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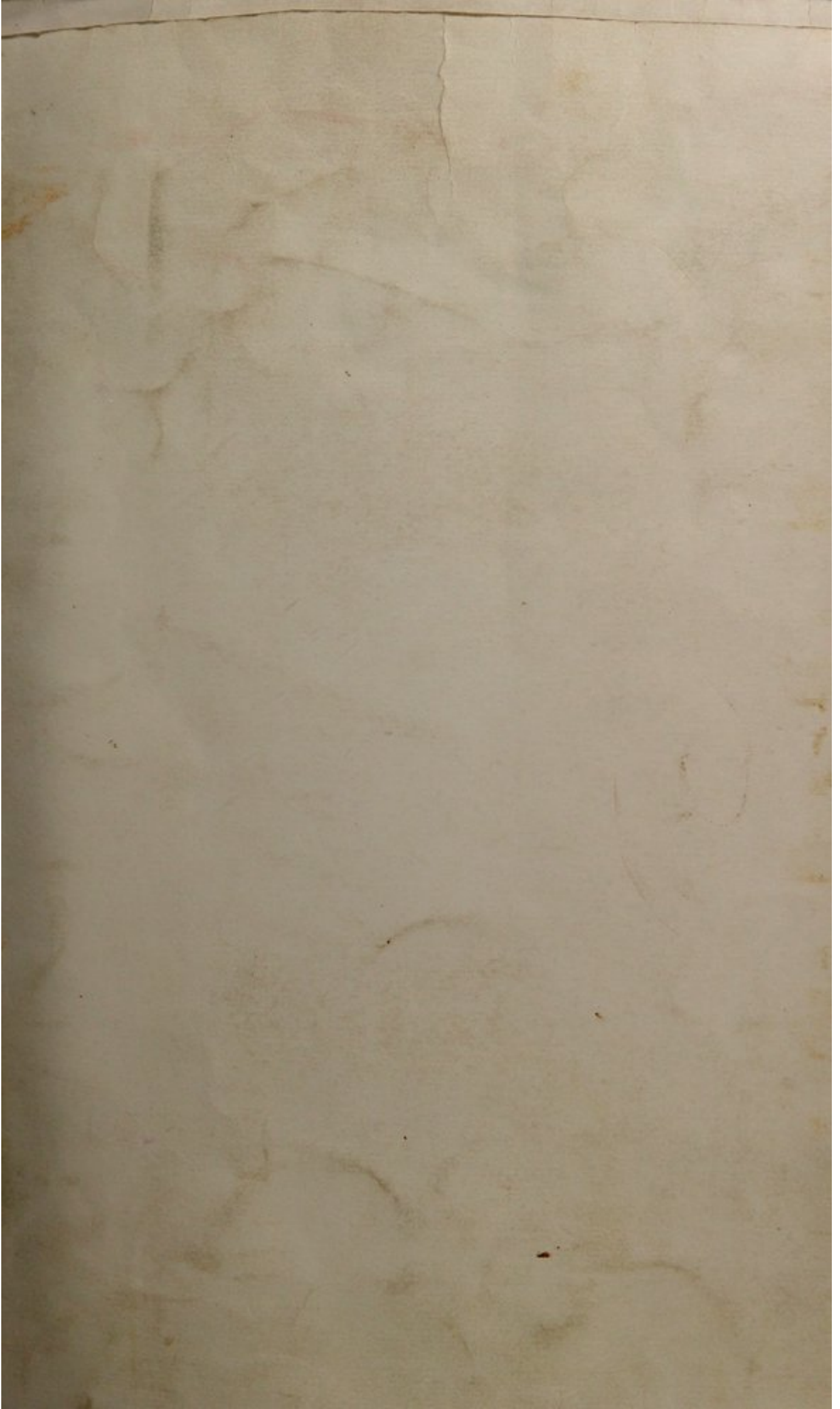
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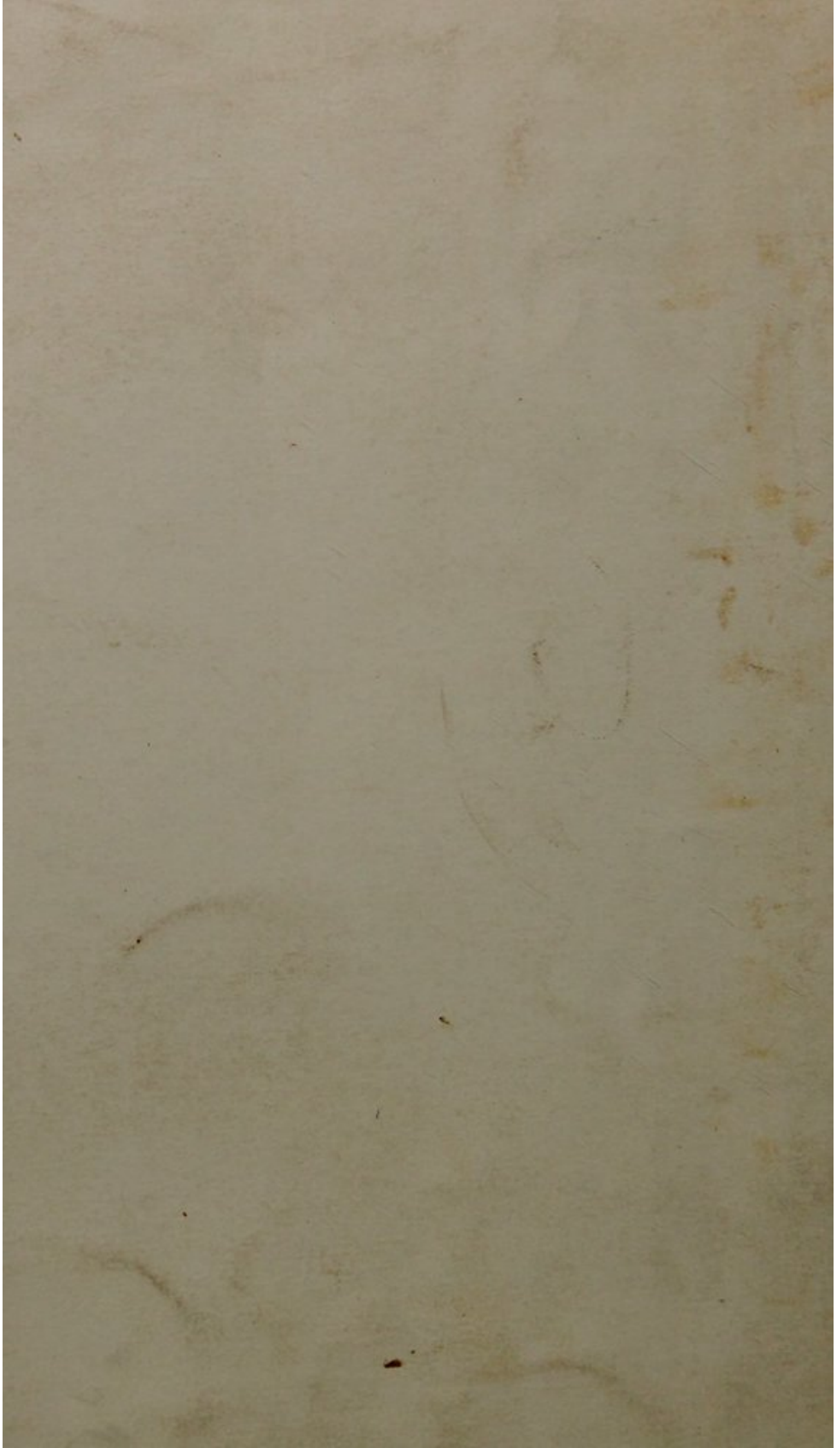
