On the Treatment of Insanity by Thyroid Extract

by Jas. Middlemass
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On the treatment of insanity by thyroid extract.

Within the last three years the treatment of insanity has undergone a most important development by the administration of the active principles of the thyroid gland in one or other of their various forms. This mode of treatment was originally devised and carried out by Dr. Lewis C. Bruce, and as he humorously states* it was suggested to him by the so-called 'alterative' effects which follow in some cases of insanity the occurrence of an acute inflammation, such as erysipelas, carbuncle, or one of the scrofulae. The connection of these inflammatory attacks with the sub-

sequent recovery of the deceased donor was and still remains to a large extent purely conjectural but whatever it is there can be no doubt that it is a most important one. One of the chief symptoms produced by such inflammatory attacks is a rise of temperature, and as it had been observed that even in healthy individuals, and still more in those suffering from mycosedema, the temperature rose two, three or more degrees after the administration of thyroid, the endeavour to induce an artificial fever by this means was naturally suggested. Whether the beneficial effects observed are due solely to the diminishing of a feverish state and the bodily changes associated with this, or to a further specific action of the active principles of the thyroid is a question
which a careful consideration of the subsequent cases to be described will materially assist in answering.

As my experience of the effects of thyroid feeding has been confined almost entirely to insane patients it is not possible for me to give at first hand an account of the symptoms produced by this treatment on healthy individuals, that has already been done by various observers, notably Hareley,* and a comparison of their observations with those seen by myself show that no one respects the existence of insanity does not modify the physical effects produced, and that the slight difference is in the mental symptoms.

Since the method of thyroid feeding was first published by

Dr. Bruce it has been tried very extensively in the Royal Edinburgh Asylum, as well as in other Institutions in this country, on the Continent, and in America. Dr. Bruce* has recorded his further experiences of its use, and has shown not a few remarkable cases resulting from it. Up to the present time his results have not only been the most important, but, being based on a study of over 100 cases, his conclusions are entitled to be regarded as the most authoritative we have. His first important paper on the subject, published in January 1895, is based on a study of 23 cases of various forms of insanity in both sexes. The effects produced by the drug were in all cases most evident. Its already stated the theoretical

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basis of the treatment was the produc-
tion of a greater or less degree of feverishness, as this was origi-
nally thought to be the ground of the improvement occasionally seen in cases where this followed
with an attack from other causes. During the course of the experi-
ment, however, it became evi-
dent that this was not the sole,
nor even a necessary cause of
the subsequent improvement.
The chief results of his experience
may be briefly summarized.
At first the dosage was to a large
extent tentative. It was given in
the form of tinctures containing
5 grs. each, and ultimately it was
found that, in the majority of
cases, the best effects of the drug
were obtained by a dosage of
20 grs. given thrice daily. The
influence of this on the tem-
perature was not always uni-
form. In the majority of cases,
a distinct rise above the normal was obtained, seldom reaching above 100°F. and the highest point being attained by gradual stages in three or four or more days followed by an equally gradual subsidence. In many of the cases the normal temperature is considerably below 98.6°F. so that a rise above that point is not necessary to show the production of a febrile condition. The temperature reaction is also influenced to some extent by the surrounding conditions. In cold weather the rise is distinctly less than in hot and there is also experimental evidence to show the influence of the thyroid gland on the regulation of temperature.* One important effect noticed in every case was the distinct rise in

* Smith: Jour. of Phys. 1893.
the pulse rate, and the change in the character of the pulse. This does not depend on the temperature in any direct way, for it was observed in cases where the degree of fever was slight, and the pulse-rate continued to increase when the temperature fell, if the drug were continued. Not only is there an increase in frequency, but the volume is at first increased and the tension diminished, while later both are lowered. In some cases there is slight irregularity produced and occasionally a feeling of faintness. Looking to the fact that some deaths have occurred from cardiac syncope in the case of papeosedema patients under treatment with thyroid, it is evident that the pulse and cardiac condition should be the subjects of careful and regular observation, so long as thyroid
is being given and for some days after its administration has ceased. Both on this account and because the temperature is usually elevated, it is necessary to have the patient in bed during the whole course of the treatment.

The length of time during which the dosage of the gland has been continued in each case has varied considerably. But recently, as the result of past experience, the time has generally been six days. It is governed largely by the effects produced on the temperature and circulation. As a rule the fever reaches its highest point in four or five days, and after that, in spite of the continuance of the drug it usually falls gradually. The pulse is very differentily affected and goes on diminishing in volume and tension and increasing in frequency as long as the gland is administered. The rational practic
therefore, seems to be to continue the drug until the temperature shows evidences of falling and then cease it altogether. In a few cases where the temperature is not much affected the pulse must be the guide as to when the desired limit has been reached. Quite lately the effect of giving small doses for a prolonged period has been tried and the results of this mode of administration will be subsequently detailed.

As regards previous records of the results of thyroid treatment of illness, as was to be expected considering the short time it has been in practice, are not very numerous. Of L. C. Bruce has recorded by far the largest number of cases and his results are therefore of the greatest weight. In his first paper* he gives details of 23 cases. The

following table shows the particulars of those so far as the results of the treatment are concerned:

<table>
<thead>
<tr>
<th>Acute Mania</th>
<th>Recov.</th>
<th>Impro.</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>3</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>D.C. Melancholia</td>
<td>4</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Puerperal Insanity</td>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Alcoholie Insanity</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>General Paralysis</td>
<td>4</td>
<td>4</td>
<td>0</td>
</tr>
<tr>
<td>Totals</td>
<td>23</td>
<td>14</td>
<td>4</td>
</tr>
</tbody>
</table>

As regards sex they were as follows:

<table>
<thead>
<tr>
<th>Males</th>
<th>females</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>8</td>
<td>12</td>
<td>20</td>
</tr>
<tr>
<td>2</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>3</td>
<td>2</td>
<td>5</td>
</tr>
</tbody>
</table>

The conclusions he drew from a consideration of all the facts of these cases were:

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 60 grs. of extract daily.
3. Excessive and prolonged administration of thyroid 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 minimized 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 malabsorption of food.
6. Thyroid treatment appears to be specially useful in the minority of the adolescent, climacteric and premenstrual 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 as nearly at normal 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.

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

It remains to be seen how these conclusions have been verified by more extended experience and in what respects they differ from the results of other observers.

In a second paper* Dr. Bruce gives an account of sixty further cases which had been treated by thyroid. The following table gives the main results:

<table>
<thead>
<tr>
<th></th>
<th>Cases</th>
<th>Recov.</th>
<th>Not Recov.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Males</td>
<td>25</td>
<td>7</td>
<td>18</td>
</tr>
<tr>
<td>Females</td>
<td>35</td>
<td>14</td>
<td>18</td>
</tr>
<tr>
<td>Total</td>
<td>60</td>
<td>24</td>
<td>36</td>
</tr>
</tbody>
</table>

In this paper he sets before himself mainly three questions, to which he gives the following answers.

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* *Jour. of Mental Science. Oct. 1895.*
1. Thymoid produces undoubtedly a mild feverish reaction, which is often of considerable benefit to the patient.

2. It is a direct cerebral stimulant.

3. There is a strong probability that at some periods of life the administration of thymoid supplies some substance necessary to the bodily economy.

These conclusions are supplemented by the previous ones, and the figures given, though not presenting such a high recovery rate as the first series, still show a high percentage, when the fact is taken into account that most of the cases were such as were looked upon as very probably incurable.

Dr. Clark of Rockwood Hospital, Ontario, records* a series of five cases, the results being that three recovered, one improved.

* Jour. Soc. of Insanity, Oct. 1895.
and the fifth after improving, again relapsed.

Drs. Ficklenka* gave the treatment to 12 patients. Their maximum dose was 30 gms. in a day and in the majority it was much less. Four of them were general paralytics, and in them there was no improvement, this result being somewhat at variance with Bruce's. The remaining eight were neuroses and of these one recovered, four were improved and three were unaltered. The following table shows the nature of the insanity under which they laboured:

<table>
<thead>
<tr>
<th>Disease</th>
<th>Base</th>
<th>Recover</th>
<th>Improved</th>
<th>Unimproved</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stupor Melancholia</td>
<td>3</td>
<td>0</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Delirium Melancholia</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Puerperal Insanity</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Second Dementia</td>
<td>3</td>
<td>0</td>
<td>2</td>
<td>1</td>
</tr>
</tbody>
</table>

Total 8 1 4 3

Dr. W. J. Babcock records notes of 13 cases treated by Seirin with the following results:

<table>
<thead>
<tr>
<th>Cases</th>
<th>Recovered</th>
<th>Improved</th>
<th>Unchanged</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mania</td>
<td>5</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Melancholia</td>
<td>8</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>13</td>
<td>2</td>
<td>7</td>
</tr>
</tbody>
</table>

He states that the four whose remained unchanged were undoubtedly delirious, as regards sex all except two were females. One of the two recovered, and the other was improved. The conclusions he draws from his experience in the above cases are:

I. Cases of post-melancholic melancholia following a lengthy period of depression, offer the best prospect of improvement and are more or less influenced in the majority of instances.

II. Cases of stuporous melancholia of long duration are usually improved by thyroid. Cases which recover

appear to have a special predilection to relapse.

Illusory cases relieve attacks have been mildly prolonged give a very encouraging prognosis. Recoveries in this class hold no greater prospect of permanency than recoveries without special aid. The attack has simply been cut short by the thyroid, and, other things being equal, a recurrence is more than probable.

Cases of cerebral exhaustion following acute delirium or stupor whose elimination of urea and other nitrogenous compounds is greatly reduced, offer a fair chance of improvement.

Chronic disturbed cases. During the course of observations we have noticed many cases of chronic mania without fixed delusions benefited by a course of thyroid treatment.

In doubtful cases thyroid may assist in clearing up the diagnosis.
It will early differentiate between true stupor and dementia. In delusional cases of a doubtful nature a course of treatment will usually show whether delusions are fixed or temporary.

These are rather positive conclusions to draw from so limited an experience as thirteen cases, but it will later be shown that they are in the main quite correct. The physicians of Willard State Hospital* give the results of treating 22 cases with thyreoidin in doses of ½ to 1 gr. representing 5 to 10 grs. of the gland of the sheep. The cases chosen were mostly those looked on as hopeless so far as other methods of treatment were concerned and the observations given do not extend beyond the actual period of treatment, so that the results are necessarily limited.

ni value. Still they show a distinct improvement in seven, and none were made worse.

Dr. J. J. Currie1 treated seven patients with large doses of dried seaweed gland from 15 to 50 grs. per day for 11 to 22 days. Two recovered, three were improved, and two were not changed. They were all male patients.

Dr. Lord2 gives in tabular form the results of the treatment in 16 cases of which he had the particulars sent to him. Of these two recovered, one improved, ten were not affected and three were made worse. The two who recovered were a case of adolescent mania in a female and a case of alcoholic insanity, also in a female.

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Of those submitted 20 cases to the thyroid treatment and his results were as follows:

<table>
<thead>
<tr>
<th>Condition</th>
<th>Cases</th>
<th>Recovered</th>
<th>Improved</th>
<th>Improved %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Excited Melancholia</td>
<td>5</td>
<td>1</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td>Simple Melancholia</td>
<td>7</td>
<td>0</td>
<td>1</td>
<td>6</td>
</tr>
<tr>
<td>Enfeeblement</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>Dementia</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>Senile Insanity</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Chronic Manic</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td><strong>Totals</strong></td>
<td>20</td>
<td><strong>1</strong></td>
<td><strong>1</strong></td>
<td><strong>18</strong></td>
</tr>
</tbody>
</table>

The case which recovered was a male suffering from excited melancholia. The draughts a number of conclusions from his experience of the cases as a whole. He says:—

"All the cases showed a greater or less reaction to thyroid administration, as shown by the slight rise of temperature, slightly increased respirations, together with more marked changes in the pulse.

In all cases the pulse was the first

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"tending to show any change, and was the condition most affected. In all cases this reaction increased and became most pronounced toward the end of treatment.

After treatment was discontinued the reaction passed off gradually in the majority of cases, being quite noticeable for at least a week.

As regards the relation of the mental condition to the amount of reaction produced, it is not possible to speak definitely. One of the cases which improved showed very slight reaction; while one, which showed no change mentally, reacted very strongly, although the amount of thyroid given was the same.

