

**A reply to Dr. Trotter's second pamphlet, respecting the means of destroying the fire-damp / by the author of "An address to the proprietors and managers of coal mines."**

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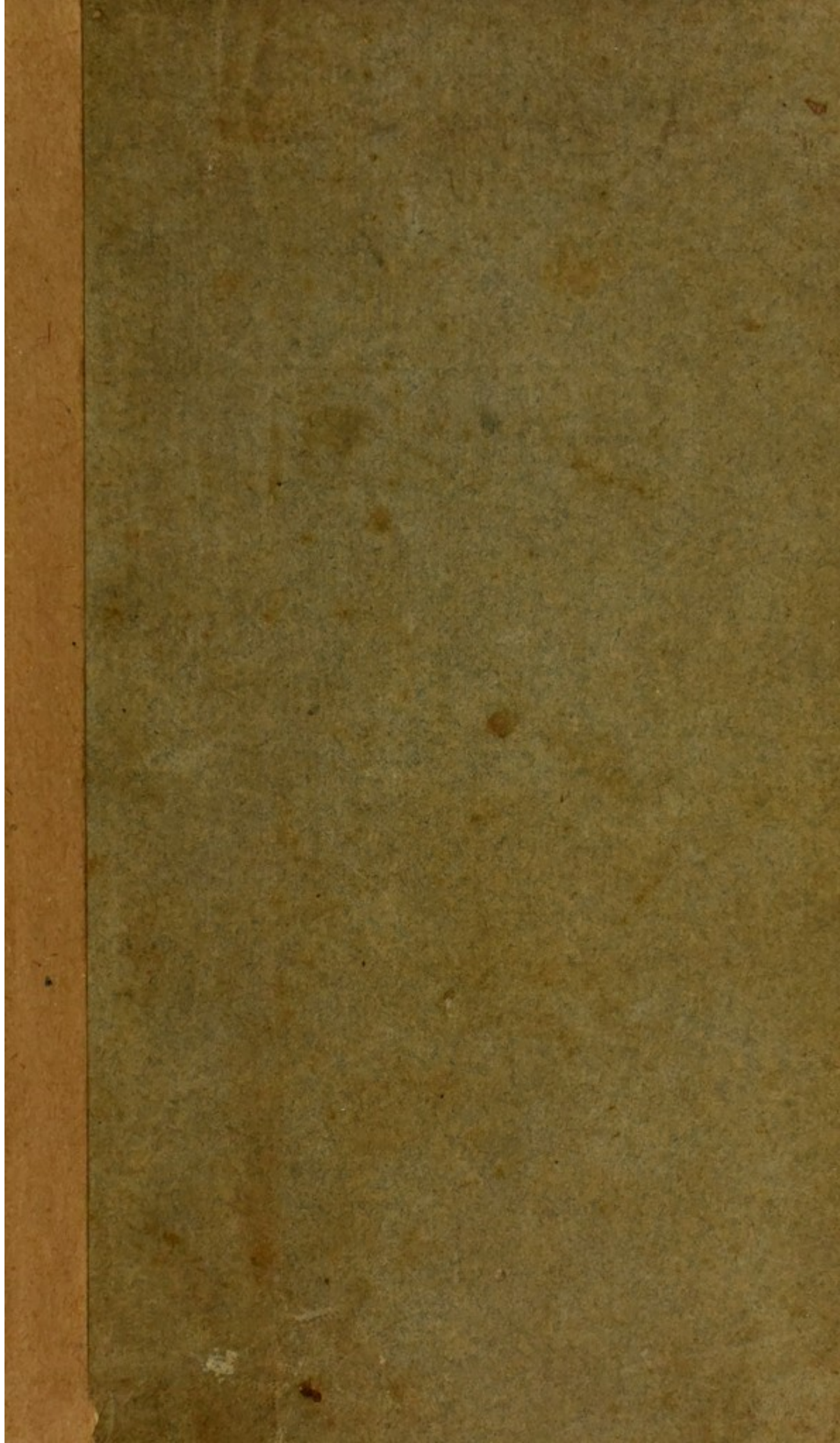
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curiosity to direct a few experiments to be made in your premises, I am induced to recommend also a trial of the vapors of the *nitrous acid*. Saltpetre, put into a heated pipkin is decomposed by the acid of Vitriol; and the fumes rise up in a thick cloud, and attract the hydrogenous gas (fire-damp) that comes in their way, and annihilate it. This acid very easily parts with its *oxygen*, and is not liable to some objections which have been made against the oxy-muriatic gas. It was my intention at one time, to recommend this process in preference to the other, for they both act on the same principle.

