11 he found death to be due to asphyxia, while in the remaining 20 cases the skull was not dissected, so that no actual diagnosis was made. Browne, on the basis of an examination of 200 stillbirths in the Edinburgh Maternity Hospital, showed that cerebral haemorrhage was ten times more common in breech than in vertex cases.

The moral to be drawn from these observations is that intracranial injuries resulting from the rapid extraction of the after-coming head are a considerably greater source of danger to the child than is asphyxia from delay in the birth of the head. It is generally accepted that the foetus can exist for at least ten minutes without receiving fresh supplies of oxygen. Bourne, in his valuable little book, *Recent Advances in Obstetrics and Gynaecology*, refers in this connexion to the apnoeic condition of children born after a prolonged period of "twilight sleep," and who, if left severely alone but merely kept warm, remain motionless for perhaps ten minutes or a quarter of an hour while the heart beats quite regularly, and then quietly and gradually establish respiratory movements. As one who uses "twilight sleep" to a large extent, I have had a great many instances of this, and I can confirm it absolutely. But the application of the matter at present is that it emphasizes the need for care and deliberation in the extraction of the head, and the danger of "hurry."

WHITE ASPHYXIA.

Many of you will have read recently in the *British Medical Journal* a short correspondence which followed a letter by Mr. Bourne in regard to the pallid form of asphyxia—and that is usually the only serious form. With the main burden of Mr. Bourne's letter I am in entire agreement. There is far too much done in the way of violent efforts at resuscitation of the asphyxiated child, and there is no question in my own mind that in many cases the child who is in this condition of suspended animation actually has the flickering spark of life extinguished by these misguided efforts. Clearing out the mucus and liquor amnii from the throat by means of a soft rubber suction tube, warmth to the surface of the body, and a little old brandy on the gums and palate, and in severe cases the intramuscular injection of one or two minims of pituitary extract, have in my experience proved most successful. The main general point to remember is, however, that infants who pass into a condition of white asphyxia are suffering from a condition akin to shock, and should be treated along appropriate lines, warmth and extreme gentleness of handling being the essentials.

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THE TREATMENT OF EXOPHTHALMIC GOITRE

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THE controversy which centres around the treatment of exophthalmic goitre is largely due to the fact that patients may get better without treatment. These recoveries are too often attributed to some particular line of treatment, which is then hailed as having the power to effect a cure in a substantial percentage of cases; thus numerous procedures have been advocated, all of which were said to produce good results. Until recently the physician alone showed any interest in the disease, and in his treatment he often adopted a rather fatalistic outlook. He insisted on the removal of all septic foci, advocated a diet in which meat was restricted, advised rest, prescribed sedatives, and if the case was not improved then, the disease had to be left to Nature. Serums, vaccines, and numerous lines of treatment have all been tried, but to-day the most popular remedies are (1) rest combined with iodine, (2) x-ray therapy, (3) operative procedures.

In this paper an attempt is made to compare the results obtained from these three lines of treatment, and in dia-

gnosis, and in estimating improvement or otherwise, I have relied on the basal metabolic rate, the pulse, and the weight; the element of personal bias is thus eliminated and the results are probably rendered more acceptable. In calculating the basal metabolic rate the Douglas bag and Haldane gas analysis apparatus have been used exclusively.

In deciding whether a patient has exophthalmic goitre or not the view is adopted that there must be in every case an increased basal metabolic rate in addition to the usual signs and symptoms. There is a small group of women between the ages of 40 and 45 who show some signs and symptoms of exophthalmic goitre but in whom the basal metabolic rate is not increased; these are therefore not included in my cases. Cases of toxic adenoma are also omitted.

TREATMENT WITH IODINE.

The possibilities which treatment with iodine held out were first appreciated by Marine and Lenhart¹ when they found that the goitre in Graves's disease contained less than the normal amount of iodine. Ten years later Neisser² gave small doses of iodides to patients, and reported good results. These results were supported by the observations of Beebe,³ using small doses of iodine, and by Loewy and Zondek,⁴ who prescribed 3 drops of a 5 per cent. solution of potassium iodide. This they increased to 20 drops three times a day so long as the weight continued to increase.