In conclusion I desire to emphasize the fact that, out of twenty cases treated, two showed permanent improvement, and both of these had previously been regarded as hopeless on account of the stationary character..."
of their mental condition. Although none of the other cases were so distinctly benefited, it appears to be indicated that this method of treatment should receive a fair trial before any patient is regarded as hopelessly miserable.
I propose now to give an account of a number of cases in the Royal Edinburgh Hospital which have been treated by thyroideum and the results produced by it. The method of administration has been nearly uniform. The usual dose given was 60 grs. per day and this was continued for 5 to 10 days according to the reaction produced. The patient remains in bed for one or two days before treatment is begun to ascertain the normal temperature and pulse-rate, as these are the chief guides to the estimation of the extent to which the drug is affecting the patient. Advantage is also taken of the patient being in bed to make a thorough physical examination of the heart and lungs, as it is of great importance to ascertain that they are healthy before the treatment is begun. The weight is also taken in order to obtain some estimate
of the tissue metabolism produced.

The first case on which the treatment was tried by me was that of Mrs. C. S. B. She was admitted into the asylum in since 1894 suffering from great mental depression with strong suicidal feelings. Her age was then 46, and the physical accompaniments of the climacteric were manifesting themselves. As she did not show signs of settled improvement under the ordinary methods of treatment she was put on thyroid in January 1895. At that time her condition was as follows. Physically she was very poorly nourished, her appetite was poor and frequently she would not have taken food at all if she had been left to her own inclination. No active nor latent disease was discoverable in her heart or lungs. Mentally she was exceedingly depressed, restless, agitated, unable to occupy herself in any way.
for any length of time, and was much given to speaking about her melancholic delusions, which were chiefly of a religious character. The reaction to thyroid was fairly well marked (see chart). The temperature rose gradually to 99.4°F., and the pulse-rate increased from about 90 to 125. Illusorily there was at first a temporary increase of the restlessness and it was with difficulty she could be kept in bed. In a few days this passed off and she became quieter and more rational. After about a week of improvement she again became rather more restless and this condition lasted for two or three weeks. Her depression was also greater and she required very careful attention as she had before made a determined suicidal attempt and the feeling once again became decidedly more prominent. In a month she began to show signs of slight improvement.
She was less restless, less depressed, occupied herself more and took her food better and more willingly. This improvement continued for some months longer, but it was very gradual and not very decided. A year later she began to fall off in flesh, her appetite got worse and there was a decided retrogression in her physical and mental condition. She was then discovered to be suffering from phthisis, and from this disease she ultimately died several months after. It is quite possible she may have had a latent phthisical condition in the lungs before she undertook the treatment, and the temperature chart tends strongly to confirm this surmise, though its significance was not observed at the time. It is well known that a feverish condition due to other causes may light up a dormant phthisical process into
activity. A reference to the temperature chart shows a decided tendency to an evening rise and a morning fall, and this difference between the two temperatures is considerably greater and more regular than is observed in the normal reaction to thyroid. It points to a tendency towards the well-recognised temperature variation in thyreosis, and in subsequent cases any indication in the same direction was carefully noted. As a result of experience we now know that the effect of thyroid is most prejudicial to a phthisical person, as the morbid process is at once stimulated and may make rapid progress. It is therefore most necessary to make a careful examination of the effect before the treatment is undertaken.

The most case was that of Mrs. A. D., age 25, who was admitted
in April 1892 suffering from an attack of adolescent insanity which had been in progress for five months. She had been mildly delusional for some time with hallucinations and restlessness, culminating just before admission in attacks of excitement and violence. After admission the excitement soon passed off and was succeeded by a slight degree of stupor with hallucinations of hearing, which latter occasionally led to impulsive attacks. The subsequent history was one of slight improvement for a few days, during which she spoke a little in answer to questions, took her food herself and was not active in her movements, followed by relapse when she became stuporous, resistive, mutely and requiring to be fed. In course of time the improvement became less marked after each attack, and the signs of dementia more pronounced.
In October 1894 it was decided to give her the thyroid treatment. At that time she was still in a condition of mild resistance stupor, lethargy in her movements, sluggish in her mental processes and hardly able to look after herself in any way, even in the matter of taking food. To most questions she did not reply at all, and if pressed her invariable answer was 'I don't know.' Physically she was in good condition, weighing 138 lbs. Thyroid was given in doses of 60 gms. for nine days, and the reaction, although it was a fairly typical one, is shown in the accompanying chart. During its administration there was a considerable mental improvement; within the first four or five days after it was begun she had a more intelligent expression and her mental processes became clearer and less
sluggish. She answered simple questions readily and correctly and was more observant of what was going on. Her behaviour, however, was childish and occasionally there was a tendency to slight excitement. After the treatment was over and she was going about again she was weighed and found to have lost half a stone. The improvement noticed during treatment was maintained for some time after, but did not advance to any great extent. Still her condition was very decidedly better after it than it had been before. She was no longer slow-moving, was more active, did a little simple work, and was able to take her food and attend to herself. She was, however, more like a child than a grown-up person in her expression, conversation, and manner. This improvement was present for three
months; after which no further advance was made, and it was accordingly decided to put her on a second course of treatment. This was carried out in February 1895. The weather was then much colder, and neither for this reason or because a similar course had been given only a short time before, the reaction, at least as regards the temperature, was not nearly so well marked as on the first occasion. (See that No. 2.) In this case the experiment was tried of giving the patient hot drinks and placing hot bottles in the bed. This plan had already been carried out by Dr. Bruce. In another case to be described, the effects of this treatment were at once evident. The temperature rose and free perspiration set in. Whether this had any beneficial action, however, is open to question as in the previous course there
was a distinct improvement in the mental condition during and after the treatment. There was a decided increase of activity and intelligence and her expression improved and was less silly and childish. She was now able to look after herself in every way, took her food and dressed herself, and she was also able to do simple work about the house. This improvement lasted for a good many months, but at present she is not quite so well as immediately after the treatment. Still there is no doubt she is better now than she was when the thyroid was first given. From the symptoms she showed at that time there is every reason to believe that but for it she would now have been in a state of helplessness and meekless dementia. This case may therefore fairly be classified as a comparative success. Instead of being a burden to herself, her relatives, her nurses and every
one account here she is now comparatively happy, a source of interest to her relatives, for they visit her with great regularity, to some extent a useful, instead of a useless, patient, and requiring comparatively little attention on the part of her nurses. Instead of this she would, in all probability have been one of the bugbears of asylums, worse in many respects than an intelligent animal, a source of endless care on the part of the nurses in charge of her, and a patient in whom it would have required an exceptional amount of enthusiasm on the part of the staff to have taken any lively interest.

Mr. H. J. H. was admitted as a voluntary patient in February 1895, suffering from melancholia brought on by business worries and overwork. Though his age was 30 he still looked an adolescent, there being no hair on his face, and his
voice high-pitched and their in volume. He had been ill for about
three months, being depressed, sleep-
less, apathetic about everything, and
quite unfit for work. This condition
became somewhat worse after ad-
mission and symptoms of stupor
gradually manifested themselves.
This lasted for a week or two, and
as there was no appearance of im-
provement he was put on thyroid
about a month after admission.
Sixty grains were given for nine
days and towards the end of that
time considerable difficulty was
experienced in getting him to take
the drug. His digestion was a good
deal upset, and for some days even
after the thyroid was discontinued
he could hardly be persuaded to
take any food at all. The reaction
to the drug was practically nil,
so far as the temperature was con-
cerned, but the pulse showed the
usual and characteristic changes.
There was not much change noticed in his mental state. The stupor was less pronounced, but he remained apathetic, depressed, and difficult to rouse. In the course of four weeks his physical condition which had been considerably reduced by the treatment, for he had lost about half a stone, began to improve steadily, and along with this there was a corresponding mental change. The stupor passed off, he became less depressed and took a more lively interest in surrounding matters. As time progressed this change became still more manifest, and in the course of another month he became quite another person. If anything he was inclined to slight exhilaration and excitement, and took an exceptionally lively interest in all the announcements that went on. In another month this slightly worked out state passed off and he settled down into his
normal condition again. Shortly after he returned to work and since then he has kept quite well. Those who saw him during his residence in the asylum, and were acquainted with the facts of his case, had no doubt that his recovery was due directly to the thyroid treatment.

Miss B. B. was admitted in November 1893 suffering from excited melancholia. She was then 41 years of age and had been ill for about a year. At first she had been simply depressed, but latterly she had had attacks of excitement in addition. During her stay in the asylum she had remained more or less depressed, but the excitement had largely passed off. She had always, however, been more or less resistive, and at times this feature became very troublesome. She put on flesh very considerably and gained over two stone in weight. There was little
essential mental improvement, and her old delusions that she was lost and that she was getting weaker every day were frequently given expression to. For over 15 months various efforts were made to bring about an improvement but were only partially successful, and there then seemed to be signs of dementia supervening. It was accordingly decided in January of 1895 to subject her to thyroid treatment. At that time her condition was one of extreme melancholia with frequent attacks of excitement, which at times became so aggravated that sulphonal was necessary to control them. This drug always proved remarkably efficient in so doing, for while under it she was quiet, less resistive, less depressed, and was even able to raise a smile, though at best rather a vacant one. She was given thyroid tincture for ten days in doses of 60 grs. per
day. The temperature did not show a very marked reaction, the highest point reached being about a degree and a half above her normal, which was about 97.4° F. On the tenth day the experiment was tried of giving her some hot drink and placing hot bottles and extra blankets on the bed. Under the influence of these the temperature rose from 97° to 99.8° and she revealed profusely. After this the drug was stopped and the temperature fell in the evening to 97.4°. The pulse was considerably affected during the treatment. It rose from about 85 to 110 or more per minute, and its character became more febrile. On the tenth day, during the experiment above described, it rose to 120 (see chart) corresponding to the rise in temperature. In her mental condition there was no great change at the time. At first she was a little more restless, and
and then she became rather quieter, more rational in her conversation, and not so depressed. In the course of a week or two, during which she was given extra diet and alimentive tonics with a view to her regaining the 10 lbs. she had lost in weight as the result of the treatment, these signs of improvement became more manifest.

This progress was maintained for several weeks longer, and it seemed as if a substantial advance were to be made. She improved physically to a great extent and became much fatter, but after a certain stage the mental state ceased to advance, and expectations were not realised. She remained stationary at the level reached and for two or three years she was less restless, less depressed and more manageable than before the treatment was tried. After that true signs of dementia began
to manifest themselves and were pretty evident when she was removed by her friends in the autumn of 1897. But this case also illustrates the benefit which thyroid treatment may accomplish even when it does not bring about a cure.

There is no doubt she was considerably improved by it and was much less troublesome than there was every prospect she would be before it was undertaken.

The next case is that of Miss M.D.C. who was admitted in June 1892 at the age of 31. She had had a previous attack of insanity during adolescence, and had never been so intelligent nor energetic as before. She was in fact slightly demented on admission, she was excitedly melancholic, suffering from a confused sense of fear, and from delusions of having committed great sins. At times she was very excited and restless, slept badly.
and was with difficulty induced to take food. For about a year she exhibited occasional improvement, followed after a short interval by relapses. These latter always took the form of depression until a year after admission when she became mildly excited and excitable after which she had attacks of depression and excitement with short periods of improvement, during one of which she talked quite rationally to an old friend who visited her. In January 1895 when it was decided to subject her to thyroid treatment, she was in a condition of melancholic stupor. This had lasted for some weeks and had necessitated artificial feeding for a time. This attack was unaccompanied by excitement, but dementia seemed to be threatened. Thyroid was given in doses of 60 grs. for eight days. It caused a considerable degree of gastric disturbance, and the treat
was on this account stopped sooner than had been intended. The change in temperature is seen in the accompanying chart. It will be seen from it that the reaction reached its highest point on the fifth day, after which it fell, though the drug was continued to be given. The pulse was affected to an increasing extent so long as thyroid was taken. Mentally no great change was apparent. The condition of stupor passed off soon after the treatment was stopped, and she became excited with occasional slight excitement. There was also difficulty with her food, but artificial feeding was not again necessary. During the next few months she improved slowly in physical condition and there was also a slight change for the better mentally. The latter did not last long however, and five months after the signs of dementia became
ncident and gradually deepened. She had slight spells of excitement, during which she became more restless and more delusional, requiring to be fed because she thought her food was poisoned. Her emotional condition was almost uniformly one of depression. The dementia became greater and her nutrition failed owing to the persistent delusion that her food was poisoned and the consequent difficulty in getting her to take a satisfactory amount. A year later she died of influenza and pneumonia. It cannot be said that the thyroid treatment had any decided beneficial effect on the mental condition in this case, though it is equally true that it had no injurious influence. Any change effected by it was in the direction of some amelioration of the symptoms.

