that of glandular epithelium. Logwood. Obj. $\frac{1}{2}$ inch, Pillischer.

FIG. 4.—Ependyma of the lateral ventricle from a G.P. Into a very slight thickening of the membrane are two small epithelial down-growths, derived from the surface epithelium. The cells are of a less columnar form, and have assumed a more glandular appearance. Logwood. Obj. $\frac{1}{4}$ inch, Pillischer.

Observations on the Effect of Thyroid Feeding in some Forms of Insanity. By LEWIS C. BRUCE, M.D., Assistant Physician, Royal Asylum, Edinburgh, late Assistant Medical Officer, Derby Borough Asylum.

One of the best and latest descriptions of the functions of the thyroid gland is that by Victor Horsley.* This paper furnishes an account of recent work on the subject, and so fully details the results arrived at by other workers that I use it as my chief reference throughout this paper.

Horsley holds three views with regard to the functions of the thyroid gland.

1. That it is directly a blood-forming organ.
2. That it is indirectly a blood-forming organ.
3. That it modifies or destroys substances which, circulating in the blood, are harmful to the general economy.

Dr. Gibson,† in an article on the function of the thyroid, says, in his original paper, he "gave adherence to the hypothesis advanced by Schiff, that the gland secretes some substance whose absorption into the blood is essential to life; and to the extension of this hypothesis by Sanquirico and Canalis, that the gland secretes some material which is necessary for the nourishment of the central nervous system." Gibson believes this to be the gland's chief function, and explains the anæmia which occurs in animals after thyroidectomy as being due "to the very serious effect that the absence of the thyroid has upon the nervous system and upon the general body metabolism, exercising a depressing influence on the blood formation."‡

Horsley makes no definite statement with regard to the gland's influence on the nervous system, but remarks that

* "Brit. Med. Jour.," Jan. 30, Feb. 6, 1892.
† "Brit. Med. Jour.," Jan. 19, 1893.
‡ "Brit. Med. Jour.," Sept. 23, 1893.

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"it secretes some substance useful to the general metabolism of the body."*

In a series of experiments made by Dr. Otto Lanz† on dogs, he found that when the motor region was removed in one hemisphere "a very remarkable phenomenon was that, after complete recovery from the extirpation of the motor region, so that no trace of paralysis remained, the paralysis reappeared the same day that the thyroid gland was removed." It would appear from this that the thyroid has some very direct influence on the nervous system.

The successful treatment of myxœdema by the internal administration of thyroid gland is now an established fact.

Dr. John Thompson has obtained good results by thyroid feeding in sporadic cretinism.‡

I was first led to try the effect of thyroid feeding on the insane after reading the accounts of various cases of myxœdema treated in this manner, where the temperature rose from subnormal to normal and even became feverish, with a quickened pulse rate. Bearing in mind the slow pulses and low temperatures often noticed in asylum practice, it appeared feasible that if one could induce quickened pulse rates and higher temperatures, in fact, increase ultimate cell metabolism, there might be a corresponding mental or physical improvement, which, judiciously persevered in, would be a valuable addition to the treatment of the insane.

Two mental cases were selected for observation, not because there was any hope of their ultimate recovery, but because they had reached such a low stage of human degradation, that the treatment, if not beneficial, could at least do no harm. Glycerine extract of thyroid was at that time the form in which the drug was chiefly used, and my first observations were made with this preparation.

Small doses (one thyroid lobe in seven days) gave no result, and it became evident that the treatment would not justify the expense incurred if this method was continued. I accordingly got fresh sheep's thyroid from the asylum butcher, and made large quantities of glycerine extract. Both this extract and that obtained from the druggist were administered by the mouth. This attempt was more successful; doses of the extract equalling half a thyroid per day produced changes in the pulse and temperature, with corresponding mental changes.

* *Loc. cit.* † *Loc. cit.*

‡ "Edin. Med. Jour.," May, 1893.

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I have not given these cases in detail, for the reason that I do not consider the treatment was sufficiently accurate. It was not always possible to obtain a regular supply of fresh glands, and frequently the resulting extract became putrid and offensive at the end of the week. This caused irregularity of administration. Further, I am positive that the extracts did not always yield the same percentage of active constituents.

It was noticed in these two cases that the pulse increased in rate and fell in tension, coincidently the skin became moist and warm, while the temperature rose from subnormal to normal, with at times a tendency to be feverish. After discontinuing the drug for a few days, a period of reaction set in, the appetite increased, there was slight desquamation of the cuticle, and an improved colour and tone in the skin.

Mental changes were likewise noted. One of the patients under treatment had not spoken for several months. One day, during the administration of the thyroid extract, he suddenly began to talk, and soon became quite communicative. Memories of past events were more vividly brought to his mind, and his powers of attending to himself were increased. He put on his boots and dressed without assistance—actions almost foreign to him since admission a year previously.

In the other case similar changes were noted, but in a much less marked degree.

If such results were got by extracts of uncertain strength and composition, I thought myself justified in putting more hopeful cases under treatment. I now aimed at inducing fever, with its resulting reaction. Psychological literature is full of the records of cases which made good recoveries after suffering from the exanthemata, carbuncles, erysipelas, and inflammations generally.

Dr. Clouston, in his "Clinical Lectures on Mental Diseases,"* says, "I think we shall some day be able to inoculate a septic poison and get a safe and manageable counter irritant and fever, and so get the 'alterative' effect of such things, and the reaction and the stimulus to nutrition that follow febrile attacks."

The cases on which these observations were made were not specially selected. Some had been in the asylum for a year or more, others for a few days, while the remainder were patients recently admitted, who were either making no progress to recovery, or were actually losing ground.

