic of ordinary goitre. The secondary tumour imitates in the minutest detail of structure the primary growth, presenting the glandular saccules and colloid secretion just like the primary one.

Symptoms.

(1) Objective. There is a protuberance or swelling in front of the throat in the situation of the thyroid gland, usually soft, smooth and elastic. The lobes of the gland become more obvious. Sometimes the whole tumour is irregularly lobulated, sometimes the exact form and relative proportions of the gland are preserved, each individual part being equally increased in size. At other times there is a soft uniform or irregular swelling, without much distinction of parts. There is a general diffusiveness and want of consistent hardness.

In cystic goitre you can obtain fluctuation of fluid within the walls.

In the fibroid variety there is a uniform consistency and hardness of its substance. Sometimes scattered throughout the substance of the gland you may have hard stony fibroid nodules.

It is attached to the trachea and follows all its movements when the act of deglutition is performed. This is a leading point

in diagnosis and serves to help in excluding other diseases such as cancer, enlarged lymphatic gland, aneurism, fatty and other tumours of the neck. The size and effects of the tumour both vary much in different cases. The injurious effects are not always, by any means, in proportion to the size or bulk of the tumour.

Sometimes there is only a slight fullness of the throat, which is often thought rather graceful than otherwise.

It is often not bigger than a cherry, varying between that and the size of one's fist and then generally occupies the central portion, or what is called the isthmus of the gland. On the other hand it may be very large, it may surround all the front and sides of the neck like a thick collar, and rise as high as the ears; or it may hang down in a pendulous lump, and be supported upon the chest, sometimes it has been said to reach to the abdomen.

Albert mentions one case in which the swelling was of a tapering cylindrical

shape, and reached to the middle of the thigh.

Fodéré states he has known the gland weigh 7 or 8 pounds.

In cold weather I have often noticed a temporary increase in the bulk of small and medium sized goitres.

Now and then, the swelling, after its first commencement, develops itself with great rapidity, but its ordinary progress is slow. It often continues for months, nay for years, without attaining any extreme or troublesome magnitude.

Sometimes it remains stationery for a considerable time, and then suddenly increases without any obvious cause.

On the other hand, it sometimes gets much less without any treatment, and this increasing and diminishing sometimes alternate.

There is often a temporary increase during the catamenial period and during pregnancy, and flooding in child-birth is not uncommon.

A tendency to the haemorrhagic diathesis has been noted.

Pulsation due to the vascular character

of the growth may be felt, or pulsation may be communicated to the tumour from the carotid or enlarged thyroid vessel.

(ii) Subjective

The main subjective symptoms are those due to the pressure upon adjoining structures. As a general rule there is no pain, neither is it tender, unless it has become very suddenly enlarged or inflamed.

In many cases no very serious results arise from the presence of the goitre, except the disfigurement and inconvenience of the weight of the gland.

The intensity of the pressure effects depend upon,

(i) Situation of the tumour
(ii) Rapidity of growth
(iii) Manner of growth ie. whether it bulges in or outwardly
(iv) Effect of muscles and fascia in binding it down and causing it to press upon the parts beneath.

far more than upon the actual size or bulk of the tumour.

When it is not confined by muscles or fascia,

The skin readily yields, and the entire growth of the tumour takes place in front. By pressing on the wind-pipe, it may cause hoarseness, wheezing, and dyspnœa. It may interfere with or even prevent swallowing, a case of starvation from this cause has been recorded by Sir T. Watson. The worst effects caused by pressure are its interference with

(i) The circulation
(ii) The Respiration.

The circulation. By its pressure upon the veins it may obstruct the free descent of the blood through the veins of the neck, and give rise to headache, giddiness, noises in the ears, confusion of thought, and a turgid condition of the head and face. The pulse becomes feeble and often is intermittent.

The respiration

A goitre may compress the trachea in the neck, flattening it from side to side, so as to make it scabbard shaped, It may push it out of the straight line, or it may bend it. It is by no means the largest

goitres which are most apt to have this effect, much depends upon the exact situation of the growth, and upon the condition of the overlying muscles, which oppose resistance to its extension outwards. The middle lobe of the thyroid, according to Virchow, when it becomes enlarged, sometimes passes down behind the sternum so as to compress the trachea backwards against the spine. Virchow says that such a "substernal goitre" may be present without there being any obvious swelling of the thyroid in the neck. Ross of Kiriech in vol xxii of the Arch. f. klin. Chirurgie. has drawn attention to a peculiar change in the tracheal cartilages, which occurs as the result of the pressure of a goitre and renders them soft and flaccid. The way in which he recognises this after death is by dissecting off all other structures from the larynx and trachea and then placing them upright, the tube collapses at some one point, bending sharply, so that its channel becomes completely closed. A like collapse is believed by him to be the

cause of the supervention of sudden fatal dyspnœa as the result of goitre. Pressure on the trachea causes dyspnœa, and is found most commonly in young people when the tracheal rings have gained much power of resistance.

