

Craniectomy with the after-history of two cases / by T. Telford-Smith.

Contributors

Telford-Smith, Telford.
Coupland, W. H.
Telford-Smith, Telford
King's College London

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14

CRANIECTOMY,

WITH

THE AFTER-HISTORY OF TWO CASES.

BY

T. TELFORD-SMITH, M.A., M.D.,

Medical Superintendent, Royal Albert Asylum, Lancaster.

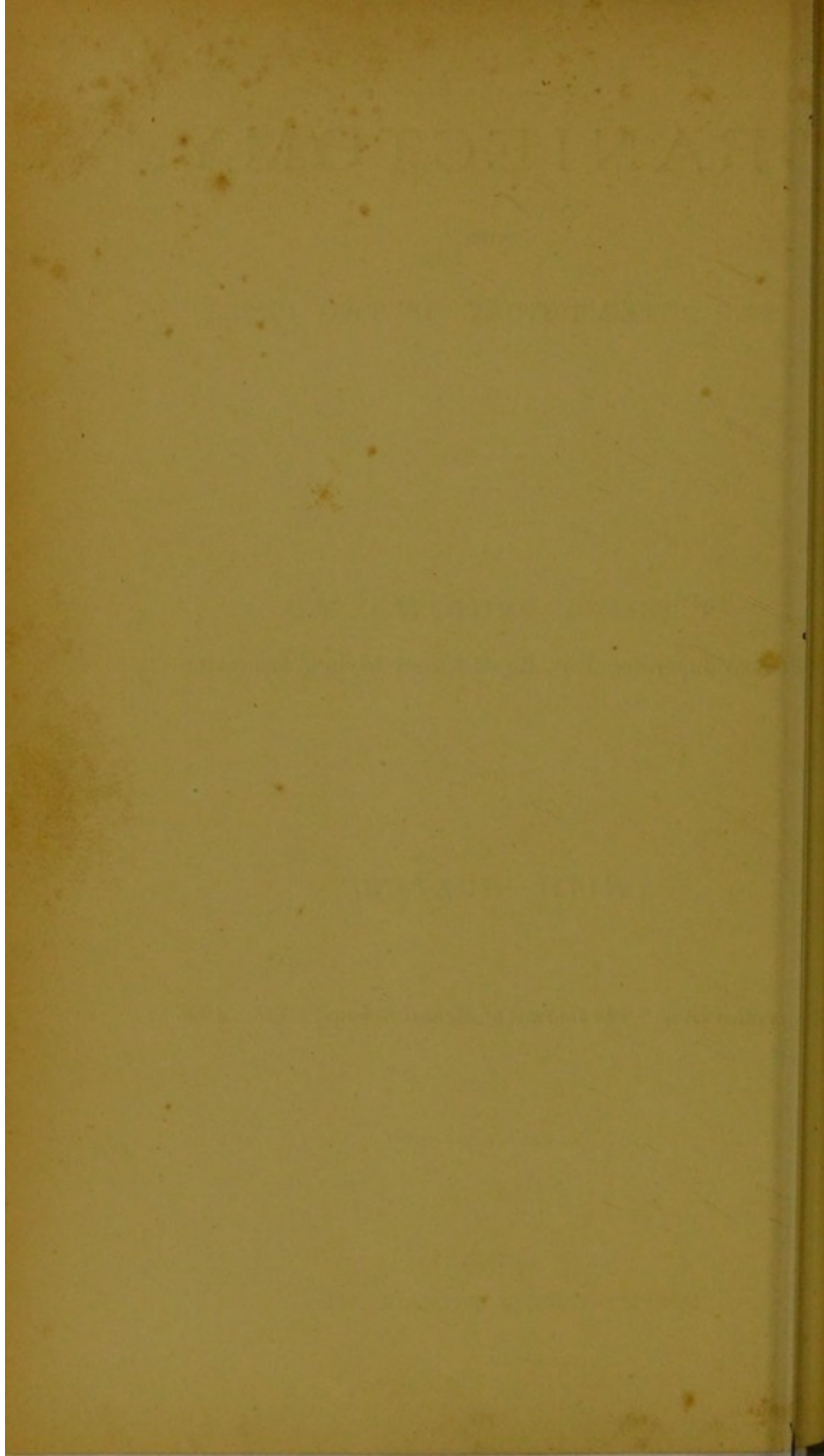
(WITH PLATES.)