We owe most of our knowledge to Plummer,⁵ who reported the results of 43 cases in which Lugol's iodine was used; he found that 95 per cent. were benefited. He stated that the basal metabolic rate was considerably reduced, though only temporarily, in most of his cases in about ten days; this was confirmed by Cowell and Mellanby⁶ in this country.

I have observed the effects of iodine in 36 cases, paying special attention to the basal metabolic rate, pulse, and weight. No case is included in which the basal metabolic rate was under +30 per cent., while in the most severe case there was a basal metabolic rate of +114 per cent. In 31 of these cases iodine was being given for the first time, and the drug prescribed was usually Lugol's iodine in doses of 20 to 30 minims a day. In 8 cases the basal metabolic rate and pulse rate were reduced to within normal limits; in 18 other cases there was marked improvement, but the basal metabolic rate and pulse were still raised. In 4 cases there was little or no effect, while in one case the patient became definitely worse, the basal metabolic rate and pulse rate rising from +32 per cent. and 100 to +53 per cent. and 128 respectively. Thus improvement followed the administration of iodine in 84 per cent. of cases. In mild cases with a basal metabolic rate of +20 to +25 per cent. the improvement which followed iodine administration was slight, and it was often difficult to say whether it was the relaxation from mental worry or the iodine which caused the improvement.

In 16 cases the effects of a second course of iodine were observed; these include 11 cases from the first group, on whom the results of a first course of iodine have already been noted. The interval which elapsed between the first and the second course in these 16 cases was variable, and appeared to influence the subsequent action of the drug—the longer the interval the more likely is it that the drug will act a second time; but this is by no means invariable. The length of time that the drug was continued on the first occasion also seems to be important; the longer the course the longer the interval before the drug will act a second time. If the course is a short one there is every likelihood of the drug acting a second time.

The lowest basal metabolic rate among these 16 cases was +33 per cent., while the highest was +75 per cent. In 6 cases the basal metabolic rate and pulse fell considerably at the end of ten days, and the improvement was quite comparable to the result of a first administration of iodine. In 5 cases the improvement was slight, but poor compared to the results of a first course. Three patients died within a month; they were very ill, however, when the iodine was given, and it is not thought that it hastened their deaths. In 2 cases the patients became definitely worse, the basal metabolic rate rising and the weight falling, but in one of these iodine had been of little value at its administration.

TABLE I.—Results on the Basal Metabolic Rate of a Second Course of Iodine.

No.	First Course.		Interval.	Second Course.	
	Before.	After.		Before.	After.
1	Per cent. +60	Per cent. +29	5 months	Per cent. +39	Per cent. +13
2	—	—	4 months	+35	+15
3	+46	+27	10 weeks	+53	+14
4	+60	+19	7 months	+59	+15
5	+71	+44	3 weeks	+75	+47
6	+59	+13	3 weeks	+61	+31
7	+70	+28	3 weeks	+39	+26
8	—	—	1 year	+58	+44
9	+114	+56	6 weeks	+75	+65
10	+65	+31	4 weeks	+50	+40
11	—	—	1 year	+33	+26
12	+72	+42	9 months	+70	Died
13	—	—	6 months	+54	Died
14	+60	+40	1 month	+72	Died
15	—	—	1½ years	+55	+70
16	+52	+48	3 weeks	+54	+61

From these figures it is seen that in only 37 per cent. of cases was a second course equal to a first. In all cases in which improvement was noted the maximum fall in the basal metabolic rate and pulse rate occurred in ten to fourteen days; in only one instance did the basal metabolic rate fall to any marked extent after the fourteenth day.

Cowell and Mellanby,⁶ using small doses of potassium iodide, noted that the fall of the basal metabolic rate occurred in ten to twenty days, while Cole⁷ says it occurs in two to three weeks.

