

Goitre

With Special reference to its
prevalence in the Devon Valley

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Goitre, (probably derived from the Latin word guttur, the neck) is the term applied to a chronic, indolent enlargement of the thyroid body.

This enlargement varies greatly - from a slight fulness in front of the throat to a tumour of large dimensions, giving rise to considerable deformity. The tumour gives rise to little or no constitutional disturbance, is usually slow in its growth, and does not readily take on inflammatory action.

It is known by a variety of synonyms. Prosser from its frequency in the hilly districts of Derbyshire, called it the "Derbyshire neck".

Sir Arthur Mitchell from its supposed frequency in the Valley of the Aith, termed it the "Aithdale neck". Keister applied to it the name Tracheocele.

Alibert called it Thyrophascia. It was referred to by the Ancient Greeks as Bronchocele, and this last term was the one chiefly in use by English Medical Authors of last Century. More recently the name Thyrocele has been given to it.

An Eastern physician, Albucasis, who practised in the eleventh Century, appears to have been the first to give a good account of Goitre; but the affection is referred to in Manuscripts written in the days of Hippocrates and Aristotle. In the latter half of last Century, Wilmer of Coventry and Prosser of London, gave good descriptions of the disease and its treatment; and more recently, treatises and essays have been written concerning it. - By Bally (Encyc. Pract. Med. vol. 1).

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U. Grange (Ann de Chimie et de Phys. Vol. XXIV).
M. Sellow (Medical Top. of Bengal). M. Varnava (Climate
and Top. of Himalayan dist). Mitchell (Brit. For.
Med. Chir. Rev. Vol. 1862). Bruce Low (B. M. Journal 1884)
and Robinson. (Endemic Goitre. 1885)

Varieties

It is usual to speak of several Varieties of Goitre,
1st The Simple Goitre: in which all the constituents
of the gland - blood vessels, connective tissue, and
vesicles - are increased in size. The gland differing
little from the healthy condition except in bulk.

2nd Fibrous Goitre: in which the hypertrophy
affects chiefly the fibrous tissue, which becomes in-
creased and hardened. This form is most frequently
met with among those who have been subjects of the
affection for some considerable time, and is probably
the result of further changes in a goitre which at
first was of the Simple variety.

3rd Cystic Goitre: in which the hypertrophy main-
ly affects the vesicles of the gland, which become
distended with a gelatinous fluid.

4th A form in which the vascular tissue under-
goes considerable increase. The increase commonly
being more apparent in the venous supply of the gland.

Characters and
appearance

In young persons the tumour is usually soft
and elastic to the touch, occasionally however it
is found to be hard and unyielding. These latter
characters however are more frequently met
with in long standing goitres occurring in old subjects.

The contour of the tumour is generally rounded and

Smooth. More commonly, the normal shape of the gland is retained in the early stage of the development of the tumour, and, as growth goes on there is a tendency for one lobe - most commonly the right - to increase at a greater rate than the rest of the gland. In some cases, from the very commencement the increase in size is apparently confined to one lobe.

Again it has been often observed that a certain portion of a lobe has a tendency to increase in a particular direction, and it may thus, under certain conditions, give rise to considerable discomfort by pressing on the trachea, or oesophagus, or by interfering with the arterial or venous supply of the brain. One of the most severe cases of acute

suffering from dyspnoea that has come under my observation was due to the pressure on the *trachea of a hard left lobe of trifling dimensions.

The size of a goitre indeed does not seem necessarily to bear relation to pressure symptoms. Many goitres of huge dimensions cause no further discomfort than the inconvenience produced by their weight, and restriction of the movements of the neck.

I never have had to treat a case for pressure on the oesophagus. Sir Thomas Watson refers to one where this condition existed and the patient died from chronic starvation.

In many subjects of goitre hoarseness and even aphonia have been observed, conditions which were probably due to interference with

the functions of one or both of the recurrent laryngeal * Probably the ^{rec.} laryngeal nerve was also irritated from pressure

Nerves.

