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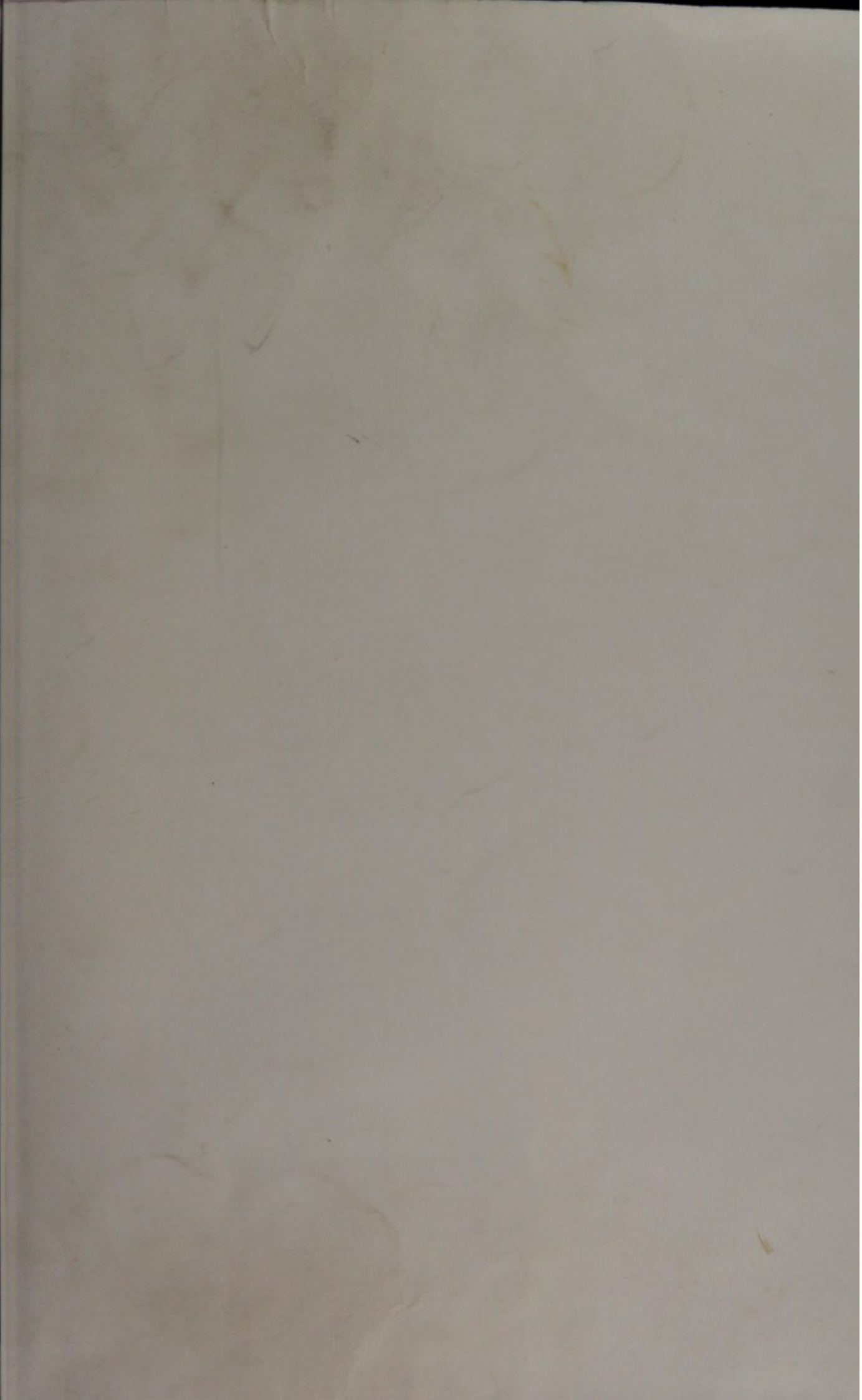
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## ON THE USE OF CALCIUM SALTS AS CARDIAC TONICS IN PNEUMONIA AND HEART DISEASE.

By SIR LAUDER BRUNTON, M.D., LL.D., F.R.C.P., F.R.S.

CONSULTING PHYSICIAN TO ST. BARTHOLOMEW'S HOSPITAL.

(Reprinted from the BRITISH MEDICAL JOURNAL, March 16, 1907.)

FIFTEEN years ago, in the BRITISH MEDICAL JOURNAL of January 23rd, 1892, Dr. Prickett and I published a paper on the use of oxygen and strychnine in pneumonia. This paper was hurriedly put together, half of it having been written in a country house while watching a case of pneumonia and the other half scribbled in a railway train on my way back. The reason for our hurried publication was the prevalence of pneumonia at the time, and the hope that the treatment which we had found so promising might prove useful in the hands of others. The event has justified our expectation, and the treatment of pneumonia by oxygen and strychnine is now widely and successfully employed. A similar reason induces me to write this short paper on the use of calcium salts, because in the present epidemic of post-influenzal pneumonia there seems to be a great tendency to cardiac failure, and this, I think, may to some extent be averted by the free use of calcium salts which have a tonic action upon the heart.