* "Clinical Lectures on Mental Diseases," p. 129.

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The forms of mental diseases comprised mania, melancholia, general paralysis, syphilitic insanity, alcoholic amnesia, puerperal and lactational insanity, and insanity at the climacteric.

The following was the method of observation employed: — First of all the patient was weighed, then put to bed, and for three or four days previous to the administration of the drug the pulse and temperature were observed morning and evening, the urine collected for quantitative examination, and where possible a blood examination and pulse tracing made. When these preliminaries were satisfactorily settled, the patient had thyroid tabloids administered thrice daily, in doses ranging from thirty to sixty grains per day, either with the ordinary meal or immediately afterwards. All the cases to be detailed were treated with the drug in the tabloid form, each tabloid representing five grains of fresh sheep's thyroid. When the physiological effects of the drug were well marked the observations on the urine and pulse tracing were repeated. The pulse rates, respirations, and temperature were taken morning and evening throughout the whole period of observation and treatment. The drug in most cases was administered until a feverish condition was induced for two or three days. Failing this, I had to be satisfied with increased pulse rate, flushing of the skin, and perspiration. To guard against dangerous results frequent examinations of the pulse were made. When the pulse became rapid, soft, and compressible, the limit of safety of the physiological action of the drug was considered to be attained. Individual constitutions differ so much in their power of resisting the action of the drug that the amount of thyroid necessary to produce these results varied to a great extent.

The patients stayed in bed for several days after treatment was stopped. When they got up, usually at the end of a week, the weight was again ascertained, and a blood examination made. During treatment the diet was not restricted in any way.

The after treatment consisted in the administration of a tonic, combined with extra diet.

The weights were taken a fortnight after the thyroid treatment was stopped, and afterwards at the end of each month.

Mental and physical changes were noted from day to day. To avoid repetition I give in detail two typical cases out of the 23 on which these observations are based. (*Chart.*)

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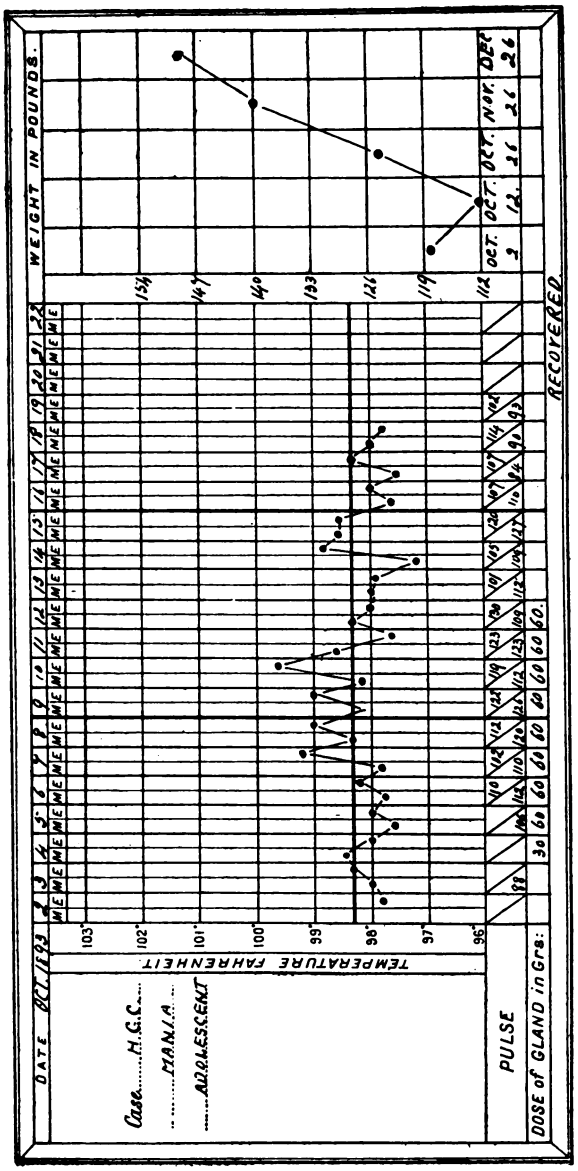


Chart illustrating Dr. Bruce's Article.

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H. G. C., male, aged nineteen, admitted September 1, 1893.—First attack, cause stated to be overwork, but there is little doubt that the attack was induced by the practice of masturbation.

State on Admission.—He was very boyish in appearance, and poorly developed for his age; height, 5ft. 4½in.; weight, 116lbs. No physical disease detected.

His mental condition was one of acute mania, with great restlessness, intense excitement and incoherence.

He was sleepless and noisy at night, and for four nights was given drachm doses of paraldehyde. During the day he walked much in the grounds, and was prescribed a full diet. Under this treatment he gradually recovered, so that by September 15 he was free from excitement, and talked in a fairly rational manner. He appeared to be making a good recovery until September 27, when he relapsed, the excitement returned, and he again became sleepless.

October 1.—Weight, 118lbs. He was acutely excited, and though he was kept out of doors all day in the grounds he did not sleep.

October 4.—Since last note he has been continuously excited; dirty and destructive in habits; drachm doses of paraldehyde produce little or no effect on the insomnia. To-day he commenced taking thyroid tabloids, and took in all thirty grains (six tabloids).

October 5.—Confined to bed; skin hot and dry; pulse full and strong; dose of thyroid increased to sixty grains per day (twelve tabloids).

October 6.—Slept soundly last night for ten hours; skin moist and flushed; pulse quick, tension much diminished.

October 7.—Much quieter and less restless; evening temperature 99·2° F. Slept well all night.

October 8.—Perspiring freely. Evening temperature 99° F.

