Medical Sciences. The objection to the work is, that in many particulars it is not up to date. The value of the work consists in the carefully-prepared statistical tables on the results of operations on the larger arteries, drawn from all sources, and the tabulated results of the fractures and dislocations admitted to the Pennsylvania from 1830 to 1850. Statistics are also given of the cases of amputation in the same hospital from 1850 to 1860. These latter will always be of value, and we think that Dr Norris has done well to publish them in this collected form. A paper on Compound Fractures has been added, which, as far as we can gather from the preface, has never been published before. It surely cannot have been written last year, because the antiseptic treatment of these cases is not even referred to. Water-dressing and poultices seem to be the perfection of treatment in Dr Norris's opinion. The statistical tables and historical references are the valuable parts of this book, and as a book of reference we recommend it to students of surgery.

Papers on Leprosy, read before the Grant Medical College Society.  
By J. C. Lisboa, Graduate of Grant Medical College. Bombay: 1874.

Report on Leprosy and Leper Asylums in Norway. By Henry Vandyke Carter, M.D. Lond.; Surgeon-Major H.M.'s Bombay Army. Presented to the Secretary of State for India in Council, November 1873. London: 1874.

These works on leprosy, for which I am indebted to the kind courtesy of the authors, suggest the following brief remarks:—

About the year 1850, the researches of Drs Danielssen and Boek on leprosy in Norway became known to the profession in India. At that time I was teaching medicine in Bombay, and daily visiting the leper ward in my hospital.

Conscious that an advantageous field for the clinical study of leprosy had been disregarded by me, and that for various reasons there was little prospect of my being able to turn it to good account, I proposed to Mr Lisboa, at the time attached to the hospital, that he should take charge of the leper ward and engage in the investigation of the disease. In February 1852, Mr Lisboa read his "Observations on Leprosy" before the Grant College Medical Society; and a full abstract of the paper was published1 in 1854; from which nine of the illustrative cases were quoted by me in the first edition of my "Clinical Researches." Mr Lisboa has now published in a separate form a complete edition of

1 Transactions of the Medical and Physical Society of Bombay for the year 1854. No. II., New Series, p. 290.
his original paper, and has annexed an additional contribution to the literature of leprosy: these constitute the pamphlet now before me.

The twenty-six cases which were the subject of Mr Lisboa's study in 1857 were, for the most part, in the advanced stages of the disease. The symptoms, both of the anaesthetic and tubercular forms, are carefully described, and an occasional blending of the two is noted. The presence of vesicular, pustular, and squamous eruptions, with their consequent discharges and incrustations, is mentioned in reference to a right understanding of the phenomena of the disease, and of the methods and results of treatment. Mr Lisboa, so far as I am aware, was the first observer who had shown, that though the shortening and disappearance of the fingers and toes, carpus and tarsus, are sometimes caused by caries and necrosis, they are more generally, at all events in the anaesthetic variety, effected by a slow and gradual process of interstitial absorption of the osseous tissue. The attendant phenomena of this process are minutely described, and the result is well shown in preparations presented by Mr Lisboa to the Museum of Grant College, and which form, he believes, the subject of plate 3, annexed to Dr H. V. Carter's paper¹ on the "Symptoms and Morbid Anatomy of Leprosy."

In only one case is there a report of the post-mortem appearances. Mr Lisboa did not find the state of the spinal cord described by the Norwegian observers. He noted, however, that the gray matter of the cord was very pale, but he inclines to the opinion that a similar condition probably exists generally after death from chronic exhausting disease.

My observation of leper establishments in Calcutta, Madras, and Bombay, had taught me that the accommodation and arrangements usual in such institutions were altogether inadequate for the comfort and wellbeing of those afflicted with this sad disease. The system followed in the Madras Asylum was much in advance of the others; and before finally leaving India in September 1859, I placed in the hands of Dr Bhau Dajee² the reports of that institution, for which I had been indebted to the kindness of Dr Alexander Hunter, the officer in charge; and proposed to him, as an object worthy of his well-known zeal and philanthropy, the establishment and endowment, with the aid of his fellow-countrymen, of an institution in the proximity of Bombay, arranged in such manner as to minister to the comfort and the cheerfulness of this unfortunate class of sufferers.