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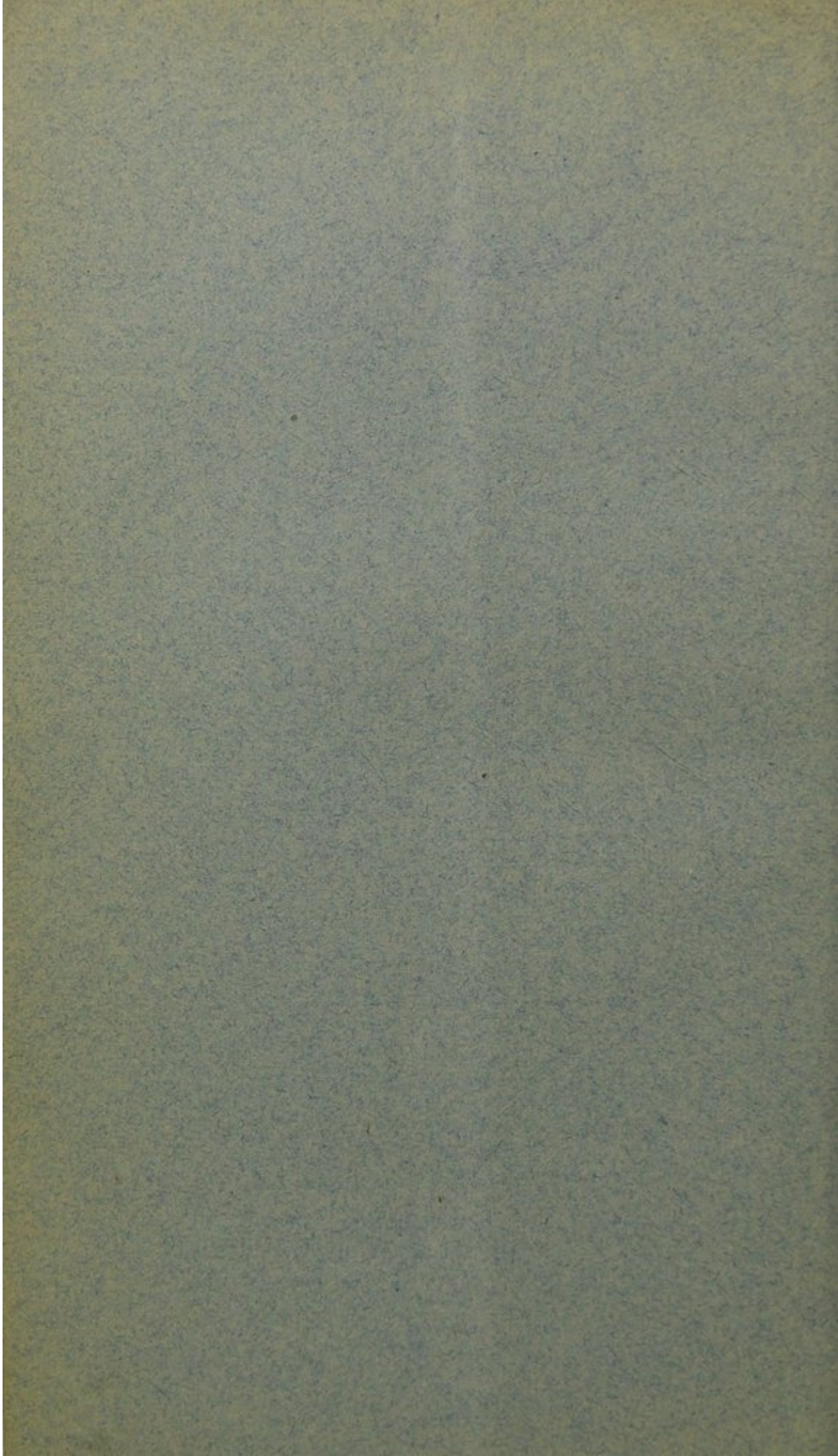
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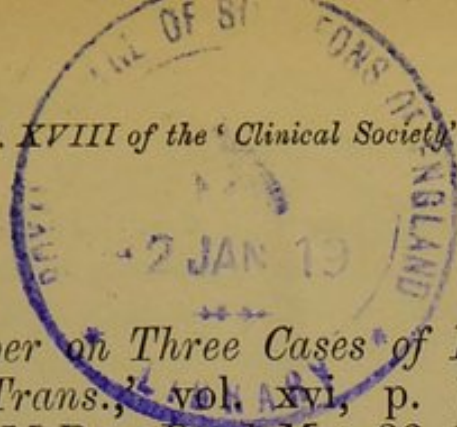