T. T.

*F I N I S.*

NEWCASTLE:  
PRINTED BY EDW. WALKER.

[Amn] 4  
A REPLY

TO

DR. TROTTER'S SECOND PAMPHLET,

RESPECTING

THE MEANS OF DESTROYING

THE

*FIRE-DAMP;*

BY THE AUTHOR OF

“ AN ADDRESS TO THE PROPRIETORS AND  
MANAGERS OF COAL MINES.”

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LONDON:

PRINTED FOR J. JOHNSON, 72, ST. PAUL'S CHURCH YARD,

AND

E. CHARNLEY & SON, NEWCASTLE UPON TYNE.

1806.

PRICE ONE SHILLING.

MR. THOMAS'S...

THE...

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THE...

LONDON:

T. Bensley, Printer,  
Bolt Court, Fleet Street, London.

## A R E P L Y,

&c.

IT is an observation founded on the history of controversies on almost every subject, that he who fails in argument is apt to supply the deficiency with invective, and to indulge a violence of resentment and keenness of reproach, pretty accurately proportionate to the weakness of his cause. In perfect conformity with this remark, both the reasoning and the language of Dr. Trotter's second pamphlet are such, as would have justified me in refraining from any reply. And had not the postscript con-



tained a new proposal for the destruction of fire-damp, I should have left the point, already at issue between us, to your decision; in full confidence that coarse and vulgar epithets can have no weight with you, when opposed to sound reasoning on well established facts,—facts which do not rest on the authority of an anonymous writer, but are recorded in the history of chymical science, and are accessible to all inquirers. In Dr. Trotter himself, I do not encourage the hope of producing conviction; but, among yourselves, I know that there are many, who are qualified, by previous knowledge of chymistry, to understand the argument, as stated in my first pamphlet, and to perceive that it remains unshaken by any thing which has been advanced against it. Like an artful advocate, indeed, the Doctor has anxiously endeavoured to divert your

attention from the chymical question; and to enlist your feelings of compassion and generosity on his side, by representing himself as a very disinterested and meritorious, yet injured man. With the same view, also, he has accused me of being incited to address you “by the fordid motive of persecuting his writings and reputation.” He imputes to me both republicanism and impiety; and assures you that my pen has been “dipped in gall on other topics of controversy,” assertions which are equally remote from truth and from probability, and are not deserving of a serious answer. They prove, however, in conjunction with other charges, that the Doctor has not formed even a feasible conjecture respecting the real author of the “Address\*.”

\* Of the elegant epithets, which the author of the “Proposal” applies to Dr. Dewar and myself, the following

It would have been easy for Dr. Trotter, had it equally suited his purpose, to have assigned more honourable motives for the strictures, which his pamphlet has occasioned. For whenever a proposal is brought before the public, which professes to accomplish a benevolent object by new and untried means, especially if the use of these means be necessarily accompanied with hazard, and is intended to supersede practices of established utility, it is the undoubted right of every member of the community to canvass it with freedom, and to state without reserve every objection, which occurs against its adoption. And if the views of

are only a small proportion. "Malignant duumvirate," p. 8. "Men who are adepts at misrepresentation and for a bellish purpose," p. 13. "They have, thus hyænalike, the foulest beast of prey," &c. (ib.) beside taxing us with "falsehood and slander," p. 15; "artful sophistry and vulgar malignity," p. 24, and with "impeaching Omnipotence," p. 23.

the projector be really as pure and disinterested as they are pretended to be, he will feel gratification, rather than resentment, from such discussion, provided it be conducted with temperance and decorum, neither of which has been infringed in my "Address" in the smallest degree. This is a right, which Dr. Trotter himself has not been slow to exercise in the most unrestrained and unceremonious manner\*.