It has been shown by most writers that improvement is merely temporary, that eventually there is a gradual exacerbation of symptoms with a coincident rise in the basal metabolic rate and pulse rate, and that this period of improvement depends largely, if not entirely, on whether the patient is exposed to worry or not. If the patient is kept away from the anxieties which attend home life or is treated in an institution, the basal metabolic rate may begin to rise again after two weeks and then gradually increase in height until it reaches the level prior to the administration of iodine. On the other hand, in some patients it may show no tendency to increase for four or five weeks, and in others eight weeks may elapse without any rise, but as soon as such a patient is sent home from hospital the basal metabolic rate returns to the original height.

I will quote three cases to illustrate these points and to emphasize that relapse ensues as soon as the patient begins to worry or is sent home.

1. A married woman, aged 30, was admitted to hospital; after she had rested in bed for a week the basal metabolic rate was +72 per cent. and the pulse usually about 120. She was given Lugol's iodine, and ten days later the basal metabolic rate was +28 per cent. and the pulse 92. Fourteen days later a rise to +45 per cent. was noted, while when a further nineteen days had elapsed it had risen to +57 per cent. and the pulse was then about 110.

2. A patient was given Lugol's iodine, and the basal metabolic rate fell to normal. It remained within normal limits for three weeks, at which time she received news that her child was not well. The basal metabolic rate rose the next week to +57 per cent., and consideration for her health forced us to send her home.

3. A patient was admitted to hospital, and after seven days' rest in bed the basal metabolic rate was +70 per cent. and the pulse 115. She was given Lugol's iodine, and ten days later the basal metabolic rate was +47 per cent. and the pulse 100. The basal metabolic rate varied between +44 and +53 per cent. for seven weeks, and she was then sent home, iodine treatment still continuing. Five weeks later she was readmitted, and the basal metabolic rate was +75 per cent. and the pulse 130.

If a patient has been given iodine and the basal metabolic rate and pulse rate have been lowered, the

stopping of the iodine is followed by an immediate relapse. If the basal metabolic rate and pulse have been lowered, and after perhaps five weeks have risen slightly, but not to anything like the previous height, the withdrawal of the iodine still results in a relapse. In both cases the basal metabolic rate rises to the original level before iodine was given. On the other hand, in cases where iodine has been given, and the basal metabolic rate and pulse have gradually relapsed to their levels before iodine was administered, stopping the drug now appears to have no effect whatever; further, the patient does not appear to improve as the result of stopping the drug. I have frequently ceased to give a patient iodine after she has been on it continuously for six months, and the basal metabolic rate and pulse have not been influenced for better or for worse. On the other hand, Fraser⁸ considers that 6 minims of 10 per cent. tincture of iodine may do harm if continued over a long period. Several French physicians, however, give larger doses than is customary in this country over a longer period, and claim that they obtain better results.

As shown above, in only 6 out of 16 cases was the response to a second course of iodine satisfactory. This means that in 10 cases, where an operation contemplated, the patient would not be able to have the beneficial effect of iodine as a preparation for the operation.

An example of this is that of a girl, aged 19, who was admitted to hospital with a basal metabolic rate of +59 per cent. and a pulse of 120. She was given Lugol's iodine, and ten days later the basal metabolic rate was +13 per cent. and the pulse 84. She refused operation and went home, but ten weeks later she was readmitted with a basal metabolic rate of +65 per cent. and a pulse of 125. During seven of these ten weeks she had been having iodine. On admission, Lugol's iodine, 10 minims three times a day, was prescribed, but the basal metabolic rate and pulse never fell below +60 per cent. and 120 respectively; the dose was then increased further, and the basal metabolic rate fell to +31 per cent., but no further.

The seriousness of such a state of affairs was emphasized by Goetsch.⁹ In such a case, if an operation is undertaken, the risk is considerable, while had operation been performed when the patient was first given iodine the risk would have been far less. As it is held by most authorities that iodine by itself cannot cure exophthalmic goitre it seems only fair to the patient that iodine should be held back until an operation is decided upon, since its value in preparing patients for operation is well recognized, and is reflected in the improved mortality rates in published cases.