Functions of
Thyroid

Our knowledge of the functions of the Thyroid body has been advanced considerably within recent years by a study of its pathological states, and of the relation which seems to exist between the condition of the gland, and the disease termed Myxoedema, as also by experiments on animals. The gland appears to exercise a twofold function in the animal economy. By its large vesicles it seems to excrete from the blood a large quantity of Mucin, or a substance exactly resembling it; and it has, secondly, what has been called, a hematogenous function; as shown by the large quantity of hematogenous elements found in it. Experiments have shown that removal of the whole gland has been followed by great increase of Mucin, in those tissues which normally secrete it; by a gland - the parotid - which normally secretes no Mucin assuming muciparous functions; by hypertrophy of the spleen; and by alteration of the number and proportion of the corpuscular elements of the blood; and further by some changes in the higher nerve centres, producing imbecility, and finally death from Coma.

Distribution

Goitre is an affection which exists in an endemic form in many English Counties. It exists in Ireland, and indeed in all European Countries. In some Villages in the Swiss Alpine Valleys, a very great

percentage of the inhabitants are affected with it. A few years ago when exploring one of those huge lateral clefts that run South from the Rhine Valley, I observed evidence of the disease in almost every native met with. It has been noticed in Asia, notably in the Kumaon district and in Oude. And in various parts of America it is frequent. Livingstone.

² Thomson and other travellers refer to it as being common among certain tribes in Africa.

³ Mitchell states that in Scotland the endemic form of the affection is confined to the Southern Counties - meaning thereby, Kirkcubright, Dumfries, Wigton, &c. He bases this statement on the results of personal observation and extensive inquiries; and also on the results of the examination of large numbers of Asylum inmates in various districts. My own observations, to be referred to later, shew that this statement is erroneous. St. Lager says, that it prevails in Fife and Perthshire and is found in Perthshire, as well as in the Southern Counties, and that it is not unfrequent in the Island of Arran, near the Coast at Skiskern.

The affection is one which appears to prevail in hot as well as in cold regions. In moist and in dry climates. Among the inhabitants of plains as well as in those of the valleys. At high altitudes as well as in low lying places.

The affection on the whole appears to be most common over lime stone formations, but it is not restricted to these formations.

1. Last Journals. 2. Central African Lakes 3. Brit. For. Med. Clin. Review
 Vol. 1, 1862. 4. Etudes sur les ^{causes de} Prevalence et Gitee endemique

etiology

Looking into the literature of the subject one is astonished to find the immense variety of opinions that exist among Medical writers, when referring to the etiology of this disease. The majority agree in regarding drinking water as the responsible agent. And many of the older writers believed that the ingredients in water which tended to give to it the quality of hardness, - e.g. the salts of lime and Magnesia, especially the Sulphates and Carbonates - were really the agents which were to blame.

From the fact that the disease was so common among the inhabitants of the valleys of the Pyrenees and Alps, Snow water was supposed to give rise to it.

Again water which contained in solution a large quantity of organic matter was blamed.

Coindet, of Geneva, expressed the opinion that the cause was to be found in deficiency of Iodine in the waters in use.

Watson (Princip and Pract of Physic) states that the deleterious agent has been traced to water with considerable certainty, but the exact nature of the agent he does ^{not} state, leaving the solution of the question to the Chemist and Geologist.

Bristowe (Theory and Pract of Med) is also inclined to believe that drinking water is the agent, and he refers to the presence of the Sulphates of lime and Magnesia & also their Carbonates as being generally believed to be the poisonous ingredients. He however inclines to Virchow's view, that when these salts are