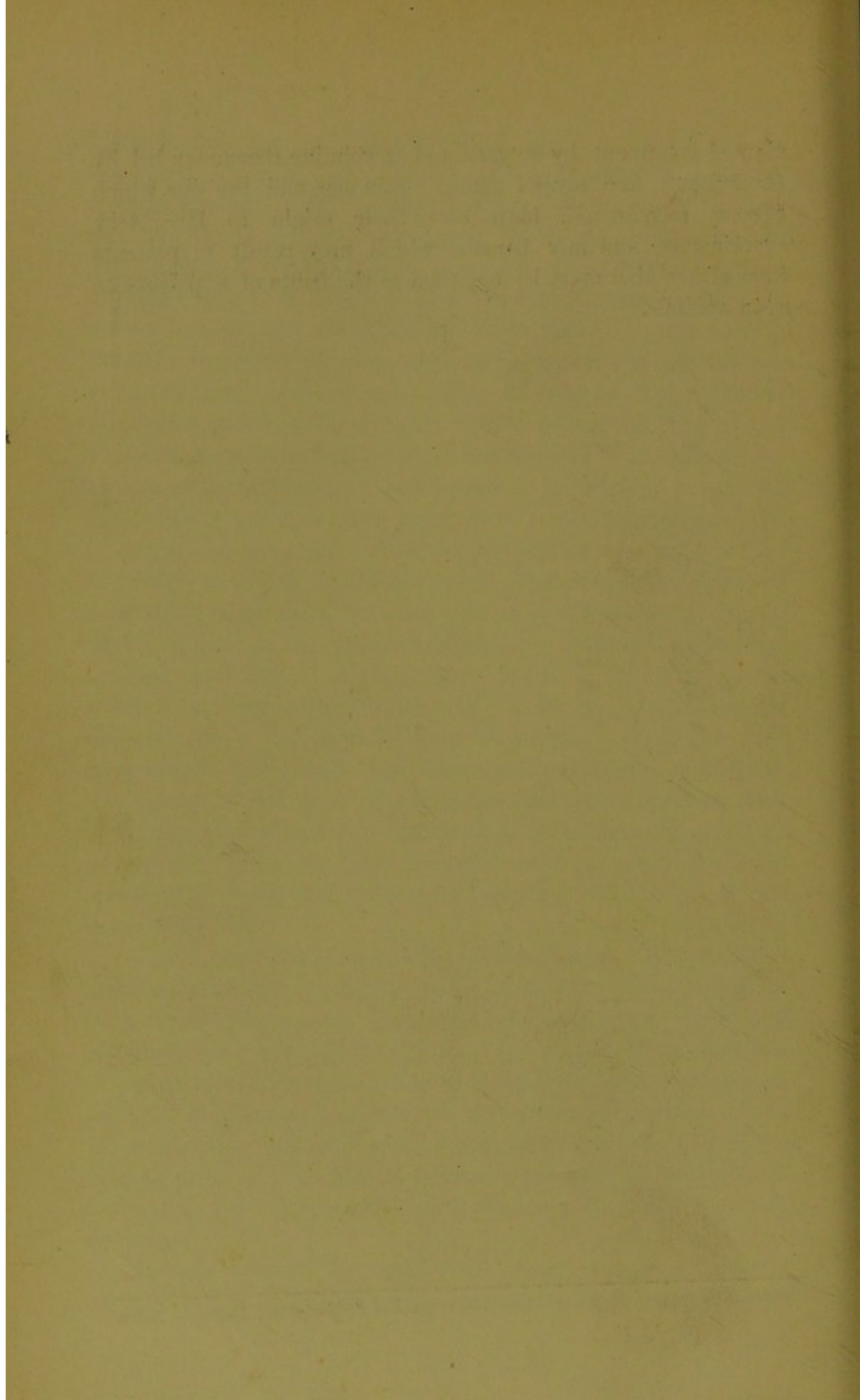
Nearly twenty-five years ago Dr. Sidney Ringer discovered that when the frog's heart is perfused with a solution of sodium chloride in distilled water the heart soon loses its power of contraction. This result does not occur if the solution is made with tap water. Professor Ringer's scientific acumen soon led him to the important discovery that the maintenance of the contractility of the heart when tap water is used is due to the calcium salts contained in the water. This discovery is constantly utilized in physiological laboratories, but, so far as

I know, has not had any practical application in medical treatment. A good many months ago I was called to see a case of pneumonia, and, fearing that the heart would fail, I thought over all the remedies which were likely to avert such an unfortunate result. It then occurred to me that calcium chloride ought to be useful. The only harm it was likely to do was to increase the coagulability of the blood, but any risk of this sort was small in comparison to that from cardiac failure, so I prescribed it. It is not so easy to judge of the usefulness of calcium salts in threatened cardiac failure as it is of the action of oxygen and strychnine, because the results are not so immediately apparent. As the patient for whom I prescribed the calcium made a good recovery I was encouraged to give it again, and have done so in a considerable number of cases. In some of them a fatal result has ensued in spite of everything that could be done, but in a number of them the effects appear to me so encouraging as to deserve a wider trial for the medicine. I usually give it in 5 to 10 gr. doses every four hours, simply dissolved in water. As it is very deliquescent it can only be kept in solution. It has a very disagreeable saline taste, but this is well covered by saccharine, one minim of the elixir of saccharine containing one-twentieth of a grain of saccharine is sufficient to cover the taste of 10 gr. of calcium chloride. This mixture may be given either in water or in milk, and it does not interfere with the use of any other remedies.