Iodine is an excellent remedy for the crisis with vomiting with which many patients are troubled, but if a course has already been given its value at such a time may be disappointing. On five occasions I have seen cases where a course of iodine has been given for months and then stopped. Later, the patient has had a crisis with vomiting, and iodine was valueless in checking it. More often than not, however, the crisis can be controlled by giving iodine, whether the patient has had it before or not.

In prescribing iodine I have rarely given a larger dose than 30 minims of Lugol's iodine a day, as it is said that large doses cause an actual exacerbation of symptoms. Cowell and Mellanby⁶ found that improvement followed minute doses of potassium iodide, such as 2 or 3 grains a day, and they do not think that large doses are necessary. After the maximum reductions in the basal metabolic rate and pulse rate have been apparently reached an increase in the amount of iodine reduced the basal metabolic rate and pulse rate still further in 3 cases. These patients had had iodine for several weeks; in 2 cases the basal metabolic rate and pulse rate had returned to the levels before iodine was given, while in one case, already mentioned, it had had little or no effect. It was decided to operate on them, and the dose of Lugol's iodine was increased from 20 minims a day up to 40 minims. In the first case the basal metabolic rate fell from +65 to +31 per cent., in the second case from +34 per cent. to within normal limits, and in the third from +75 to +40 per cent. The first two patients were operated upon at once, but in the third the mistake was made of increasing the dose to 50 minims, and in spite of this, or because of it, the basal metabolic rate rose within a week to +63 per cent.

A striking fact which is noticed during iodine administration is the patient's increase in weight. This increase

TABLE II.—Results of X-Ray Therapy.

	Case		3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
Before treatment.	+79% 98 101	+78% 120 123	+50% 114 128	+57% 110 112	+63% 104 116	+43% 116 96	+40% 120 107	+65% 108 117	+37% 114 93	+52% 121 126	+30% 100 102	+5% 106 112	+50% 94 104	+40% 90 108	+30% 90 110	+60% 120 91	+48% 105 95	+36% 1.0 1.2	+33% 89 1.6	+55% 1.4 1.7	+70% 118 77	+30% 100 1.1	+58% 1.0 83
After 1 mth.		+62% 110 134				+70% 114 103	+49% 121 107			+54% 100 123	+2% 90 106	+47% 100 105							+57% 101 125	+70% 128 131	+57% 92 102		+62% 110 82
2 mths.		+49% 100 135	+33% 102 126			0% 90 116						+52% 105 112	+45% 50 110		+21% 90 109				†	†		+42% 121 103	+83% 1.0 91
3 mths.	+76% 121 103		+31% 94 127	+25% 92 112			+18% 90 114							+51% 100 99		+72% 125 92	+38% 100 101						
4 mths.		-9% 70 123		+31% 93 120						+28% 86 133	+22% 82 107			*		*		+33% 100 —				+35% 110 112	
5 mths.	+0% 90 107				+8% 86 129			+32% 110 120	+25% 118 91			+47% 103 112									+2% 120 106	+8% 92 125	+73% 100 92
6 mths.	+38% 104 108						+24% 92 114				+23% 80 107	+37% 50 120	+61% 90 107										
7 mths.										+9% 80 132												+20% 93 138	+96% 124 89
8 mths.			Normal 80 134	+29% 94 120																		+61% 106 106	
9 mths.	+5% 85 110	Normal 70 130		+18% 86 116	+7% 84 126			+40% 86 123	+10% 112 92	+36% 80 131		+35% 86 122	+12% 86 113		+15% 75 116		+25% 81 101	+11% 91 123			†	+50% 140 —	
10 mths.								+36% 84 123														Died	
11 mths.				+21% 88 117																			+72% 150 84
12 mths.			+4% 72 145	+10% 80 117	+2% 75 127	+5% 80 118		+16% 84 127	+19% 100 92	+30% 86 134		+30% 84 126	+46% 95 111		+30% 100 112		+35% 85 96	+40% 104 115					Died

* Insisted on operative treatment.

† Refused further treatment.

