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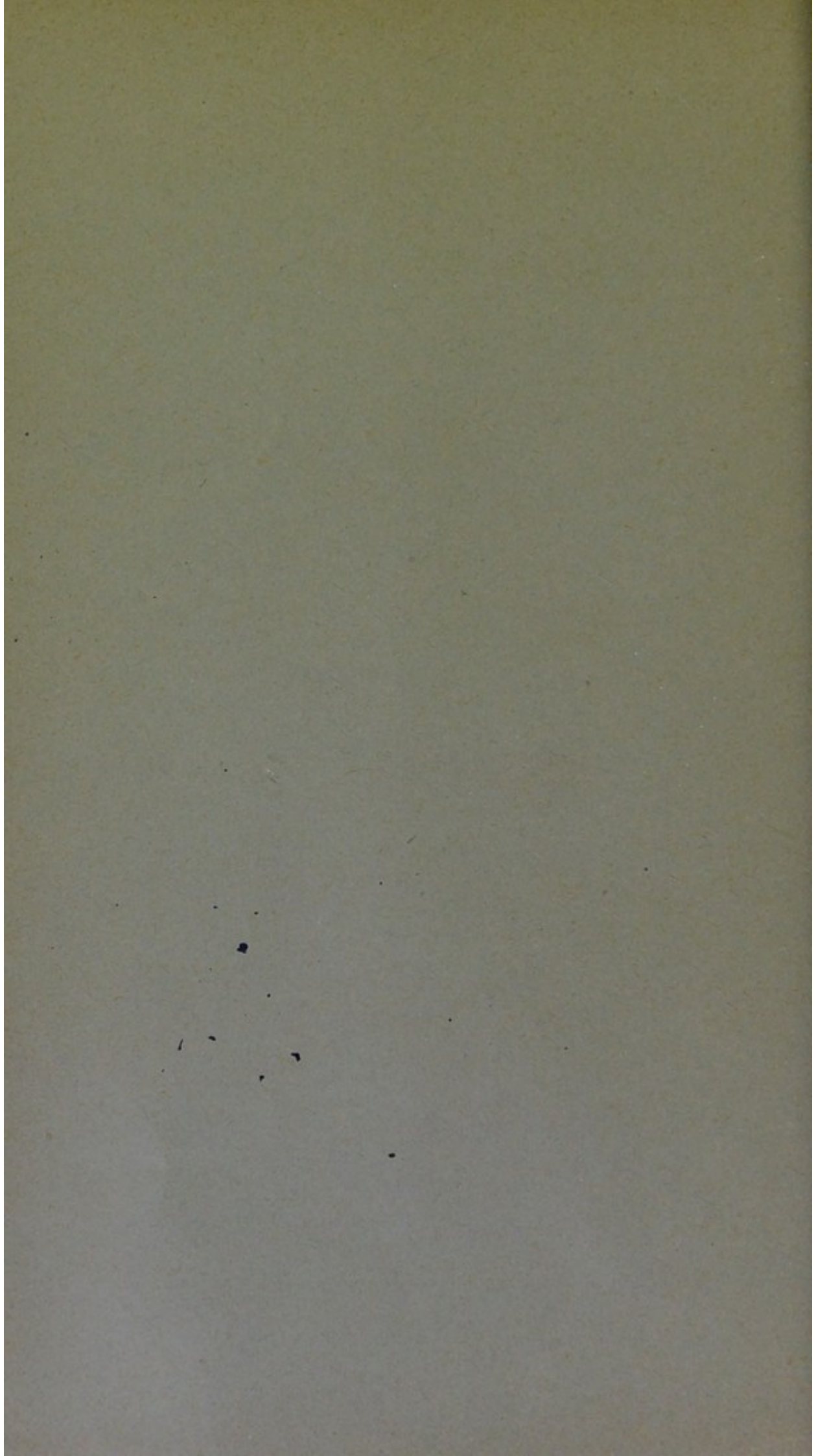
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FŒTAL MALARIA,
AS ILLUSTRATED BY TWO CASES.

BY
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(Read before the Obstetrical Society of Edinburgh, 13th February 1889.)

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FŒTAL MALARIA.

It has long been recognised as a fact that a foetus in utero can suffer from a paroxysm of malarial fever, and ague-cake in the foetus is perfectly familiar to those who have practised in tropical countries. To-night I am bringing forward two cases of an unusual, or, at any rate, I believe, an unrecognised character.