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present in the drinking water, they do not act directly, - but that associated with them there is some other agent of a malarious nature to which the goitrous tendency is due. Aitken (Science and Pract. of Medicine) and Roberts (Theory and Pract. of Med.) are both in favour of the theory that water impregnated with salts of lime and magnesia, is the cause of enlarged thyroid. Parkes (Manual of Hygiene) also expresses his belief in the drinking water theory, and he states that in France and Italy certain waters have been resorted to with the view of producing goitre and so escaping the conscription. Many of the French Army Surgeons, he says, related instances of goitre being produced in a few days by the use of certain drinking waters, and further, he says, that evidence has been adduced when, after the introduction of a new supply of water, differing in composition from that formerly in use, goitre has entirely disappeared from the locality. It has been noticed also that in a community supplied with different waters, those partaking of a particular water suffered while others not using this water escaped. The other conditions being the same. Dr. M. S. Lalland (Med. Topogr. of Bengal) believes that water from certain geological strata holding in solution, the earthy salts of which particular strata are composed, is the agent. He compiles a table in which he shows that in Bengal, the population using water passing over or through limestone rocks, are affected to the

extent of 33 per cent., while not more than 5 per cent of those using waters from granite, mica, Clay Slate and Sandstone formations were affected. Dr. St. Lager (*Etudes sur les causes du Crétinisme et du goitre endémique*) does not believe in the connection between hardness of water and goitre. He instituted a series of examinations of water by means of the soap test, and got results which were unfavourable to the hardness theory. He also supplied waters highly charged with Magnesium and Lime salts to animals, with entirely negative results, so far as the thyroid was concerned. He believes that the deleterious agent in water is ~~the~~ a Sulphide of Iron, and more unfrequently, a Copper or other Metalliferous Sulphide — It is interesting to note that Paracelsus in his "Chirurgia Magna", written in the early part of the 16th Century, considers the Salts of Iron in water to be the chief cause of goitre — St. Lager explains the relation which appears to exist between hardness of water and goitre by the fact that very frequently hard waters in some part of their course come in contact with a Metalliferous stratum. He states that goitre exists over, or is found associated with, all geological strata in which Iron pyrites exists. He appears to have remained satisfied with geological evidence principally, and does not seem to have instituted any series of exact chemical analyses of the waters reported upon

He states that he was able to produce goitre in mice by mixing iron pyrites with their food for a certain period. Dr. L. B. Wilson (Indian Annals of Med Science) analysed specimens of the drinking water at Bhagsoo, where goitre is exceedingly rife. As a result of careful analysis he found the water exceedingly pure. Only slight traces of lime were found and these were confined to three specimens and in none were there found any traces of iron or magnesia. M. Kamara (Climate and Topogr. of Himalayan Districts) supposes the affection to be due to a poison of a fungoid nature. Woakes (Lancet March 24 1880) has propounded the theory that goitre is due to vaso-motor paresis of the inferior thyroid artery. He does not believe in the endemicity of the disease, and is of opinion that it is more wide spread than is generally supposed. It is held by many that the causes of goitre are such as are ^{found} present in a damp narrow valley. E.g. Coldness of soil stagnation of air and absence of Sun's rays. The statements of Dr. Livingstone and Joseph Thomson do not bear out such views. The former mentions having seen it in natives living at an elevation of 3500 feet. and Thomson says it is met with among the tribes inhabiting the high mountains shirting the

western shore of Lake Tanganyika, at an elevation of 4000 feet, and he then makes the interesting statement that those affected go down to the shores of the Lake in order to get rid of the deformity.

To many of the theories above alluded to some objection may be taken. Against the Snow water theory may be offered the evidence we have that in countries such as Greenland and Lapland, where snow or ice water is used by the inhabitants, almost all the year round, goitre is exceedingly rare. And again goitre is prevalent on the plains of India where no water from melted snow can be obtained.

To the theory that waters largely impregnated with lime or magnesia salts - the so called hard waters - is the cause, may be offered as an objection the evidence of Dr. J. B. Wilson whose results have been already referred to. The waters used in this district contain less than 6 grains per gallon of lime, and goitre is endemic in it. Again there are places whose water supply is found to contain from 30 to 40 gr. per gallon of lime and goitre is unseen in them.

Coincident hypothesis that absence of bovine in water is the cause is shown to be at fault when it is pointed out that the waters used by many of the goitrous inhabitants of the Swiss valleys

is highly charged with Iodine.

