

**OBSERVATIONS ON THE FUNCTIONS OF THE
LIVER, MORE ESPECIALLY WITH REFERENCE TO
THE FORMATION OF THE MATERIAL
KNOWN AS AMYLOID SUBSTANCE, OR
ANIMAL DEXTRINE, AND THE
ULTIMATE DESTINATION OF THIS SUBSTANCE
IN THE ANIMAL ECONOMY**

Published @ 2017 Trieste Publishing Pty Ltd

ISBN 9780649317264

Observations on the Functions of the Liver, More Especially with Reference to the Formation of the Material Known as Amyloid Substance, Or Animal Dextrine, and the Ultimate Destination of this Substance in the Animal Economy by Robert M'Donnell

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Edited by Trieste Publishing Pty Ltd.
Cover @ 2017

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ROBERT M'DONNELL

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ETC., ETC.

DUBLIN:
FANNIN & CO., 41, GRAFTON-STREET.
LONDON:
WILLIAMS & NORGATE, HENRIETTA-ST., COVENT GARDEN,
AND 20, SOUTH FREDERICK-STREET, EDINBURGH.
1865.

UNION THEOLOGICAL LIBRARY
100 N. 3rd St.
PHILADELPHIA, PA.
1910

DUBLIN:
Printed by J. H. Cooke & Son,
6 AND 7, GZ. BRUNSWICK-ST.

P R E F A C E .

THE majority of those engaged in practice, still, I believe, look upon the liver as if the principal duty of this gland was nothing else than the secretion of bile. It is certain, however, that it does other work, little, if at all, inferior in importance to the formation of biliary matters, and quite as necessary to the maintenance of health. Its power of making, and storing up for a time within its cells, a material resembling starch, constitutes, without doubt, one of its most important functions. This no person will for a moment doubt, who takes the trouble of ascertaining, by experiment, the immense increase or diminution in bulk which the liver may be made to undergo in the space of a few days by such changes of diet as increase or diminish the amount of this starch-like material in its tissue.

The subject is one which I conceive to be of great interest, in a practical point of view; and on this ground I would solicit the attention of practitioners to the *facts* recorded in the following pages, especially those relating to "The Formation by the Liver of Amyloid Substance" (p. 11, and seq.). While I venture to hope that physiologists will also carefully consider the facts, I must also hope that those who differ from the theoretic view, as to the ultimate destination of the amyloid substance in the animal economy, which I advance in the following pages, will, at least, remember that I do not put forward my view with dogmatism, but as one keenly alive to the difficulties and delicacy of the question at issue.

When criticising the view which I advance, as to the ultimate destination of the animal dextrine formed by the

liver, some persons may still be inclined to cling to the notion that this matter is destined solely for the maintenance of animal heat, and that it is consumed in the respiratory process. To ask such persons to consider and reflect upon the facts connected with the disappearance of the amyloid substance from the tissues of the fœtus before birth, is the best reply that can be given to this objection.