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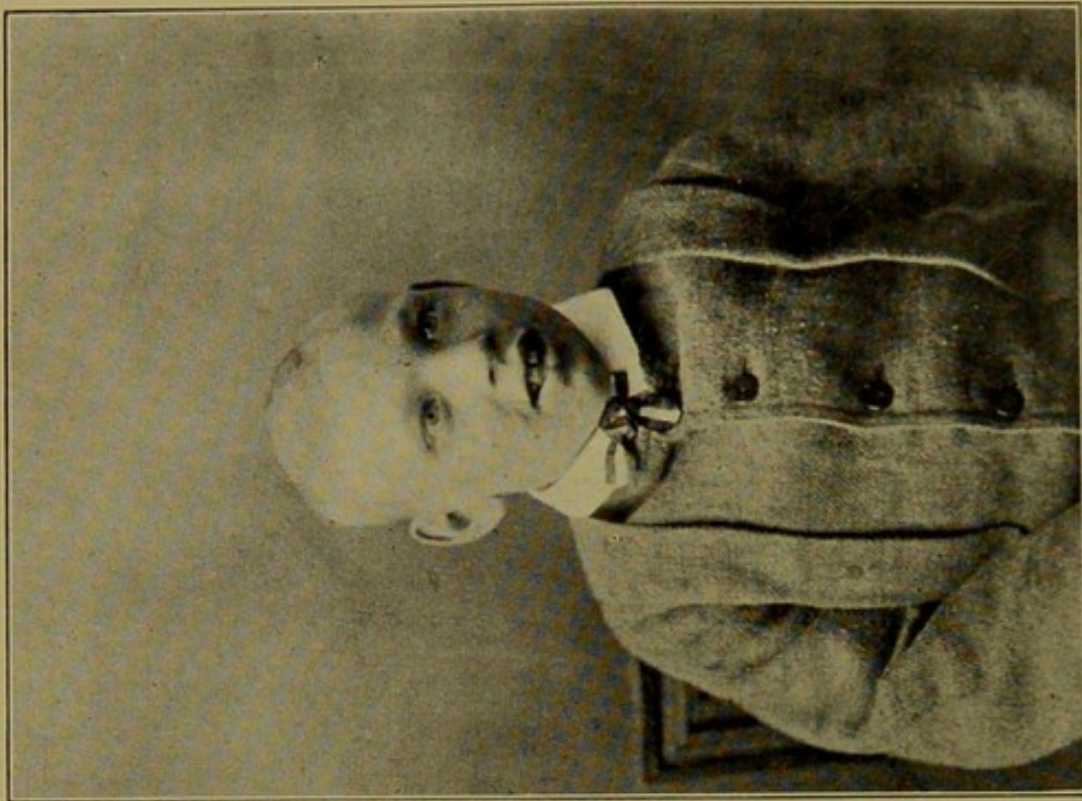