The dyspnœa is greater during inspiration than expiration, it is increased on exertion, and at night on assuming the dorsal decubitus and is often paroxysmal in character. It varies in intensity according to the amount of compression.

The pressure on the trachea prevents the free passage of air into and from the lungs and thus causes

diminution of oxygen
increase of Carbonic Acid Gas.

This condition is characterised by increased respiratory movements in which numerous muscles take part. Thus, in addition to the ordinary respiratory muscles such as the diaphragm, other muscles, such as the scaleni and posterior serrati, take part. The ribs are forcibly elevated and depressed, and the larynx,

which is almost motionless in ordinary respiration, is thrown upwards and downwards through a considerable distance.

If the pressure on the trachea has been rapidly produced, or is great in extent, there is apt to be produced a grave condition of pulmonary oedema and bronchial catarrh.

Should the pressure actually cause death, it is not due to the lack of oxygen, but rather to the surcharge of of the blood with carbonic acid gas, since the exit of CO_2 soon becomes impeded when the renovation of the air within the lungs is imperfectly performed.

The first effect of the deficiency of oxygen in the blood is the stimulation of the respiratory centre of the medulla oblongata, giving rise to increased inspiratory efforts. As the compression increases the blood becomes more venous, the inspiratory efforts more violent, until finally every possible muscle that can assist respiration is called into play.

Pressure upon nerves.

The recurrent or inferior laryngeal branch of the vagus nerve from its position is most exposed to pressure from a goitre. This nerve on each side, on its course to the larynx, is placed between the trachea and œsophagus, supplying branches to both tubes. It distributes branches to supply all the special muscles of the larynx, except the crico-thyroid muscle, which is supplied from the upper laryngeal nerve.

The left or the right recurrent laryngeal nerve may be pressed upon, but very rarely, if ever, both. If this pressure be great in amount, or prolonged in duration there is produced paralysis more or less complete of the muscles supplied by the nerve. The paralysis of the larynx is not quite universal, since the crico-thyroid muscles escape. But it does not appear that any appreciable physiological action results from their contraction when the other laryngeal muscles are powerless.

This condition of unilateral paralysis does not produce that change of voice which we might expect. It is often weak and hoarse, and sometimes breaks into a falsetto as soon as an attempt is made to speak forcibly.
Gerhardt has drawn attention to the fact that when two fingers are placed, one on each side of the thyroid cartilage, while the patient is speaking, a more distinct vibration can be felt with one finger than with the other.
If both nerves are pressed upon, then of course the paralysis is bilateral, but this is — must be — a very rare condition, if it ever does occur from a simple goitre.
Spasm of the larynx may be produced by the pressure of a goitre causing irritation or stimulation of the vagus trunk so that the adductor muscles are thrown into a state of tonic spasm.
Goitre does not cause pressure upon the oesophagus nearly so frequently as upon the trachea, hence difficulty in swallowing

is not so common as difficulty in breathing. Dysphagia may and does occur from a goitre pressing directly upon the gullet as when the lateral lobes rest behind the oesophagus, or when the goitre develops directly in front of the trachea, the rings of which transmit the pressure to the gullet.

When the calibre of this portion of the alimentary canal is encroached upon by a goitre, a mechanical impediment is set up to the act of swallowing, and liquids can pass with more ease than solids. To swallow solids, in some cases, necessitates a certain amount of voluntary effort. This supplementary aid is usually sufficient to propel the solid bolus onwards, and deglutition may be successfully performed, tho' the act is slower than in health and may be accompanied with pain. It does happen, however, that the obstruction is sometimes so great as to prevent the passage of the food downwards and regurgitation takes place, and even death may result from starvation.

as in the case already mentioned, recorded by Sir Thomas Watson.
Most of the cases, in fact nearly all, occur in girls and women who are likewise more or less anaemic.

There is a very remarkable and close relationship between. Goitre, Cretinism, and Myxoedema. There is probably some cause, accidental or essential, which is common to all three, We may express the action of the common cause thus,

(I) Goitre is produced when the common cause has acted for a short time and with mild intensity.

(II) Cretinism is produced when the common cause has acted for a longer time and with greater intensity.

(III) Myxoedema is produced when the common cause has acted after complete ossification of the bones, when the stature and mental faculties are already fully developed.