At an interval of some years I have met with two cases of foetal malaria (amongst numerous examples of the ordinary kind) in which, to the best of my knowledge, the mothers were entirely free from the disease, so that the question, Can a father transmit malaria to a foetus? has now to be considered.

The first case I saw in 1880 in South Africa, the other I met with last year in Edinburgh. Before making a few remarks on these cases, I will read my recorded notes.

In 1880 I was staying in a small place near Durban in South Africa. One night I was called up and asked if I would attend a lady staying in the same house who had been taken suddenly ill. She complained of pain and of a curious sensation in her abdomen, and said that she was over eight months pregnant. On palpating her abdomen, I distinctly felt the foetus shaking. The lady told me that the same thing had occurred on several previous occasions, but never so severely as now, nor had she previously experienced pain. The next night, and again the next, the same thing occurred at the same hour, and the following history was given to me by the lady's husband. He had been employed for several years on the west coast of Africa, and had suffered severely, both from intermittent and remittent fever,—so much so, indeed, that he decided to throw up his employment and to try a change of climate at the Cape after a holiday in Madeira, where he obtained a temporary situation. Whilst in that island he met his wife and married her. She was a Lancashire lady. They remained for some eight months subsequent to their marriage in Madeira, and arrived at Durban about a week before I met them. She had never suffered from malaria in any form whatever. The husband still had occasional attacks of intermittent fever, and he told me that just previous to his marriage, and for the first month after, he

had had several very severe attacks. On the fourth night I was again summoned to my patient, and found that the child was again shaking violently. At the same time I ascertained that labour had commenced. On examination I found that the os was as large as a five-shilling piece, the head was presenting, and all apparently going on well. Until the head arrived on the perineum the labour was satisfactory, but from this time, although the pains had been fairly strong, no progress was made. After waiting some time, as the patient was getting exhausted, I put on forceps and delivered the head with more difficulty than I had expected, and I had very great difficulty, indeed, in delivering the body on account of the greatly distended abdomen, caused by an enlarged spleen. In spite of all my care, the perineum was slightly torn during its delivery. The further progress of this case is of little interest. All went on well, and I subsequently heard that the child was thriving, that the spleen had been reduced to about normal size, and that after birth the child had only had seven attacks of ague. I only saw one of these attacks, which was very well marked, the cold, hot, and sweating stages being all present. The paroxysm lasted about seven hours, but unfortunately I cannot find a note of the temperature. If memory serves me right, the highest temperature during the paroxysm was rather over 102° F. in the rectum.

Now, if this case had occurred alone, I do not think I should have brought it under your notice, although I consider it is a fairly conclusive one. It might, however, be objected by some that it was just possible that the mother might in some way or other have become infected by malaria, although she had manifested no symptoms. The next case, I believe, precludes all such possibility.

On the 3rd of January 1888 I was called to see Mrs H., who was suffering from pleurisy and bronchitis, and from the effects of a severe beating which she had received from her husband. She was extremely ill, and a charitable lady who took an interest in her got her a nurse. On the 5th of January the nurse told me that the woman was pregnant, and that at ten o'clock on the previous evening she had complained of pain and "fluttering" in her abdomen. The nurse described it as being like a bad quickening, and said it lasted for about an hour. I told her to send for me should it occur again, and I was sent for the same evening at 10.30. On examining the patient I was forcibly reminded of the case above described. On January 7th, at the same time, after another similar paroxysm, labour came on, and the child was born about half an hour before I arrived. It was very feeble, about a seven-and-a-half month child, with a slightly enlarged abdomen. We managed to keep it alive for forty-eight hours, and it died on the 9th of January at 11 P.M. in the cold stage of ague, the second attack it had had since birth. The attack of ague on the 8th

commenced shortly before 11 o'clock. The cold stage was very well marked, the child distinctly shivering, and continuing to do so for rather more than half an hour. The hot stage lasted about two hours, and was followed by fairly profuse perspiration, the cotton-wool in which the child was wrapped becoming quite wet. During the attack the temperature was taken several times, and the highest point reached was $102^{\circ}6$.