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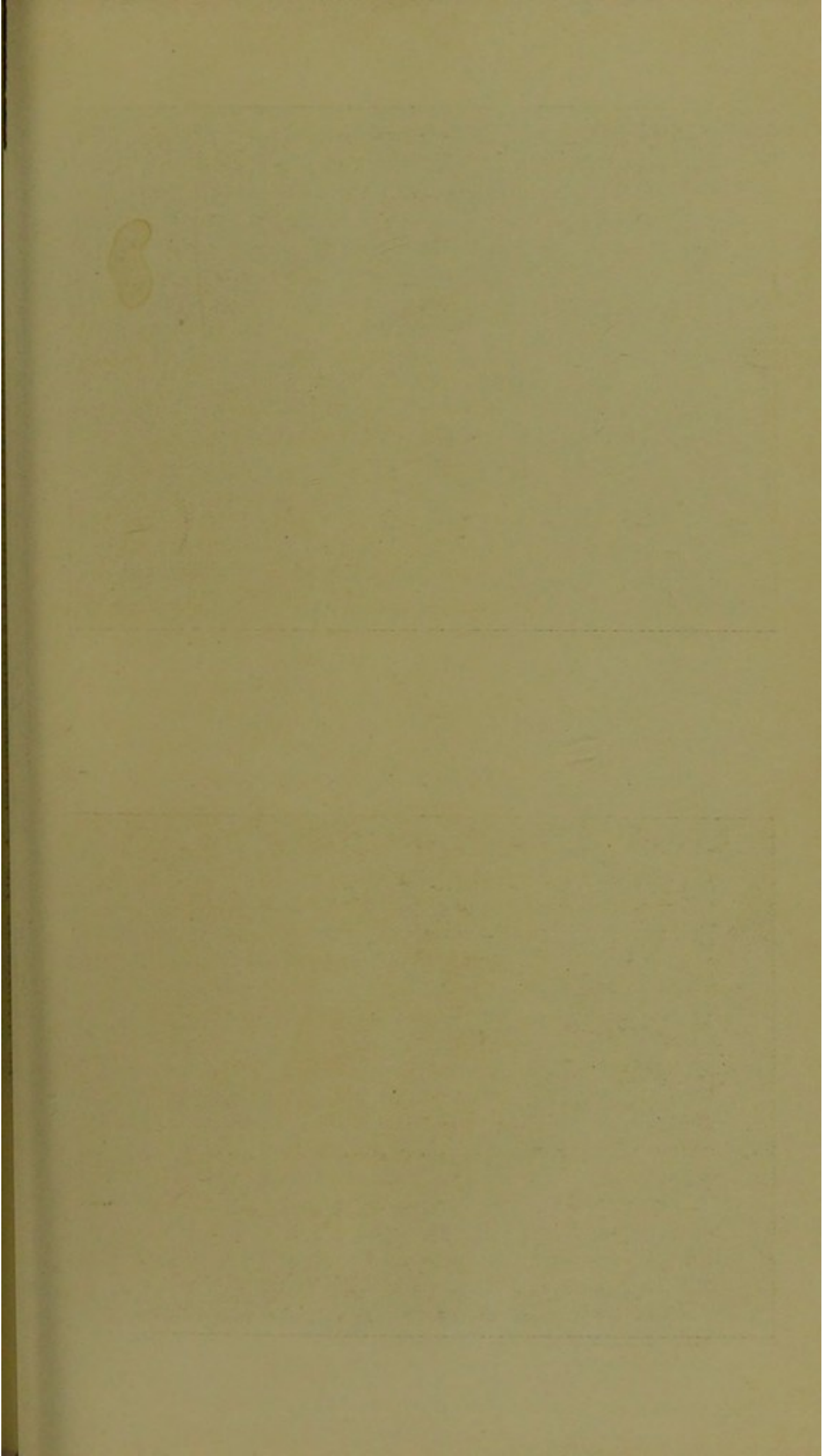