There is probably no district in the world where endemic cretinism occurs without goitre being still more common. When a family migrates into a place where goitre and cretinism are endemic, goitre is the first to appear, it is only in the second and third generation that cretinism will appear.
Many cretins are also goitrous, but others have no Thyroid at all, and these are generally the worst cases. There is no real difference between endemic and sporadic cretinism, except the difference in the frequency of their occurrence.
In the Medico-Chirurgical Transactions 1871 and the Pathological Transactions 1874 Hilton Fagge described cretinism. He said, in this form of the disease there never seems to be a large goitre, but in the case of a boy who came to Guy's Hospital from Halden, in Kent a sister had goitre. In most cases the Thyroid, so far from being enlarged is entirely absent, and no trace of it can be discovered on dissection

This fact was first pointed out by Curling in 1850.

Some of the figures which illustrate the communications show how close, in their general character, is the resemblance between the diseases.

Figs 1 and 3, pl. III. Med-Chir. Trans., vol. XIV, and fig. 2. pl. XII. Path. Trans. vol. XXV.

Paget says, among the patients affected, one, at the age of sixteen years and a half, was only two feet eight inches high, another when twenty years old, was only two feet four inches high.

They have the same broad, square hands and short fingers, the same dry hair, the same rough scurfy skin. Their heads are large and broad; their noses are flat at the root, so that the distance between the eyes is increased, and their mouths are large and gaping, with thick lips. In the case of a patient 81 years old at the time of death, an autopsy showed, that the base of the skull was much altered in shape; the posterior clinoid processes were at a

higher level than the anterior, and the sella turcica was very narrow.
The clivus was horizontal and its position seemed to be part of a general elevation of the occipital in relation with the other bones, for the cerebellar fossae were exceedingly shallow.
One of the most curious features of sporadic cretinism is the presence on each side of the neck in the "posterior triangle" outside the sterno mastoid muscle, of a soft, lobulated, and movable lipoma.
Dr. Fletcher Beach in the Trans: Intern. Med. Congr. 1881 Vol III describes a very characteristic case of cretinism in which there was no thyroid, but two large supra-clavicular masses of fat. In one of Hilton Fagge's cases these supra-clavicular swellings were much larger than hens eggs.
Their size seems to be influenced to some extent by the state of the general health. They are sometimes developed in adults who otherwise appear to be in good health. As a rule they are most frequent in young cretins, and become less marked as age increases.

It has been held to militate against the one cause theory that some cretins are not goitrous, but if we look upon cretinism as the result of loss of the physiological function of the thyroid gland, a condition which may obtain in

(i) Congenital absence

(ii) Atrophy

(iii) Hypertrophic degeneration

we see the inadequacy of this objection. In cretins who have goitres there is probably no normal structure of the gland left.

Two Swiss Surgeons, Dr. Rouvolin of Geneva and Dr. Kocher of Berne have furnished proof that lack of the thyroid gland gives rise to cretinism.

They performed in some cases partial and in others complete extirpation of the thyroid gland.

In 16 upon whom partial ablation had been performed, the results were excellent, dyspnoea was removed and the general health had suffered in no respect

In 18 upon whom complete ablation

had been performed, 16 showed more or less considerable derangement of their general health.

Some months after the ablation they began to show mental [illegible] lethargic stupor, pallor, oedema, and other characters of an adult cretin.

In April 1883, to the Twelfth Congress of German Surgeons Dr. Kocher related the following.

A few months after the operation early fatigue, weakness, and sensation of heaviness in the limbs were complained of. In many cases these were preceded by actual pains in different parts of the body.

Soon afterwards a sensation of coldness, especially in the extremities, was superadded. In winter time the hands and legs swelled, became bluish-red and cold, and the patients suffered from chilblains.

The mental activity decreased; thought, speech, and movements became slower.

At the same time the patients were themselves painfully aware of these facts.

Simultaneously with the above symptoms swellings of the face and body made

their appearance, which were sometimes at first only transitory, but soon became lasting features; the parts most and earliest affected were, as a rule, the infra-orbital and the eyelids, which showed a somewhat transparent swelling; later on, the nose became thick, the lips coarse, the hands and feet swollen and the waist stouter; the skin became dry, desquamated a little, was infiltrated, and its elasticity lost; it could only be lifted in thick folds. The hair fell out.

The most marked symptom in the purpura cases was anaemia.

Examination of the blood showed a relative richness of leucocytes, inasmuch as the number of the red blood cells was greatly diminished.

In the patients who were young and still growing at the time of operation, the development became most markedly arrested.

Rare symptoms were slight dysphagia, giddiness, and headache.