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Sequel to paper on Three Cases of Raynaud's Disease,  
'Clin. Trans.,' vol. XVI, p. 179. By THOMAS  
BARLOW, M.D. Read May 22, 1885.

I PROPOSE in this communication to give some brief notes of the further progress of the three cases of Raynaud's disease which I described in the 16th volume of the *Transactions*, and to deal especially with the results of treatment.

The first case, Elizabeth N., originally under the care of my colleague, Dr. Poore, came again under my observation August 29, 1884. She was admitted into University College Hospital with the fingers of the right hand almost black, the dorsum of the hand of a dark purple, and the palm of a light purple colour. The forearm for the lower two thirds was blue, the colour gradually fading away. There was slight distension of superficial veins.

The left upper limb was similar to the right, but the colouration was less intense. The limbs felt very cold. The radial pulse was almost imperceptible at the wrists. The feet were also of a purplish colour, which was most marked over the toes, but not so intense as the colour of the fingers. The colouration extended upwards for at least an inch above the ankles. There was also a little distension of superficial veins, and the child complained of aching in both feet and arms.

The face was sallow and pale. Temp. in axilla at 12 noon, 98.8°. The heart-sounds were natural, the second being, perhaps, a little accentuated, 84 per minute. The urine passed at 2 P.M. was pale, acid, free from deposit of any kind, and contained no albumen.