October 12.—Thyroid treatment was discontinued to-day, as the pulse had become weak and slightly irregular. With the exception of the night of October 9, when he was restless, he has slept well and has been much quieter during the day. Weight, 112lbs.

October 14.—The weather has suddenly become warm and close. He had a slight return of flushing of the skin, while his evening temperature rose to 98·8°.

October 15.—Slight muscular tremors noticed in his arms and legs; perspiring freely; morning and evening temperatures, 98·6°.

October 18.—Was allowed up; the mental improvement is most marked; he is quiet and rational, but looks thinner.

October 20.—Weight, 117lbs., an increase of five pounds in eight days. He now works in the garden.

October 27.—Weight, 124lbs. He has taken Fellows' syrup during the past week. His appetite has improved. He has

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perfect self-control. A marked growth of hair has appeared on the lip and chin, and his manner and appearance have become more manly.

November 3.—Weight, 129lbs. His hands and feet have been desquamating freely in large flaky pieces for the last few days. The trunk also shows desquamation of a branny character.

November 26.—Weight, 140lbs. He has steadily improved ever since the reaction to the thyroid treatment became marked.

December 29.—Weight, 149lbs. Was discharged recovered. He was strong, healthy, and well developed for his age.

This case illustrates:—1. The febrile condition which may be induced by thyroid treatment, viz., the slightly feverish temperature, increased pulse rate with diminished tension, flushings of the skin, perspirations, and rapid loss of body weight. 2. The susceptibility of patients under the influence of thyroid to any change in the temperature of the surrounding air. 3. The period of reaction following cessation of treatment, viz., desquamation, increased appetite, and rapid gain in body weight; this physical improvement being attended by a return of mental power and self-control.

No. 2.—S. A., female, aged thirty-seven, admitted February 14, 1890. First attack, domestic trouble being the only known cause.

History.—She has been insane for fourteen months; part of this time has been passed in two other asylums and part at home.

State on Admission.—In indifferent health and condition. No active physical disease detected. Height, 5ft. 2½in. Weight, 114lbs.

Mental.—Subacutely excited, nervous and irritable. Irrational in manner, and sometimes used abusive language.

During the earlier part of her residence in the asylum her mental condition varied a good deal; at one time she was irritable and suspicious, but expressed no definite delusions; at another she was acutely depressed, threatened suicide, and was for some months under special supervision. As time went on she became more listless and apathetic, careless of her dress and personal appearance, and appeared to be drifting into confirmed melancholia.

On November 1, 1893, her condition was as follows: Temper capricious and uncertain, spent most of the day absorbed in herself, would neither employ herself nor read, unreasonable in her likes and dislikes, seldom spoke, except to her husband when he visited her; she was thin, and took food badly; complexion sallow, skin dry and harsh.

On November 22 she was put to bed to facilitate observations on the pulse, temperature, etc. The first time her pulse and temperature were taken she resisted, and was abusive and angry; finding resistance useless, she gave no further trouble.

November 25.—To take four tabloids thrice daily.

November 27.—Face flushed; complained of pains in legs and head; pulse quick and soft evening temperature 98·8°.

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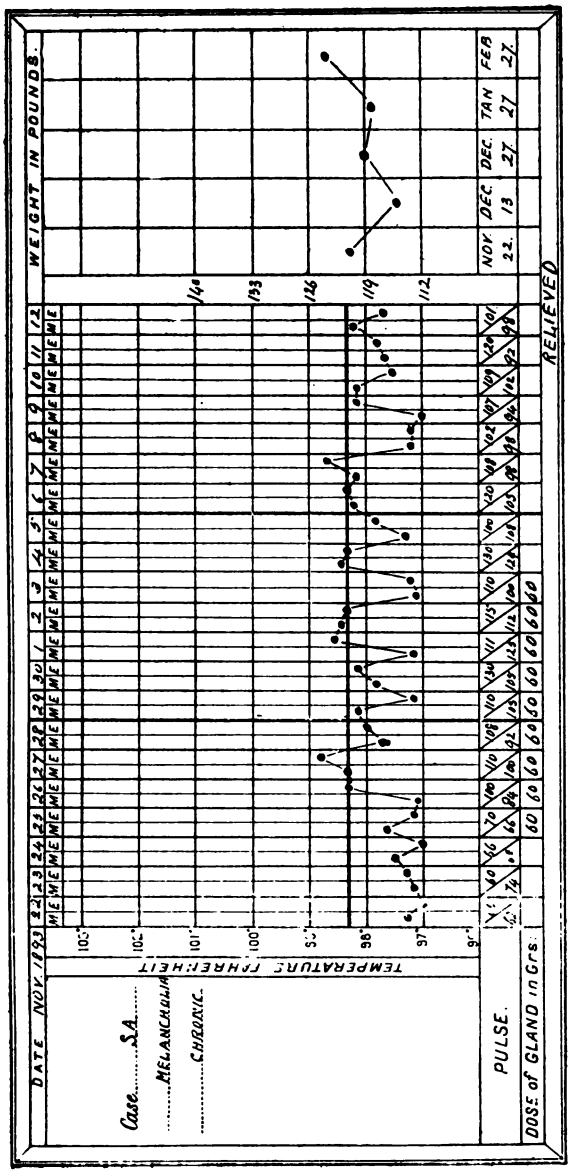


Chart illustrating Dr. Bruce's Article.

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November 29.—Fine muscular tremors in the arms, legs, lips, and tongue. Complains of slight headache.

December 2.—Pulse rapid and soft. Her temperature has never been higher than 98·8°. A sudden change has occurred in her manner; she is pleasant, laughs, and talks sensibly. Her complexion has become clear and her skin soft.

December 3.—Felt sick and disinclined for food. Thyroid administration stopped.