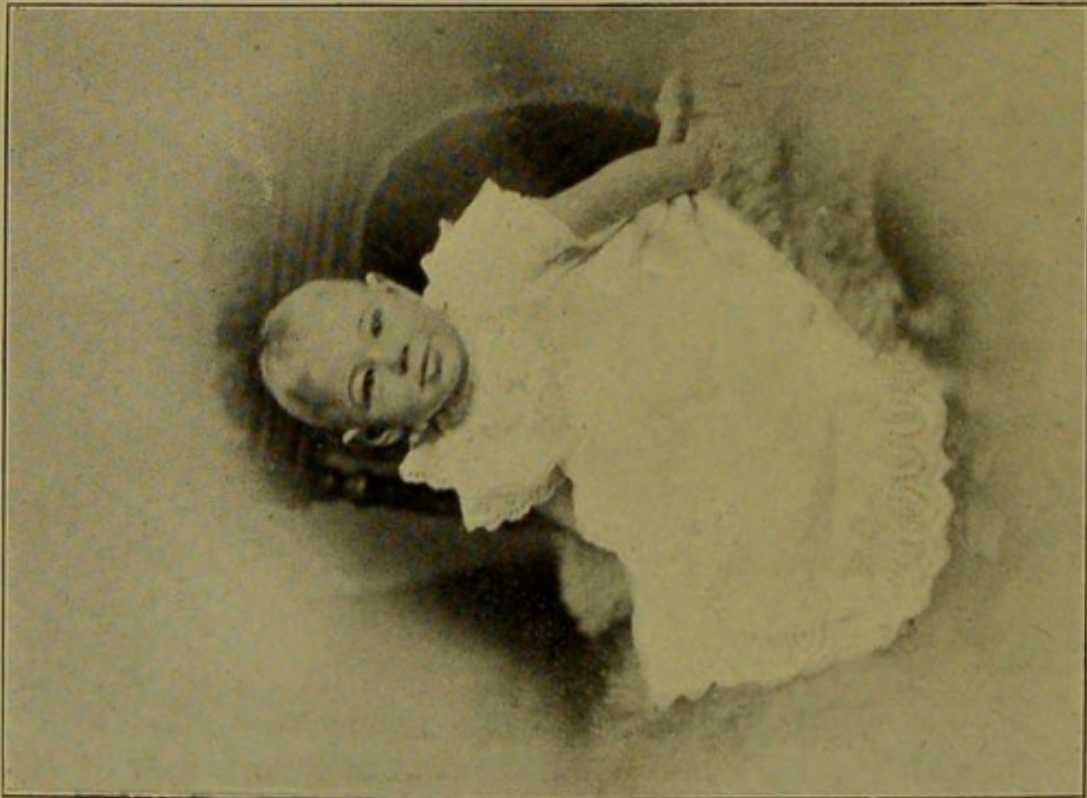


R. J. (aged 7 years).
One year before Operation.



R. J. (aged 9 years 10 months).
Eighteen months after Operation.





N. L. (aged about 18 months).
Two years before the Operations.



N. L. (aged 7 years 10 months).
Two years after the Operations.

CRANIECTOMY, WITH THE AFTER-HISTORY OF TWO CASES.*

BY T. TELFORD-SMITH, M.A., M.D.,

Medical Superintendent, Royal Albert Asylum, Lancaster.

(*With Plates*).

When Lannelongue published † his accounts of his first cases of craniectomy for microcephalus, the hope was raised that microcephalic idiocy would prove a curable form of mental deficiency, and would come to be classed among the ordinary surgical diseases of children, as being mainly a bony deformity to be remedied by the use of the knife and the saw; and though Lannelongue himself did not follow Virchow's teaching and regard premature ossification of the cranial sutures as the primary cause of microcephalus, but attributed it to its actual cause, namely, arrested development of the brain, still he considered that there was undue compression and consequent dwarfing due to bony pressure, and that craniectomy would relieve this and lead to increase of brain growth.

It seems, however, from later examinations of both microcephalic skulls, and of the brains that they contained, that the idea of pressure being exerted and acting as a dwarfing cause must be abandoned.‡

Sir Geo. Humphry writes as follows in a paper published by him in "The Journal of Anatomy and Physiology" after an examination of 19 microcephalic skulls:—

"There is nothing in the specimens to suggest that the deficiency in the development of the skull was the leading

* Read at the Annual Meeting of the British Medical Association, London, 1895.

† "Congrès Français de Chirurgie," 1891, p. 80.

‡ "The Journal of Anatomy and Physiology," Jan., 1895, p. 304. "The Microcephalic or Idiot Skull, and the Macrocephalic or Hydrocephalic Skull," by Sir George Humphry. See also "The Scientific Transactions of the Royal Dublin Society," Vol. v. (Series 2): "The Brain of the Microcephalic Idiot," by D. J. Cunningham, M.D., F.R.S., and T. Telford-Smith, M.D.

feature in the deformity, and that the smallness of the bony cerebral envelope exerted a compressing or dwarfing influence on the brain, or anything to give encouragement to the practice lately adopted in some instances of removal of a part of the bony case, with the idea of affording more space and freedom for the growth of the brain. In these, as in other instances of man and the lower animals, the brain-growth is the determining factor, and the skull grows upon and accommodates itself to the brain, whether the latter be large or small. This view is corroborated by the fact that, in the brains taken from several of the microcephalic skulls, the convolutions of the brain give no indication of compression, but are free, outstanding, and separated by well-marked sulci."