I cannot give the exact duration of this attack, but I believe it was not more than three hours. It is to be noted that August 29 was very chilly, succeeding a very hot day.

Next day, August 30, between 6 and 7 A.M., body temp. was 100°, and at 9 A.M. 99.8° in the rectum. The urine passed in the night was of a dark amber colour, but there was no deposit of pigment. It was of slightly alkaline reaction, sp. gr. 1018, and free from albumen. There was no play of colours with nitric acid.

The limbs felt warm and the skin showed no pigmentary changes. The child was kept in bed until September 2, when

she was allowed to get up at 8.30 A.M. At 9.55 A.M. the hands and feet began to get blue and gradually became quite purple, the colouration extending to 1 in. above the wrists and just above the ankles. The child cried out with pain and nothing could quiet her.

At 10.5 A.M. I placed the child's right hand in a large basin of hot salt and water, the positive pole of a Leclanché constant current battery being applied to the inner side of the child's arm and the negative pole in the water. The current was rapidly made, broken, and reversed by a commutator and the number of cells increased until a moderately vigorous contraction of muscles occurred. At the end of thirty minutes the right hand was perfectly normal in colour, or rather, of a pale pink tint. The thumb and two radial fingers lost their lividity first, then the little finger, and finally the ring finger. The left hand was still as purple as before. The same treatment was then applied to it, and in about the same time recovery took place and in the same order. Nothing was done to the feet except that they were surrounded with cotton wool. The colouration had not been so intense as that of the hands, but it is noteworthy that it did not clear up entirely until 6 P.M. The urine passed at 12 noon was pale in colour, contained slight deposit of mucus, but no pigment and no blood corpuscles; it was of sp. gr. 1016, and was free from albumen. The temp. was, at 7 A.M.  $99.4^{\circ}$ , 1 P.M.  $99.2^{\circ}$ , 3 P.M.  $100.4^{\circ}$ , 8 P.M.  $101.2^{\circ}$ .

Patient was kept in bed on September 3, but on September 4 was allowed to get up. She was quite comfortable till 2 P.M., when she complained of slight pain in the right foot and said she felt an attack coming on. A slight colouration of the right sole was found. She was allowed to sit by the fire and in half an hour this attack passed off. It is noted that the temperature of the ward was higher that day than on the 2nd.

September 5.—Patient was allowed to get up at 3 P.M. She was playing about in the ward until 5.15 P.M., when she complained of her feet. The soles were found bluish and the colouration rapidly extended over the dorsum up to the middle of the leg. The colouration was more intense on the left leg than on the right. The child complained of much pain. There was nothing abnormal about the hands. I was anxious to ascertain the effect of nitrite of amyl, and Mr. Fleming, the house physician, allowed the child shortly after the beginning of this attack to inhale three minims. For about ten minutes the radial

pulse became perceptibly fuller and the face became markedly flushed, but no change whatever took place in the appearance of the lower limbs. The constant current was then applied to one leg, but the child struggled so much that the application could not be persevered with. The feet were wrapped in cotton wool and the child was put in front of the fire. By 8 P.M. the feet were normal.

September 7.—The child got up to-day at 2 P.M. She was comfortable until 4.30 P.M. and then complained of her feet. The distribution of the lividity was about the same as that of the last attack and the hands were quite normal.

The feet were wrapped in wool and she was allowed to sit by the fire. The feet were normal by 6 P.M. Urine normal. The mother volunteers the statement that the feet are attacked about three times as often as the hands.

From September 8 to September 15 she was allowed to be up and was free from attacks. She was then discharged from the hospital. I learnt that on October 9 and 10 she had attacks, but she was not brought to the hospital.

On November 3, she was brought to me in the out-patient room, five minutes after the commencement of an attack. The left foot was cold and blue up to the ankle and the child was crying with pain. I placed the child's foot in a galvanic bath as before described, and in ten minutes the foot was quite right again. The second and third toes recovered first and the big toe last.

I satisfied myself, whilst the child was in hospital, that in her case there was no initial pallor observed, and that whenever she complained of pain at the onset of an attack there was already some blueness which generally increased up to lividity. The freedom from paroxysms when in bed, as stated in the previous paper, was confirmed.

The second case, Lillie C., recommenced her attacks on October 1, 1883. During the time she was under observation her attacks occurred as before, generally in the middle of the day. They were chiefly confined to the lower extremities. They lasted from half an hour to an hour and were repeatedly followed within an hour or two by the passage of a small quantity of dark urine. I had several opportunities of examining such dark urine, and found as before no red blood-discs, but pigment and oxalates, marked reaction to the guaiacum test, and the characteristic spectrum of methæmoglobin.