On inquiry, I ascertained the following facts:—The child's parents had been married twelve years. The mother had never been away from Edinburgh. Three children had all been born at full time and quite healthy during the first seven years after the parents' marriage. The father then went as fireman on a steamer trading with West African ports. The men were forbidden to land at the ports, but the second engineer and this fireman managed to escape several times, and had severe remittent fever. The engineer died, and his death so frightened the fireman that he did not go on shore again, although he remained another year in the service suffering from ordinary ague. He had never suffered from syphilis. Ten months after his return home a child was born at full time, but it soon "pined away and died." Rather more than a year later another child was born. It has always been ailing, and has a rather enlarged spleen. Appropriate treatment has greatly improved this child, and now (1889) it is fairly well. Lastly, the child I have referred to was born. In all her last three pregnancies, the mother assured me that she had suffered from the curious feelings I have mentioned, and her friends had joked her about quickening so often.

With regard to this case, there is no doubt in my mind that the foetus suffered from ague, that the mother had never had ague, and that the father had transmitted the disease to no less than three infants. Unfortunately the woman died ten days after the birth of the last child. The nurse had occasion to go out for a few hours; the woman drank a bottle or more of whisky, became exceedingly ill, and Dr Hare, who kindly saw her for me, sent her to the Infirmary, where she died soon after admission, and unfortunately no post-mortem was obtained.

Dr Woodhead has had the kindness to have sections of the liver, spleen, and kidneys of the child cut for me. The specimens you will be able to see under the microscope.

Dr A. Bruce has been good enough to examine them for me, and to give me the following report:—

"*Kidney*.—The epithelium of the convoluted tubules shows marked cloudy swelling, the nuclei of the cells continuing to stain, while the surrounding protoplasm is highly granular, and so swollen as to occupy the whole lumen of the tubules. The nuclei of the cells of the glomeruli stain with great distinctness; the glomerular capillaries seem dilated.

"*Liver*.—The capillaries are much dilated and engorged with blood. The white corpuscles seem to contain very numerous fine granules of a dark brown and black colour. These granule-carrying leucocytes form a very distinct feature on the field; they are the first thing that attracts the eye of the observer. The liver cells are somewhat cloudy.

"*Spleen*.—The spleen is congested, the venous sinuses being considerably dilated. On the field large numbers of the leucocytes in the sinuses, the endothelial cells in their walls, and the large connective tissue cells of the pulp contain fine pigment granules, identical with those observed in the liver. The Malpighian bodies appear to be fairly normal."

I think that, apart from the intrinsic interest of these cases and the comparative rarity of meeting with foetal malaria in this country, the cases have a great importance; for they seem to me very clearly to prove that malaria is a specific disease, that it is due to a micro-organism and not to chill, as some would have us even yet believe. How could any amount of chill from which the fathers might have suffered be transmitted in the way I have indicated? And I think it is well to bring forward such cases as these, in order to keep the question as to the origin of malaria before the profession. It is not my intention to-night to enter into the general etiology of malaria, as I hope shortly to enter into it more fully in another place. All I wish to do is to introduce for discussion one point, namely, the possibility of a non-malarious woman producing a malarious child.

It is an admitted fact that the foetus in utero may suffer from syphilis, the ovum being directly infected by the father, and the mother escaping. With regard to the transmission of syphilis from the father to the foetus, the mother remaining unaffected, Mr Jonathan Hutchinson says:—"The evidence on this point seems to be overwhelming. It is a matter of constant experience that the father of a syphilitic infant is known to have had the disease before marriage, whilst not a symptom has ever been observed in his wife. . . . In these cases it frequently happens that the taint in the father is wholly latent, that he has for long appeared to be absolutely well, . . . it being then taken as established that the child may at the time of conception take syphilis from its father alone." But in neither of my cases was the disease latent; it was active. Therefore I think the possibility of the father affecting the foetus may be the more readily granted. Again, speaking of syphilis, Mr Hutchinson says:—"The transmission of the disease, as well in inheritance as in acquisition, is always effective by the conveyance from person to person, not of a tendency to disease, but of a particulate virus. The virus is probably as specific and individual as are the seeds of barley or of clover. If it passes into the sperm or germ, then the foetus is liable to the full development of the disease; and if it chance that none of its elements do so pass, then

the offspring, although born to a tainted parent, escapes free." The facts stated by Hutchinson, "that a woman who bears a syphilitic foetus inheriting from its father, although herself remaining free from symptoms, acquires silently a state of constitution which protects her from syphilis in the future," is, I think, a proof that some day preventive inoculation will be practised against syphilis, and for malaria too, if my observations and belief be right.