And Professor Cunningham, of Trinity College, Dublin, after an exhaustive examination of two microcephalic brains, writes as follows:—"The view that the arrest in brain-development was due to a growth restriction, brought about by a failure on the part of the cranial cavity to expand to the required extent, is untenable, because it is now known that the early closure of the cranial sutures is by no means a distinguishing feature of the microcephalic skull. It is evident, from the condition of the two brains, that the arrest in growth has taken place at a period corresponding to the third or fourth month of foetal development, or in other words, at a time when sutural closure is altogether out of the question, seeing that at this stage the ossification of the cranial bones has only advanced to a very small extent. It is not going too far to say that all anatomists of the present day who have studied the question have abandoned this view, and the tendency now is to consider cranial growth as being subsidiary to, and dependent upon, brain-growth. Still, old theories die hard, and when they are proved to be erroneous it is well, for a time at least, to reiterate the evidence against them. This is all the more necessary in the present case, seeing that in recent years operative procedure has not only been proposed, but in several cases carried out with a view of relieving the supposed cranial restraint upon the growth of the microcephalic brain. We have no hesitation in saying that it would be quite as rational a proceeding to operate on the head of an ape in the hope of producing an access of brain-growth as upon the head of a typical case of microcephaly."

Another point which must not be forgotten is that on

post-mortem examination of cases of microcephaly in which craniectomy was performed, there is strong evidence that the after effects are rather an increase of pressure and diminution of the skull capacity than otherwise. Bourneville says: "There is a narrowing of the brain's interior by thick fibrous bands encroaching upon it," as a result of the operation.

Still the otherwise hopeless outlook as regards mental development in the case of the microcephalic idiot, even under the most favourable circumstances, doubtless rendered the operation of craniectomy justifiable as an experiment, and if it could be satisfactorily established that any hopeful mental improvement took place in the cases operated on, after even a considerable period of observation and training, the operation would have established its right to be recognised as a necessary one. Lannelongue regarded systematic training and education of the child as essential in the further treatment of the case after operation, so that to judge of the success of the surgical procedure it is only fair to wait a considerable time after the actual operation, and to observe the child continuously under suitable educational treatment. I fear that the glowing accounts given as to the results of the first cases were mainly due, as Bourneville remarks,* "to all those about the child, surgeons, students, nurses and attendants, being so interested in the child, and looking for more improvement than they did before;" when we wish for and expect a certain improvement we are very liable to imagine we see it.

The two cases whose after-history I give have had these conditions as to systematic training and education fulfilled, so that they have had all the circumstances favourable to a successful and hopeful result, and for that reason they seem fair cases from which to form an estimate as to the advisability of the operation.

I.—Both patients are boys. The first, N. L., has been under observation for four years, and under daily systematic training and education in the Royal Albert Asylum since May, 1894. N. L. (now 8 years of age) was born September, 1887, of healthy parents; he is the fifth-born child, the four older children being quite normal, mentally and physically. The mother attributes the boy's condition to the fact that she

* "Recherches cliniques et Therapeutiques sur l'Epilepsie, l'Hysterie, l'Idiotie et l'Hydrocephalie," par Bourneville, Paris, 1894.

had rheumatic fever during her pregnancy with him. The child was strong and active, but there was difficulty in feeding him even from his birth. His mental deficiency became more noticeable at the time he should have commenced to talk. He never has articulated more than a few simple words—ta-ta, pa-pa, bye-bye, etc. He is said to have had a kind of fit lasting five minutes when two weeks old; none since.

At the age of 3 years and 5 months, just before the operation of craniectomy was performed on him, he is thus described:—

He is strong and well-developed for his age; is extremely restless, and cannot be kept still. Constantly puts his hands to his head, and cries out as if in pain there. Knocks and slaps his head with his hands. His expression is vacant. He has to be fed; will not use a spoon. Deglutition very imperfect. Slavers. Habits very faulty; frequently wet and dirty. He is a well-marked case of microcephalic idiocy. Circumference of head, $17\frac{1}{4}$ inches.

In February, 1891, the boy was first operated on by Professor Victor Horsley. At the 59th Annual Meeting of the British Medical Association, held in Bournemouth, Prof. Horsley read a paper on "Craniectomy in Microcephaly,"* and gave an account of this boy's case up to the date of the paper, July, 1891, or five months after operation. The boy at the time of the operation was 3 years and 5 months old. A linear canoe-shaped piece of the skull, measuring about four inches long by half-an-inch broad, was removed, slightly to the left of the middle line, and extending backwards from the frontal eminence. The boy recovered rapidly and completely from the operation.

I saw the boy for the first time two months after the operation; parents say he is quieter on the whole; does not knock his head about so much, and does not cry out as if in pain.

Seen again six months after operation; somewhat less restless. Does not knock his head, nor seem to suffer from pain in the head. Some days fretful all day, and other days full of mischief. Slightly cleaner in habits.