The most successful of the whole series of cases subjected to the
Treatment was that of Alco's C. I. S. She was admitted in April 1895 suffering from an attack of excitement which came on during the course of insanity of the stuporose type which has been in progress for fully two years. Mental symptoms first manifested themselves at the age of 21, when she became confused and stuporose with occasional attacks of restlessness and impulses. She was put in charge of skilled nurses and subjected to the best conditions and treatment that her relations and her doctor could give her, but apart from slight improvements followed by relapses to her previous mental condition there was no substantial advance towards recovery. As already stated she became rather acutely excited and had to be brought to the asylum in consequence. For some time after her admission this excitement
continued, though it was never very great and when it passed off she was in a condition which appeared to indicate that secondary dementia was imminent. All the usual means of treatment were had recourse to in an endeavour to ward off this undesirable result, but with only partial success. She was very apathetic, seldom spoke unless spoken to and not always then, and her answers to questions were often apparently purely reflex. She had little or no initiative, never did anything unless told to do so, except go to bed. Indeed, she was always ready to do; seldom occupied herself, and the work she did was always of the simplest kind. Altogether she was more like a baby than a grown-up person. Occasionally she had little attacks of excitement, during which she was inclinced to strike and to break things. These attacks also
raised her to talk more and to be less stuporose, and during them she exhibited much more intelligence than during her usual state of stupor, and were the only indications that dementia had not definitely set in. These conditions lasted with little change for six months, and as there was no prospect of any material change except for the worse, it was decided to put her under treatment with thyroid. This was done in November, 1895. The dose was 1/5 gr. a day and this was continued for seven days. The physical reaction was quite distinct. The temperature and pulse are shown in the accompanying chart, and they indicate the effects of the drug in a most marked way. The temperature rose fully three degrees and the pulse-rate over 20 per minute, and these alterations remained more or less manifest during the interval since the drug was given.
and for a day or two more beyond it. No mental change was visible for the first four days, but on the fifth she appeared to be a little restless, more inclined to speak and more observant of what was going on. She did not sleep so well also. When the fever passed away and she began to go about again the improvement was more noticeable. She lost a considerable amount of her apathy, began to talk a little of her own accord, and her replies to questions were less mechanical. She took quite an interest in what was going on and then began to ask questions about her surroundings. A few weeks later the improvement became still more evident. She seemed to have entirely forgotten the events of the previous two and a half years, and had to undergo a gradual process of education so far as that period of her life was concerned. She had to learn the names of persons she had
seen daily for six months before she apparently had ever noted. Her expression of face, which formerly had been vacant or silly, became intelligent and alert. Physically there was also an improvement. Her weight, which had gone down 9 lbs. now began to increase; her skin became clearer and more healthy-looking and her hair less stiff and dry. She was still somewhat childish in her conduct and conversation, but this was evidently undergoing a daily improvement. About two months after the treatment she had a slight relapse and she became hysterical and emotional, eccentric and foolish, but this passed off in a week or two and her improvement then went on uninterruptedly. She was discharged in March 1896. At that time her mother declared that she was more intelligent and bright than she had ever been.
life, and the contrast between her condition then and a year before was sufficiently striking to all who had seen her at both periods. Since then she has kept well and is now filling her place in society like any other sane person. It case like this suggests many ideas regarding the pathology of mental diseases, but our knowledge on this point is as yet too obscure to make it profitable to enter into any consideration of these at the present time.

Mr. O. C. W. was admitted into the asylum in August 1875 at the age of 26 suffering from an attack of adolescent insanity which had first manifested itself four years previously. He had had a remarkably brilliant school career and passed very high into the Indian civil service. He was sent to Burma and got on very well for two years, but his health then began to break
donor, and he had an attack of what was said to be a stroke, though the symptoms were quite consistent with an ordinary attack of insanity. He was invalided home but could not settle to any work and gradually drifted into a more and more unsettled way of life until he was arrested by the police for an alleged theft. He was pronounced insane and sent to the asylum. On admission he was quiet in manner, but his conduct was eccentric and his conversation not always coherent. He had no specific delusions, but his mental state suggested the existence of some degree of dementia. After admission there was little change noted in his condition. He remained eccentric, incoherent, lazy, undisciplined, and insensible. Though it appeared evident that there was a considerable element of dementia in his mental condition and the prospect
of improvement was therefore not at all hopeful, it was decided to put him on thyroid. This was carried out on January 1896. The reaction to the drug, so far as the temperature was concerned, was comparatively slight, as only on three days was it above normal and the highest point reached was only 99°F. The pulse was more marked affected and rose in frequency from about 60 to above 90. He also lost considerably in weight, and his digestion was somewhat disturbed. Mentally there was little appreciable difference. After the treatment was over he gradually became a little brighter, less irritable, less irascible, and more lenient in speech, but still recalcitrant and suspicious. No further change was manifest in course of time, and though he was distinctly no worse for the treatment the improvement was so slight
Name: M. J. S. S. (Case 8)  Age: 31  Disease: Chronic Mania

Observations taken at: A.M. and P.M.

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Temperature (Fahrenheit):
- March 17: 106
- March 19: 104
- March 20: 102
- March 21-24: 104
- March 26: 102

Pulse:
- March 17: 88
- March 18: 76
- March 19: 74
- March 20: 78
- March 21: 84
- March 22: 90
- March 23-25: 84
- March 26: 100
- March 27: 104

Respirations:
- March 17: 88
- March 18: 76
- March 19: 74
- March 20: 78
- March 21-24: 84
- March 26: 100
- March 27: 104

Graph shows a fluctuation in temperature and pulse rates over the period.
as to be practically of little value. He went to another asylum in June 1896.

Miss S. was admitted in September 1890 suffering from an attack of adolescent mania at the age of 25. This ran a course marked by great variability, improvement followed by relapse occurring frequently, until in the course of two or three years symptoms of undoubted dementia set in and gradually became more apparent. Even at this stage, however, there were frequent attacks of excitement, and sedation was often necessary to control them.

In March 1896 it was decided to try the effect of thyroid. Sixty gr. were given daily for seven days but the temperature did not show much alteration, as only on two days did it rise above normal to 99.2°F. The pulse became much faster and weaker, rising
from 80 to 120 on the last day of treatment. Mentally there was no change whatever; the dementia remained as marked as before. A week after the treatment was stopped, she unexpectedly developed pneumonia and died two days later. This untoward result could not be directly attributed to the thyroid treatment, though it is quite possible that the physical effect which we know the thyroid always has may have reduced his powers of resistance, and so indirectly contributed to the pneumonia proving fatal. This is, however, an open question, but it leads one to think that great care should be exercised not only during the administration, but for some time after.

Miss J. G., age 43, was admitted in June 1893. She had suffered from depression for about three weeks before and suddenly she
had become very suicidal. Her last was an exceedingly prominent feature in her case and remained so for many months. The impulse was so strong at first that she seized nearly every opportunity to indulge it. Her favorite method was to twist the neck of her dress as tightly as to strangle herself. If allowed she would keep up the compression so long as to render herself black in the face, and she had in this way caused extensive congestion of both conjunctive. At first suicide seemed to be the only thing she thought of, but in about three weeks she became somewhat less restless, and rather inclined to be stuporose. This condition lasted for a few weeks but through it all the suicidal impulse was occasionally manifested. She then improved a little but again relapsed. This went on for several
months during which relapses and improvement succeeded each other at irregular intervals. At the end of this time she had improved physically but was still rather stuporose, slow in her movements, and taking a long time to think before replying to questions. The suicidal impulse was still occasionally manifest. At the end of another year there was not much change. She was still on the whole depressed, stuporose occasionally manifested suicidal feelings. As she was not showing much sign of recovery it was decided in November 1895 to subject her to thyroid treatment. She was given 60 grs. for three days and then 45 grs. for another four. The temperature reaction was very slight, the highest point reached being only 98.8° F. The pulse was more markedly affected and became somewhat irregular.
of the drug being diminished. The pulse remained affected for some time after it had been stopped. The mental reaction was slight, but it was distinctly in the direction of improvement. She became brighter, less stuporous, more observant and more talkative. The suicidal impulse appeared to be roused into greater activity, but it never became so marked as it had originally been and it soon again became dormant. The improvement noticed at the time of treatment advanced slowly for some weeks and then came to a standstill. She did not relapse, however, but kept the ground gained and for the past five years, though still somewhat stuporous, she is able to do work of various kinds, to read to answer questions, and to take an interest in what goes on. The suicidal symptoms have never been manifested, but she has not been
trusted in any way yet. There seems no reason to doubt that this permanent improvement was due entirely to the treatment with thyroid to which she was subjected.

The next case to be considered is that of Mrs. E. E. M., who was admitted in February 1894 at the age of 24 suffering from stuporose melancholia. She had been recently married and the cause of the insanity was pregnancy, though this was only made certain two or three months after her admission. Before marriage she had been a hard-worked governess and her physical health had been poor for some time. She got sleepless, depressed, restless and suspicious, and immediately before admission she attempted to commit suicide. On admission she was markedly depressed, and suffered from a vague fear that something dreadful was going to happen. She was slightly stuporose, but after a
few days when she got over the effects of the sedatives she had previously
got, this symptoms very largely passed off, though not entirely. In course
of time the improvement became
more manifest, and her depression
and apathy almost entirely left her.
In the beginning of July, however,
five months after admission she
had a relapse and began to suffer
from hallucinations of sight and
hearing. She apparently about this
time became aware that she was
pregnant, and the knowledge of
this reacted unfavourably on her.
She suffered much from headache
and sleeplessness, and there was a
good deal of constitutional disor-
dance. As time advanced her men-
tal symptoms became worse. She
got very delirious, especially in
regard to the identity of people she
had often met and consequently
ought to have known, and she be-
came peevish, capricious, jealous,
and very difficult to please. Her letters were very foolish and incoherent and contained much evidence of her delusions. Labour came on in the middle of September and was easy and uneventful. Immediately after she was much improved, took an affectionate and natural interest in her child, and was almost entirely free from delusions. It was noticeable, however, that her attention could not bear a strain for any long period. She could talk quite well and to the point for a few minutes and then she was apt to go off to some irrelevant subject. She returned to the asylum in a fortnight and the child was sent home. It first the improvement continued, but then ceased and she began to get delusional again. Her affection for her child got less and gradually she ceased to speak of it, or if she did it was with ill-will, and occasionally she expressed
the wish that she had strangled it. This condition of things continued during the winter and she remained in much the same delusional state, being occasionally angry, capricious or good-tempered as the mood seized her. Her manner was eccentric and sometimes silly and instead of being depressed, her emotional condition was gradually transformed into one of exaltation. She still occasionally had hallucinations of being sick. In the following spring she gradually improved and thus went so far that she was able to go to the convalescent villa and she did very well there for several months. Even at her best, however, she was still rather eccentric, absent-minded, apathetic and difficult to reason except occasionally when she got angry over some trifling affair or supposed slight. Again in winter she relapsed
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Name: Mr. J. M. (Case 10) Age 26 Disease: Hyp. Melancholia Result...
and became distinctly more lethargic, even stuporous, and apparently presented some symptoms of dementia. In the spring of 1896 she again improved a little, but as the change fell considerably short of convalescence, and did not advance beyond a certain stage it was decided to give her thyroid. It caused a considerable amount of gastric disturbance and could not be given in full doses nor for as long a period as was thought necessary on that account. The temperature reaction was slight and remained not above 99°F. Mentally there was not much change at first, but after she began to put on weight again a distinct improvement began to manifest itself. She became more natural in her manner took a greater interest in what was going on, and lost her delusions to a great extent. Her improvement steadily advanced until good hopes of her recovery began to be
entertained. After a few months, however, they were disappointed. She relapsed into her former condition, and the symptoms of dementia became more marked than ever. The previous improvement seemed to be nature's expiring effort to return to health, but the brain proved unequal to the task. The patient's heredity was bad, and the cerebral energy appeared to be exhausted before she was well out of the adolescent period.