December 7.—She continues bright and pleasant; wrote a sensible letter to her husband. This morning she fainted when walking from her bed to the bath-room.

December 11.—She got up to-day for a few hours, but felt weak.

December 12.—Is menstruating.

December 14.—Has relapsed to an emotional, irritable condition.

December 15.—Pleasant and sociable to-day; occupies herself sewing. Has not slept well for two nights.

December 17.—Has dyspeptic symptoms, and refuses food. Mentally dull, morose, and irritable.

December 21.—Sleeps better, and under treatment dyspeptic symptoms have improved. She takes her food better.

January 21.—Very variable; one day irritable, the next cheerful and talkative. Her friends say she is much improved; more intelligent and more active mentally than she has been since first becoming insane.

March 22.—There has been no further change in her condition. Her husband is satisfied with the late improvement, and took her home to-day. She was discharged relieved.*

This case illustrates:—

1. The subjective symptoms often noticed in patients treated with thyroid, namely, pains in the head and limbs.
2. The motor symptoms—tremors of the lips, tongue, arms, and legs.
3. That mental improvement is not necessarily confined to the period of reaction, but may occur early during treatment.
4. The dyspeptic symptoms which sometimes complicate treatment.
5. That there is danger of cardiac failure if the patient is not strictly confined to bed for some days after treatment is stopped.

These two cases give a general idea of the effect of thyroid feeding, in large or moderate doses, upon diseased conditions other than myxœdema.

I now proceed to give a *résumé* of the more important symptoms.

Circulatory System.—Subjective phenomena: In several cases there was a tendency to fainting when in the upright position. One patient actually fainted when walking from

* She has since completed her recovery at home.

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her bed to the bath-room. Dyspnœa occurred in one patient who suffered from incompetence of the mitral valve.

The Pulse.—The changes which occurred in the pulse were the first indication that the drug was affecting the patient. These changes were, increased pulse rate, increased volume, and diminished tension. In every case the pulse became rapid, in the majority the tension was lowered. The increased rate was usually combined with excitability or irritability of the pulse, *i.e.*, if, when the pulse was being counted, the patient coughed, laughed, spoke, or moved a limb there was a perceptible quickening of the pulse rate.

Among the later pulse changes were irregularity, intermission, and compressibility. There was much variation in the time which elapsed, after the discontinuation of the treatment, before the pulse became normal.

Sphygmographic tracings of the radial pulse were taken in fifteen cases. The first tracing was obtained immediately before the patient was subjected to thyroid treatment; the second, several days after treatment commenced, when the pulse gave indication of being affected on digital examination. The following tracings give an idea of the alterations found. I need not multiply cases, but will content myself with giving typical examples. The chief distinctions between the pulse-tracings taken at different times were:—

S. G., 1.—Pulse slow, tension high. Line of ascent slightly oblique and short. Line of descent well sustained; no traces of aortic notch or dicrotic waves, but presents several little wavelets.

2.—Pulse more rapid, volume increased, tension diminished. Percussion stroke long and vertical. Apex generally acute, line of descent fairly oblique, predicrotic wave tends at times to form a semi-plateau with the apex, aortic notch shallow, dicrotic wave faint.

J. A., 1.—Pulse regular in rhythm, but not always so in force; tension tends to be high. Line of ascent practically vertical, apex rounded, tends to form a plateau with predicrotic wave. Line of descent fairly oblique, presents several little wavelets.

2.—Pulse more rapid, volume increased, tension diminished. Percussion stroke long and vertical. Apex acute. Line of descent falls rapidly, presents aortic notch, predicrotic and dicrotic waves.

H. E., 1.—Pulse small and sluggish. Cardiac percussion stroke weak, results in low line of ascent. Line of descent

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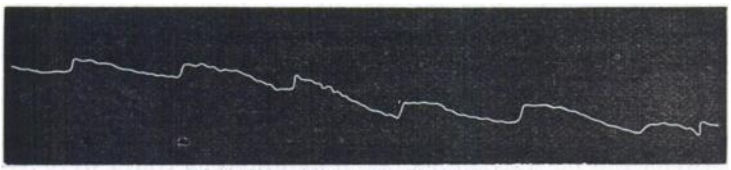
forms a wide angle with line of ascent, and gradually reaches its lowest point; no traces of aortic notch or dicrotic waves.

2.—Pulse more rapid, volume increased, tension high. Line of ascent fairly vertical and of medium length. Apex rounded. Line of descent less sustained and faintly undulating.

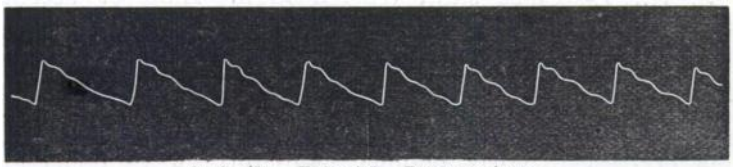
3.—Pulse smaller, increased in rate, tension diminished, slightly irregular and undulating. Percussion stroke almost vertical and short. Apex acute. Line of descent falls rapidly; shows traces of aortic notch and dicrotic waves.

T. S., 1.—Pulse regular in rhythm and force, tension high. Line of ascent practically vertical. Predicrotic wave prominent, tending to form a plateau with apex. Line of descent falls rapidly to the aortic notch, followed by a well-marked dicrotic wave.

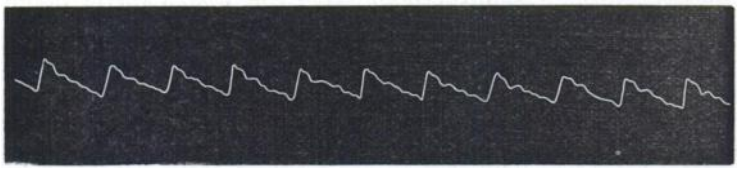
2.—Pulse increased in rate and volume, tension diminished. Line of ascent vertical and fairly long. Apex acute, line of descent oblique; presents dicrotic waves and aortic notch.