Seen June, 1892, sixteen months after the operation.

* "The British Medical Journal," Sept, 12th, 1891, p. 579, "On Craniectomy in Microcephaly, with an account of two cases in which the operation was performed," by Victor Horsley, B.S., F.R.C.S., F.R.S.

Parents think he shows some improvement in intelligence, but not more than they would have anticipated apart from the operation. Still very restless. Speech as before. Has grown a good deal.

Second operation, Sept., 1893.—A separate longitudinal piece of bone removed close to first strip.

Third operation.—About a week later a transverse strip removed from one side of longitudinal strip.

Fourth operation.—About three weeks later a second transverse strip removed on opposite side of longitudinal strip.

Fifth operation.—About a week later another piece removed, lengthening the longitudinal strip posteriorly.

The boy recovered from each of the operations rapidly, and without any bad symptoms.

In May, 1894, he was admitted to the Royal Albert Asylum, Lancaster. At the time of his admission the only improvement that I could detect in his condition was that he had given over the violent knocking of his head, and the crying out as if in pain. He was nearly as restless as at first, and there was no change in his power of speech.

He has now been in the Royal Albert Asylum for about fourteen months, and during that time has undergone the constant and systematic training of the institution. He has been in the charge, with a few other little boys, of a bright and intelligent nurse, who has done all she can to improve his habits and develop his intelligence. He has attended school daily, and while there received the attention of the staff of female teachers, and been taught to sit in class with other children, and to give some degree of attention to what is going on in the way of musical drill and various kindergarten exercises. As a result he is now considerably less restless, and is more obedient. He seems to understand better what is said to him. His habits are somewhat improved, although he is still wet and dirty frequently. He makes a fair attempt to use a spoon in feeding himself, when carefully watched. He does not knock his head, nor cry out. On the other hand, there is no improvement in his speech; his vocabulary has not increased, and he still slavers, and he is, as far as I can see, a restless and, I fear, a hopeless case of idiocy. The only part of the improvement that seems attributable to the operation is the cessation of head-knocking; the other improvements mentioned would, I think, have taken place under training, even if the

skull had not been operated on. The boy has grown well, and continues to be physically strong and well-developed, with the full and active use of all his limbs.

	Head Measurements, N. L.			
	1891.	1892.	1894.	1895.
Circumference	17 $\frac{1}{4}$	17 $\frac{3}{8}$	17 $\frac{7}{8}$	17 $\frac{7}{8}$
Transverse <i>a.</i>	10 $\frac{1}{2}$	10 $\frac{1}{2}$	10 $\frac{3}{8}$	10 $\frac{3}{8}$
<i>b.</i>	4 $\frac{1}{8}$	4 $\frac{1}{8}$	4 $\frac{1}{8}$	4 $\frac{1}{8}$
Longitudinal <i>c.</i>	10 $\frac{1}{2}$	10 $\frac{1}{2}$	10 $\frac{3}{8}$	10 $\frac{3}{8}$
<i>d.</i>	6	6 $\frac{1}{16}$	6 $\frac{1}{8}$	6 $\frac{1}{4}$

Circumference taken above ears and over Occipital Tuberosity.

Transverse *a.* Tape measure from ear to ear over Vertex.

b. Calliper " " " " " "

Longitudinal *c.* Tape measure from Nasal Notch to Occipital Tuberosity.

d. Calliper " " " " " "

Shape of Head, Dolichocephalic.

Cephalic Index, 74.5.

Measurements, N. L.			
Date.	Age.	Height. Inches.	Weight. Lbs.
1894	6 $\frac{1}{2}$	45 $\frac{1}{2}$	47
1895	8	48	49

II.—The second case, R. J., was admitted to the Royal Albert Asylum, May, 1893, at the age of 7 $\frac{1}{2}$ years. He is the first born and only child. The parents are apparently healthy and normal, physically and mentally. There is, however, a history of phthisis on both the father's and mother's side. An uncle of the father and a sister of the mother died of phthisis. There is no history of consanguineous marriage in the

family. The father was aged 26 and the mother aged 27 at the time of the boy's birth. The mother says she was in poor health during the whole period of her pregnancy. The labour was severe and prolonged; instruments had to be used, and the child was cut about the head and was asphyxiated when born. He is said to have had a fall at six months on the left side of his head and to have been unconscious for about an hour after. He has never had any kind of fit. Began to attempt to walk at about three years.