The next case is that of Miss A. B. J. who was admitted in September 1894 at the age of 23. She had had an attack of insanity beginning some months previously with excitement which gradually passed into melancholia with stupor. On admission she was distinctly melancholic in expression, but as she would not answer questions it was impossible to ascertain
Name: Mrs. A. B. Y. (Case 11)  Age: 24  Disease: Syph. Melancholia

Temperature:
- Fahrenheit:
  - Data points: 96, 98, 97, 96, 95, 96, 97, 98, 99, 100, 98, 96, 95, 96, 97, 98

- Centigrade:
  - Data points: 36, 37, 38, 39, 40

Pulse and Resp.:
- Pulse:
  - Data points: 76, 78, 76, 78, 80, 76, 96, 92, 96, 94, 92, 94, 96, 98

- Resp.:
  - Data points: 100, 100, 99, 100, 99, 100, 98, 92, 94, 76

Observations taken at 12 A.M. and P.M.
what she was thinking. She was also stuporous and resistant and required artificial feeding as she would not take any food. After a short time she improved somewhat, the change always being more marked in the evening. For a time the improvement went on but a relapse came in two months. She became excited once more and then passed into a state of stupor. For some months this cycle went on and after each attack she became more stuporous, and the onset of dementia more and more apparent. On August 21st, 1895 she was put on thyroid, the dose being 60 grs. thrice daily. After four days sickness and vomiting became so bad that the drug had to be stopped. The temperature did not rise very much, but there was a quite evident reaction. The pulse-rate rose about 30 per minute. The course of treatment was much shorter than
was intended and this case illustrates well one of the drawbacks of the drug. Her digestion was always rather troublesome, but it was completely upset by the thyroid. At that time I had not tried any special method of getting over this difficulty. In later cases a denounced vegetable overcame it to all appearance completely. In those cases where were troubled by sickness the cause seemed to be the unpleasant and unusual taste of the thyroid when it was given in water alone. Allowing it wilt preserve is a good method of softening this, but the most effectual is to give it in beef tea or bouillon, which so warm lent not too hot. The efficacy of the thyroid, when the gland is partially cooked, which was demonstrated by Markman, Murray, and others, shows that the active principle can stand a certain amount of heat without injury. There is therefore no danger of
destroying its efficiency if it is given in warm soup or other such article of diet. This completely obscures the taste and in cases where there is difficulty in inducing the patient to take medicine it may be adminis-
tered in this way without his knowing. In such a method, how-
ever, it is necessary to see that the vehicle contents of the banni or cup are taken, otherwise the major part of the drug may be left in the bottom. In the case under discussion the drug was given for only five days. The mental results were not great. She improved a little for a time and then relapsed once more. The disease made fairly steady pro-
gress and six months later, when she was transferred to another asylum, she was in a state of partial dementia.

Mrs. M. P. was admitted in June 1894, suffering from an attack of insanity which had begun some months
previously and was associated with the chloracetic period. She had gradually become dull and depressed with occasional attacks of restless-
ness. When admitted she was still melancholic with a certain degree of stupor. She had delusions of various kinds chiefly concerning the identity of persons she saw, but there was difficulty in eliciting them as she replied to questions only after pressure and answered in a barely audible voice. She became in ad-
dition occasionally excited and appeared to have hallucinations of hearing. She took her food badly and lost weight steadily. There was little change for some months and in November 1894 she was put on a course of strychnoid. It had an almost immediate effect both physically and mentally. The temperature and pulse rose and she became very restless and excited. She would not stay in bed and talked violently.
and as a rule ineffectually. After four days she became so weak that it was decided to stop the treatment altogether. She soon quieted down and then manifested some little improvement. She was rather more talkative, less stuporose, and not so depressed. For a little while improvement was noticeable and then she began to cease progressing. During the following year she remained much the same, with slight ups and downs, but no substantial advance was made. It was accordingly decided in March 1896 to put her on a second course of treatment. Sixty grains were given for six days and once more the reaction was very distinct. The temperature and pulse-rate rose considerably, and she became rather restless, though less so than on the first occasion. After the treatment was over she again showed some mental improvement,
and this went on fairly steadily for a year. In May 1897 she was much more rational in her behaviour, was much less depressed, wrote regularly to her husband and had evidently got over many of her delusions. She had been in the habit for some time of getting up and going to the door every time any one came into the house, and the reason she gave for this conduct was that she thought it was her husband coming. This habit she had given up. She was also much improved physically. For the next three months she did not make much progress and she was then subjected to a rigid course of treatment. On this occasion she was given 15 grs. a day for two months. It made no change was apparent but gradually her emotional condition underwent a complete reversal. From being quiet and mildly depressed, she became lively, active.
talkative and smart in her conversation, and decidedly excitable. She went off her sleep somewhat also and got considerably thinner. At the end of two months the treatment was stopped as the excitement seemed to be increasing. After this she gradually settled down again and became almost well. Her emotional condition became practically normal, she occupied herself steadily, slept well and put on weight again. Occasionally she got a little excited, especially at entertainments and then she would talk a good deal but as a rule she was quiet and rational. At the present time progress is being steadily maintained.

This case exhibited a remarkable susceptibility to the influence of thyroid. On each occasion on which it was given it appeared to act as a direct cerebral stimulant, even in moderate doses. Other cases have exhibited something of the
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**Observations taken at 8 A.M.**

**Centigrade A. Hanl**

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same feature, but none in so distinct and unmistakable a form.

Miss H. M. age 21 was admitted in March 1896 suffering from an attack of adolescent insanity which had been in progress for several years. At that time she was in a condition of melancholic stupor, but there were also strong evidences of some degree of dementia. As she had remained in much the same stuporous state for some months and there were no appearances of any improvement, thyroid treatment was begun almost at once. The reaction was fairly well marked, both in respect of the pulse and the temperature, but as in some other cases the digestion was considerably disturbed and gave some trouble. The mental effect produced was not marked and did not at all correspond to the physical reaction. She improved a little, however; became
less stuporose, answered questions somewhat more readily, was able to do a little work and to look after herself better than she had done before. It was evident, all the same, that the dementia had progressed too far, and that the corresponding cerebral changes had become too well established to be influenced to any great degree. Still this case illustrates, as others have done, that even in dementia some good may result from thyroid treatment, and that after it the patient may be a source of far less care and trouble than before. The improvement was maintained for some time, but eventually the progress of the disease once more manifested itself and now the dementia is quite well pronounced. She is, however, better at present than at all likelihood she would have been had the thyroid not been given.
Mr. D.P. admitted in January 1896 at the age of 27 was then suffering from an attack of melancholia with stupor and occasional excitement. The attack had come on insidiously about a year before. He had got lazy at his work, attended revivalist meetings and often wandered about the streets at night. Immediately after admission he had an attack of congestion at the base of the right lung, but this soon passed off. It caused a considerable rise of temperature and some restlessness, which lasted for a fortnight. A month later he began to improve. He was quieter, less confused and more rational. This improvement went on until the beginning of April, when he relapsed into a condition of stupor with restlessness. This passed off and again he improved. He continued having these alternations for a time, the probable
explanation of this being that he indulged at times in the habit of self-abuse. In July 1896 he was put on thyroid and was given 60 grs. for six days. The temperature reaction was very marked and it did not abuse as expected when the drug was stopped. There was also a tendency towards an exhibition of an 'evening rise' as was seen in the case of Mr. C. B. (cited). He developed a slight cough and on examination of the lungs it was found that the former condition of congestion at the right base had returned. Previous to treatment it had appeared quite sound, but this case shows that great care must be exercised in the giving of thyroid in all cases where there is pulmonary weakness. He was in bed for some weeks, but ultimately the lung recovered and he came apparently sound again. He lost a considerable...
amount of flesh and did not regain it for some months. The mental
change produced was exceedingly slight. He improved a little after
the lung got better, but this was not maintained and during the
succeeding months he had numerous alternations, improvement
and relapse following each other at irregular intervals. On the
whole he has gone downhill and is evidently on the way to demen-
tia. This case was a complete
failure as regards any perma-
nent change for the better.

Mr B.S. was admitted in October
1895 at the age of 27. His insanity
had been in existence for at least
two years and had come on gradu-
ally and without any marked
symptoms at the outset. He was
in fact an almost typical case
of paranoia, though his age was
less than that at which this
disease usually manifests itself.
His heredity was very bad and altogether the prospects of improvement were not great. Thyroid treatment was given about a month after admission. It that time he was irritable, irritable, suspicious and apt to be impulsive, but he seemed to be quite sharp mentally. He would seldom answer a question categorically but always seemed to be suspicious of some hidden meaning in it. He insisted that there was nothing the matter with him but he would never occupy himself in any way, would often stand for hours at a time and refuse to sit down, evidently on account of some delusion, and would not converse with any one. The thyroid was given in doses of 60 gr. a day for six days but the reaction was slight in every way. Mentally there was a little change for the better, but
it was not marked. He became a little less suspicious, somewhat less unapproachable and more ready to converse, but still he had an evident mental twist. He remained in much the same mental state for several months, when it was deemed advisable to put him through a second course of treatment. This was carried out in July 1897. Again the reaction was slight and the temperature did not rise above 99.0° F. His physical condition was considerably reduced, however, and evidently the drug had had a marked effect in this direction. The dosage was the same but it was continued on this occasion for nine days, and this may have been the reason why he was so much affected by it. He took some time to pick up again, but even when he had done so there was practically little mental change. The
was not worse, and what little change there was was on the way of improvement. Still the result was on the whole a failure.

Miss J. S. was admitted in August 1895 at the age of 41. She was very depressed and had the delusion that she had killed the whole world. The physical condition was not normal as there was slight inequality and irregularity of the pupils, tremulousness of the tongue and exaggeration of the deep reflexes, all which symptoms indicated the possibility of gross brain disease. She was restless and slept badly. After admission the depression persisted with little change, but the physical symptoms became slightly modified. After some months her depression became somewhat less, and she was less restless. This was followed after a time by a relapse when she again became
very miserable and very delusional imagining she was dead. During the next year she improved and relapsed several times. The physical symptoms also underwent some improvement, but never entirely disappeared. In January 1897, when it was decided to subject her to treatment with thyroid, she was still depressed, had the delusion that she was a horse, was apathetic and slow in all she did and could hardly be got to answer questions. The reaction to thyroid was of a normal character for a time, but after the drug was discontinued the temperature did not fall. She complained of pain in her side, and on examination a localized patch of congestion and pleurisy was discovered. It is possible that the giving of thyroid may have been the cause of this preliminary condition, as we have already seen that it has a stimulating effect on chronic...
tuberculous processes, rousing them from dormancy into activity. On the whole it is not probable that it was so in this case. It is more likely to have been an attack of influenza, a number of cases of which occurred at the same time. She gradually got over the attack but it reduced her strength considerably. Mentally she was slightly better as the immediate result of the thyroid, and when she was able to get up and go about again the improvement became still more pronounced. She was much less depressed though still delirious, she took more interest in things, and was able to do work. This improvement has been maintained and has advanced slowly up to the present time so that although a complete cure cannot be claimed a very considerable change for the better has to be recorded as the result of thyroid treatment in this case.
Mrs J. G. was admitted in October 1896 at the age of 52, and suffering from slight mental depression. She had no delusions and her memory was quite good. She was rather hypochondriacal and somewhat given to taking a gloomy view of her case without sufficient cause. Her state of things had lasted for several years, though during this time she had often got over her dulness completely and been quite well, but had always relapsed again. The attack which she had on admission had lasted for nine months, and there were continued hopes that it too would have passed off, but it had not done so, and had lasted rather longer than previous ones. After admission she improved a little, because somewhat more cheerful especially in the evening, but was still disinclined to exert herself or to meet other people. She began to sleep better, but was still troubled
with headaches. She continued to improve a little though slowly and in the hope of hastening her recovery thyroid treatment was given in February 1897. The dosage was 60 grs. a day and it was continued for four days only, as her stomach wasinclined to be a little upset. The reaction was only moderate, and the loss of weight was small amounting only to four lbs. Mentally there was a slight improvement even at the beginning of the treatment. This was maintained afterwards, and she gradually got so well as to be regarded as convalescent. She left at the end of March, but could hardly be regarded as quite cured then, as there was still some degree of depression, though the major part of this appeared to be hypochondriacal. To all appearance she seemed likely to make a complete recovery before long.
Miss A.A. age 35 was admitted in December 1895 suffering from melancholia, which immediately before admission had taken a suicidal form, resulting from religious delusions. There was then a slight tendency to stupor, and, as is not infrequent in such cases, to a certain degree of melancholia, she was noticeably worse in the morning and it was then that the suicidal impulse was most manifest. Shortly after admission she became much worse, more depressed and more actively suicidal. This passed away in a short time but she then exhibited considerable variability in her mental state. At times she was better and this was followed by relative to depression with stupor and restlessness and occasionally with excitement. In a few months she got somewhat more stable, but remained depressed, melancholic and
Name Mrs A.A. (Case 18) Age 36. Disease Etc. Melancholia.