As Arguments against St Leger's theory it may be stated that Anemia is a frequent Concomitant of Goitre. That Iron Medicinally administered has never been known to give rise to goitre, and again, the Sulphide of Iron is not Soluble in water.

Relation to Cretinism

In places in which the most extreme forms of Goitre are met with instances of the Condition termed Cretinism are more frequent than in those districts in which the enlarged Thyroid does not usually produce such monstrous deformities, hence Cretinism is much less frequently met with in this Country than in Switzerland. Baillarger in his work on Goitre and Cretinism points out that three-fourths of Cretins are Goitrous, and concludes from his own observations that the gradual destruction of the Thyroid gland by disease develops the Cretinoid state. The Condition of the gland with respect to its capability of performing its functions in cases of endemic Cretinism has not, however, been ascertained with sufficient accuracy in a sufficiently large number of subjects, as to enable us to state positively that there is such a definite connection between atrophy or loss of function of the Thyroid and Cretinism, as would entitle us to place them in relation to one another as Cause and effect.

In the majority of cases of Sporadic Cretinism that have been reported, the thyroid has been found to present some abnormality, either in the direction of enlargement or more frequently in an apparent absence of the gland. W. Curling (Lancet Vol 2. pg 61. 1877) refers to several cases in which the gland was found to be absent.

Dr. Robinson (Endemie Suisse 1885) refers to a post mortem of a Cretin in which no trace of a thyroid could be made out. I have under observation at present two Cretins in neither of whom have I been able to make out the existence of the gland, by palpation.

Relation to
Myxoedema

Sir William Gull (Vol VII Trans. Clin Soc.) writing upon "A Cretinoid Condition Supervening in Adult Women" describes a set of symptoms which are now recognised as peculiar to that Condition termed Myxoedema, and described by Dr. Ord. Dr. H. Hodge in reporting upon several cases of Cretinism occurring sporadically in England refers to the presence of symptoms which greatly resemble those found in Sir William Gull's cases.

Dr. Gull does not make any reference to the condition of the thyroid, nor does he offer any theory with regard to the etiology of the affection. Frequent descriptions of cases of Myxoedema, and the relation it bears to the condition of the thyroid have appeared in the medical journals within recent years. Reference has already been made

to the experiments carried out by Doctor Horsely. These go to prove that complete removal or destruction of the thyroid body in Monkeys induces a condition apparently identical with Myxoedema as seen in Man. There have also been recently put on record cases in the human subject, in which, after total extirpation of the thyroid for disease, there followed a train of symptoms whose clinical characters were indistinguishable from Myxoedema. It is now a generally accepted opinion that a loss of function of the thyroid is the cause of Myxoedema, and total removal of this body as a method of treatment when it is in a diseased condition is regarded with disfavor.

The Ochils are a range of hills forming a part of the chain which crosses Scotland north of the Firths of Clyde and Forth under the names of Sidlaw, Ochil, Campsie and Kilpatrick hills. They begin on the west side of the Firth of Forth and extend in a west-south-west direction to Bridge-of-Allan. The length of the range is thus nearly 25 miles. They are composed mainly of trap and porphyrites. Basalt is commonly found but greenstone very rarely. Dionite stretches along behind the village of Hillcrouthy. Geikie (Scenery of Scotland) says "the Ochils are formed by a broad anticlinal fold of the volcanic rocks of the old red sandstone period".

The minerals

Geikie on
the
Devon Valley

found are numerous. These are chiefly situated on the southern slope in Clackmannanshire. Copper, Silver and Cobalt have been worked at various times in the glens behind Alva and Fife country. And Iron is not uncommon over the range.

The southern face of the hills rises abruptly from the plain, cutting off suddenly the coal measures which are here tilted up at a sharp angle

Running in a parallel direction with the western end of the range for a distance of nine miles, is a ridge from 300 to 500 feet high, rising sharply on its northern aspect to face the Ochils and so forming a valley, the mean height of which above sea level is 50 feet, and which has a breadth varying from 3/4 to 2 miles. Through the centre of this valley there flows a rather sluggish stream, the Devon. The glen is thickly populated, the inhabitants being grouped in the four villages of Dollar, Fife country, Alva and Menstrie which have populations numbering respectively 2,400, 5,500, 5,200 and 1,200 or a total of between 14,000 and 15,000.