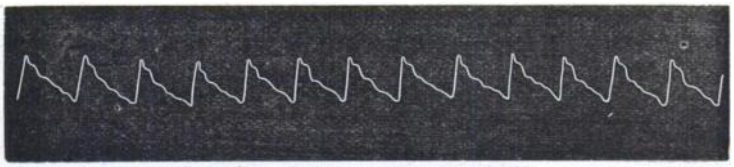
S. G. (1).—Pulse 56. Pressure 4 ozs.



S. G. (2).—Pulse 76. Pressure 4 ozs.

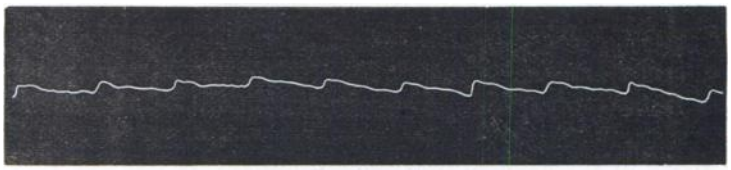


J. A. (1).—Pulse 78. Pressure 5 ozs.

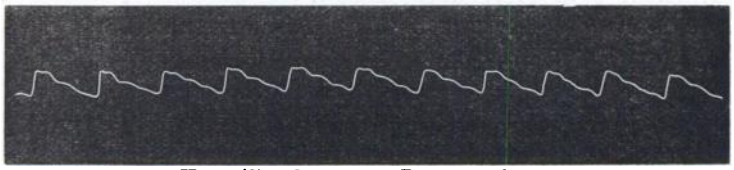


J. A. (2).—Pulse 99. Pressure 5 ozs.

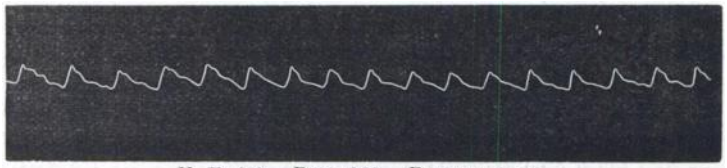
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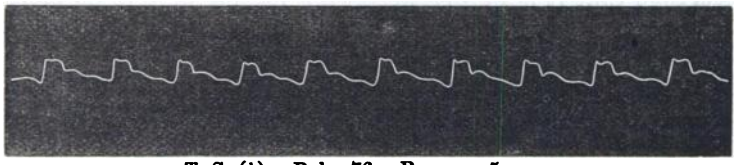
H. E. (1).—Pulse 80. Pressure 2 ozs.



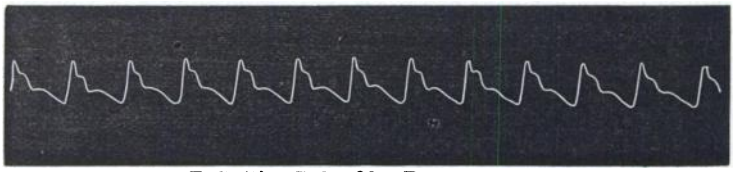
H. E. (2).—Pulse 98. Pressure 2½ ozs.



H. E. (3).—Pulse 120. Pressure 4 ozs.



T. S. (1).—Pulse 76. Pressure 5 ozs.



T. S. (2).—Pulse 96. Pressure 5 ozs.

Respiratory System.—Rapid respiration has been noted in animals and man after thyroidectomy, and also in patients suffering from exophthalmic goitre. This being the case, one would expect to find respiratory changes in connection with the cardiac disturbance induced by the action of thyroid as a drug. The respirations were noted in nineteen of the cases. On an average the respirations were slightly accelerated as the pulse rate increased.

It has been stated that patients suffering from exophthalmic goitre are, as a rule, exempt from phthisis, and a suggestion

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has been made that phthisical patients might be benefited by treatment with thyroid. Five of the twenty-three cases had symptoms of phthisis pulmonalis on admission, but the disease was not active. The immediate effect of administering thyroid tabloids to these patients was the lighting up of activity in the phthisical areas. On discontinuing the drug, phthisical symptoms disappeared. Four out of the five patients, during the reaction after treatment, gained weight, and are now in better health than when treatment commenced. The fifth is neither better nor worse.

Alimentary System.—The tongue generally became furred. The appetite diminished, and where the temperature was high, thirst increased. Nausea and actual vomiting occurred in several cases. The vomiting did not appear to be cerebral, for all the cases had foul breaths and furred tongues, and the symptoms disappeared under stomachic treatment.

Hæmopoietic System.—The thyroid gland plays a special part in the metabolism of the sexual organs. Victor Horsley* remarks in his paper:—"Of late years the subject has been so carefully considered by Frend in its chief bearings that it is hardly necessary for me here to do more than point out how the truth of the conjunction of the functional activities of these parts is confirmed by the far greater liability of the female sex to suffer from myxœdema. The harmony between the two sets of organs is evinced by the enlargement of the thyroid occurring when active changes happen in the sexual organs. What is the nature of the change which requires the increased activity of the thyroid is not yet known, but that such a need should arise is comprehensible from the altered condition of the blood in pregnancy and menstruation."

Eight of the thirteen female cases had goitre in more or less degree. All these have made good recoveries, and in four cases there was no alteration in the size of the gland after treatment.