\* In speaking of the proposal of a very respectable physician (Dr. Carmichael Smyth, physician to her Majesty) for the destruction of febrile contagion, a proposal which was sanctioned by a parliamentary reward, Dr. Trotter uses the following language. "A new form of fumigation has been introduced among us in the course of the present war, more highly recommended, indeed, than some preceding fumigations, but favouring as much of empirical principles. This is the nitrous fumigation of Dr. J. C. Smyth, recommended in the instructions given by the Board of Sick and Wounded to navy surgeons. I should have thought *this quackery* unworthy of notice in this part, as it is fully discussed in its proper place, were it not to guard officers against some erroneous notions that are apt to impose on common observers." See *MEDICINA NAUTICA*, vol. iii,

He is, therefore, of all men living, the least entitled to complain, when his own opinions become the subjects of criticism.

In the course of the Address, it must be acknowledged, I have more than once spoken with no great respect of the Doctor's chymical knowledge, my estimate of which is founded on the numerous "blunders," as he himself happily terms them, which occur in the "Proposal," and in his other chymical writings. He has declared, indeed, that "no blunders were committed which could not be corrected by half an hour's reading;" and again (page 22) "it would not have cost much time, surely, to

p. 291.—In p. 506, the author applies to the practice recommended by Dr. Smyth, the epithet, "*demonstrated quackery*," and in p. 507, that of "*empirical trumpery*." Can Dr. Trotter, after this, with any show of reason or propriety, impute to those who controvert his own opinions malignant motives, or a departure from decency of language?

learn ten or twelve phrases, which include all the substances spoken of in my essay."

The acquirement of terms, however, is merely the office of the memory, and is a small part of the attainment of natural science, which implies an enlarged and accurate knowledge of the properties of bodies, and of the general laws, under which these are arranged. Half an hour's reading, it is true, would amply suffice for acquiring such a knowledge of chymistry as might suggest a crude and impracticable project. But to extend the boundaries of the science, or to make a successful application of its principles to new and difficult purposes, requires not only the attentive study of years, but a familiarity with chymical phenomena, and skill in the use of chymical instruments.

Nothing could have been more unjust (considering the manner in which a great part of Dr. Trotter's life has been spent, and I believe very creditably and usefully), than to have imputed it to him as a crime, that he is not an adept in chymistry; provided he had not brought the remark upon himself, by the confidence and ostentation with which he has published chymical proposals and essays; and by the contempt with which he has treated others, who have presumed to differ from him on particular subjects belonging to this science\*. Nor will all the testimonials which the Doctor

\* From this contempt, it does not appear that any eminence in science, however great and deserved, is a sufficient protection. In page 54, vol. 2, of the "Medicina Nautica," Dr. Trotter sneers at the chymical reasoning of Mr. Keir, because that celebrated chymist enforces the distinction between the vapour of nitric acid and nitric gas, substances most essentially different, though Dr. Trotter never was able to understand the distinction.

has so ostentatiously displayed establish his character as a chymical writer, so long as his own books unfortunately remain in evidence against him. These documents may be abundantly competent to prove his services in the capacity of Physician to the Fleet, but they cannot, with any propriety, be regarded as a dispensation, authorising him to publish absurd schemes in chymistry; nor ought they to protect him, when he obtrudes such projects on the public, from the criticism, and even from the censure, of judges. In estimating the chymical talents and acquirements of Dr. Trotter, these testimonials are, therefore, to be considered as dust in the balance. In any other way, *valeant quantum valere possunt*. I, for one, (whatever motives the Doctor may impute to me), shall not feel mortified by the ser-



vices which they may render him in the exercise of his proper calling.