‡ Operation considered advisable.

will often continue when the basal metabolic rate and pulse rate are rising. Thus, a patient weighing 5 st. 7 lb. was admitted with a basal metabolic rate of +70 per cent.; she was given iodine, and ten days later the basal metabolic rate was +28 per cent. and the weight was 5 st. 12 lb. Six weeks later the basal metabolic rate was +57 per cent., but the weight had increased to 7 st. 3 lb.—an increase of 19 lb. while the basal metabolic rate was rising from +28 to +57 per cent.

TREATMENT BY X RAYS.

The treatment by x rays is probably the most widely adopted to-day, and its chief merit lies in the fact that there is no mortality rate, although patients may die during the course of treatment as the result of the disease itself. X-ray burns, which a few years ago were only too common, are now rarely seen, and, indeed, the only cases seen recently are of patients who received treatment some years ago. It is probably no more frequent than injury to the recurrent laryngeal nerve during thyroidectomy.

The question whether x-ray therapy is of any value was discussed at the British Medical Association Meeting at Edinburgh in 1927, and most of the speakers were rather sceptical. Walton¹⁰ recently said he did not think it was of much value, but there are many who have great faith in it, and some who make extravagant claims for its value. Little has been published in this country on x-ray therapy, but Hayes¹¹ found there was improvement in 76 out of 100 patients treated by him. Unfortunately no basal metabolic rates were given, and one has to rely on his judgement. Sanger¹² obtained good results in 41 out of 50 cases, and his results are adequately supported by basal metabolic rate estimations on all the patients. Borak¹³ stated that 80 per cent. of patients improve, while 33 per cent. become free of symptoms.

There can be little doubt, therefore, that x-ray therapy is a valuable line of treatment in some cases. The time

required to produce results is doubtful; some say one to four months, while Murray¹⁴ states that it may take as long as two years.

I have been able to collect 23 cases in which I had examined the patients before the commencement of x-ray therapy, repeatedly during the course of treatment, and, finally, at the end of a year or at the termination of their treatment. Since it is undoubtedly a fact that various factors, such as excitement, influence the basal metabolic rate, great care has been taken in arriving at an accurate result, and in my cases the basal metabolic rate given is the mean of several estimations.

All the patients had well-marked signs and symptoms of exophthalmic goitre, and it will be seen that no patient had a basal metabolic rate of less than +30 per cent. at the commencement of treatment. A number of other patients were treated, but they would not come into hospital for a basal metabolic rate estimation, and so are not included. Some very mild cases with basal metabolic rates of around +20 per cent. were also treated, but in many of these it was not considered absolutely certain that they were not simple cases of neurasthenia.

The actual method of treatment is as follows:

Coil and Coolidge tube. Kilovoltage 90. Current 3 milliamperes. Filter 3 mm. aluminium plus two layers of felt. Dosage measured with Sabouraud pastilles, and a dose equal to half tint B (with filter in place) is given. This equals with apparatus in use a quarter of an erythema dose. Treatments are given at first twice a week, then once a week, and the intervals are gradually lengthened until a total of about thirty doses has been given, spread over a year. The interval between the doses and the total number of doses given depends on the progress of the patient.

In Table II, showing x-ray results, the details are given in the following order: (1) basal metabolic rate, (2) pulse rate, (3) weight in pounds.

In 6 of these 23 cases it will be seen that the basal metabolic rate has returned to within normal limits, and the pulse rate is between 70 and 85 beats per minute. The weight has increased in each case, the smallest increase

being 5 lb. and the biggest being 20 lb., while the average increase is 11 lb. In 6 cases there has been improvement, and in 5 of these the improvement was marked. The basal metabolic rate has fallen considerably in each instance, but not to within normal limits, while there has been an average increase in weight of 6 lb.

In 9 cases there was no improvement worth recording; in 5 of these the patients were emphatic that they felt no better, and either clamoured for an operation or refused further treatment. The other 4 cases showed no improvement whatever. Records for one year's treatment are given, while actually they have been treated for sixteen months and no improvement has been noted; it is not thought there is any likelihood of further change. Two deaths occurred, and it will be seen that one patient died after being treated for ten months and the other after receiving treatment for twelve months.

The time required for cure or improvement has now to be considered. It will be seen that among the cured cases the average duration of treatment necessary to bring the basal metabolic rate and pulse within normal limits is six and a half months, but it may occur as early as at the end of two months or as late as twelve months.