The boy is a profound case of idiocy. Cannot articulate. Slavers a great deal. Faulty in habits. Cannot feed himself. No power of attention. Is fairly developed for his age, but is not active. He walks badly, with a shuffling gait, and his grasp is feeble. Palate about normal in height and shape. Reflexes well marked. Although the boy is not markedly microcephalic (his head measuring $18\frac{7}{8}$ inches in circumference), the father seemed anxious to try the effect of craniectomy, and in January, 1894, the boy was operated on at Newcastle-on-Tyne, by Mr. Rutherford Morison, F.R.C.S.

Three discs of bone in longitudinal direction on left side of middle line removed with trephine, and the openings then united by cutting the intervening bridges of bone away with a Hey's saw.

The whole strip of bone thus removed was about five inches long by $\frac{7}{8}$ inch wide. The skull was nearly double the normal thickness, and extremely hard and dense.

The patient recovered rapidly without a bad symptom. Five months after the operation he returned to the Royal Albert Asylum. There was no apparent change in his mental condition. It is now 18 months since the operation, and during the latter 13 months of the time the boy has been under educational and general training in the Asylum, in the constant charge, with others, of a careful nurse, and at intervals during the day he has come under the teaching of the school mistresses.

I cannot say that there is any improvement in either his mental or physical condition. He is still a profound idiot, without speech, and requiring everything to be done for him. He slavers as before, and his habits are still very faulty. He still walks badly, and has little skilled movement in his hands. His attention cannot be fixed.

The space left in the skull after the removal of the bone

seems, as far as can be judged by pressure with the finger to be filling in and becoming hard.

Head Measurements, R. J.				
			1893.	1895.
Circumference	18 $\frac{3}{4}$	18 $\frac{1}{2}$
Transverse	<i>a.</i>	...	11 $\frac{1}{2}$	11 $\frac{1}{2}$
	<i>b.</i>	...	4 $\frac{1}{2}$	4 $\frac{1}{2}$
Longitudinal	<i>c.</i>	...	11 $\frac{1}{4}$	11 $\frac{1}{4}$
	<i>d.</i>	...	7 $\frac{3}{4}$	7 $\frac{3}{4}$

Circumference taken above ears and over Occipital Tuberosity.

Transverse *a.* Tape measure from ear to ear over Vertex.

b. Calliper " " " " " "

Longitudinal *c.* Tape measure from Nasal "Notch" to Occipital Tuberosity.

d. Calliper " " " " " "

Shape of Head, Brachycephalic.

Cephalic Index, 79.3.

July, 1895—Height, 51 inches. Weight, 64 lbs.

The operation of craniectomy for microcephalus and idiocy has now been on its trial since 1890, and taking the cases operated on in France, in America, and in this country there are about 200 cases from which it ought to be possible to form some judgment as to the success of the operation, in so far as mental development is concerned.

The information which up to the present has been published as to the after-history of the majority of these cases is meagre in the extreme. We find in some cases "amelioration" or "improvement" reported, but particulars as to the kind and degree of improvement are not stated. Also in the published cases the space of time between the operation and the report is generally too short to admit of a well-founded opinion as to the results really due to craniectomy.