By the ophthalmoscope nothing abnormal was seen, beyond remarkable narrowness

of the arteries,
Professor Kocher concluded by remarking that the relationship of the above complexity of symptoms to idiocy and cretinism was unmistakeable.
For the affection he described he proposed the name Cachexia strumipriva.
At the time of his making this communication he was unaware of the existence of myxoedema.
Further confirmation has been supplied by Victor Horsley who repeated these experiments on monkeys. See the Bruce Lectures British Med. Journal Jany. 1885. He finds that, usually within a week, after the operation, fibrillary tremor appear in the limbs, which, like those of paralysis agitans, cease on voluntary movement. The monkey becomes anaemic, with increase of leucocytes as well as diminution of red discs. It sits moping and immobile. The eyelids and abdomen swell. The temperature falls below normal all tremors disappear, and the animal dies comatose in six to seven weeks.
Two remarkable conditions appear

to justify the application of the word myxoedema

(i) Great swelling of the submaxillary and parotid glands so that the latter become as it were transformed into muciparous glands.

(ii) Great increase of mucin in the connective tissues, especially the tendons and superficial fascia and its appearance in traces in the blood.

The argument of these two sets of experiments, (except that in man it takes much longer for the full effects to develope after thyroidectomy than in monkeys) and of both with the cretinoid condition of Sir Wm Ewell and of sporadic and endemic cretinism ably support the view of the intimate relationship existing between Goitre, cretinism, and myxoedema. In myxoedema the thyroid gland has been found atrophied or degenerated, and not one symptom is present, which does not occur in cases of total extirpation of the gland.

Aetiology.

Locality, The distribution of gritt is very wide, it is present in magnesian-limestone districts in the highest degree. Derbyshire, Nottinghamshire Cheshire, Lancashire afford abundant examples of this. It also occurs along each side of the Pennine Range, South Tynedale, Allendale, Redesdale and upper Coquetdale. In Durham in upper Weardale & Teesdale. In Yorkshire at Hawes.
In Westmoreland on each side of the Eden valley
In Cumberland in the Alston mining district.
In Bristol, and in Pembroke at the Forest of Dean.
Cretaceous. chiefly chalk in Norfolk
upper Greensand in Sussex & Kent
Gault, Folkstone Marl
Lower Greensand. Especially at
Ampthill in Bedford,
sparingly in Surrey.
Wealden. Wealden clay and Hastings sand
Abrupt Tunbridge Wells, at Speldhurst,
Hazelmere and Penshurst.

In Arran and at Umbrum near Northampton it is endemic, in new red sandstone

According to St. Lager, goitre is found in Scotland in Perthshire

Fife - East part.
Roxburgh.
Selkirk.
Peebles.
Ayr.
Lanark.
Dumfries.
Firth Valley.
Kirkcudbright.
Wigton.
Berwick.
Arran.

It does not occur indigenous in any country, but is more or less confined to certain districts where it is endemic. But no country nor race is quite free from it.

It is found on the Continent; in France, mostly in Savoy, in Germany, mostly in the Black Forrest, in Austria, mostly in Styria.

The valleys of the Alps and Pyrenees teem with it. In Switzerland it is worst in the Valais.
In Russia it occurs [illegible], about the Altai mountains in Siberia.
In Africa, Mungo Park said the regions of Barbary suffered from goitre.
Livingstone said goitre is frequent in the Bopue & Kebrire districts in Central Africa.
It has been observed among the Makungus, a warlike tribe living on the lofty peaks of the mountains of the Western bank of Lake Tanganyika.
It occurs in various districts in both North & South America in the latter it occurs in the high flat country of Bogotá 6000 feet above the level of the Magdalena River as well as in the lower course of the river.
In Asia it occurs in some Western parts of Siberia, in Western China and Tartary, in Bengal especially along the line of the Himalaya mountains, in Calcutta and in the island of Sumatra.

Sex

There is no doubt that women are much more liable to the disease than men, in my own practice, in a village of 3000 of a population, it is rare, exceedingly rare, amongst men, while the women suffer to a large extent, I should certainly put the proportion 50 to 1 in the working class part of the community. I attribute this to the fact that the men drink beer, which comes from a distance, while the women all drink water, another factor is the larger size of the thyroid in women. This I think is confirmed by the fact that in India where both sexes are about equally affected neither drink beer, both drink water.
Then the vascular influences that women are subject to at menstruation, pregnancy, and lactation is to my mind a powerful factor in their greater liability to the disease. Many cases are brought to my notice for the first time either when the girl has just entered into womanhood, or maternity.
I think a rational explanation of this

is found in the facts (i) that the female's thyroid is larger than the males (ii) that the function of the thyroid is to manufacture or elaborate some specific internal secretion which is absolutely necessary to the maintenance of a proper and healthy composition of the blood.

At menstruation, pregnancy, and lactation you have an alteration of the normal condition of the blood, you have a call for more blood, and consequently an increased activity of the organs having to do with the manufacture or elaboration of that fluid. As we have seen the thyroid is one, its activity is increased, consequently it must have more blood, thus you get produced that hyperaemia which is the initial stage in hypertrophy.