After 1852 no progress was made in the clinical study of leprosy in Bombay till about 1860, when Dr Henry Vandyke Carter entered upon his laborious and valuable researches in the same field in which Mr Lisboa had observed, and published the results, as

¹ Transactions of the Medical and Physical Society of Bombay for 1862. New Series, No. VIII.
² Clinical Researches on Disease in India, 2d edition, p. 696.
already stated, in the Transactions of the Medical and Physical Society of Bombay for 1862. These results are derived from the study of 186 cases of hospital and dispensary patients. Of these, thirty-two cases are detailed; and the morbid anatomy of sixteen cases—eight anaesthetic, seven mixed, and one tubercular—is tabulated with great minuteness and care. The symptoms of the anaesthetic, tubercular, and mixed forms are described with much fulness. The cases which came before Dr Carter in dispensary practice suggested the belief that there is an early recognisable stage of the anaesthetic form marked by an eruption chiefly papular—not, however, special in character—arranged in patches various in form, size, and situation, and preceded, accompanied, or succeeded by central anaesthetic spots. This is very probable, and it forms a most essential and important part of the clinical history of leprosy in India; but there is need of further careful study in good fields of inquiry. There should be established a sure diagnosis of the papular and other forms of cutaneous disease common to ordinary asthenic states and the cachexia of leprosy; not altogether derived from observation of cases in the conditions of doubt, but confirmed by a knowledge of their after-history and progress.

Dr Carter did not find the state of the cerebro-spinal centres mentioned by Danielssen and Boek, but he has described with greater minuteness the microscopic morbid appearances presented by the peripheral terminations and in portions of the nerve-trunks in the proximity of the affected parts. There was a clear gelatine-like deposit between the nerve-tubules in the scanty inter-tubular matrix, in which nuclei and subsequently fibres are developed, and which itself may become fibrillated. This deposit leads to a gradual disappearance of the nerve-matter in these situations. He thus established a close connexion between the morbid anatomy and the anaesthesia, the muscular rigidity and paralysis, the atrophy of tissue, and the liability to cutaneous disease.

Thus so far we find a cachexia characterized by exudation-deposit in close relation with and destructive of the terminal parts of nervous tissue, on the surface of the corium (bullæ), and into its substance (tubercles).

Dr Carter, in his very interesting account, just published, of leprosy in Norway, states, that though the forms of the disease in that country are identical with those in Bombay, their relative ratios are different. In Norway, the tubercular is 70, the anaesthetic 30 per cent. of the whole; in Bombay, compared with Norway, the anaesthetic form is twice as frequent. The tubercular form in Norway is of shorter duration and more characterized by febrile exacerbations, caused, it is believed, by the re-absorption of softened leprous matter from the skin-tubercles and its re-deposit in internal organs, as the liver and the spleen. The latest researches of Dr Hansen point to the probable existence of minute organisms in the leprous matter.
The theory of the re-absorption of the softened matter of the tubercles is of interest in connexion with the effect produced by the external application of gurjun-oil in softening or converting the tubercles into bullae; or, in other words, transforming the characteristic feature of the tubercular into that of the anaesthetic form. I am not aware whether it has been demonstrated microscopically, that the contents of the bullae are identical with the matter of the softened tubercle. If it be so, and if the idea of re-absorption and re-deposit in the tubercular form be accepted, we have, in the external discharge of the contents of the bullae, an explanation of the less degree of severity and of internal deposit in the anaesthetic form; and in the reported action of the gurjun-oil, we have possibly a key to the method by which remedies applied externally may act favourably—viz., the conversion of the severer into the milder form, by prevention of re-absorption and re-deposit of leprous matter.

The condition of the blood in leprosy has yet to be studied, for Drs Danielssen and Boek only remark that the albumen and fibrine are in excess, and Dr Carter has noted nothing peculiar in its appearance. The discovery by Dr Lewis of a hematozoon in the blood of persons affected with chylous urine in India has a manifest bearing on this question, and doubtless this skilful observer will direct his attention to the blood in leprosy and other forms of cachexia in India.