Result

1897
March

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Farenheit

- 102°
- 102°
- 104°
- 105°
- 106°
- 107°
- 108°
- 109°
- 110°

Centigrade

- 36°
- 37°
- 38°
- 39°
- 40°

Pulse

- 76
- 78
- 80
- 82
- 84
- 86
- 88
- 90
- 92
- 94
- 96
- 98
- 100
- 102
- 104
- 106

Resp.

- 16
- 18
- 20
- 22
- 24
- 26
- 28
- 30
- 32
- 34
- 36
- 38
- 40
- 42
- 44
- 46

Observations taken at A.M. and P.M.

EDW. CASEY, M.D. Design.

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in some respects sensitive. A year after admission she still suffered from religious delusions, could not enter into conversation and was still irritable. Her depression, however, had largely passed off and her mental state seemed to be mainly one of resentment against her fancied wrongs. As there were no signs of material advance during the next three months, she was subjected to thyroid treatment in March 1897. Her physical condition was then much improved and in every respect seemed to be healthy. The accompanying chart shows the physical effects produced by the drug. These were moderate, the highest temperature being 99.6°F. While the rise in pulse-rate was about 30 per minute at the worst, in both cases the greatest effect was apparent about the 7th day of treatment, and in the case of the temperature it remained
alone the normal for several days after the drug was stopped. The mental effects were very marked. Two days after the treatment was begun she became lively, talkative, laughed inordinately and without cause, and was distinctly excited. This state of matters lasted for several days after treatment was discontinued and then gradually subsided. After she began to go about and the excitement passed off, it was apparent that her mental condition had undergone some improvement. Her emotional condition instead of being one of depression was now more or less normal. She was somewhat less insociable and though still irritable and fidgety in her manner, there was improvement in this direction also. She was still resentful against her detention and declared that she was quite well. She had religious delusions, but these she
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Observations taken at 8 A.M.

Measured at 8 A.M.

Pulse: 66, 67, 69, 64, 68, 76, 79, 86, 96, 96, 94, 90, 90, 80, 80, 86, 76

Resp.: 72, 77, 77, 80, 84, 82, 86, 94, 94, 90, 90, 90, 90, 90, 90, 74
would never definitely formulate. She did not advance beyond a certain stage and it was accordingly decided in the following May to subject her to a second course of treatment. The dose of the drug was the same, viz. 45 grs. per day, and it was continued for eight days. The temperature reached in much the same way as before, and remained on this occasion also somewhat above the normal for two or three days after the drug was stopped. The pulse was not so markedly affected as before. The mental effect was also somewhat less, but there was the same tendency to excitement as there had been on the first trial.

This case seemed to show very clearly, as some others also did, the direct influence which thyroid has on the brain apart from those which may be regarded as secondary, such as the fever and the increased metabolism. Certain cases exhibit it more markedly than others, and
in the one under consideration it was very evident. Though the initial idea was giving thyroid was to induce a feverish condition, it has been discovered that in addition to its power of causing this change it has also a directly stimula
ting action on the cerebral cortex. Nearly all cases exhibit this reaction to some extent, but in some the tissues of the cortex seem more susceptible to the influence of thyroid and in these a condition of sub-acute excitement is manifested. This must be distinguished from another feature of the action of thyroid, viz. the tendency which it has to reproduce the mental condition which exists at the onset of the attack of meningitis. It is possible that both may be due to the same cause, but results are certainly different. After the second course of treatment there was a further improvement in Moidi's
mental condition. This was not so apparent to the staff of the asylum as she continued in an attitude of resentment towards them, and would seldom speak to them, but to her friends the change was more apparent. With them she talked freely and repressily, so much so that they took her home after the lapse of a few months. She could hardly be considered as cured, however, as her manner and conduct were not quite natural nor rational, and it seemed likely that she would remain in a delusional state for some time at least. There was no doubt, however, about the substantial improvement effected by the thyroid.

The case of Mrs. M. was a most gratifying one as it revealed in a complete cure, and there is no doubt it was due solely to the effect of thyroid feeding. She was admitted in July 1896 at the age
of 34, suffering from an attack of melancholia of several months duration. This was not very profound but it had lasted for some time and the patient had got into a somewhat hopeless condition about herself. She suffered from melancholic delusions, e.g. that she had no money, and that she had neglected her children. She deserved punishment for it. The cause of the attack appeared to be the exaggeration due to lactation. After admission she improved a little and began to take some interest in things outside herself and to do some work. This improvement went on for a time, but she could never throw off the depression which she had had, though the delusions disappeared after some months her progress came to a standstill, and in March 1897 it was decided to give her the thyroid treatment.
grs. were given for three days and 45 for another three. The reaction was fairly well marked both as regards the temperature and pulse (see chart). On the fifth day of treatment the temperature rose to 100° and a rash appeared on the face. During that day she had been perspiring freely and it is probable that the rash was associated with this, as it had the usual characteristics of such an eruption. It took the form of a slightly papular erythema, and passed off in the course of a day or two. It was the only case in which such a thing occurred and it did not appear to have any special significance.

The loss in weight was considerable, amounting to 12 lbs. The mental effect produced was remarkable. Three days after treatment ceased she went to sleep feeling in much the same depressed state as before, but when she woke on the following
morning she felt as if a cloud were lifted off her mind. The depression was gone and she could hardly realize the complete change that had come over her mental outlook.

For a few days she was apparently quite well, but after that a slight degree of excitement and excitement was apparent. It was perhaps natural in the circumstances, but to some extent it was morbid. In a short time it became more

what modified, but for some weeks longer she was rather more excitable, talkative and energetic than was her wont. Otherwise she was quite well, and her husband confirmed this opinion when he saw her. After four months she was discharged practically well. For some time after there were some evidences of slight hyperactivity in her mental actions, but ultimately this completely passed off. There is no doubt
that this case may fairly be claimed as a success for the thyroid treatment. The improvement was so immediately connected with it and had failed to be manifest from every other means of treatment that had been tried, that there could be no doubt as to the cause and effect. She herself was fully persuaded that the thyroid had cured her, and wished all the other patients to get it forthwith.

Miss J. K. C. was admitted in September 1896 suffering from an attack of adolescent miscarry which had been in progress for a little over a year. She was then 25 years of age. At the onset of the attack she had been depressed and agitated with melancholic delusions chiefly of a religious character. For a while the depression increased, and she got restless and excited as well. After some months
the depression diminished, but the excitement got worse and she became most troublesome, being violent, noisy, destructive and most difficult to manage. At that time she was in an asylum, but the task of looking after her was so great that arrangements were made to have her transferred. She came well, a very bad reputation and quite fulfilled it. She was usually morose, taciturn, idle and lazy, but every now and again she became excited, sulked, threw the furniture about, struck, bit and spat upon the nurses if they came near her, and altogether was in a typical state of acute mania of the furious type. It seems she was somewhat more rational and would answer questions as if she were well pleased with herself. There was seldom any evidence of mental depression. Various measures
Name: Mrs. J. H. C. (Case 20.)  Age: 28.  Disease: Acute Mania. Result:

1927
April

10 11 12 13 14 15 16 17 18 19 20 21 22 23

Observations taken at 7 A.M. and 7 P.M.
were tried to bring about some improvement, but they were only very partially successful. She gained some weight and her appetite improved, but the attacks of violence and excitement still continued. In April 1897 it was resolved to give her thyroid. Sixty grains were given for six days, but the reaction to all appearance was exceedingly slight. The temperature did not rise above 99.2°F. and the pulse remained practically the same. There was, however, a considerable physical change evidenced, as she became much thinner and was very weak for a twain. Her digestion was feeble and remained so for a week or two. In a month her physical state began to mend, and it was only then for the first time that signs of a decided mental change began to be apparent. She became quieter, and the attacks of excitement less frequent and violent.
she was still morose, taciturn and idle, but seemed to be more ob-
erservant. As time went on the im-
provement also advanced. She began
to talk more freely, her attention
was more alert and the excitement
gradually relaxed. In two months,
she conversed more freely and quite
rationally, though her memory
was not very good and she was
depressed and slightly stuporous.
She did not remember anything
of her illness and took some time
to grasp her surroundings and
the course of events. A week or two
later she was transferred to a
convalescent villa and there con-
tenued her progress until she was
quite well. Even at her best, how-
ever, it is questionable if she was
quite the same in all respects as
she had been before her illness.
This is hardly to be wondered at
considering the severity of her attack
and the length of time (nearly 2 years).
which it lasted. She kept well for several months and then she had a slight relapse, becoming sleepy, rather restless and more moody. At the present time she is slightly better again, and it is hoped that this relapse may pass off, as it is slight and shows signs of lessening. A relapse is not altogether to be wondered at seeing that all insanity has a tendency to be recurrent, and that thyroid cannot be expected to completely alter the brain constitution. This patient had also a very insatiate tendency to combat and doubters this and further handicaps her.

Mrs. J. M. Y. was admitted in May 1897 at the age of 46. She had been ill for over 14 years, the attack beginning with depression followed by excitement. At the time of her admission she was depressed with a large element of stupor associated
with this and also some suggestions of dementia. She was very slow in everything she did and if made to do anything quicker than she was inclined she became resistive. She would hardly reply to questions at all, and did so only after persistent pressing. Her mental processes were slow and her observation and attention defective. This was evidenced by her on one occasion knocking her head against a door until she had not observed to be open. She slept badly and was inclined to be restless at night, getting up frequently and wandering about her room. As she had been in practically the same condition for many months, it was decided not to wait longer but to put her under thyroid at once. This was begun on May 20th and the dosage was 45 gms. daily for six days. The temperature reaction was well marked and showed a
rice of a little over 30°F. The pulse-rate also increased over 20 per minute. While the thyroid was being given she was somewhat more restless and seemed to be directly affected mentally by the drug. This however soon passed off and in a few days signs of improvement began to be manifested. She was less slow in her mental processes and her attention was decidedly more on the alert. She spoke on her own initiative occasionally, which she had never done before and replied to questions without her previous hesitation. The improvement went on steadily for a time, especially after she began to regain the weight she had lost. In sixty she wrote two letters, which she had not done for months, and these were quite rational, maternal and well expressed. She also joined in amusements though not quite willingly and she was rather slow in her
reaction, but insignificantly. It was noticeable that she was markedly better at night. After a certain point she ceased to advance so rapidly, but for a considerable time improvement went on, and at present there is no doubt that she is considerably better than she was before the treatment was undertaken. It is uncertain in cases in which another course of treatment would be advisable.

Mrs. H., age 31, was admitted in March 1897 suffering from an attack of insanity which had begun five months previously, and had been caused by childbirth. At the onset of the attack she had been very excited, but this condition soon passed off and at the time of admission she was in a state of melancholia associated with stupor. She was unable to do anything for herself, had to be dressed and fed, would not speak, and had a decidedly vacant expression. Her physical
Health was poor as she was ill-nourished and pale. There was a slight enlargement of the thyroid which had come on during pregnancy and had remained since then. The mental state on admission had undergone no change for three months. After admission she improved a little and answered questions though very slowly, and only after much pressure. A little later she relapsed again, became silent and evidently had hallucinations of hearing. In the beginning of May there was practically no improvement and it was then that thyroid treatment was begun. The method adopted was not, however, the usual one as she was given only three tablets a day and this was continued for five weeks. There was no temperature reaction and the pulse did not undergo any appreciable change. For three weeks there was no mental change observable.
but after that she began to brighten up a little. She was less stuporous, her expression became more intelligent and she began to talk somewhat more and with less hesitation. Early in June there was a decided change for the better, and when the thyroid was stopped in the middle of June she was so far well as to be regarded as convalescent. Her memory of events which occurred during her illness was a complete blank, and she had no recollection of having left home at all. From this time she progressed uninterruptedly until the end of July when she left practically recovered. The condition of the thyroid gland had undergone no appreciable change during the whole time of her residence.

It is of course open to question whether the recovery in this case was due to thyroid at all. Cures such as hers are known to be
eminently recoverable and it is quite possible she might have recovered without having had the treatment. A single case cannot of course prove one of the other conclusions, but as other cases have shown that small doses of thyroid given for a comparatively long time are sufficient to produce meatal effects, it is, I think, legitimate to look on this case as one of recovery from such a use of it. It is also a point of interest in the case to note that the thyroid gland, which was enlarged on admission, underwent no change that could be detected.