Man has neither the strain of menstruation nor pregnancy hence perhaps we have one more factor of his greater immunity from the disease.

Uterine haemorrhages are rather more common in this locality than has been my experience elsewhere and this I think

has some connection with goitre.
I have one patient, who at every confinement alarms me with the terrible amount of blood she has lost, her mother informs me she also suffered in the same manner, and her mother before her, all three generations are living, and all have large goitres, the eldest daughter of my patient who is only 13 years, with fair skin, red hair, has just begun to menstruate and her neck is now decidedly full. Here the first menstrual flow was excessive in amount.
I have another patient with a large goitre, whose menstrual flow is always large, and who, when pregnant, does not cease to menstruate.
49 cases of goitre were admitted into the Hampshire Hospital in 10 years and of these 49 cases 48 were women 1 man
Of 70 admitted into the Chichester Infirmary in 9 years. 68 were women, only 2 males, and these were boys of a very pubic and feminine habit, and backward for their years.
Dr. Mamon of Nottingham gave the proportion

as 7 to 1. whilst Prosser mentions a village in Derbyshire where not one man was affected, although 60 females were affected.

Age

It is most common to begin at or after puberty, but no age is exempt. Children have been born with it, twice have I delivered a woman, with a child well marked with a distinct goitre, and in each case the child died within seven days from a constant oozing of blood from the umbilicus, notwithstanding that I transfixed the integument at the root of the navel, with a couple of hare lip-pins and twisted around them strong silken ligature. Goitre has begun for the first time in people who have passed the prime of life.

Heredity I think the disease is, at any rate it sometimes is hereditary, although of course there is no doubt it can be acquired.

I have an example in Crich of

Three generations, mother daughter and granddaughter suffering from it, several examples of two generations, mother and daughter, Until very lately I had a well marked case of four generations all in the female line.

The mere enumeration of the various theories advanced as to the essential cause of goitre is enough to convince us of the imperfect knowledge we possess.

(1) Every variety of geological formation has been adduced as a cause

(2) Each and every condition of the air

(3) has been brought forward as a cause

(3) It is almost universally believed that some condition of or impurity in the water is the essential cause.

(4) Dr. P. H. Macnamara has brought forward the theory that it is due to a poison of a fungoid nature.

(5) Billroth believes it due to a miasm acting through the agency of drinking water.

(6) The Commission appointed by the Sardinian Government reported that the causes were multiple. viz

Insalubrity of locality.
Humidity.
Absence of Sun's Rays.
Lack of ventilation
Insufficient nourishment and
Poverty.

(7) Dr. Weaks regards it as due to vaso motor paresis of the inferior thyroid artery, the result of disease or weakened function of the inferior cervical ganglion See Comet Feb 19. 1881.

(8) St. Lager advanced a metallic theory, According to his view goitre was probably due to decomposition of iron pyrites, one of the many sulphates probably being the cause, sulphate in its nascent state being probably most active. The presence of goitre almost universally when iron pyrites is found was an argument in favor of this theory.

(9) Dr. Jno. Coats, seems to consider that it is due to a morbid poison which has its residence in the soil, and finds its way into the bodies of men just as the malarial poison does, and that the only connection that the lime in drinking water has, is that it fosters the propagation of the morbid poison concerned.

(10) Virchow suggested that the salts in the water do not act directly, but that associated with them there is some other principle of a malarious character to which the goitrous tendency is due.

Rustig and Carle made a number of experiments published in the Journal of the Italian Academy of Medicine July & August 1890. The conclusions arrived at by these observers are:

(1) All the different waters examined which are used for drinking or domestic purposes by the inhabitants of the regions afflicted with endemic goitre were exceedingly rich in bacteria, and were exposed to constant contamination.

(11) Qualitative examination of the

bacteria contained in these waters showed the constant presence, though in variable quantity, of a bacillus which liquefies gelatine, and which has specific morphological and biological characteristics.

(III) Drinking experiments with the suspected goitrigenous water carried out, with all the usual caution in a country free from the disease, on animals (horses dogs) natives of goitrous countries, showed that the water alone had the power of producing an unquestionable enlargement of the thyroid gland

(IV) It was not sufficiently proved that the elimination of the microbes took away from the water its goitre-producing property.

It is somewhat difficult to accurately estimate the respective significance and relative importance of these varied theories as to the cause of goitre. But, for the purpose of intelligible comprehension, it is necessary that such of the causes as are only occasional in their appearance should be separated

from such as are constant, and that the latter should be treated as the essential causes of the disease, whilst the former are regarded as supplementary or accidental.