In asserting (page 21), that I have not made a single experiment, Dr. Trotter is as correct as when he charges me with disloyalty and impiety. The fact is, that a great portion of my life has been employed in making chymical experiments; and that if there be any one branch of chymistry in which I have had more experience than in another, it is in that of the inflammable gases. It has not, indeed, fallen to my lot, though the opportunity has been anxiously sought, to examine the gas which is generated in coal-mines; and, from some acquaintance with the history of the science, I can confidently affirm, that no such examination has ever been made by any other chymist. Is it then "an ignominious confession," as

the Doctor is pleased to term it, that no analysis of this gas has hitherto been effected; or rather does not the ignominy, if any, attach to him, who, anticipating this analysis, rashly proposes means which are not adapted to the evil, either by their nature or by their extent? In medicine, the Doctor has told you, and truly, that a doubtful remedy is better than none. But to defend his "Proposal," it will be necessary for him to show, that a doubtful and inadequate remedy is better than one which has been proved to be capable, when judiciously administered, of all the efficacy consistent with the nature of the disease.

Doctor Trotter accuses me of rashly attempting to calculate with mathematical certainty the bulk of fire-damp; and of intimidating you from the experiment by an

exaggerated representation of the expense. But does not his own proposal rest on a calculation, which he has offered (first pamphlet, p. 42), of the quantity of materials required to purify a given space; whence he has inferred, that 100l. would cover the annual expenditure in purifying one mine? The difference between the Doctor's calculation and mine is, that his estimate is not founded on any one datum, but is altogether vague and conjectural; whereas I have built mine (which does not pretend even to guess at the bulk of the fire-damp) on the known quantity of the proposed remedy to be obtained from a given weight of materials, and the ascertained effect of the product in destroying that gas, which Dr. Trotter assumes to constitute fire-damp. On these grounds I have

demonstrated, that the remedy is in the highest degree insignificant, when compared with the infinite magnitude of the evil.

In p. 20 of the second pamphlet, the author declares, that he has “no where asserted the identity of fire-damp with hydrogen gas.” This declaration betrays a singular deficiency of memory in the Doctor, who, beside using the two terms as synonymous throughout his whole pamphlet, unequivocally declares (p. 19 of the Proposal), “The fire-damp of mines, from its burning with vehemence when in contact with atmospherical air, and from having been the subject of experiment,” [with whom?] “is known to be the same with the hydrogenous gas of modern chymists.” Whether the deleterious gas of coal mines shall be found, however, to consist of pure hydrogen gas, of carburetted or sulphu-

retted hydrogen, or of all three in conjunction, the Doctor's proposal is equally incompetent. In truth, it furnishes you only with a straw as a weapon of defence against the overwhelming force of a giant.

Nothing less than the solemn declaration of Dr. Trotter (p. 13 of the second pamphlet), that in what appeared to me and to others insinuations against the late Dr. C., he had not that eminent physician or any particular individual in view, would have exculpated him, in my mind, from the intention of such an application. By several other persons, who are superior to the practice of misrepresentation, though not more so than myself, Dr. Trotter well knows that the objectionable passages were thus interpreted; and his declared spirit and temper towards that gentleman, while living, whose memory was supposed to be

wounded by the passages alluded to, rendered such an interpretation no great breach of candour or charity. But, though in this instance, I and others may have affixed a wrong meaning to Dr. Trotter's language, he will assuredly not deny that the 18th and 19th pages of his second pamphlet do contain allusions unfavourable to the reputation of Dr. Clark, and too plain to be mistaken by any one. They sufficiently demonstrate that he retains, unabated, an enmity which ought long ago to have terminated, and to have given place to kinder and more honourable feelings.