Another case in which similar treatment with thyroid was tried was that of Miss I. E. She was admitted to St. Elizabeth's Hospital in July 1896 at the age of 28 suffering from a considerable degree of melancholia with numerous delusions. This had lasted for more than a year and
her state had undergone little change for some months. When admitted she was visibly much depressed, said she had arrived beyond for-
giveness and evidently was quite hopeless of ever being any better. She complained much of indiges-
tion, but this to a large extent seemed to be fictitious. There was some blueness over the apex of the left lung with muffled breath-
sounds. Her condition underwent very little change in spite of vari-
ous attempts to improve it. Her sleep improved but continued
rather variable and her physical condition also got rather better, in spite of her rarest protests against
the amount of food she was given.

In August 1897 when thyroid
treatment was begun she was still
very depressed, thought her soul
was lost for ever and went about
in a mechanical cheerless way
as if all her interest in life was
gone. During the treatment, which consisted of 15 grs. daily for over two months, she improved steadily. She became gradually less depressed and more active and more mentally alert. She took a more natural interest in her relatives and in amusements at the asylum and was able to talk about other subjects than herself. In October she was comparatively well and left at the end of that month. She had then a surge of melancholy in all her mental processes and it appeared as if there was a certain degree of permanent mental damage. But there could be no question about the fact that she was vastly improved as what she had been and it seemed as if the thyroid should be credited with the change. The reason why small doses rather than large were given in this case was because of the suspicion of pulmonary phthisis. The treatment had no prejudicial effect whatever on this condition.
Mr. B. K. was admitted in February 1896 at the age of 19. Five months before he had an attack of mania from which he partially recovered, but he remained for some weeks apathetic, listless, unsettled and slightly depressed. On admission these symptoms were still present and there were also evidences that pointed in the direction of some mental enfeeblement being present, though it was early in the attack to conclude this with certainty. For some months he remained the same, and then began to improve a little. He was less unsettled, more natural in his manner, and able to talk more rationally. This improvement went on for some months, though at the best he was by no means well, and showed a distinct mental want. He was removed hence in September 1896 but did not do at all well there. He was idle, lazy, foolish in his behaviour and utterly unable to carry
through any piece of work satisfactorily. He took silly ideas into his head and tried to carry them out in a feeble way. He was sent back to the asylum in December of the same year. For a time after his re-admission he was rather exalted and excited, wrote poetry of which he was very proud, but altogether he gave the impression of weakness. In May 1897 thyroid treatment was begun, and 50 gms. of the drug were given for seven days. The reaction was slight except in regard to the pulse which was distinctly affected. He was considerably reduced physically and took some time to recover from this, but he did so in a few weeks. Mentally there was practically no change produced. He was a little better for a while, but this did not last long and he soon relapsed into his former state of apathy, silliness and occasional restlessness, with
strong suggestions of approaching dementia.

Mrs. A. D. L. was admitted in June 1896 at the age of 34 suffering from melancholic delusions. Her illness had been in progress for several months and had been characterized chiefly by delusions that people were talking about her and trying to make mischief between herself and her husband. On admission she was suspicious about various trifling things and had the delusion that medicines given to her made her do things she would not otherwise have done. She was in an acute but not ill-nourished condition. She complained of frequent pains in the top of her head; her pulse was rapid and there was a soft mitral systolic murmur probably of functional origin. For a time after admission she continued to manifest delusions of various kinds, but very similar to those she had had.
At times they were the occasion of attacks of violence and excitement as she would accuse the servants of making mischief between herself and her friends and once or twice she attacked them in consequence of this belief. It was also apparent that she had hallucinations of hearing as her delusions seemed to result from what she imagined she heard.

Her physical state gradually improved, but her mental condition underwent only a slight change for the better. She remained unsettled, delusional, suspicious and idle, and occasionally was excited also. Sometimes she became excited and imagined herself to be a person of great importance, though she did not say who she was. Her delusions gradually became less prominent, at least she ceased to speak of them though usually she gave utterance to them when the hallucinations of hearing were strong. After a year
there was practically very little change beyond that mentioned, so it was agreed to give her thyroid. This was done in June 1897. The dosage and reaction are shown in the accompanying chart. The temperature change was fairly pronounced, the highest point reached being 99.8°F on the sixth day of treatment. The nurse stated that during the first day of the patient's being in bed and before treatment was begun she seemed a little better, but the change was only slight. The day after treatment ceased she was decidedly better. She was much more natural in her manner and conversation, was brighter and less suspicious, never gave utterance to any delusions, and seemed to have got rid of the hallucinations of hearing. Her headache also, which used frequently to be present, was not now complained of. She began to read and to do some work, which
she had never done before. Four days after there was a return of her former excited manner and she was unreasonable and had slight headache. This state lasted for a few days and then she improved again. During the succeeding four months she had a succession of improvements and relapses, but on the whole she made progress. In November 1897 she was less suspicious, less delusional, less subject to hallucinations, more industrious and more natural in her manner. During the succeeding months there was little further advance and lately there has been a tendency to fall back. In this case there was no doubt a considerable improvement due to thyroid treatment, but it was only partial and the good effects seemed to be temporary. It seemed a case in which a second course of treatment was advisable.

Mrs. D. M. admitted March 1897 at
the age of 28 was suffering from an attack of acute melancholia brought on apparently by pregnancy. She was in her seventh month and had been somewhat depressed for a few weeks, but then got much worse and attempted suicide, by throwing herself in front of a train. Her foot was so injured that it had to be amputated and the shock brought on premature labour. When admitted, she had just recovered from the injury and subsequent labour. She was still very depressed and in a state of stupor also. She would not speak and replied to questions only by nodding or shaking her head. She was quite able to comprehend what was said and the silence seemed to be the result of some deliberation. For a day or two after admission she refused food and had to be fed by the tube. A week after admission she began to speak a little but with a marked stammer.
after ten days this passed off and she also showed considerable mental improvement. She was no longer restless, spoke quietly and rationally and slept well. Progress continued for about two months and then she began to get more depressed and very suicidal. During the next month she got still worse and more restless, she remained very depressed and very suicidal for some weeks longer and then improved a little. Thyroid treatment was begun in July 1897. As a result of this the mental symptoms underwent a considerable change. Instead of being depressed she became lively, well pleased, talkative, and no longer in the least suicidal. The excitement then got rather excessive and she shouted and sang and developed a state of acute mania of the hilarous type. This gradually passed into a mania of the angry type and she shouted and scolded most of the
day and the night as well. She refused food again and once more had to be fed by the tube. This symptom soon passed off and she began to take food ravenously. She put on weight rapidly and coincident with this there was a steady improvement in the mental condition. She became much quieter, talked more sensibly and began to do a little work. She then had a slight relapse but from this she again began to recover and at present she is almost well, except that at times she has outbreaks of slight excitement, which however do not last longer than an hour or so. This case is an exceedingly interesting one as the thyroid was given at a time when the symptoms were still acute, and not as had usually been the case when they were in a state of quiescence. The result was encouraging, though there was undoubtedly a risk in
giving a drug which is known to be a powerful agent in reducing body weight to a person who was emaciated and exhausted from previous excitement and refusal of food. The change in the character of the emotional condition was also a very remarkable one. At present she seems likely to make a good and complete recovery.

Mr. E. J. C. was admitted in October 1895 at the age of 50 suffering from an attack of melancholia which had lasted for several months, but had only become decidedly noticeable a short time before. It was brought on by recurrences of a severely trying kind and probably also by the association of these with the climacteric period. Shortly after admission he developed strongly suicidal tendencies and for some months there remained very prominent symptoms. He was uniformly depressed and nothing could
house burn out of this. After six
months he was a little better, but
still depressed and unable to think
there was any chance of his ever
being better. For about a year after
this he improved slowly and steadily.
His physical health was excellent
and his sleep, which had always
been rather bad, got much better.
It was noticeable, however, that a
bad night always made his melan-
cholic delusive return, and he was
as a rule more depressed in the
morning. In April 1897 he had a
relapse. He began to have hallucina-
tions of sight, and unaided he saw
faces on the wall. He was also mis-
perceptive and occasionally struck his
attendant without anger and with
out any reason that even he himself
could assign. His sleep again became
broken. This state of matters lasted
 till July when he was put on
thyroid. He was given 60 gns. daily
for six days, but the reaction was
only moderate. It produced some restlessness, but there was no in-
crease of the melancholic condition.
She soon picked up in physical health, but for some time there
was no corresponding mental change.
About four months after she began
to lie a little better, but it is doubt-
ful if this could be attributed to
the thyroid treatment. At present
she has gone back somewhat and
is showing signs of dementia
which it is feared may deepen.

Mrs. M. S. D. was admitted in February
1897. She was 34 years of age and had
been more or less depressed for several
months previously. This began shortly
after her marriage which was in every
way a desirable one as far as her posi-
tion and comfort were concerned,
through her husband and was not perhaps
so refined as feeling as she was herself.
Previous to it she had been rather run
down in health through nursing
a relative and she had left home with
a feeling that it was perhaps more her
duty to remain and nurse her mother.
On admission this feeling had grown
to be a delusion as she said her pre-

cent illness was a judgement on her
for having left home. She was distinctly
restless and unable to
settle her mind on anything. She
suffered a good deal from headache
usually in the occipital region. After
admission she began to improve a
little and continued to do so steadily.
She lost her restlessness, began to
interest herself in other people and
was not nearly so depressed as she
had been. Six months after she was
very much better in every way, but
still she felt that she had no enjoy-
ment in life, and could not alto-
gether throw off her depression. This
state of matters lasted for sometime
and as there was no immediate
prospect of further improvement
she was given thyroid treatment.
She got 60 grs. a day for four days.
The temperature reaction was fairly marked, but the pulse-rate did not alter much. It changed its character, however, in the typical way. There was a threatening of sickness, but it did not last long. No change in her mental state was apparent for about three weeks, but then she began to improve, and this has continued up to the present time. She is now bright, active, interested in all that goes on, but somewhat reluctant to confess that she is better. She has, however, visited her house, which for a time she was afraid to do, as she thought it would upset her, but no such result followed. Indeed, she was rather the better for it. She is now practically well there is no depression, and both physically and mentally she is sound.

Mrs. M. was admitted in May 1897 at the age of 39. She was then much depressed, had lost interest in all
her home affairs and her children and could not force herself to do any work. This condition of things had gradually been growing during the previous two months, and had followed childbirth. She was much run down physically: she was thin, pale, and flabby, and her appetite was very poor. She was distinctly suicidal and had made an attempt to strangle herself. After admission she was still very depressed, and made other attempts at suicide, chiefly by strangling. She remained in much the same state for two months, and then began to improve a little. In the middle of July, she unexpectedly had an epileptic fit, the first and only one she ever had. It was of the ordinary character and not very severe. After it she still continued to improve, though slowly. In September she was fairly well, but still a little depressed and delusional, and taking only a languid interest in things. Next month she
Name Mrs. M. (Case 29)  Age 39  Disease Suic. Melancholia Result

FAHRENHEIT

1897 Nov 25 26 27 28 29 30 1 2 3 4 5 6 7

Urine 60 grn.  do.  do.  do.  do.  do.

Pulse 64 60 62 60 62 60 64 64 60 60 60 60 60

Resp. 18 18 18 18 18 18 18 18 18 18 18 18 18

Observations taken at A.M. and P.M.
had a relapse but not a serious one. She remained in the same state when she was put on thyroid treatment on 26th November 1897. The reaction was fairly well-marked there was also an almost immediate mental change for the better. She got less depressed and more restless in her manner, and took a more active interest in everything. A fortnight later there was no doubt about the improvement. She was better in every way. She wrote letters to her friends, which she had never done before and was brighter and livelier. After a month her progress became slower, but was fairly steady. At present though still improved to look at the dark side of things and to lack initiative, she appears likely to make a good recovery in time.