Personally I look upon the cause of goitre as threefold, two essential, one supplementary. The essential I hold to be

(1) A peculiar geological formation of the soil, influencing the chemical composition of the water.

(2) The presence in the soil of a living animal or vegetable poison.

The supplementary cause I look upon as some state of the system which calls upon the blood forming and blood distributing organs to increased activity, e.g. menstruation, pregnancy, in some cases extra hard work, climbing hills, carrying heavy loads.

My experience of goitre is obtained from the many cases that I come [redacted] in contact with in my every day practice. The people here seldom consult you for the goitre itself. The village where I

practice is called Brick, it is of considerable extent, occupies a lofty position 700 to 800 ft, on the slope of an isolated cliff, 12 miles north from Derby. This cliff or hill consists of limestone that are four strata of limestone, separated from each of the by an intervening stratum of toadstone, and there are many rich veins of ore. This limestone is nearly pure Carbonate of lime, and the most important of the metallic ore is lead on account of its abundance, The lead veins are both rake and pipe, penetrating the limestone to considerable distances. Zinc is met with in various form. Iron is found and traces of copper. The surface of the country, immediately surrounding the village is picturesquely diversified by lofty hills and deep valleys, in the main valley flows the river Derwent. This configuration of the land renders it impossible for the inhabitants of the village to go to their work, or to go any distance walking, without having very steep hills to climb. This climbing of the hills is an important factor.

The village has a population of 3000,
The water supply is my hard
Goitre is very prevalent among the women
but I know of only two cases in men.
I notice all degrees of intellectual vigour,
several exhibit slowness of movement,
difficulty in speech, and stolid look.
There are several cases of mild idiocy
and I fear the population furnish more
than its share of inmates to the
County Asylum.
All the women affected are poor,
hard workers, most of them are women
who in their younger days have had
to walk three miles to their work up
steep hills, many of them do so now.
It is a remarkable fact that I do
not know of a single case among the
females of the wealthy class in the
district. This immunity of rich women
I largely attribute to the fact that they
are not subjected to the same vascular
strain that their poorer sisters are.
They ie. rich women drive up hill, while the
poor walk. The rich women rest more at

Their menstrual periods, at child birth they remain longer in bed and as a rule do not nurse their children so long, often not at all.

Again the poor woman drinks water or tea to dinner, the rich most often wine or some other beverage.

To sum up then, why is it that in such a population of 3000 should give birth in many women of the poorer class, certainly over 50, none in the learned class and two in men.

All are subjected to, and live under, the same conditions of air, soil, and water. The two causes which I deem essential to the causation of goitre, viz.

(I) A peculiar geological formation of the soil, influencing the chemical composition of the water and perhaps favouring the development of the bacillus

(II) The presence in the soil of a living animal or vegetable poison,

is acting upon all the inhabitants men or boys.

Why do women suffer & men escape?

(i) Women have a larger thyroid gland than men.

(ii) Women are subjected to peculiar vascular conditions at the time of menstruation, pregnancy and lactation. Men are not.

(iii) Women drink water.
Men drink beer.

(iv) Women have not the same tonicity in their muscular structures as men, and possibly as a result their thyroids may not offer the same amount of resistance to an increased supply of blood, which is the first stage in hypertrophy.

Why do rich women escape?

(i) They do not walk up hill

(ii) They rest more during menstruation and pregnancy

(iii) They do not nurse their children so much

(iv) They usually drink wine or some other beverage for dinner, not water.

We thus see that rich women are not subjected to the same amount of vascular strain that the poor women are.

An animal or vegetable organism or poison enters the system, with a selective power against the Thyroid gland or inimical to its secretion. The system battles against it, and in the majority of cases successfully, but on the other hand you have the cases where the organism is too strong for the phagocytic resources of the system and we have the thyroid enlarging. In these later cases the vascular demands are too much for the thyroid and we have hyperaemia, hypertrophy, and ultimately possibly various degenerations produced. The marvelous effect produced in the treatment by feeding with thyroids, helps to support this argument. Additional resisting power is administered to the system by feeding with thyroid glands, with this aid the poison is once again kept in check and the strain on the thyroid diminished. The thyroid has now a chance of recuperating and in many cases greatly diminishes or even returns to its normal size.

Treatment. To tell the poor unfortunate victim of this malady to change her residence, or abstain from drinking water, is in the vast majority of cases useless, not because the advice is not sound, and if acted upon would be beneficial, but because the remedy is impossible. The woman's home and her work is in the locality where the disease is indigenous and her means will not permit the desired change.

If a change can be obtained, then, residence at the sea side is most beneficial specially if combined with sea water bathing or sea mud bath.

Can we do anything for the unfortunate victim who cannot afford a change of residence? Yes, I think, intimately much. First of all rest is indicated, avoid walking up hills, avoid excitement, and specially rest just upon, during, and immediately after menstruation.