Among the cases classified as improved, the improvement was obvious in most cases by the third month, and in all cases by the sixth month. It seems fair, therefore, to assume that if benefit is likely to be derived from x rays, improvement will be noted in six months, whereas if there is no amelioration of symptoms during this period it is doubtful if further x-ray therapy will be of much value. The cases which responded most satisfactorily to x-ray therapy were those in which the signs and symptoms were of short duration, the size of the goitre being of less importance. Cases of longer duration in which the goitre was moderately enlarged and firm often improved, but were very seldom cured. The longer the disease has existed the less hope is there of benefit being derived from x-ray therapy.

OPERATIVE TREATMENT.

The third line of treatment is surgical; before giving the results it is desirable to describe briefly the procedure in each case. The patient was put to bed, and after she had rested for three days the basal metabolic rate was estimated; this was repeated until a consistent result was obtained, since frequently the second estimation is lower than the first, but the third is usually the same as the second. This is because on the first occasion the apparatus is apt to frighten the patient, and this in itself is sufficient to give an inaccurate result.

The patient was next given Lugol's iodine, 10 minims three times a day, and at the end of ten days one or more basal metabolic rate estimations were made; the patient had an electro-cardiograph taken, particular attention being paid to the inversion of T in lead II, and less attention paid to an inversion in lead III. If the basal metabolic rate was +30 per cent. or under, the pulse rate under 95, and the electro-cardiograph gave no contraindication, the case was regarded as operable. More attention was paid to the basal metabolic rate than to the pulse or electro-cardiograph, though all three received attention. There was no undue haste in operating, as it was felt that nothing was lost by waiting up to three weeks, while the increased weight at the end of that period, and the fact that patients often felt better after three weeks than after two weeks, convinced me that something was to be gained by a short delay. After the operation, which was a complete one wherever the basal metabolic rate was under +30 per cent., iodine was continued for three days. It will be seen that some patients were operated on whose basal metabolic rate was higher than +30 per cent. In these patients medical treatment had been given a complete trial, and in each case it was felt that unless an operation was performed the patient was likely to be an invalid until an early death.

I have been able to collect 25 consecutive cases in which the basal metabolic rate was estimated before and after operation, and the fact that no deaths occurred was very gratifying. The object in giving a list of these cases is not only to emphasize the fact that care and discrimination can reduce the mortality rate, as the Mayo Clinic have done this, but, first, to compare the immediate results

with the results after a year or longer, and, secondly, to compare these results with those of x-ray therapy. Since the introduction of basal metabolic rate estimations there have been no deaths in this hospital, and this contrasts strongly with a mortality rate of 15 per cent. in the 25 cases preceding.

TABLE III.—Immediate Results of Operative Treatment.

No.	Before Iodine.		After Iodine.		After Operation.		Operation.
	B.M.R.	Pulse.	B.M.R.	Pulse.	B.M.R.	Pulse.	
	Per cent.		Per cent.		Per cent.		
1	+58	118	+33	93	-9	79	Thyroidectomy.
2	+40	110	+23	90	+39	95	Thyroidectomy.
3	+34	96	+6	80	-5	84	Thyroidectomy.
4	+61	110	+13	90	0	84	Thyroidectomy.
5	+38	91	+30	88	+8	80	Thyroidectomy.
6	+89	132	+58	130	+44	100	Lobectomy.
7	+64	110	+33	102	-4	80	Thyroidectomy.
8	—	—	+15	85	-15	76	Thyroidectomy.
9	—	—	+14	90	-7	72	Thyroidectomy.
10	+111	135	+56	108	+39	96	Ligation.
11	+78	125	+65	115	+32	124	Sympathectomy.
12	+25	100	+27	95	0	76	Thyroidectomy.
13	—	—	+28	98	+5	84	Thyroidectomy.
14	+57	104	+26	88	+20	85	Thyroidectomy.
15	+60	116	+24	95	-10	70	Thyroidectomy.
16	+43	110	+14	90	+13	85	Thyroidectomy.
17	+57	116	+18	90	-8	76	Thyroidectomy.
18	+65	112	+31	100	+17	84	Thyroidectomy.
19	+53	104	+14	81	-3	80	Thyroidectomy.
20	+57	116	+18	90	-8	80	Thyroidectomy.
21	+51	110	+36	96	+10	72	Thyroidectomy.
22	+39	96	+26	80	+18	70	Thyroidectomy.
23	+80	120	+40	100	+63	100	Lobectomy.
24	+38	100	+16	85	-11	80	Thyroidectomy.
25	+58	110	+12	85	0	75	Thyroidectomy.