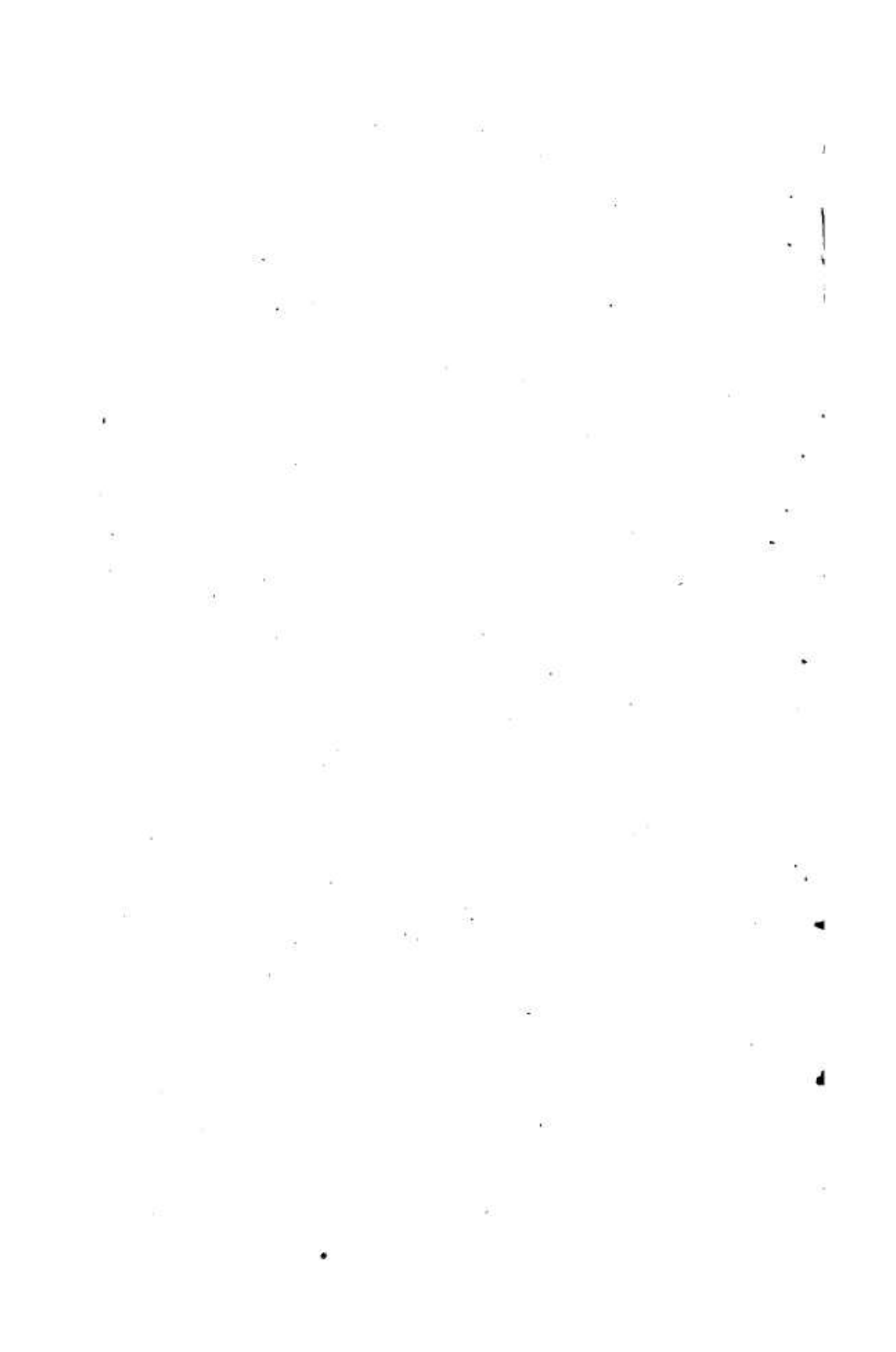
It may also be said, that the researches of Alexander Schmidt and others make it probable that fibrine may be present in the blood of the hepatic veins, but in a condition in which it does not coagulate; and if so, an important link is wanting in the chain of reasoning. It is, however, quite certain that, whatever names may be given to the materials which give rise to what is recognised as coagulated fibrine, some part, at least, of these materials has vanished from the blood which is leaving the liver; and that, therefore, in passing through the liver, either a destruction of fibrine has taken place, or something equivalent thereto. Globulin, or a closely similar substance, is certainly present in considerable quantity in the blood of the hepatic veins; and it has—to use the language of Schmidt—marked *fibrino-plastic* action in producing coagulation of hydrocele fluid, etc. If, therefore, it does not give rise to coagulation in the blood coming from the liver, it is because the *fibrino-genous* elements are wanting in this liquid.

Again, it may be argued that, if the theory put forward in these pages be correct, an animal would live for an indefinite period without receiving any *nitrogenous* food, inasmuch as the nitrogen in the system is constantly being used over and over again by the liver, in the reconstruction of a new formative material; and that, accordingly, an animal should be able to live exclusively on non-nitrogenous food. This, although not wholly true, yet is so to some extent. The effete nitrogen thrown out of the system by the kidneys, after it has done its work, must be replaced from without in order that life may be main-

tained. But there is no doubt that the amount of urea eliminated becomes diminished when a non-nitrogenous diet is administered; it is equally certain that animals which, when fed on gelatine, live only a few days, will live ten times as long if fed on starch and sugar exclusively.

Physiologists who may feel inclined to reproach me for not having made more definite and precise observations on the proteic compound, which is mentioned as being found in the blood of the hepatic veins more abundantly than in any other blood, will, I hope, remember, "that the land of protein bodies is a land full of undefined shapes, which only here and there present a well-marked form;" that our knowledge of these bodies is indeed most imperfect; and that their investigation constitutes a series of problems among the most abstruse to be met with in the whole range of animal chemistry.

14, LOWER PEMBROKE-STREET,
Dublin, February, 1865.



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