Blood Examinations.—The blood of the patients undergoing thyroid treatment was examined in fifteen instances. I made observations on the blood of most of the others, but doubt the accuracy of the results, and therefore omit them. The examinations were made with Gowers' hæmocytometer and hæmoglobinometer. The corpuscular richness was ascertained by examining two separate drops from each solution. The corpuscles were counted in never less than 24 squares and the average taken.

* *Loc. cit.*

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The first examination was made before treatment was begun; the second three or four days after discontinuation of the drug.

In eight of the cases no other medicinal treatment except thyroid was used. On comparing the results of the second examination with the first these eight cases showed a loss in percentage of hæmoglobin and a reduction in the number of red blood corpuscles, with the exception of E. E., whose corpuscular richness was increased from 71·3 per hæmic unit to 75 per hæmic unit.

Seven cases took iron, either Blaud's pills or a solution of Ferri et Ammonii Citratis, coincidently with the thyroid. Of these there was a gain in hæmoglobin in two; three showed a loss. Four gained in corpuscular richness, two showed a loss, and the seventh neither gained nor lost.

The average loss of hæmoglobin in the eight cases treated without iron was 6·6 per cent., and the diminution in red blood corpuscles averaged 7·3 per hæmic unit.

On the other hand, those treated with iron showed an average loss of 1·9 per cent. in hæmoglobin, and an average gain of 1·9 in red blood corpuscles per hæmic unit.

It would therefore appear that the impoverishing effect of thyroid, when given in large doses, on the blood can in some measure be prevented by the coincident administration of iron.

CASES TREATED WITHOUT IRON.

		Before Treatment.				After Treatment.			
Case.	Number.	Hæmoglobin per cent.	Red Corpscls. per Hæmic Unit.	White Corpscls. per Hæmic Unit.	Red Corpscls. per Cub. Mill.	Hæmoglobin per cent.	Red Corpscls. per Hæmic Unit.	White Corpscls. per Hæmic Unit.	Red Corpscls. per Cub. Mill.
R. O.	VII.	54	68·1	·20	3,400,000	50	64·1	·16	3,250,000
M. E.	XIV.	68	82·7	·25	4,100,000	64	75·2	·40	3,760,000
E. E.	XVII.	69	71·3	·33	3,560,000	67	75·0	·20	3,761,000
C. W.*	XVIII.	74	81·9	·41	4,040,000	70	58·9	·16	2,940,000
M. O.	XX.	64	80·1	·25	4,050,000	60	74·8	·20	3,720,000
E. F.	XXI.	60	78·4	·57	3,910,000	56	75·6	·40	3,860,000
S. G.	XI.	76	89·7	·25	4,530,000	60	76·6	·25	3,790,000
T. S.	XXII.	85	87·7	·25	4,440,000	70	81·1	·16	4,040,000

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CASES TREATED WITH IRON AND THYROID.

Case.	Number.	Before Treatment. Hæmoglobin per cent.	Red Corpscls. per Hæmic Unit.	White Corpscls. per Hæmic Unit.	Red Corpscls. per Cub. Mill.	After Treatment. Hæmoglobin per cent.	Red Corpscls. per Hæmic Unit.	White Corpscls. per Hæmic Unit.	Red Corpscls. per Cub. Mill.
A. T.	V.	76	73·9	·50	3,750,000	68	78·0	·30	3,980,000
A. B.	IV.	62	59·6	·12	2,980,000	55	66·6	·12	3,760,000
J. A.	XII	68	80·0	·25	4,000,000	64	79·3	·33	3,960,000
A. U.	XIII	50	79·8	·25	4,050,000	56	70·2	·16	3,510,000
M. C.	XV.	60	79·7	·33	3,930,000	60	81·0	41	4,010,000
C. W.*	XVIII.	62	79·3	·30	3,960,000	64	79·4	·33	3,970,000
H. E.†	XIX.	—	61·5	·24	3,250,000	—	72·6	·22	3,600,000

Integumentary System.—As the pulse quickened, the skin became moist, and at times the perspiration was profuse. Flushings, especially marked about the face and neck, were likewise constant symptoms. As treatment progressed, pigmentation of the skin, if present, disappeared, and the complexion became soft and delicate looking. One case was suffering from acne of the face; this condition greatly improved under thyroid treatment. Desquamation occurred to a greater or less degree in every case after the treatment was stopped.

In some patients desquamation was so slight as to be hardly observable, while in others the skin peeled off the palms of the hands and the soles of the feet in large flakes, while the skin of the body was shed in small branny scales.

Urinary System.—It has been stated that in myxœdema the thyroid drug produces a diuretic action, and I therefore thought it desirable to make some observations on the urine.

Dr. Alex. Haig ‡ says "I can prove that in myself the taking of thyroid glands or a thyroid extract produces results which are identical with those produced by so much uric acid, that is to say, there is a first stage of stimulation,

* Compare results in case of C. W., twice under treatment, the first time without iron, the second time with iron.

† The blood coagulated so rapidly in this case that sufficient blood was not obtained at either examination to estimate the percentage of hæmoglobin.

‡ "Brit. Med. Jour.," Sept. 23rd, 1893, p. 674.

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with rising acidity, well-being, relaxed arterioles, and diuresis."

A quantitative examination of urine was made in fifteen of the cases.

The urine was collected prior to commencement of treatment, and the second examination was made when the physiological action of the drug was well marked. No observations were made on the amount of urea or uric acid. In none of the cases was there any evidence of albuminuria or other abnormality.