Mrs. J. N. age 30 was admitted in June 1897. She was suffering from utter melancholia.
with great restlessness. The attack had begun eight months before during the puerperium and was manifested at first by excitement and violence. This soon passed off and she became much depressed and suicidal. The depression took an excited form and this lasted for some months. She then improved a little, but once again the excitement returned in an intense form. She lost flesh very considerably and seemed to be going from bad to worse. When admitted she was fairly quiet, and would not say much in answer to questions. Her expression was melancholic and she was little and dejected in attitude. She cried a good deal but would not say for what reason. She evidently was observant of what was going on. Very soon after, she became restless and did not sleep
at all well. She had some delusions connected with the hour of 12 o'clock at night, as she never would go to sleep until that hour was over, when her restlessness also moderated. After a time she confessed that she thought the world was going to come to an end each night at 12 o'clock, and only after that hour was passed did she feel safe. For a time the excitement grew greater and she got so weak that it was necessary to keep her in bed. This seemed to suit her, as she was quieter there than when going about. The excitement, however, continued fairly acute and various medicines were tried to overcome it. Sedatives of various kinds caused some improvement, but it was only temporary. Opium suited her best, but the good effect from it did not last long either. In December 1897 she was put under thyroid
treatment. It that time she was still very depressed, had the delu-
mon that she was cursed and was doing harm to everyone
round her, was occasionally restless, wriggling her hands
and pulling her hair, a picture
of misery. The temperature reaction
was not great, though doses of
60 gns. were given for six days.
the pulse was more incidently
affected. Mentally the drug seemed
at first to cause some aggravation
of the symptoms. She was
somewhat more restless and
her sleep again became disturbed.
A week after it was stopped, she
was, however, considerably better.
She was quieter, less depressed,
would answer questions if
pressed, and read a little, but
only when she thought she was
unobserved. She slept better, and
after the slight sickness produced
by the thyroid was cured off, she
took her food much better. This improvement went on steadily for some weeks and she began to occupy herself a little. There was still a tendency to restlessness when she was up, as had always been a feature in her case. At present she is considerably improved compared with what she was, but still she is depressed, delusional and apt to get excited. There is no doubt of the existence of a change for the better, which is due to the thyroid treatment.

The next case is that of Miss J., age 35, admitted in December 1896. Her illness had lasted only four days. She had been acutely excited as the result of delusions, but she had been too incoherent to express them connectedly. For several days she remained in a very excited condition and then became quieter. She expressed excited delusions about herself and
her attitude and conduct were quite in accordance with these. Three months later she was still better, able to occupy herself, less delusional and more rational in every way. This improvement went on for some three months more, when she began to get depressed. She would hardly speak, and was very quiet, though she occupied herself steadily. During the next few months she got still more depressed and became almost stuporous. Her extremities were blue and cold and her weight decreased somewhat, though she did not become thin, as she had previously been very stout. In December 1897 she was put on thyroxin, 50 grs. a day for 6 days. The reaction was moderate (see chart). On the third day of treatment she began to brighten up somewhat, and gave expression to some of her former delusional.
this soon passed off, however, and there was then a decided change for the better. A month later this was still more marked. She was active, industrious and cheerful, and did not give expression to any delusions. It present she is not quite so well, as she has developed hallucinations of sight and hearing and these have rendered her more delusional than before. It is hoped that there may be only temporary though she has not yet quite recovered, this patient improved in a very remarkable way after the thyroid treatment and may be regarded as a comparative success.

Miss J. M., admitted in April 1897, age 35, was suffering from melanchoolia with numerous delusions. Her illness had begun several months before and was immediately caused by the death of
her mother, whom she had never
and to whom she was very devoted.
It came on gradually, first with
simple depression and then with
delusions of various kinds accom-
panied by restlessness and rest-
lessness. Latterly she had been
almost entirely refusing food,
because she thought it was
poisoned. On admission all
these symptoms were present
in a prominent form. Her
delusions having reference to
her food, so her having been
upset and to her having been
thought guilty of some crime.
Physically she was anemic and
thin. After a few days her sus-
pications and her restlessness
became even greater than they
had been, and as she refused food
altogether it was necessary to
have recourse to artificial feeding.
For two months she remained in
much the same condition, still
depressed and still delusional, but taking her food a little better, though still suspicious of it and under protest, as she knew it would be given to her if she did not take it herself. About that time she began to develop delusions of a grandiose type, asking in a haughty manner if we knew who she was. She never gave definite expression to the idea which prompted this question, but from her expression it was obvious that she thought herself a person of some importance. This state of matters continued for some months, her mental state being one of partial confusion, impulsiveness, restlessness, accompanied by delusions of a mixed kind. She improved considerably in physical condition, but there was no corresponding mental change. In January 1898 it was re-

solved to subject her to the thyroid
Name: Miss J. M. (Case 52)
Age: 35
Disease: Renal Malignant Oedema
Result:

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Temperature:
- FARIENHEIT
- CENTIGRADE

Pulse: 70
Resp.: 100

Signature: F. W. CASEY, M.D.
treatment. She was under this for eleven days, getting usually 50 grs. per day. The physical reaction was fairly typical (see chart). Mentally also there was a considerable effect produced. For the first day or two she was rather more restless and excited and at times became almost hysterical, and she did not take her food without pressure. After three or four days she improved, became much quieter and less hysterical, spoke more rationally and took her food well. This improvement continued after the treatment was stopped and she began to go about again. She was visited by her relations and spoke quite rationally to them, never mentioning any delusions. About a month later, however, she became worse again, sensitive, melody, refusing her food and reverting to her former delusion that she was accused of some crime. This state
of matters lasted for another month, when she was removed hence. This case was undoubtedly benefited by the treatment, but the good effects appeared to be only temporary. She seemingly belonged to a class of case in which the thyroid has only a partial effect, so far as cure is concerned.

The next case to be discussed is that of Miss B. Y. She was admitted in November 1896 at the age of 44 and was then suffering from considerable depression. She was listless and apathetic and could not settle to anything for even a few minutes at a time. Her physical condition was poor and her nutrition bad. Her illness had existed for about a year and the symptoms had been much the same all the time. There had been a gradual incipient deterioration and she had undoubtedly indulged in self-abuse, which habit
had become worse. After admission she exerted some amount of self-control and was better for a short time, being less idle and more correct in her habits. She then got somewhat worse again, her appetite became poor and she went off her sleep. In January 1897 she was given ovarian globoids for three weeks, but they effected practically no improvement. During that year she remained much the same, being depressed, restless, idle, careless in her dress and in her habits of cleanliness and with various delusions, which, however, were never quite fixed. In January 1898 thyroid treatment was begun; she was given 60 grs. for six days and then 75 and 90 for two more days, but the temperature reaction was very slight, and the pulse also was not very markedly affected, though to a greater degree
than the temperature. Mentally there was practically no change. For a few days she was a little better, and every effort was made to get her out of her state of idleness and apathy, but with only very partial success, and she soon relapsed into her former condition. This case was an entire failure so far as any beneficial result of the thyroid treatment was concerned. The reaction both physically and mentally was comparatively slight.

The last case to be described is that of Mrs. E. R., age 60, who was admitted in June 1896. She had been ill for three years previously with melaneridia, chiefly associated with religious delusions. She believed she had taken money which did not belong to her, and had ruined beyond forgiveness. She imagined detectives were investigating her crimes and
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**Observations taken at**

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that they would soon come to
take her to prison. She often ex-
pressed the wish that she were
dead. She was restless and could
not settle to anything. This state
of matters had been gradually
getting worse. For over a year
she remained in much the
same state and then she began
to improve slowly, though slightly.
She became somewhat less rest-
less and took more interest in work
and in other things besides her
own depressed ideas. She would
always, however, refer upon her
delusions whenever she was spo-
ken to and refused to confess
that she was any better. In Jan-
uary 1898 she was put on thyroid
and given 60 grs. for six days.
There was a sharp physical re-
action. The temperature rose
considerably and she complained
of throbbing pain in the head
and limbs. The skin was hot and
dry, but when she was given a mild diaphoretic, perspiration set in and she felt much easier. She did not sleep so well, but mentally she was more cheerful and less absorbed in herself. There was no doubt about the improvement in her state, and thus was still more evident when she got up and began to go about again. She was still depressed but she was able to think of other things besides herself and her own ideas, and took an interest in the other patients. At present she is doing well and seems likely to improve still further.

Having given the facts of the cases in which thyroid treatment was tried and the details of the results, it is now possible to see what conclusions can be drawn from them. It will only facilitate matters if, before proceeding further, a table is given showing most
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<td>Recovery</td>
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<td>Ci. Mancia</td>
<td>420</td>
<td>Moderate 99.2/124</td>
<td></td>
<td>No change</td>
</tr>
<tr>
<td>9</td>
<td>Mr. G.</td>
<td>45</td>
<td>Cuba, Melan.</td>
<td>360</td>
<td>Slight 99.8/120</td>
<td></td>
<td>Distinct improvement</td>
</tr>
<tr>
<td>10</td>
<td>M. D.</td>
<td>20</td>
<td>Cuba, Melan.</td>
<td>240</td>
<td>Slight 99.8/104</td>
<td></td>
<td>Distinct improvement, (Temporary)</td>
</tr>
<tr>
<td>11</td>
<td>Mr. D.F.</td>
<td>24</td>
<td>do.</td>
<td>300</td>
<td>Slight 99.0/124</td>
<td></td>
<td>Slight improvement, (Temporary)</td>
</tr>
<tr>
<td>12</td>
<td>Mr. H.P.</td>
<td>47</td>
<td>do.</td>
<td>240</td>
<td>Decided 100.0/112</td>
<td></td>
<td>Slight improvement</td>
</tr>
<tr>
<td></td>
<td>M. of D.</td>
<td>49</td>
<td>Stup. Melan.</td>
<td>260</td>
<td>4</td>
<td>Decided</td>
<td>100</td>
</tr>
<tr>
<td>---</td>
<td>----------</td>
<td>----</td>
<td>--------------</td>
<td>-----</td>
<td>---</td>
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<td>-----</td>
</tr>
<tr>
<td></td>
<td>do.</td>
<td>50</td>
<td>do.</td>
<td>960</td>
<td>60</td>
<td>None</td>
<td>Normal</td>
</tr>
<tr>
<td>13</td>
<td>M. of D.</td>
<td>21</td>
<td>do.</td>
<td>360</td>
<td>6</td>
<td>Decided</td>
<td>1000</td>
</tr>
<tr>
<td></td>
<td>do.</td>
<td>27</td>
<td>do.</td>
<td>360</td>
<td>6</td>
<td>do. 100</td>
<td>0 116</td>
</tr>
<tr>
<td></td>
<td>do.</td>
<td>28</td>
<td>do.</td>
<td>540</td>
<td>7</td>
<td>do. 90.5</td>
<td>104</td>
</tr>
<tr>
<td>16</td>
<td>M. of D.</td>
<td>43</td>
<td>do.</td>
<td>360</td>
<td>6</td>
<td>Moderate</td>
<td>1000</td>
</tr>
<tr>
<td>17</td>
<td>M. of D.</td>
<td>52</td>
<td>Viz. Melan.</td>
<td>240</td>
<td>4</td>
<td>Slight</td>
<td>99.5</td>
</tr>
<tr>
<td>18</td>
<td>M. of D.</td>
<td>36</td>
<td>Seri. Melan.</td>
<td>315</td>
<td>7</td>
<td>Moderate</td>
<td>99.5</td>
</tr>
<tr>
<td></td>
<td>do.</td>
<td>36</td>
<td>do.</td>
<td>360</td>
<td>8</td>
<td>do. 99.6</td>
<td>96</td>
</tr>
<tr>
<td>19</td>
<td>M. of D.</td>
<td>35</td>
<td>C. Melan.</td>
<td>210</td>
<td>6</td>
<td>do.</td>
<td>1000</td>
</tr>
<tr>
<td>21</td>
<td>M. of D.</td>
<td>46</td>
<td>Stup. Melan.</td>
<td>270</td>
<td>6</td>
<td>Decided</td>
<td>1004</td>
</tr>
<tr>
<td>22</td>
<td>M. of D.</td>
<td>31</td>
<td>do.</td>
<td>525</td>
<td>35</td>
<td>None</td>
<td>Normal</td>
</tr>
</tbody>
</table>
From this table it will be seen that, out of the 39 trials made with thyroid, 6 cases recovered, 16 showed decided improvement, 11 slight improvement, while in 6 only (15.37%) was there no change. In no case could the patient be said to have been the worse afterwards.
It is now possible to draw certain conclusions from the experience gained by a consideration of the foregoing cases as far as the action of the thyroid is concerned. It will be convenient to take up first of all the physical effects which it produces. It is very clearly proved that the thyroid gland contains one or more substances which are capable of exerting a distinct physical influence. In view of Metchnikoff's experiments it seems likely that this is a complex substance containing iodine, which he has separated and which he finds capable of producing the same effects as the thyroid gland itself. He has named it "thyroidin" or "thyrocol," but whether it is a pure chemical substance or not is as yet uncertain. Every case in which the thyroid was given showed some reaction, though the degree varied very much in different individuals.
as contracts might be taken the cases of Miss I. W. C. (No. 20) we believe the reaction was slight, and Mr. J. M. Y. (No. 21) we believe it was very decided. In most cases the reaction is evidenced by a rise of temperature, which in some may amount to as much as 4 degrees Fahrenheit, but which is usually somewhat less, between two and three degrees. I reference to the charts, however, shows that the rise varies very considerably and that it some it is very slight, and in one or two exceptional cases it is practically absent altogether. Since it is not known how the principles of the thyroid act in producing a feverish condition, whether by affecting the heat-regulation or the heat production, through more probably by the former of these, it is of course manifest that it is impossible to foretell in each
cases the rise of temperature will occur and in which it will not. There is no doubt, however, that surrounding conditions have some influence on the effect of thyroid. Trousseau already pointed this out, and the experiments made in the cases of Bliss X. D. (No. 2) and Bliss H. B. (No. 4) also clearly show it. This makes it highly probable that the thyroid produces its effect of raising the temperature by influencing the regulation of heat rather than its production or dissipation. As has been already stated Prof. Lorrain Smith's experiments point in the same direction. We are, however, still far from certainty on the point. Besides the effect on the temperature thyroid also possesses a marked influence on the pulse, both in its rate and its character. So far as the cases considered are concerned this change was practically
constant, though its amount varied somewhat. In most cases the rate was considerably increased, but the more constant change was one affecting its strength and volume, both of which are first increased and then diminished. As this change in the pulse is apparently more constant and is a source of greater danger than any rise of temperature so far itself likely to be, it follows that the pulse is a much better guide than the temperature in estimating the effect of thyroid and in judging when it has been pushed far enough. There is another difference in the change in temperature and pulse produced by thyroid. This consists in the fact that as a rule the temperature ceases to be affected after a few days, usually six or seven, while the pulse continues to be affected as long
as the drug is given. In the case of the latter the effect appears to be cumulative, so that for this additional reason the pulse ought always to be investigated carefully during the course of treatment. In cases of unceaseful death, death has occurred during administration of thyroid it has almost invariably been due to cardiac failure, so that it is quite evident the drug powerfully affects the heart.