Though it yet remains to demonstrate the fallacy of the new remedy against fire-damp, proposed by Dr. Trotter in the "Postscript" to his second pamphlet, yet I shall not have occasion to encroach much

longer on your time and attention. "From the hope which I entertain," says the Doctor, "that some of your number may have the curiosity to direct a few experiments to be made in your premises, I am induced to recommend also a trial of the vapours of the nitrous acid. Salt-petre put into a heated pipkin is decomposed by the acid of vitriol; and the fumes rise up in a thick cloud, and attract the hydrogenous gas (fire-damp), that comes in their way, and annihilate it." The existence of such a property in the nitrous acid, is to me, and I believe to most chymists, perfectly new information; and I am very certain that the Doctor will not be able to establish the fact, either by any experiment of his own, or by the authority of any chymical writer. "Hydrogen," says Fourcroy, "has a stronger attraction than azote for oxygene,

and decomposes the nitric acid, *but only at a high temperature*. If we pass this acid and hydrogen gas at the same time, *through a red-hot porcelain tube*, an inflammation and detonation ensue; water is produced; and there remains azotic gas, or the radical of the nitric acid in a separate form \*." But at the ordinary temperature of the atmosphere, or at any other temperature short of ignition, the nitric acid has no action whatever on hydrogen gas; and is therefore destitute of the power of condensing fire-damp in any quantity, however small. Neither has it, under similar circumstances,

\* L'hydrogène a beaucoup plus d'attraction pour l'oxygène que n'en a l'azote, et décompose l'acide nitrique, mais seulement à une température élevée. Si on fait passer cet acide et du gas hidrogène en même temps dans un tube de porcelaine rouge; il y a inflammation et détonation; il se forme de l'eau, et il reste du gas azote ou du radical nitrique séparé. Fourcroy *Système de Connoissances Chimiques*, I. 251, 4to edit.



a more notable action on carburetted hydrogen, the only other gas, which, with any probability, can be supposed to constitute the chief bulk of fire-damp, since the sulphuretted hydrogen or hepatic air, is not likely to be mixed with it in any other than small proportion.

In having thus exposed the fallacy of the new remedy against fire-damp projected by Dr. Trotter, it is not improbable that I may have been at pains to effect what the ordinary course of events would with equal certainty have accomplished; for we have the Doctor's own information (page 6), that, in your district, his former labours are already consigned to oblivion. The influence of this controversy on his own mind, I trust, however, will be permanent; and that in any future "ephemeral productions" in the subject of chymistry, he will learn

to temper the zeal of a philanthropist with the modesty, the caution, and the science of a philosopher.

I remain,

Gentlemen,

Your obedient servant,

A FRIEND TO RATIONAL SCHEMES  
OF IMPROVEMENT.

Aug. 26, 1806.

P. S. Since the foregoing pages were written, I have been enabled, by means of a correspondent at Newcastle, to ascertain a fact, respecting which my curiosity has been strongly excited. In the 6th page of his second pamphlet, Dr. Trotter says, “ a respectable philosopher in this town (the Rev. W. Turner), always ready to serve the arts in his neighbourhood, has mentioned my work in his useful lectures, in terms of commendation; and it is some proof that my studies have been employed in the cause of humanity and virtue, though without the desired success.” This information, I confess, affected me with the greatest surprise; because such an expression of approbation appeared to me inconsistent with the sound judgment and extensive knowledge, universally and most justly ascribed to that gentleman. I learn, however, from

indubitable authority, that Mr. Turner has positively denied having made any reference in his Lectures to Dr. Trotter's proposal; and has stated, moreover, the impossibility of the fact; since his chymical lectures were concluded in March 1805, and Dr. Trotter's pamphlet was not published till November in the same year. These circumstances, I understand also, have been made the subject of a private communication to Dr. Trotter, with a view to the correction of his statement.