The Report published by the Royal College of Physicians of London in 1867, on proceedings respecting leprosy initiated in 1862 by request of the Secretary of State for the Colonies, contains full summaries of information, communicated from all parts of India, in reply to the queries of the College. These show the prevalence of the disease in all parts of India, and the general knowledge possessed of it in that country: not, it should be remembered, proceeding from methodized research, but from the general impressions of routine observation and practice.

In 1867, a nominal return of all known lepers in the Bombay Presidency—giving the residence, sex, age, and hereditary predisposition, if any, of every affected person—was procured by the Government. These returns, digested and elaborated with great industry by Dr H. V. Carter, form the subject of an exhaustive Report, published in 1871.

It may be well to explain what I conceive to have been the agency employed in collecting the information embodied in these returns. The queries, or tabular forms, were probably passed by the Secretary of Government to the divisional Revenue Commissioners, thence to the Zillah collectors, from them to the district assistant-collectors, then to the native mamlutdars, to be by them

1 Treatment of Leprosy among the Convicts of the Andaman Islands, by Surgeon-Major J. Dougal.—Edinburgh Medical Journal, July 1874.
2 Transactions of the Medical and Physical Society of Bombay for the year 1871, No. XI., Second Series.
distributed to the village koolkurnies (accountants), who, in association with the village patels (headmen), unlettered men, would, after communication with each individual leper, endeavour to ascertain and record, to the best of their untutored ability, the information required. Such is the theory of this kind of inquiry, which, even if faithfully worked out, hardly promises data for important practical etiological and sanitary conclusions.

Dr Carter has been led by these returns, and other collateral sources of information, to the conclusion that leprosy is not caused and maintained by endemic or defective hygienic conditions, but mainly, if not exclusively, by hereditary taint; and that the decline and ultimate disappearance of leprosy in Europe in the middle ages were due to rigid segregation in lazars, and that, in order to the eradication of the disease from India, a similar principle should be applied. Dr Carter, in his late visit to Norway, found that the same views existed there. He says, in his Report (p. 24), “In fact the original investigators of the national plague in Norway came to the unanimous conclusion that the main cause of the perpetuation of leprosy is its transmission from parent to offspring. I had come to a precisely similar conclusion for Western India.” “Hence the ratio agendi of asylums: they serve for sequestration of the possible parents of a diseased offspring, and thus directly check the propagation of an inherent malady. From the nature of the case no other plan can be effective, for time and due perseverance being granted, the aim of eradicating the morbid taint must inevitably be successful.”

In this exclusive view I do not concur. That hereditary predisposition exercises an influence in the propagation of this cachexia as it does in that of several others, and that the social lesson thereby taught should be carefully inculcated and observed, may not be questioned.

But this predisposition is, I believe, a factor subordinate to endemic and defective hygienic conditions, the precise nature of which has yet to be learned by right methods of investigation conducted by a competent agency. Social feeling and custom offer an influential obstacle to the marriage of lepers in India. The death-rate of the afflicted is high—10 per cent. and upwards.

These conditions, which imply an excess of deaths over births, would, if leprosy be mainly perpetuated by inheritance from parent to child, necessarily lead to the gradual extinction of the disease in the natural course of events.

It is very probable that the law of excess of death-rate has kept leprosy in check; but in the fact that it has not brought about its marked diminution and extinction, we have evidence that there are other active factors in its causation besides hereditary taint. The more precise but still immature statistics of Norway point to the same conclusion. Within the last five years[1] in that country the

[1] Dr Carter's Report, pp. 24, 25.
death-rate of leprosy has exceeded the birth-rate by 100 annually. This, however, Dr Carter would seem to attribute to the enlargement and more perfect organization of the four leper asylums of Norway, commenced in 1856; but there are no trustworthy statistics prior to 1856 for comparison; and this opinion is also apparently inconsistent with other statements in the Report. Not that it need be questioned, that the tendency of the segregation of—as in Norway—one-third of the known lepers of a country would be, under the ordinary estimate of predisposition, to lessen the amount of the disease; but in order to make this appreciable, there should be data, which do not appear in this Report—as the proportion of married inmates in the asylums, their average age at the time of admission, the duration of residence, the number of their children before admission and the proportion of these which has become leprous, etc.