The ligation and sympathectomy were performed on the same patient, and there can be no doubt that the patient was benefited by these operations. A basal metabolic rate estimation was made a year after the sympathectomy; the result was +26 per cent., and the pulse was 90. Of the remaining 23 patients 17 have been cured by the operation, while in 6 cases the basal metabolic rate is still above normal limits; 4 of these have been considerably improved by the operation, and indeed it was a surprise to find in 3 of them that the basal metabolic rate still persisted above normal limits. The remaining two patients were not relieved of their symptoms and signs, and I felt, entirely apart from the basal metabolic rate, that the patients were not benefited to any great extent. It is obvious that in order to justify any surgical procedure the results must be considerably better than non-surgical methods, and, comparing the surgical results given here with the x-ray results, I feel that the surgeon has proved his case. The figures published by surgeons never give the number of cases regarded as inoperable and sent for medical or x-ray therapy. While the average case treated by a radiologist is more severe than that treated by a surgeon, it must be admitted that in operable cases the results are excellent—so good that it might be better for patients if experienced surgeons temporarily forgot mortality rates and did their fair share in the treatment of the disease.

The next step was to examine patients who had been operated on a year or longer, and to compare these results with the immediate results of operation, and also with cases treated by x-ray therapy. It is always difficult to get patients who have been treated a year or longer to return for a couple of days to hospital in order to have a test made,

but 16 patients did so, and, as in previous examinations, the basal metabolic rate was estimated and a careful four-hourly pulse chart kept. The basal metabolic rate and the mean pulse collected from the charts show that these results are pleasing, but not quite so convincing as the immediate results. Four cases in which one lobe was removed are given, and in each the basal metabolic rate has remained above normal limits.

TABLE IV.

No.	Years since Operation.	B.M.R.	Pulse.	Operation.
		Per cent.		
1	1½	+ 3	80	Thyroidectomy.
2	2½	+40	99	Lobectomy.
3	1½	+10	80	Thyroidectomy.
4	1	+ 7	80	Thyroidectomy.
5	1½	+19	95	Thyroidectomy.
6	1	+25	95	Lobectomy.
7	5½	+ 8	70	Thyroidectomy.
8	2½	-12	80	Thyroidectomy.
9	1	+40	100	Lobectomy.
10	1	+15	84	Thyroidectomy.
11	1	+10	84	Thyroidectomy.
12	1	+12	80	Thyroidectomy.
13	1	+ 5	60	Thyroidectomy.
14	1	+27	90	Thyroidectomy.
15	1	+14	85	Thyroidectomy.
16	2	+60	95	Lobectomy.

In the cases shown it would appear that about 80 per cent. of patients operated on are cured or are considerably benefited by thyroidectomy, and these figures hold good for at least one year after operation. The best result that has been obtained from x-ray therapy is improvement or cure in 12 out of 23 cases—that is, 52 per cent.; if the surgeon's mortality rate is not above the average the difference of 28 per cent. between the surgical and the x-ray results certainly seems to justify surgery and to give it the premier place in the treatment of the disease. Many surgeons who do not operate frequently on exophthalmic goitres have a rather appalling mortality rate, and whereas one may advocate surgery for some cases, it cannot be too strongly emphasized that surgical intervention should only be undertaken by an experienced surgeon. In few diseases will care and discrimination in the preparation and selection of the cases be rewarded by more gratifying results.