I have also used it in cardiac disease, where the ventricular wall appeared to be losing power, and here also the results have been encouraging. In cases of pneumonia, where one wishes to get rapid action, I think the chloride is the best salt of calcium, but in cardiac disease other salts may be employed, such as the lacto-phosphate or the glycerophosphate. It is quite possible that the great benefit one frequently observes from a milk diet in cases of heart disease, may be due, in part at least, to the large quantity of calcium salts which the milk contains.

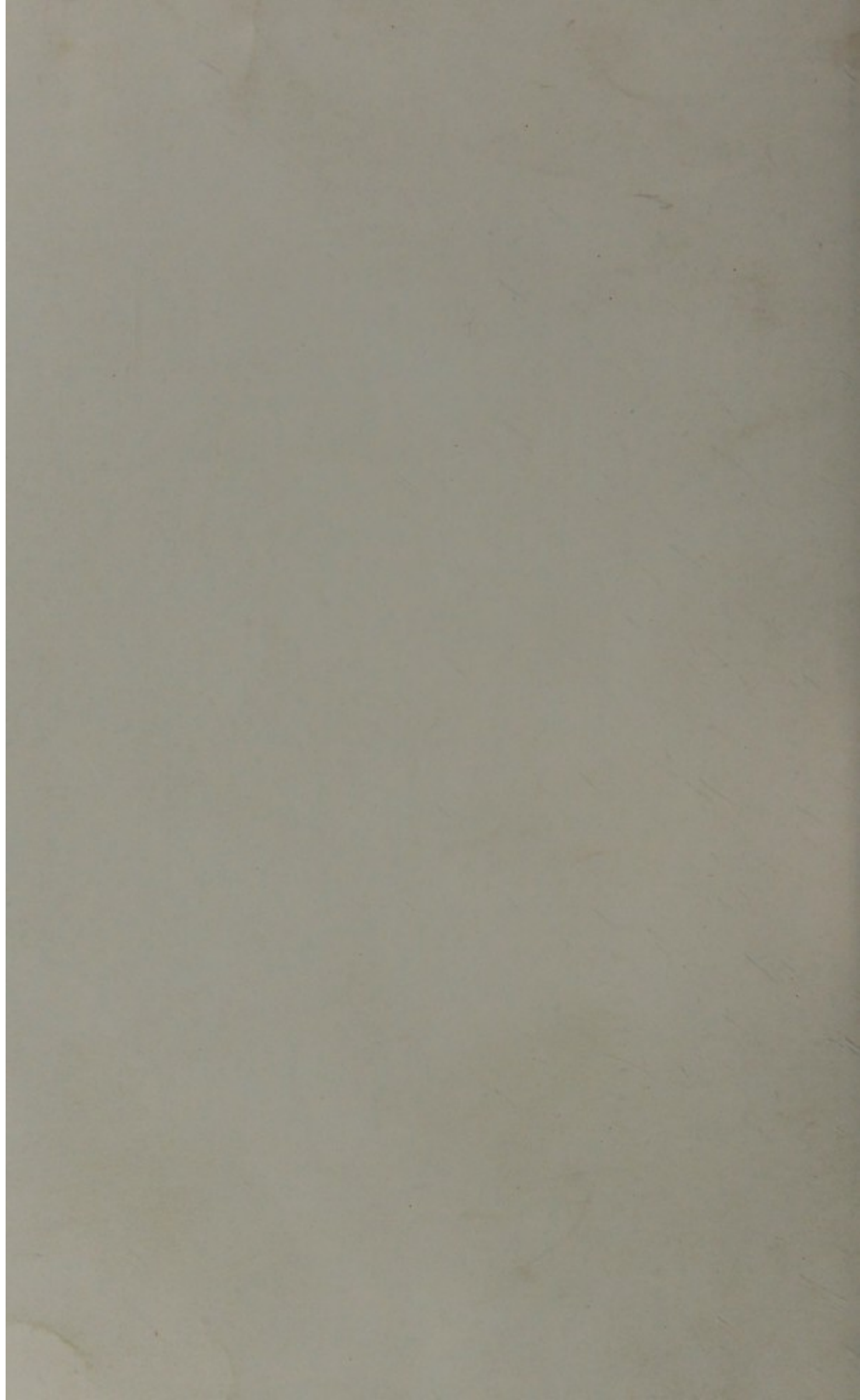
At the present moment, when there is a good deal of antivivisection agitation, it may be interesting to note that the

plan of treatment by oxygen and strychnine recommended by Dr. Prickett and myself fifteen years ago, and the one which I now recommend, both owe their origin to laboratory experiments, and any benefits which may result to patients from either plan must be regarded as the fruits of experiments upon animals.









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