Machiafava and Celli have now placed on record five cases, in which the injection of about one gram of malarial blood induced well-marked malarial fever, possessing the same type and the same symptoms in the patients inoculated as in those from whom the blood was taken, and in each case the characteristic alteration was found in the blood of the persons inoculated as well as in the blood of the patients undoubtedly suffering from malaria. It is also certain that when once a man has suffered from malaria of whatever kind, he is liable to attacks for the rest of his life. These and other facts, too numerous to mention, incline me to the belief that it is just as possible for malaria to be produced in a foetus in utero, in the way I have indicated, as it is for other diseases, the transmission of which is now undisputed.

Professor Simpson said that he believed that the cases brought before them in Dr Felkin's paper opened up a perfectly new view of the mode of development of malaria in the foetus in utero, and he would like to know if Dr Felkin had himself found in obstetric literature any hint of the occurrence of the mischief in infants whose mothers were free of the disease. As the cases were being read, the analogy which Dr Felkin had pointed out with the production of syphilis had occurred to him (Prof. Simpson) as it had doubtless to the other Fellows, and he thought that Dr Felkin was entirely justified in the conclusions he had drawn from his valuable record of these striking and instructive cases.

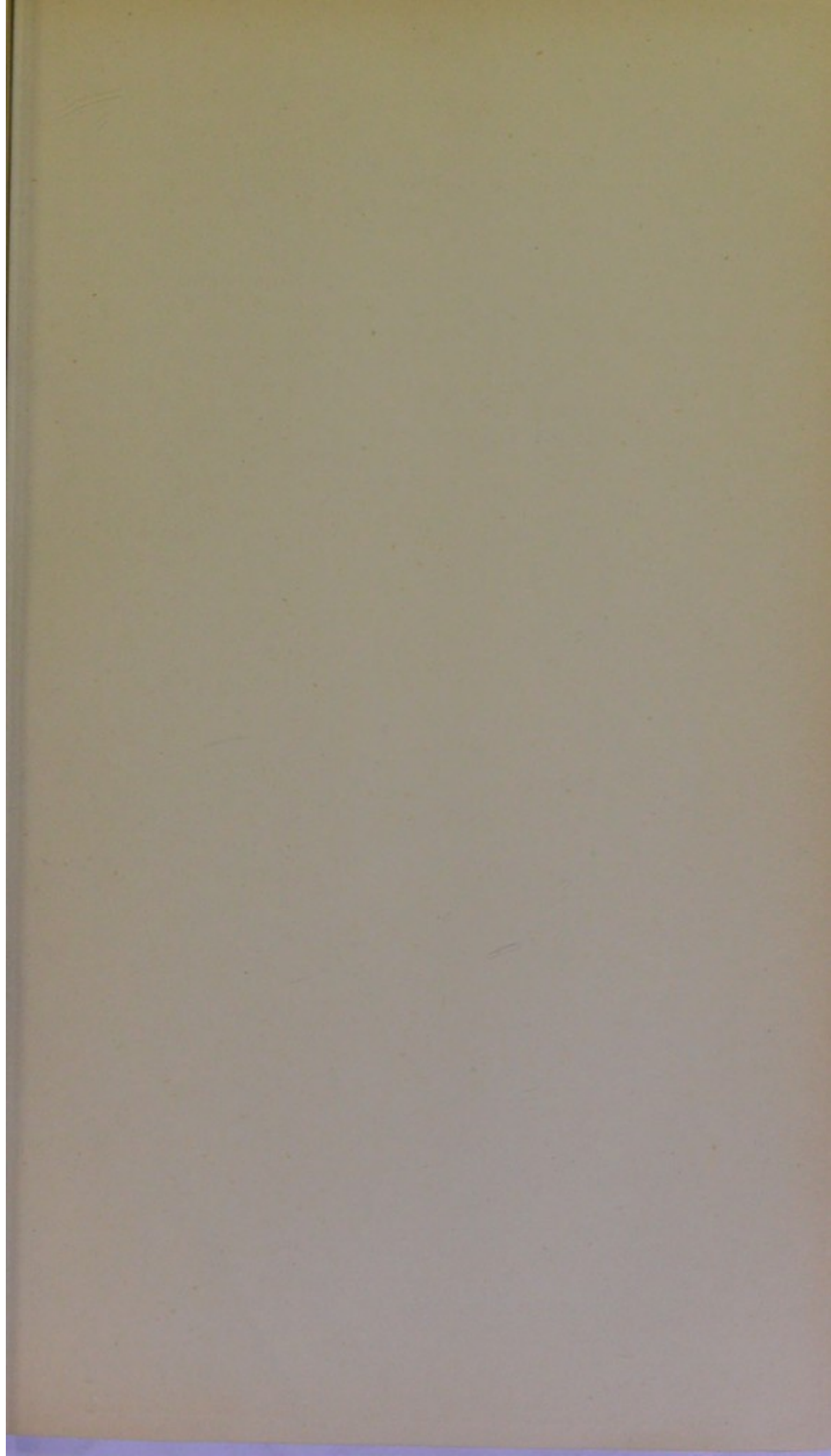
The President was greatly interested in Dr Felkin's cases and the deductions he had drawn from them. The second case seemed to prove, without any possibility of doubt, that the malarial poison, whatever its nature may be, can be transmitted direct from the father to the foetus without infecting the mother. The first case seemed less certainly confirming this view, because malaria may sometimes be latent. The only case of ague he had seen in connexion with pregnancy occurred in a lady who had been born in India, and had been there until she was seven years old. She then came home, and married at the age of 23. At 25 she had her first child, having never suffered either in infancy, so far as she knew, nor since she left India from any malarial disease. On the day following delivery she had a severe attack of ague, and these attacks occurred every second day for about a fortnight, and