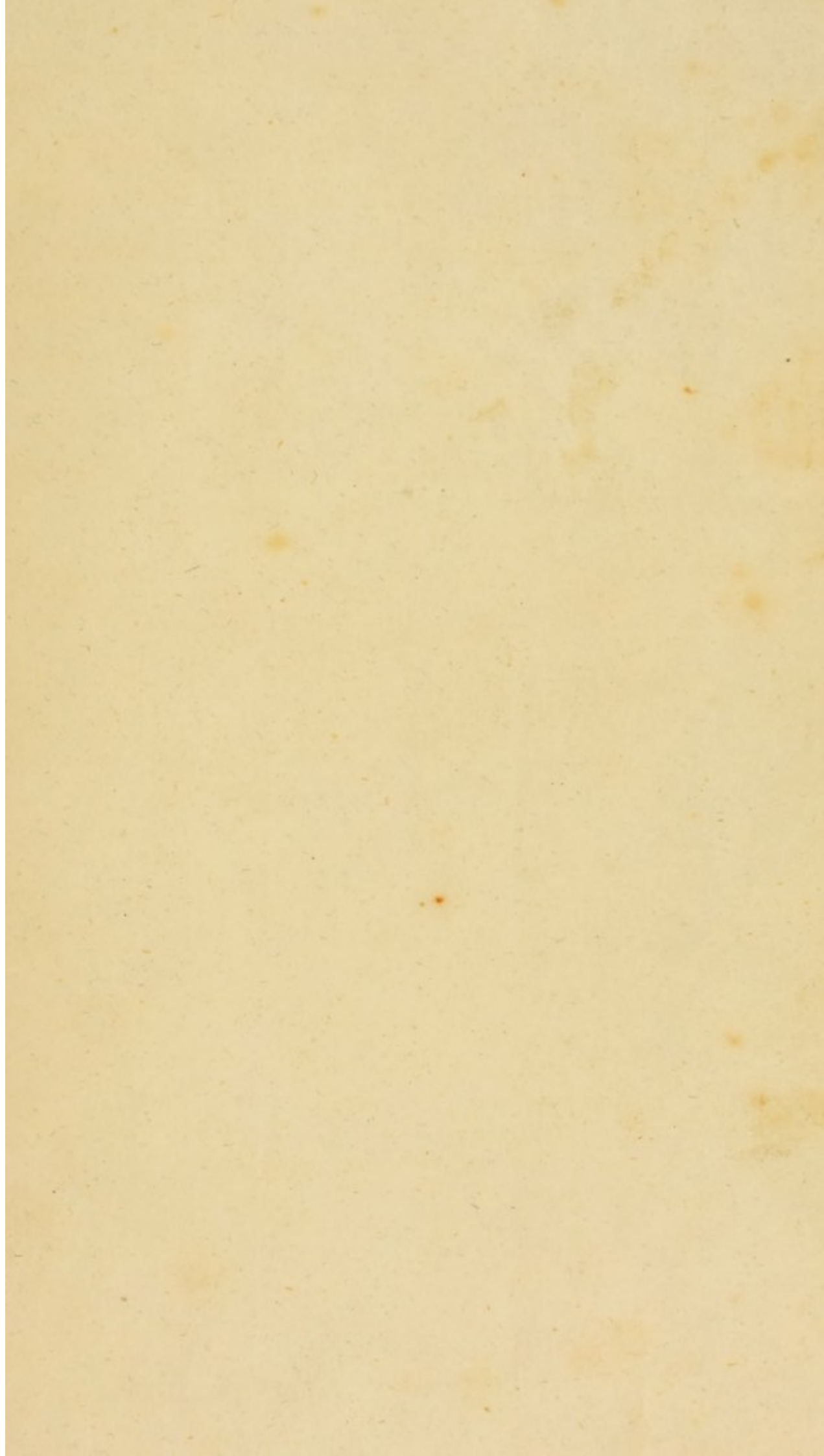
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