The drug treatment may be comprised in three words Iodine, Thyroid feeding, Biniodide of mercury locally.

Iodine has almost acquired the reputation of a specific. There is no doubt that it has a wonderful effect when combined with rest specially. I find a combination of the Iodides act best, two grains of each, three times a day gradually increased up to ten. While giving the Iodides internally it is a good plan to paint the surface with the tincture of Iodine or apply Iodine Ointment. If the enlargement is of firm consistence then injections of Iodine into the substance is beneficial
This treatment with Iodine is far more effectual when combined with rest.

Biniodide of Mercury.

Sir Geo H. B. McLeod used when lecturing on Goitre to lay great stress on the effectual benefit derived from the biniodide in India.
In India the ointment of the biniodide of mercury is applied and rubbed in for ten minutes by means of an iron spatula about one hour after sun rise, the patient sitting with his goitre held well up to

the rays of the sun as long as he can bear the exposure. After sitting as many hours as possible exposed to the rays of the sun, the ointment should again be well rubbed in, and the patient sent home with strict injunctions not to touch it with his hands, but to allow it to be gradually absorbed. A Captain Cunningham, the originator of this plan, treated gratuitously about 60 000 natives in two years. He is said never to have produced salivation and to have rarely failed in effecting a cure.

Thyroid feeding. This is the remedy par excellence for disputing the evil results of disease of the thyroid gland. Burroughs & Wellcomes tablets 5 gr each may be given twice daily. or subcutaneous injections of the extract of thyroid gland may be given thrice times a week. The intrascapular region is a good place for injecting the thyroid extract and M xv should be injected each time The unpleasant symptoms following

The injections may be summarised as

(i) Inflammation which may terminate in abscess.

(ii) Giddiness and Headache

(iii) Faintness

(iv) Loss of power in the upper extremities.

Treatment of Cysts.

In the Lancet June 1890, Wrakes published a paper on the treatment of Cystic Goitre by the introduction of Chromic Acid into the Cyst after Tapping.

He introduces the acid upon a special form of instrument introduced through the canula, and applies it to the walls of the cyst, speedy obliteration of the cavity ensued in all his cases.

Sometimes in Cystic Goitre, in urgent cases where the patients life is in peril from asphyxia, temporary relief may be obtained by simple aspiration of the cyst. This is only a very temporary resort as the cyst soon refills, or blood or a sanguineous fluid may be rapidly effused into the sac.

Free incision of the cyst may be resorted to, and its cavity plugged with cotton wool soaked in an astringent or antiseptic fluid. The free edges of the lining membrane should be attached to the skin wound, so that the cavity may fill up with granulations.

Porters method of treating small cysts consisted of drawing off the fluid and inserting several inches of catgut, previously soaked in tincture of Iodine. The catgut is allowed to remain till suppuration is established, the canula having been withdrawn after its insertion.

Excision of the cyst may be sometimes done with advantage, but it is a formidable operation and one not to be generally or lightly resorted to.

The late Sir Morel Mackenzie in the Clinical Societys Transactions vol. VIII. page 14 strongly advocates, Tapping the cyst with a trocar and canula, and then injecting a solution of the perchloride of Iron, a watery solution (85%) of the solid perchloride, inject one to two drachms, this is the best method. It destroys

the secreting power of the lining membrane of the cyst and promotes suppuration for which free drainage must be provided, as there is the risk of the iron causing the formation of a plug.
A special syringe, designed to prevent the possibility of the admission of air, must be used. The canula is plugged and left in situ for 48 hours after which the plug is withdrawn and the contents allowed to flow out. Should the liquid be found to contain blood or to show no symptoms of suppuration the injection is to be repeated, the plug inserted and the solution permitted to remain for 48 hours more. After pus appears, the plug being withdrawn and the canula retained, free poulticing should be kept up for weeks. At first to still further suppuration, the plug may occasionally be inserted so as to retain a quantity of pus for several hours. After this, the cavity should be well syringed several times a day with a tepid antiseptic lotion.

In operating be careful to avoid wounding any visible vein and the Trachea. Purse the skin over the site of puncture. Keep the patient in bed.

To prevent air entering any accidentally injured vein during the tapping and injection, a tape should be tied pretty tightly round the neck below the tumour to compress the superficial veins.

One injection generally is sufficient to establish suppuration, but in some cases a second or even a third may be necessary.

In the after management of the case care should be taken to prevent the canula becoming obstructed. Morell does this by inserting a piece of Ellis's spiral silver wire drainage tube into the canula and fixing it there with the extremity projecting into the abscess cavity.