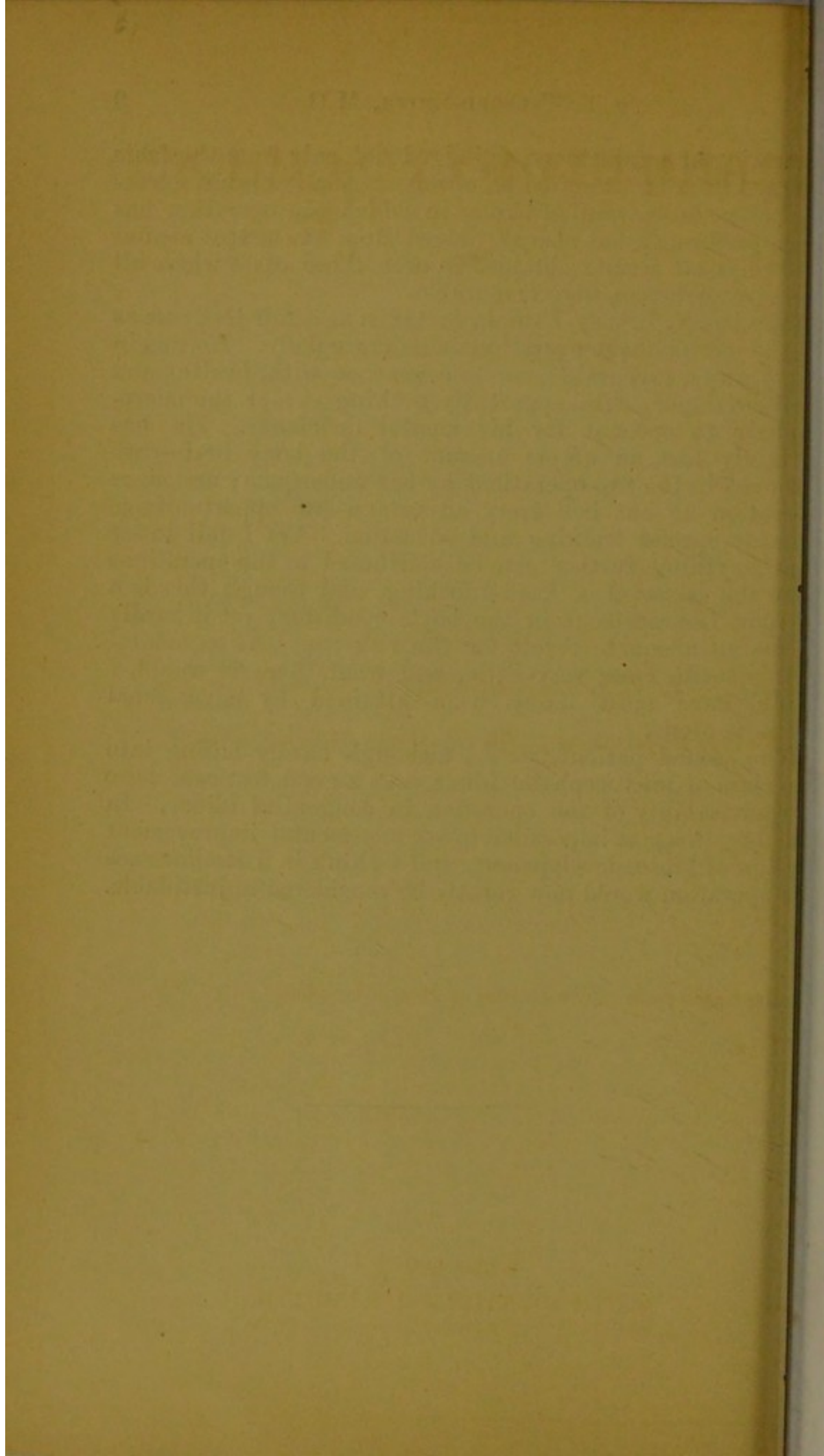
It seems time, however, to urge upon all who have had an opportunity of observing the after-results of the operation in any cases where a sufficient time has elapsed, to publish a full and impartial account of the present condition of the patients, and to contrast it with the condition before the operation.

The weight of evidence so far is, I think, against the

operation of craniectomy, as judged not only from the facts learned from an examination of microcephalic brains, microcephalic skulls, and of skulls in which the operation has been performed, but also as judged from the actual mental and physical results obtained in even those cases where all the circumstances were favourable.

The boy N. L. may, I think, be taken as a fair test case as to the merits of the operation in microcephaly. He was in every way a favourable case to commence with, healthy and well-developed, with apparently nothing except the microcephaly to account for his mental deficiency. He has certainly had an ample amount of the bony brain-case removed in the five operations he has undergone; and since the operation he has had every advantage and opportunity as regards special training and education. Yet I fail to see that anything further can be attributed to the operations than the cessation of head-knocking, and though this is a distinct improvement in the boy's condition, yet it hardly seems an adequate result for the risk run. As to mental development, I see very little, and what there is would, I think, have most likely been attained by educational methods alone.

The second patient, R. J., although hardly falling into the class of microcephalic idiots, was a good test case as to the advisability of the operation in congenital idiocy. In this boy it seems impossible to see any mental improvement or sign of brain development, and I think in a similar case the operation would now rightly be considered unjustifiable.







TIGHT GUTTE