The child living some distance from the hospital and the attacks on the whole being of shorter duration than the former



series, there was no opportunity of trying the effect of galvanism on the shortening of an individual attack. She attended daily for galvanism for a fortnight or more, but I cannot say that the result was conclusive, because it was obvious that independently of any treatment the asphyxia of the limbs was less severe than formerly, and the child was able to go to school regularly, so that it seemed unnecessary to insist on her continuing the treatment.

The third case, John P., came under my observation again in August, 1883, and I then determined to give galvanism a thorough trial. I first applied the poles to the spine as Raynaud directs, but not obtaining any definite result, after a few days I applied them locally to the blue extremities themselves, holding the two sponges a few inches apart and painting the limbs vigorously for about a quarter of an hour daily. Fifteen to twenty cells of a Leclanché constant current battery were employed and the plan was sometimes varied by the bath method before described.

The patient very soon testified to the benefit of the treatment. He began to walk better; he was comparatively free from the burning pains, which had rendered him miserable both by day and night, and he was soon able to go to his work, for which he had been quite incapacitated. The tonic effects on the peripheral circulation were obvious directly; the colour of the skin became much less blue, though months elapsed before it became a healthy colour. There was at first a degree of anæsthesia to the galvanic as well as to the faradic current, but this gradually passed away and he became normally sensitive. There were no degenerative reactions, although there was a certain amount of wasting of the leg muscles as well as of the feet. Under the galvanic treatment and increased exercise the feet gradually became much better nourished.

The man attended regularly six days a week from August, 1883, to the end of January, 1884, and subsequently three or four times weekly until the end of May, and I have to thank my assistant, Mr. Roberts, for his systematic and regular application of the galvanism. There were three days of very cold weather in January, when it was certain that, according to his statement, in previous years he would have been exceedingly bad. He had a slight attack of blueness, tingling, and pain in his right foot, but it did not interfere with his work and it soon passed off.

When he was allowed to attend less frequently for galvanism, viz. at the end of January, great pains were taken

to show his wife how to shampoo the feet, and this was done daily by either the patient or his wife till the end of May. He was then dismissed and told to show himself again in October, 1884. At the latter date he was free from pain and his feet, though not plump, were moderately nourished, and were only a little colder and bluer than natural. He could walk well and do his work.

To these cases I may add two others, perhaps allied, but I think not strictly coming under the category of Raynaud's disease. The first was that of a little girl who had a deep cyanosis of both lower limbs extending nearly up to the knee. The affection was not paroxysmal and was not attended with pain. The child had always had a feeble circulation, but the condition had become greatly aggravated shortly before she came under my care. There was no *morbus cordis* to be made out and the only other noteworthy clinical feature was the occurrence of some ill-defined epileptoid attacks followed by some paresis of the lower limbs. It was for one of these attacks that the child was brought to the hospital.

The daily use of the constant current, applied alternately by "painting" and by means of the bath, was followed by very marked benefit to the cyanotic condition of the limbs. The child's legs were also shampooed, but there could be no doubt about the benefit of the galvanism to the local condition and she expressed herself as more comfortable after every application and walked much better.

The other case was that of a middle-aged woman who had severe tinglings and pains in both hands, and a condition something like "dead fingers." The pains often kept her awake at night, and this and the numbness from which she suffered had seriously interfered with her work as a needlewoman. There was no actual lividity, but the fingers were of a pale leaden colour, also there were no definite paroxysmal attacks.

My assistant, Mr. Roberts, galvanised her several times weekly for more than two months with very great benefit. She was taught to rub her fingers systematically at home and to use alternate hot and cold water douches, but she herself was emphatic as to the comfort that galvanism gave her.

In her case as in some others the curious fact was noted that certain fingers (symmetrical on the two sides) were more affected than others and that in the healthy glow which followed any given application of galvanism certain fingers became pink sooner than the others.

To sum up, although the observations which I have nar-

rated are very imperfect, and the experiments themselves were not all of them sufficiently absolute for scientific purposes, I think they support the recommendation of systematic daily employment of galvanism for the condition of local asphyxia.

I venture to think, with all deference to Raynaud's authority, that the local application is better than the method recommended by him of passing the current over the spine, or, as he would state it, "through the spinal cord."

It seems hardly necessary to add that galvanism ought to be supplemented by the employment of every other method which can be devised of improving the peripheral circulation, whether locally, by shampooing, hot and cold douches, &c., or centrally, by the timely administration of food before any exposure to cold.