When the cyst fails to contract, and the purulent discharge becomes thin and diminished in amount from flabby granulations the cavity should be washed out daily and a solution of Chloride of Zinc 20 grs to ℥j be injected and allowed to escape.

In the treatment of goitre operatin measures of a serious nature are not much to be desired, but there are cases when any other method of treatment having bin tried, and dyspnoea and other urgent symptoms persist, operatin procedure is imperatively demanded.

Unless life is threatened, surgical treatment should not be resorted to.

Division or removal of the isthmus of the thyroid gland, as done by Sydney Jones, seems to be successful both in regard to recovery from the operation and relief from the urgent symptoms. One great advantage of this operation is that it is not and cannot be followed by myxoema as a result of the operation. It consists in exposing, isolating and resecting the thyroid isthmus. After tying double ligatures one each side near its junction with the lateral lobes, the isthmus is removed and the wound well drained and allowed to heal up from the bottom.

When this is done the lateral lobes

recede from the Trachea and become less prominent, usually there is a considerable amount of shrinkage, so that all pressure is taken off the air passages and relief from dyspnoea is obtained, and danger to life averted. The operation of Tracheotomy is of little or no benefit.

Owing to the large blood supply and free anastomosis and consequent rapidity of the establishment of collateral circulation, the ligature of the Thyroid arteries is not justified. Besides, the difficulties and dangers of the operation itself are enough to make Surgeons hesitate.

Thyroidectomy unless some portion of the gland tissue is left behind is followed by myxoedema and in the young cretinism.

It should never, under any circumstances, be undertaken with the view of simply removing a deformity, or the discomfort of carrying a large and heavy weight.

It should only be undertaken

(1) When pain and dyspnoea threaten to cut short life.

(ii) When pressure of the tumour causes compression of the Trachea, spasm of the glottis, or paralysis of the abductors of the glottis.

(iii) When the tumour has burst and the patients life is endangered by the exhaustion caused by suppuration.

The operation consists in the full exposure of the tumour by one long median incision, and a smaller oblique incision outwards and upwards on each side towards the Sterno-mastoid.

Secure all bleeding points as soon as they are

Freely expose the enlarged veins and cut them between double ligatures.

Secure as soon as possible by ligature the 4 principal arteries and when present the enlarged Thyroidea ima.

Avoid injury to the recurrent nerve.

The tumour is reflected and enucleated with the fingers and handle of the scalpel, the isthmus being divided and ligatured before each lateral half of the growth is removed.

In connection with Thyroidectomy, it is

interesting to read (Rev. de Chir. april 1898.) what Wyrmser, who has had much experience of the operative treatment of goitre in Kocher's clinic at Berne, says on the subject. He is of opinion that the possible mishaps of thyroidectomy are not so serious as to counterbalance the many advantages of this method, whilst, on the other hand, strumectomy or intraglandular enucleation is too rarely indicated to claim recognition as a regular operation.

Thyroidectomy as now performed by Kocher permits the Surgeon to establish a complete haemostasis, to avoid any injury to the recurrent nerves, and to preserve a part of the normal glandular structure if such should persist at the time of operation. This operation it is held, affords the best conditions for immediate healing, causes very little disfigurement, and renders impossible any local relapse of the disease. In strumectomy the loss of blood is usually abundant, and often very serious, and there is risk of secondary haemorrhage.

As the wound is deep and irregular, surrounded by torn thyroid tissue, and occupied by blood, there is a greater risk after enucleation of infective disorders. Moreover, as has been proved by statistics, relapses are much more frequent after this operation than after thyroidectomy.

This latter operation be ~~strictis~~, is indicated in cases of

(I) Malignant tumours of the thyroid gland.
(II) Acute and chronic strumitis
(III) Parenchymatous goitre
(IV) Polycystic goitre
(V.) Goitre with disseminated foci.

It is contraindicated in cases in which no normal thyroid tissue is left.

Strumectomy may be practised in cases of

(I) Unilocular cystic goitre.
(II) Isolated nodules enclosed in normal tissue, if such can be removed rapidly and without much bleeding.
(III) Large morbid deposits existing in immovable goitres.

Subcutaneous laceration this method was suggested by Billroth and tried by him in two cases of which one was cured and the second died. The danger of septic injection renders this method of treatment far too risky to be generally tried.

In the Lancet of Jany. 4. 1884 Mr. Henry Smith reports two cases successfully treated by him by the Introduction of Setons. The seton should pass well through the enlargement and should be kept in until suppuration is established. Great care must be taken that the exit of pus is not stopped. There is also in this method considerable risk of septic injection.

I will conclude by urging the very guarded resort to operative measures. Few indeed are the cases that will not yield somewhat, at any rate, to the beneficial effects of rest combined with appropriate medicinal treatment.