The following table gives the quantity of urine excreted in forty-eight hours in each period :—

	Before Treatment.	During Treatment.
J. H.	60 ozs.	69 ozs.
A. C.	116 „	90 „
H. E.	90 „	82 „
E. E.	115 „	100 „
C. W.	75 „	80½ „
T. S.	90 „	86 „
M. E.	104 „	114½ „
M. A. O.	98 „	126 „
E. F.	112 „	98 „
M. A. S. C.	80 „	71 „
C. W.	80 „	77 „
S. A.	90 „	96 „
H. S. P.	52 „	73 „
C. F.	64 „	74 „
R. O.	82 „	79 „
	Average 87·2 ozs.	87·6 ozs.

This table would appear to indicate that thyroid, when administered in large doses, is not diuretic in action. In

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small doses it may produce a diuretic action, but when given in large doses diaphoresis is so profuse as to tend to reduce the quantity of urine secreted.

Nervous System.—Sensory functions: Nothing unusual was noticed in any of the cases.

Motor functions: The organic reflexes were in no way altered in the majority of the cases. We must except the following:—The breathing became slightly dyspnœic in the case of E. F. She had organic heart disease. F. G. S., a case of adolescent mania, became dirty in habits and had enuresis during treatment. A. T., a female, suffering from melancholia, likewise became dirty in habits and passed urine and fæces in bed.

In many instances the voluntary muscles presented symptoms of over action; fine fibrillar muscular tremors were observed in the tongue, lips, facial muscles, and limbs. The facial and lingual tremors resembled those seen in general paralysis. I never noticed any paralysis, anæsthesia, or incoordination.

Vasomotor and nutritive functions: Flushings of the skin, profuse perspirations, and rapid loss of body weight were very constant symptoms. During convalescence a rapid gain in weight was the rule.

Cerebral and mental functions: Headaches of more or less severity were frequently complained of. These headaches were relieved by the administration of a mild purgative.

The mental condition of patients under the physiological action of thyroid varied greatly; some became depressed, others emotional, laughing immoderately or weeping without cause. Some became irritable and had outbursts of impotent rage, while on the other hand irritable, morose, and bad-tempered subjects showed marked amelioration of these tendencies.

Mental improvement was noted in several cases while the patients were under the influence of the thyroid, in others this improvement did not set in until the period of reaction was well advanced. As a rule the patients all slept well, both during and after treatment.

Heat Changes.—Although my aim in treatment was to produce a feverish temperature, I was not successful in every case. Slight pyrexia was induced in fourteen out of the twenty-three cases. The remaining eight either had no temperature as high as 99° F., or if the temperature did rise higher it only did so for the space of a few hours.

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The temperatures of patients under thyroid treatment appear to be readily affected by any change in the temperature of the air. For example, E. F., A. T., H. G. C., and J. J. were all under treatment at the same time, during October, 1893.

The weather on October 14 became warm and close for the time of year; simultaneously the temperatures of these four cases rose.

In the cases of E. F. and A. T., the temperatures had never during the course of treatment risen above normal; on the morning of October 15. E. F.'s temperature was 101·4°, and that of A. T. was 99°. J. J.'s temperature had been falling since the night of October 12. On October 15 his morning and evening temperatures were both 99·2°. H. G. C.'s temperature had been normal and subnormal since the night of October 11. On October 14 his evening temperature rose to 98·8°.

A further example is the case of M. D., who was under treatment in December, 1893, when the weather was very cold. The patient was destructive and restless, and could with difficulty be kept warm. Her temperature never rose to 98° during treatment, and she showed no further reaction to the thyroid than a quick pulse. Since then she has again been under treatment during the end of March, 1894; she reacted well and is now recovered.

The Effect of Sex.—Of the twenty-three cases detailed, eight were men, fifteen were women. Two men out of the eight recovered, three were relieved, three were not improved. Of the fifteen women, thirteen recovered, two were not improved. These results suggest that the female sex is more susceptible to the influence of thyroid, but I believe males are equally susceptible.

An analysis of the eight male cases gives two cases of general paralysis, one case of alcoholic amnesia, one of syphilitic insanity with arterial disease; four incurable cases out of the eight. Of the four remaining cases, three were recoverable. Two recovered, one was relieved. The eighth man, though improved, was not regarded as a curable case. Last year's male admissions, and curable patients resident in the asylum from the previous year, did not furnish many cases for treatment, as they either were hopeless cases on admission, or improvement set in at once and progressed favourably, so that there was no need for any unusual form of remedy.

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The female admissions last year, on the other hand, relapsed frequently, or made slow and doubtful improvement, and therefore furnished a larger proportion of cases suitable for treatment.

The following gives the results of treatment on the various forms of insanity :—

Three Cases of Acute Mania.—All of these recovered satisfactorily. Two additional cases of acute excitement were put under thyroid treatment, but the drug was discontinued because it was evident that the maniacal excitement alone was reducing the body weight so rapidly that the additional loss of weight, which almost invariably results from taking thyroid, was more than the patient could stand. One of these cases, a female, aged fifty-two, has since made a satisfactory recovery, but of course the thyroid treatment may not have contributed to the result. The other case, a male, aged thirty-eight, died of general paralysis about a month after cessation of treatment.

Four Cases of Acute Melancholia.—Two recovered, one was relieved, and one not improved.

Three Chronic Cases.—Mania drifting into dementia, of over one year's duration, one male relieved.

Two Cases of Chronic Melancholia.—One female, of over four years' duration, discharged relieved. One female, of two years' duration, recovered.

One Case of Syphilitic Insanity.—Not improved.

One Case of Alcoholic Amnesia.—Not improved.

Four Cases of Puerperal Insanity.—Three recovered after one course of treatment. The fourth recovered after a second course of treatment.

Two Cases of Lactational Insanity.—One, of over five months' duration, recovered. The other, of over one year's duration, not improved.

Three Cases of Climacteric Insanity.—All recovered.