With the exception of Dollar, the inhabitants, or at any rate the great majority of them, are employed in woollen factories. Female labour being more in requisition than male, it is found that the proportion of the former to the latter is considerably higher than the average for all

Scotland.

My observations have been confined chiefly to the inhabitants of Tullycreevy. At the point where this town is situated the valley contracts to a width of rather less than three-quarters of a mile. The soil is in parts clayey, but gravel predominates. Below the village and between it and the river Devoe there is some flat land which in time of heavy rains, and quick melting of snow is often in a "water logged" condition. Ague was rather prevalent in the district at the commencement of the present century. The village is now fairly well drained and sewered. Anemia Acute Pneumonia, Rheumatism and Phtisis are common. The first mentioned affection being very frequent among the young females. Flooding is not common. In over 1500 cases of Midwifery I have met with but three severe instances of it. There is also a marked tendency to dental Caries in both sexes, a fact which has been commented upon by several Dentists. The people are of medium height, well proportioned on the whole, and prosperous. The Scandinavian type predominates. During five days in each week the majority of them are employed in the woollen factories as hand and power loom weavers, spinners, piecers, darners, dyehouse workers &c. The means of Ventilation in the work rooms are

on the whole adequate, but, as is often found to be the case with Operatives, they frustrate the attempts of the Masters to ensure ventilation, by blocking up the openings provided for this purpose. The consequence is that the air in these rooms contains much more than the permissible amount of animal impurities.

In regard to the dwelling house, this, as a rule, is found to be much too small for the number of its occupants.

Not unfrequently, a family of eight persons occupy an apartment whose air capacity does not exceed 2500 cubic feet. I find, upon an average, that the sleeping rooms do not admit of more than 400 ^{cu feet of} air space for each person, — a space far below the ordinary requirements of health. So that for 18 hours during each of five days in the week, the greater number of the inhabitants are breathing — i.e. in their sleeping apartment and in the factories — an atmosphere which is more or less impure.

In winter, the females proceed to and from their work wearing a woollen wrap to protect the head and throat from cold. This is discarded in the evening and on Sundays when its place is taken by the usual flimsy female head gear. A habit of this kind undoubtedly induces a special tendency to throat Catarrhs and facial neuralgias.

Intemperance is unimportant. Tea as an article of diet, ^{or rather a beverage} is very largely consumed. It is taken

by many families with all meals. Butcher meat is freely partaken of, but fresh vegetables do not enter into the diets sufficiently often.

The atmosphere of the Valley is moist. The average yearly rainfall for the last five years was 37 inches, and the average relative humidity was 80. The temperature is subject to large and sudden variations in the 24 hours. In Summer and Autumn during the night and early morning, when the air is still, a layer of white fog occupying the lower portions of the valley is a phenomenon that is frequently observed. This layer settles chiefly over that portion of the village in which fog is most frequent. The prevailing winds are West and North-east.

There are thus present the conditions which favour the development of Phthisis, Rheumatism and Pneumonia.

The water for domestic purposes is obtained from three different sources. That which supplies the western - which is also the largest portion of the village - is collected at a considerable elevation from a stream, which flows down one of the flens of the Ochils immediately to the north, and is conveyed by pipes, on the constant supply system, to the consumers. This stream from its position is not exposed to the ordinary sources of pollution. This water has been in use for 24 years. It is found upon analysis to contain less than 6 grains per gallon.

of lime salts, a mere trace of Magnesia and .5 grains per gallon of Iron.

That supplied to the eastern portion of the Village is obtained from Springs which rise at the foot of the precipitous slopes towards the North-east. This water was introduced for domestic purposes 15 years ago. It contains but a small amount of lime - less than 4 grains per gallon, no traces of Magnesia, nor an appreciable amount of Iron.