With a view to useful practical action in respect to leprosy in Bombay, the following statements are made with some confidence:—

1. More careful clinical study of the early stages is required in reference to diagnosis, etiology, and treatment; and this may be best conducted in connexion with existing hospitals and dispensaries.

2. Leprosy is characterized by exacerbations and remissions: the former are aggravated by all conditions that debilitate and deteriorate the constitution; while the latter become greater in degree, and more extended in duration, by all conditions of hygiène, regimen, and treatment, which strengthen and improve the constitution. This law appears not only in Indian experience, but also in the instructive Report communicated in 1872 to the Secretary of State for the Colonies, on Leprosy in the West Indies, by Dr Gavin Milroy.

3. Much of the loathsome character of leprosy is due—in addition to the general causes of exacerbation—to neglect of the various appliances which mitigate the course of the local degenerations characteristic of the disease, and alleviate the cutaneous vesicular and pustular complications.

4. If 2 and 3 be true, it follows that the provision, for those afflicted with leprosy in its confirmed stages, of suitable resorts, in healthy positions, with means of recreation and occupation, and appropriate hygienic adjuncts and medical appliances, is a measure in which the Government and the charitable community of the presidency may without delay engage—with the certainty of effecting great and extensive alleviation of human suffering, and the gradual extinction of the more loathsome aspects of the disease. The success which attended the use of gurjun-oil in the hands of Surgeon-Major J. Dougal—already referred to—under the most unfavourable circumstances, affords ample evidence of what may be expected from the application of similar principles in association with hygienic and other kindred advantages. Large expensive
palatial structures are not proposed, but institutions on the cottage principle, with ground sufficient for gardening, and other industrial pursuits and amusements suited to the different classes of inmates. The medical officers in charge, by systematic investigation and record of the previous history of the inmates, would gradually accumulate facts, which would lead to a more certain knowledge of the etiology of the disease.

5. The districts, and towns, and villages in which leprosy chiefly prevails, should be visited by competent medical officers, with the object of studying the hygienic and social conditions of the affected, and of the locality generally, and of instituting statistical methods of record. Information thus acquired, and considered in connexion with the etiological data resulting from clinical study by officers in charge of leper asylums, would in time lead to a more positive knowledge of the causes of leprosy, and a consequent more certain application of the true means of prevention.

In conclusion, Dr Carter, believing that leprosy is chiefly maintained by hereditary descent, would aim at stamping it out by a well-organized system of segregation.

Whereas I, believing that there are other more powerful factors than family predisposition, would aim at the immediate alleviation of much present individual suffering, and the removal of public offence, as well as at the future prevention of the disease by a perfect knowledge of its causes acquired by scientific methods and a qualified agency.

I cannot close these hurried and imperfect remarks without desiring to express the great pleasure I have experienced in having thus been led to a just appreciation of Dr Carter's labours and high qualities for scientific research, and of their harmony with that early promise which it was my privilege to have personally known.

C. Morehead.

_Tropical Debility._ By James G. Dickinson, late of H.M.'s Bengal Medical Staff, etc. London: Baillière, Tindall, and Cox: 1874.

We learn from various foot-notes, and from the advertising sheet annexed to the pamphlet of thirty-eight pages now before us, that Mr James G. Dickinson is, in addition to this "Treatise on the Causes and Treatment of Debility produced by long residence in the Tropics," also the author of several other small works of kindred tenor, either published, "in the press," "preparing for publication," or "nearly ready."

Though the present treatise is professedly written "at the request of many professional friends practising in many parts of England," it seems to us to be chiefly intended for the general public, for it is strongly flavoured with that peculiar style of thought and of diction