A study of the cases shows what had already been ascertained as regards the dosage and period of administration which is likely to produce the best results. The usual amount given was 50 gms continued for six days. In some which recovered a less dosage than this sufficed to effect the cure, and it is of course always open to conjecture whether a case which is to recover would not
have done so with a less dosage than that stated. It is however certain that that amount can do no harm and is most likely to effect the physical and mental changes desired. In three cases the plan was tried of giving small doses of 15 gns. daily for a prolonged period. It is not safe to draw conclusions from such limited experience, but it may be stated that one case recovered (Mr. Ill. No. 22) and that the others both showed decided improvement. In view of these facts it would be worth while making a further trial of this method. It is unattended by any risk, and it would also assist in settling the question as to whether the production of a marked physical reaction were really essential in the tending of a cure.

More than one case exhibits the necessity for care in examining
The physical condition of the patient before the drug is given. This was already known and care was exercised to reject any patient who showed disease of the lungs or heart. In the former disease it is often difficult to detect dormant processes, and it will not be possible to exclude from the treat-ment every case which has a weakness of the lungs, but this should not preclude the possibility of reducing these to as small a number as possible by careful examination of the condition. In the case of the heart, disease is more easily detected, and hence it is less likely that a patient suffering from heart disease will be subjected to the risks of thyroid treatment. In a matter of fact no case of cardiac complication occurred in all those treated, while three developed lung symp-toms. (Cases 1, 14, and 16.) It is therefore
necessary to keep the patient strictly in bed during the whole course of treatment, and to carefully examine the sheet from time to time, as well as watch the temperature curve.

Thyroid in many cases also causes digestive disturbance which must if possible be avoided, as there is considerable loss of weight from the effects of the drug alone, and disturbance of digestion interferes with the regaining of this unless treatment has ceased. The recovery of weight lost seems to be an important element in bringing about a cure subsequently, though that it is not essential to renewed by cases in which recovery began to take place immediately after the drug was stopped. The best means to prevent gastric disturbance, as already stated,
appears to be the quinin of the drug in warm soup, beef, tea or bouillon. During treatment the patient ought to be placed on light diet, so that the stomach may not be overstressed, while after treatment is over extra diet and wines may be given with advantage in order to obtain the recovery of lost weight. It appears for the above reasons to be inadvisable to give thyroïd to patients who are badly nourished or who are losing weight. Only one case (No. 26) was treated under these conditions, and fortunately the results were not unsatisfactory, as very great improvement resulted. In such cases it seems preferable to try the effect of prolonged small doses rather than run the risk of further reducing the weight by large doses.
I come now to consider the mental effects produced by the thyroid. It may at once be said that in practically every case where mental change was observed, though the degree of the change varied much in different individuals. In many it exhibited a distinctly stimulating action, and this was particularly noticeable in some, especially in Mr. M. P. (Case 12) and Miss J. A. (Case 18.) There could be no doubt about this being so in several cases, as the stimulating action was consistent with the giving of thyroid. It was not, however, observed in every case quite clearly, and it is not yet possible to say by what properties or under what conditions it is produced. In most cases also there was a tendency towards the reproduction of the original mental
symptoms. It was also remarkable that in several cases the emotional condition under went a complete transformation. This was especially observed in the cases of Mr. M. P. (No. 12) Mr. M. D. M. (No. 26) and Messrs I (No. 31). Whether this is due to the stimulating action on the cortex already described or not it is impossible to say, as we are not yet able to define on what physical conditions the different emotional states depend. But it is highly probable that both these results are dependent on the same cause.

As already stated recovery followed in six cases, but a careful study of these does not yet permit of any satisfactory explanation of how the thyroid really acts in bringing about this result. We do not yet know sufficient about the pathological...
conditions of the brain which constitute insanity, nor of the action of thyroid in modifying these to be able to draw any conclusions of real value. One fact, however, is quite clear, and that is that the mental benefit produced by thyroid is altogether independent of the physical reaction produced, at least so far as this is evidenced by the pulse and temperature. These are not, certainly, the only physical effects which thyroid is capable of exerting, as we know that the body weight may decrease rapidly even though pulse and temperature are very slightly affected. A more minute investigation is obviously necessary before we can say that we know all the influence which thyroid exerts. It is more than probable that if we did know this we should be in a position to explain its results in different
cases. As contrasts of the way in which thyroid may influence the temperature and pulse, the cases of Miss C. J. S. (No. 6) and of Miss J. H. C. (No. 20) may be cited. In the former the temperature rose 3 degrees F. later, and the reaction was very marked, and yet both recovered, the reaction in the latter case being practically nil. In some cases, as for instance that of Miss H. M. (No. 13), the reaction was distinct, but the mental change was very slight. It therefore follows that the original idea which was at the basis of the use of thyroid, viz. to induce a condition of fever and so bring about recovery, is not quite justified by the results. If it were true benefit ought to be proportional to the degree of fever produced, but this, as has been seen, is not by any means strictly true.
In spite of fairly extensive use of thyroid it is still impossible to foretell what the mental result of its use will be, or in what forms of mental disease it is most beneficial. Most of those treated suffered from melancholia in some form or other, and all of those who recovered laboured under this form of mental disease. But further experience is necessary before sound conclusions can be drawn.

As regards age, all of those who recovered were between 24 and 35 which is the period in which recovery under other conditions is most likely to occur. But if the ages of those who showed decided improvement be also taken into account, this conclusion must be somewhat modified, and the experience of others tends in the same direction. This experience is also borne
out in another line, viz. that the female sex is much more susceptible to benefit from thyroid than the male. The following table shows this clearly.

<table>
<thead>
<tr>
<th></th>
<th>Recover.</th>
<th>Deciduous</th>
<th>Slightly</th>
<th>No Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>M</td>
<td>8</td>
<td>10</td>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td>F</td>
<td>31</td>
<td>5</td>
<td>16</td>
<td>9</td>
</tr>
<tr>
<td>T</td>
<td>39</td>
<td>6</td>
<td>16</td>
<td>11</td>
</tr>
</tbody>
</table>

It is, however, still uncertain why this should be so, unless it has some relation to the admittedly greater functional variation which the thyroid shows in women.

Another interesting conclusion which may be drawn is that in very many cases a course of thyroid modifies the rapidly with which dementia progresses even when it does not effect a cure. This was most notably seen in the case of H. D. (No. 2.) Experience also makes
it clear that with proper precautions no case is made mentally worse by the treatment. Therefore it seems strongly advisable that no case should be allowed to become demonstrable without a trial of thyroid being made. This brings us to another important point to which attention was drawn by Dr. Bruce in his original paper, viz. the possibility of a course of thyroid being used as a diagnostic of the curability of any case of mental disease. At first it was not possible to be certain of this, but after four years' experience it appears that only one case out of at least two hundred treated has recovered, which did not do so after thyroid. Even this case is a doubtful one, and if the conclusion should prove to be true a considerable step in advance in prognosis will have been made.
It may be useful to state the conclusions above drawn in the form of a series of propositions these are appended.

1. The thyroid gland contains one or more substances which on administration are capable of exerting a powerful influence on the system.

2. In most cases this is evidenced by a rise of temperature which may reach as much as three degrees above the normal.

3. In a certain number of cases this rise of temperature is slight or altogether absent.

4. It is at present impossible to predict in which cases it will occur, and in which it will be absent.

5. The surrounding conditions as to temperature to some extent influence the reaction. On a warm day or by the aid of artificial heat the temperature may be raised.

6. The rate and character of the pulse
are affected in every case by the administration of thyroid.

4. These changes consist in an increase of rate and an initial rise followed by a decrease in volume of the pulse.

6. As this is of constant occurrence while rise of temperature is not, the effect on the pulse should be made the guide as to whether sufficient thyroid has been given.

9. As the drug is cumulative and is not rapidly excreted, care must be exercised not to push it too far.

10. As a rule the full beneficial effects are obtained by giving maximum doses of 60 grs. for six days, though in some cases 45 grs. is sufficient while in others 90 grs. can be tolerated without ill effects.

11. In a few cases small doses given for a prolonged period seem to produce a beneficial reaction.

12. It is absolutely necessary in all
cases before beginning treatment to make a careful examination of the lungs and heart.

13. In cases where phthisis is active or was dormant the giving of thyroïd always increases the activity of the diseased process and exercises a prejudicial effect on the physical and mental state.

14. As thyroïd also powerfully affects the heart, disease of that organ (especially such as causes irregularity of action) distinctly contraindicates its use.

15. For the same reason during administration the patient ought to lie on bed, and remain there for a few days after it has ceased, except when the dose is small, and does not exceed 15 grs. per day.

16. Thyroïd causes digestive disturbance which can usually be avoided by giving it with warm (not hot) beef-tea or bouillon. This also disguises its taste, which is notably...
people is nauseating.

17. During administration extra diet should be stopped and the food given should be such as is easily digestible.

18. After the treatment is over, extra diet and tonics may be resumed with beneficial effects.

19. In a large majority of cases, thyroid has also a distinct effect on the mental condition.

20. In many it has a directly stimulating effect on the cerebral cortex.

21. In most cases there is a tendency towards the reproduction of the initial mental symptoms.

22. The explanation of the action of thyroid in effecting recovery is still obscure.

23. It is quite clear that the beneficial effect is altogether independent of the reaction on the temperature and pulse.

24. Therefore the initial idea of the treatment, viz. the induction of
a feverish condition is not wholly justified by the results.
25. It is at present wholly impossible to foretell what the mental result of thyroid treatment will be.
26. It is equally impossible to say in what form of mental disease it will have a beneficial effect.
27. In the series of cases given the ages of those who recovered were all between 24 and 35, and all suffered from some form of melancholia.
28. The ages of those who showed decided improvement varied within much wider limits.
29. The female sex seems to be more susceptible to improvement after thyroid than the male.
30. The reason for this is still unknown.
31. Even in cases which are regarded as hopeless, thyroid often produces so great an improvement that the degree of dementia is very greatly lessened.
32. In no case was the treatment followed by prejudicial mental results.

33. It is highly probable that thyroid furnishes a reliable diagnostic of the chances of recovery, that is to say, if a patient does not improve under thyroid, the prospect of recovery is practically nil.