then passed off. This woman must have had the disease latent in her system from the time she left India.

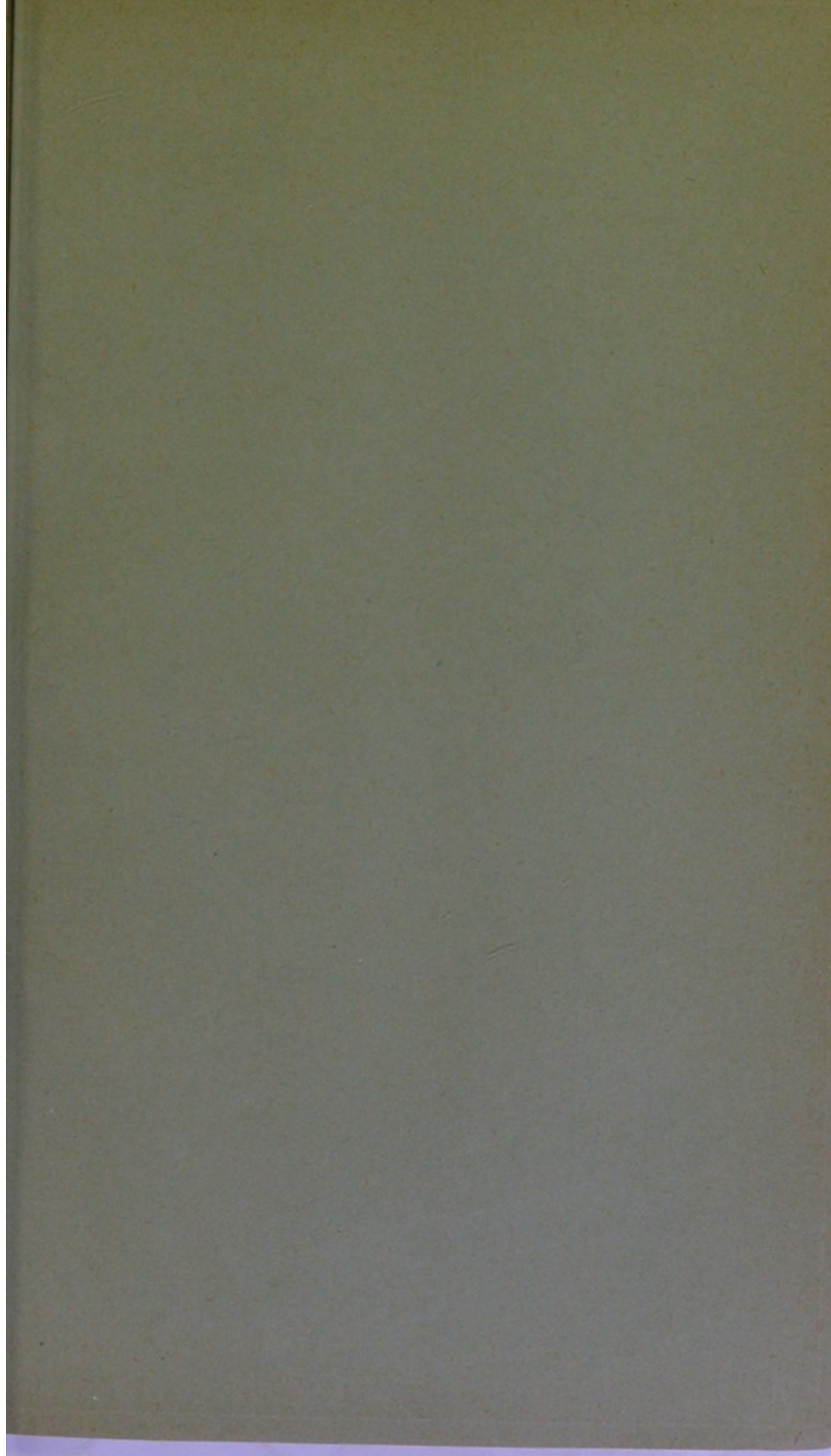
Dr Felkin said, in reply to Professor Simpson, that although he could not profess to be acquainted with all the literature on the subject of malaria, he had studied it extensively, and to the best of his knowledge there was no case on record of a similar nature. He had only to-day seen in a paper by Dr L. Thomas (p. 308, *Archiv der Heilkunde*, 1866), a vague hint in relation to the point in question. Dr Thomas says, "I know not if cases are on record in which it can be proved that newly born infants are suffering from malarial cachexia where the mother had not suffered from malaria." But this is hardly to the point, as he does not refer to children suffering from malaria in utero. With reference to Dr Hart's remarks, Dr Felkin said that a very great number of children born in the tropics were born suffering from malarial cachexia, and many, too, from ague-cake. In fact, ague-cake in many cases delayed delivery and often obliged the use of forceps. Baxa in Pola said that 90 per cent. of children suckled by mothers or nurses suffering from malaria had ague, and that 30 per cent. died in the first year of life. Luck (*Rec. de Mém. de Méd de Chir.* 1864, Nov.) relates a case in which a nurse who had suffered from malaria in Algiers returned to France, and though apparently free from malaria at the time, suckled a child whose parents were perfectly free from it, and after three months it suffered from tertian ague. And he warns against the employment of wet nurses from malarious districts. Another very interesting case could be referred to, but it is too long; it is given by Sous (*Journal de Bordeaux*, Mai, 1857). It is a rule in tropical countries to reject a wet nurse (if possible) suffering from an enlarged spleen, and it is also usual to examine her child to see that it is free from malarial cachexia or ague-cake. In India, too, it is necessary to see that the child is not a borrowed one, as wet nurses in that country are apt to be very cunning. There are also cases on record in which persons from a malarious district suffering from malaria have slept