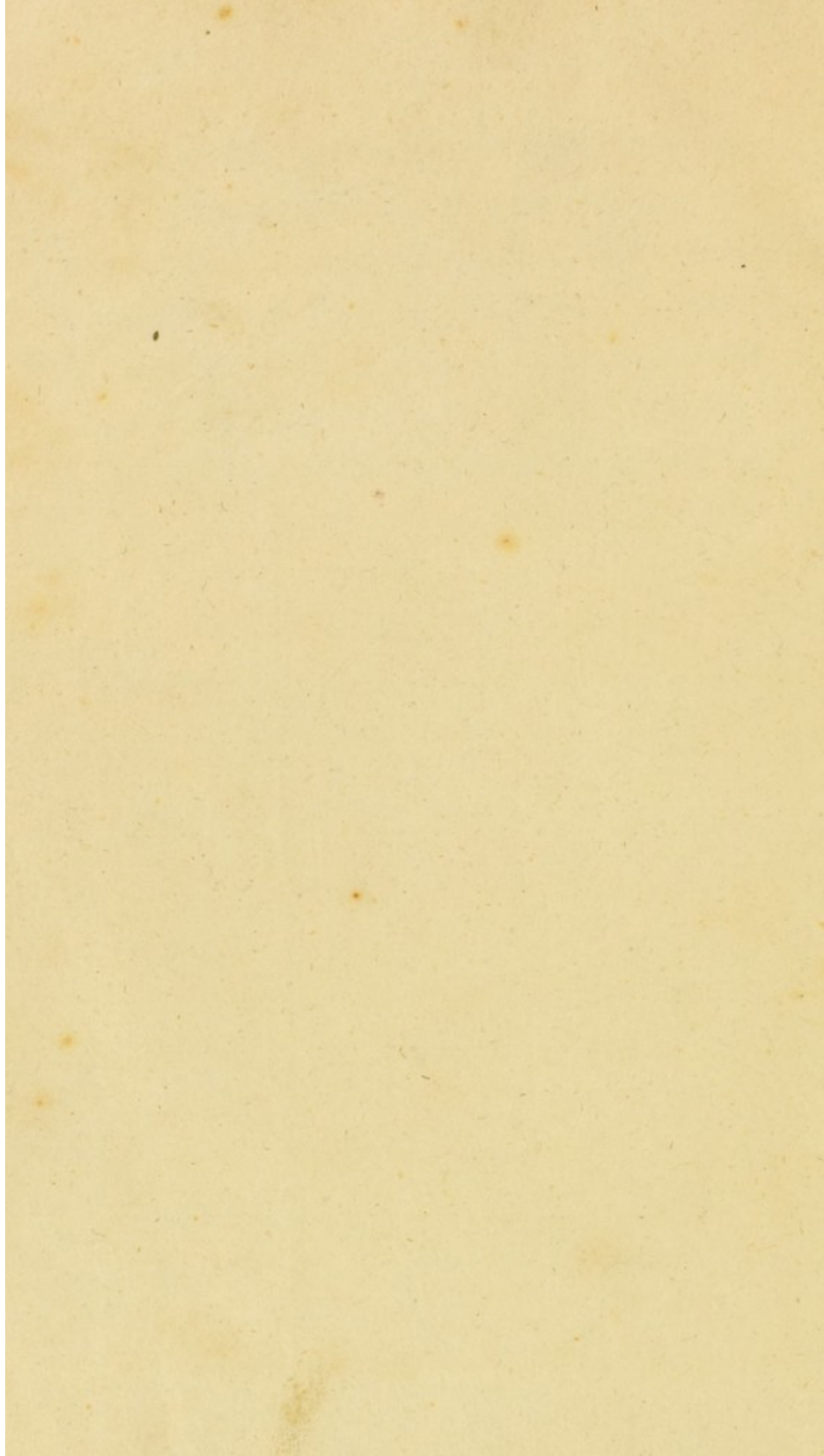
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