A third, and much smaller portion of the Village to the south, the inhabitants of which number only 220, is supplied from a shallow well sunk at the edge of a cultivated field. Water from this well was found to contain 4 grains per gallon of lime and no traces of Magnesia nor Iron. There was at the same time present a marked amount of Ammonia, phosphates, Nitrates and Chlorine, indicating, I think clearly, pollution with manure-ial fluid. The water was sweet to the taste, clear and odourless. It however had bad keeping properties, decomposing quickly when stored in vessels indoors.

I have preserved notes of 138 Cases of Gout observed in this town during twelve years of practice. Of this number not more than 50 per cent. presented themselves for treatment in the first place, on account of their Gout. The others were noticed casually, or were observed in ^{v.e. the gouts}

patients who were being treated for some other ailment. I have no reason to suppose therefore that the above represents the total of cases existing in the village.

Of the number referred to, 6 only occurred in males, whose ages ranged from 13 to 64 years. In three of these, aged respectively 19, 24 and 24, there was an absence of hair on the face and in two the voice was feminine. Two were decidedly anaemic.

Of the 132 females with ages from 11 to 68 years anaemia was marked in 22 and their ages were from 16 to 27. A period at which anaemia is apt to affect many females in this district.

The simple variety of goitre is the form most frequently met with. In a large number of instances one observes a fulness only at the fore part of the throat, which seems to give rise to little inconvenience, except that it causes the patient to carry her head rather high. A gait which often calls forth unfavorable comments from co-workers on the large measure of pride that seems to possess the individual in question. In many cases the gland had acquired considerable proportions, as large for example as a field turnip of fair size. In such cases inconvenience arose more from weight than from pressure. The greater number who suffered most severely from the effects of pressure - I have a record of only 9 such - were found to be suffering from a trifling enlargement of the gland, and this was in some instances confined to one lobe

The largest number of my cases ~~season~~ occurred in those whose ages were from 14 to 27 years, and the ages at which the gland was first observed to be affected in those cases was from 11 to 17 years.

My predecessor, who had practised in the district for 18 years informed me that many cases of Yentre came to him for treatment before the introduction of the new water supply, at a time when the people got their water from shallow wells usually sunk in some portion of the back premises attached to each house, but to what extent the affection prevailed, he was unable to state. He did not note any increase or diminution in the number of cases after the new supply came into general use.

Of the cases which came under my observation, 92 per cent. (nearly) were born and brought up in the village of Lillivorty or its immediate neighbourhood. Of the others—18 in number—12 came to the district at ages ranging from 5 years to 20. The rest had passed the age of 21 years before they came.

The highest per centage of cases occurred in No. 3. or the Southern district supplied with impure water from a shallow well. The number affected represented 4 per cent of the population of the district, and all were females.

No. 1. or the Western district and also the largest one had a per centage of 2.75 cases, 5 of which were males.

No. 3 the eastern district gave a percentage of only 1.5.

I may remark that districts No. 1. and 3. form the oldest portions of the village. The houses are small, built closely together and inefficiently ventilated, and the majority of the poorer classes of operatives live in these districts. District No. 2. is more modern; the houses are better built, larger, more comfortable and not so closely crowded together. The soil is also better drained. The people who reside in it are better off, and a considerable proportion do not belong to the class of mill operatives.

We have then obtaining in this district the elements which make a more favourable condition of health possible for its inhabitants, and as a matter of fact the percentage of ordinary diseases is less within it than within the others.

In the village of Alva, two miles to the west, gout seems to be less frequent than in Hillierulby. It is believed there to affect people living in the lower part of the village more frequently than those in the higher parts. I am however unable to get exact information as to the proportion affected.

The water supplied to this village contains more lime and iron than is present in that supplied to No. 1. district of Hillierulby. Opposite the village, the valley widens out considerably, and

at Menstree, two miles further to the west, it may be said to cease. At this last mentioned place goitre is not endemic. The village is supplied with water principally from shallow wells.