with healthy persons and have given them the disease. This last fact, however, is very doubtful, and the experience in all great epidemics seems to totally disprove the observation. It may be well to mention one or two other facts with regard to malaria. Hirsch does not believe in the contagiousness of malaria, but he admits that it may be conveyed from place to place, basing this conclusion on Salisbury's experiment of taking earth from a malarious spot to one which was free from the disease and placing it on the window-sill of a room of a second floor in which two persons slept. The window was kept open at night. Six days after both the persons who slept in this room complained of being unwell, and on the 12th day the one, and on the 14th the other, was attacked by ague of a tertian character. And Sawyer records a case in which it is almost certain that malaria must either be contagious or that it can be conveyed

in clothes or other effects. Dr L. Thomas (*Archiv der Heilkunde*, 1866) is strongly of the opinion both that malaria is contagious and that it may be given from a nurse to a healthy infant, or that an unhealthy infant can infect a nurse. In reply to the president, Dr Felkin said that he still thought that his first case was due to malaria transmitted by the father. The lady came from a non-malarious district, and the closest inquiries had failed to bring out any symptom of even masked malaria, but of course he could not be answerable for her parents or grandparents, although he obtained no history of malaria having affected the parents. The case to which the president referred was one of great interest, but it was not an uncommon thing to find that persons who had lived for many years in a malarious district were first attacked by frank ague after their return home. In these cases the poison had evidently lain dormant, or it had only previously manifested itself as masked malaria, the symptoms of which were often unrecognised by the patients. Any acute disease, however, or parturition, was quite capable of inducing in them unmistakable ague. Dr Felkin begged to thank the Society for the way in which they had received his paper.









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