Two Cases of General Paralysis.—One temporarily improved, the other relieved.

The beneficial effects resulting from thyroid treatment are, I believe, chiefly due to the febrile condition induced. With ordinary care this condition is not attended with any great risk to the patient. The temperature can be kept within reasonable limits, and readily reduced to normal by discontinuing the drug. Even where the temperature does not become febrile the effects of a fever are practically attained, the pulse becoming rapid and soft, the skin flushed

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and moist, and there is a loss of body weight. The period of reaction following cessation of treatment resembles the condition noticed in patients recovering from the exanthemata; there is desquamation of the skin, the appetite improves, the power of assimilating food increases, with a resulting gain in weight and condition. It does not appear to be necessary to induce a febrile temperature to obtain good results, so long as the pulse is rapid and the skin flushed and moist. If these symptoms are well-marked the resulting reaction is as beneficial as if the temperature had been feverish for several days.

Thyroid certainly appears to exert a direct influence on the nervous system, and especially on the mental functions. If this was the only result aimed at, small doses of, say, one five-grain tabloid, thrice daily, would probably be sufficient. Those cases, however, which recovered appeared to benefit more by the reaction which followed the febrile condition, and to induce this larger doses must be given. I now never give more than twelve tabloids per day, and discontinue the drug if the patient shows any symptoms of gastric irritation or heart weakness. Some of the cases detailed took as large doses as ten tabloids thrice daily. This enormous quantity was given in the hope of inducing a febrile temperature, but it generally defeated its object by irritating the gastric mucous membrane.

The exhibition of this drug is certainly worth a trial in that class of patient, so commonly seen in every asylum, in whom a certain improvement has occurred, but beyond that point they never advance. They linger on month after month, too insane to discharge, but sensible enough to feel their position keenly. The monotony of asylum routine dulls their interest in life, they become lethargic, and despairing of recovery and discharge, are liable to drift into dementia, and eventually swell the list of chronic inmates.

Even if they recover after months of protracted convalescence, their mental condition cannot have benefited thereby. To these cases a course of thyroid treatment appears to give the necessary impetus which leads to complete recovery, while considerably shortening their sojourn in an asylum.

Again, amongst those classed as chronic insane, there appear to be cases suffering from diseases of function rather than structural lesion.

Two of the cases detailed illustrate this point.

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S. A. was insane for more than four years. She did not improve. After a course of thyroid she recovered to such an extent that her friends removed her home, where she completed her recovery.

H. S. P. had been insane for two years, and her case was regarded as hopeless. She rapidly improved after treatment with thyroid and was eventually discharged recovered.

As the result of these observations on thyroid feeding in various forms of insanity, I think I am justified in coming to the following conclusions:—

1.—By the internal administration of thyroid, a true febrile process can be induced, and the resulting reaction is beneficial to the patient.

2.—The amount of the drug necessary to induce physiological action varies in different individuals, but it is seldom necessary to give a larger dose than sixty grains of the extract daily.

3.—Excessive and prolonged administration of thyroid extract produces gastric irritation.

4.—The use of thyroid in the treatment of the insane is accompanied by a certain amount of danger from induced heart weakness. This danger can be minimised, and almost discounted, by confining the patient to bed during treatment, and for some days afterwards.

5.—The administration of thyroid is contra-indicated in cases of mania where the excitement is acute, the loss of body weight rapid, and there is danger of exhaustion from malassimilation of food.

6.—Thyroid treatment appears to be specially useful in the insanity of the adolescent, climacteric, and puerperal periods.

7.—Its exhibition is frequently useful in cases where recovery is protracted.

8.—In cases of long standing where there is a tendency to drift into dementia, a course of thyroid treatment sometimes gives the necessary fillip which leads to ultimate recovery.

9.—Patients under treatment should be kept in as equable a temperature as possible.

10.—As far as the observations on general paralysis go, the results are sufficiently satisfactory to make me hopeful of benefit if the patient is treated at an early stage of the disease.

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11.—Finally, such results as I have given cannot fail to make an impression on those who have the responsibility of treating the insane, and are anxious to use every method to help in furthering their cure. I believe that in thyroid feeding we possess a valuable addition to our armamentarium in the treatment of certain cases of insanity.

Insanity among the Natives of South Africa. By T. Duncan Greenlees, M.B. Edin., Medical Superintendent, Grahamstown Asylum, South Africa.

Perhaps one of the most difficult investigations possible is the study of the mental characteristics of savage and semi-savage races, and, before formulating any theories regarding their psychic history, it is necessary that a careful study should be made of their mode of life, their normal mental state, and such folk lore as is accessible to us.

Unfortunately the material at our disposal with regard to the normal mental condition of the inhabitants of South Africa is extremely limited. While numerous works on travel and exploration have been published, few refer to the customs of the natives of the present day, and a perusal of works from Livingstone down to the recently-published "Travels of Selous" fails to throw much light on this important subject.

The history of South Africa is one full of interest, and reads almost like a novel. Perhaps in no other country has the influence of the white man been more apparent, and the devastating effects of modern civilization on the native races been more felt. At the present day, however, the Kafir, of all the native tribes, seems to thrive in spite of this civilizing influence, and, although the time is sure to come when the influence of intoxicants will exterminate him, yet so far he stands out as a member of a flourishing race; and, when uninfluenced by civilization, he is still one of the noblest types of mankind.

Further, strict classification is well-nigh impossible, the races have become so mixed. Thus in the Western Province the coloured inhabitants are mainly descended from the old slaves held by the Dutch settlers; while in the Eastern Province the Kafir and Hottentot still hold their own, intermixed to a certain extent with other tribes, and even with white people in many cases. Indeed, the Bastard—a

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