There are many patients with Graves's disease who are improved or cured by x-ray therapy; in view of this it seems only fair that the radiologist should be given a chance before the case is sent to a surgeon. The patient ought to be treated for about six months by x-ray therapy, and if at the end of that time the basal metabolic rate, weight, and pulse have not improved, it is probably useless to continue.

SUMMARY.

An attempt is made to compare the results of treatment by medical measures, x-ray therapy, and operative procedures. Any improvement or failure to improve is supported by the basal metabolic rate, the pulse, and in many cases the weight.

I am able to support the view held by many that iodine causes only a temporary amelioration of symptoms and signs, and that prolonged iodine treatment is of no benefit to the patient. The stopping of iodine after it has been given for some months did not cause any change in the patient's condition, as judged by the basal metabolic rate and pulse. A second course of the drug does not give the uniformly good results of a first.

X-ray therapy is considered; it is found that in only 52 per cent. of cases does any material improvement result, and improvement will be obvious in six months from the start of treatment. Cases in which there is no improvement after six months of treatment should be referred to a surgeon for operative procedures.

Operative treatment is dealt with, and a list of cases is given showing the basal metabolic rate and pulse before and after operation; it is found that over 80 per cent. are cured or improved. Emphasis is laid on the fact that usually only patients in whom the basal metabolic rate was under + 30 per cent. and the pulse under 95 after iodine therapy were operated on. A second list is given showing the basal metabolic rate and pulse a year or longer after operation, and it is found that about 80 per cent. maintain their improvement. The fact is stressed that the most unsuccessful cases are those in which too little of the goitre is removed.

In conclusion, it is considered that iodine should be reserved until it is considered necessary to operate; that the patient should be given a six months' trial with x-ray therapy; then, if improvement does not occur, or if it is not reassuring, the patient should be sent to an experienced surgeon for operation if suitable.

I wish to thank the physicians, surgeons, and radiologists who allowed me to carry out these investigations on their patients.

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A NOTE ON NARCOLEPSY.

WITH REPORT OF A CASE.

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THIS curious condition is characterized by paroxysmal attacks of sleep, frequently coming on during the day and often quite irresistible. Gelineau¹ apparently first described the condition in 1880, and very few cases had been recorded when, in 1923, Worster-Drought² directed attention to the subject by reading a paper before the Medical Section of the British Psychological Society, giving an account of three cases which had been under his care. Last year Kinnier Wilson³ summarized the current knowledge of the various forms of narcolepsy and collected records of 43 cases from the literature. At the beginning of the present year (1929) Fulton and Bailey,⁴ writing from the surgical clinic of Dr. Harvey Cushing, published an interesting contribution to the study of tumours in the region of the third ventricle, and discussed their diagnosis and relation to pathological sleep.

Attacks of sleep may, of course, be symptomatic of other definite pathological lesions, such as cerebral arteriosclerosis, dyspituitarism, suprasellar cysts, encephalitis lethargica, etc., but there is a group of cases which would appear to be "idiopathic" or "functional" in so far as no underlying organic disease has been discovered. Some of these "idiopathic" cases may have cataplectic attacks associated with the narcoleptic.

The patient whose case is now recorded was a motor car driver, who first came under my care about the beginning of November, 1928. He was then 26 years of age, and the narcolepsy was well marked. Symptoms had commenced about thirteen months previously, but it was not until four months after coming under observation that cataplectic attacks set in.

His sister, when about 23 years of age, had a "nervous breakdown," and was unable to follow her occupation as a clerk for about two years. During this period she had a constant feeling of fullness in her head, and was subject to attacks of hysteria, depression, and crying, but never had any sleepy attacks. In his own personal history there was nothing of note until he reached the age of 15 or 16 years, when he was off work for three months with a bad attack of "influenza." He seemed to have had no serious effects or sequelae of this illness, except that for some time after he suffered from "blueness" of the hands, suggesting to his doctor at that time a mild Raynaud phenomenon. Eventually, however, this condition disappeared, but later he began to have occasional "flushings" of the face, and these have troubled him from time to time since.

At the age of 22 he began to have occasional transient attacks of double vision, lasting five to ten minutes. At first, and for