The village of Dollar lies three miles to the east of Tillicoultry. The valley at this situation is wider than at the latter place and the site is 50 feet higher. Cases of goitre are occasionally seen by the medical men in practice there, but on the whole the affection is not regarded as common. The population of Dollar differs from that of the other villages referred to, in there being much fewer of the operative classes composing it. The majority live in large comfortable houses, and many remain in the place only for a term of years when their children are being educated at the Academy there.

Among my cases in Tillicoultry I met with three typical examples of exophthalmos, all the cases presented the characteristic symptoms of eye ball prominences (proptosis oculi); violent and hurried cardiac action; tremors and pulsating thyroids. Two of the patients were females, aged 20 and 26 respectively. Both were anaemic, but not pronouncedly so.

The administration of *Digitalis* and *Arsenic* seemed to exert a beneficial influence over the course of

The disease ^{in both} cases, but in neither was there a cure effected. One died from Rithis a few years ago. The other still survives and is able to attend to light household duties. The third case occurred in a man aged 64 years. He had a large goitre of the simple variety for over 30 years. This had never caused him much inconvenience, until the symptoms of exophthalmos commenced about four years ago, when he noticed his goitre begin to throb more violently than it had ever done. He attributed the onset of his symptoms to severe continued exertion and loss of sleep. In this case the heart's action was exceedingly violent and the pulsation in the goitre very marked. The patient was florid rather than otherwise. Iron and digitals appeared to produce no good result in this case and the heart's action was not in any way controlled by these drugs. Iodide of Potassium gave satisfactory results. During its administration the enlarged thyroid was markedly reduced, and the other symptoms so much relieved that the patient is now able to attend fully to his daily employment.

In referring to these cases of exophthalmos I have made a digression but as it has been stated* that the disease is seldom seen in districts where goitre is endemic; that it has been most frequently observed in

* Herman Beigel. Vol. 5 Reynolds's Medicine

Countries and in places where true goitre is comparatively unknown, and in persons who are not subject to enlargement of the thyroid I considered it of some importance to bring forward the above facts.

I do not find myself in a position to offer any new theory of the causation of goitre. The hypotheses that lime, magnesia or Iron present in excess in the drinking water, will not hold when applied to this district. It seems probable that no one agent will produce goitre under all the variety of conditions - climate, country, altitude, water supply &c - with which it seems associated, but that various different combinations of causes are capable of producing a similar effect on the thyroid gland.

With regard to treatment not much need be said. Where practicable, and in cases in which the affection is recent, removal to a healthy, bracing district is usually followed by cure, or at least by arrest of growth in the tumour. When this cannot be carried out Iodine is the remedy to be recommended. It may be administered in the form of Iodide of potassium or as the tincture in small doses well diluted. In the majority of cases improvement follows. External applications of Iodine are sometimes sufficient, without any other treatment, in arresting the growth of the tumour and

even dispersing it. I have not found from my own experience that the external application of iodine had in any way hastened the cure when the drug was at the same time being administered internally. A favorite remedy in certain parts of the Indian provinces is an ointment of the Mercuric Iodide. It is rubbed well over the goitre, the patient being directed during this operation to face the Sun in order that the direct rays may strike on the tumour. A single application is said to prove efficacious in most cases.

In this country no such favourable results have been obtained by those who gave this plan a trial. In cases which resist the iodine treatment, it has been recommended to inject into the gland at intervals a solution of Iodoform in ether. This treatment has yielded good results in the hands of Dr. von Moorhof and Felise Ferrier. Electricity has given good results in soft goitres, Duncan of Edinburgh reports fourteen cases treated by electrolysis. Six were permanently cured, and all the others are improving except one.

When medicinal treatment has failed the question of surgical interference has to be considered in hard cases. Total removal of the whole gland is an operation which

* Le Progrès Médical. Dec. 1. 1888

is considered unjustifiable and must be regarded with disfavour (until thyroid grafting has been proved to be successful) for reasons that have been already referred to. Partial removal has been known to give good results and this may also be said of division or excision of the isthmus. The portion of gland left frequently shrinking considerably