

The proofs of infanticide considered: including Dr. Hunter's tract on child murder, with illustrative notes ; and a summary of the present state of medico-legal knowledge on that subject / By William Cummin, M.D.

Contributors

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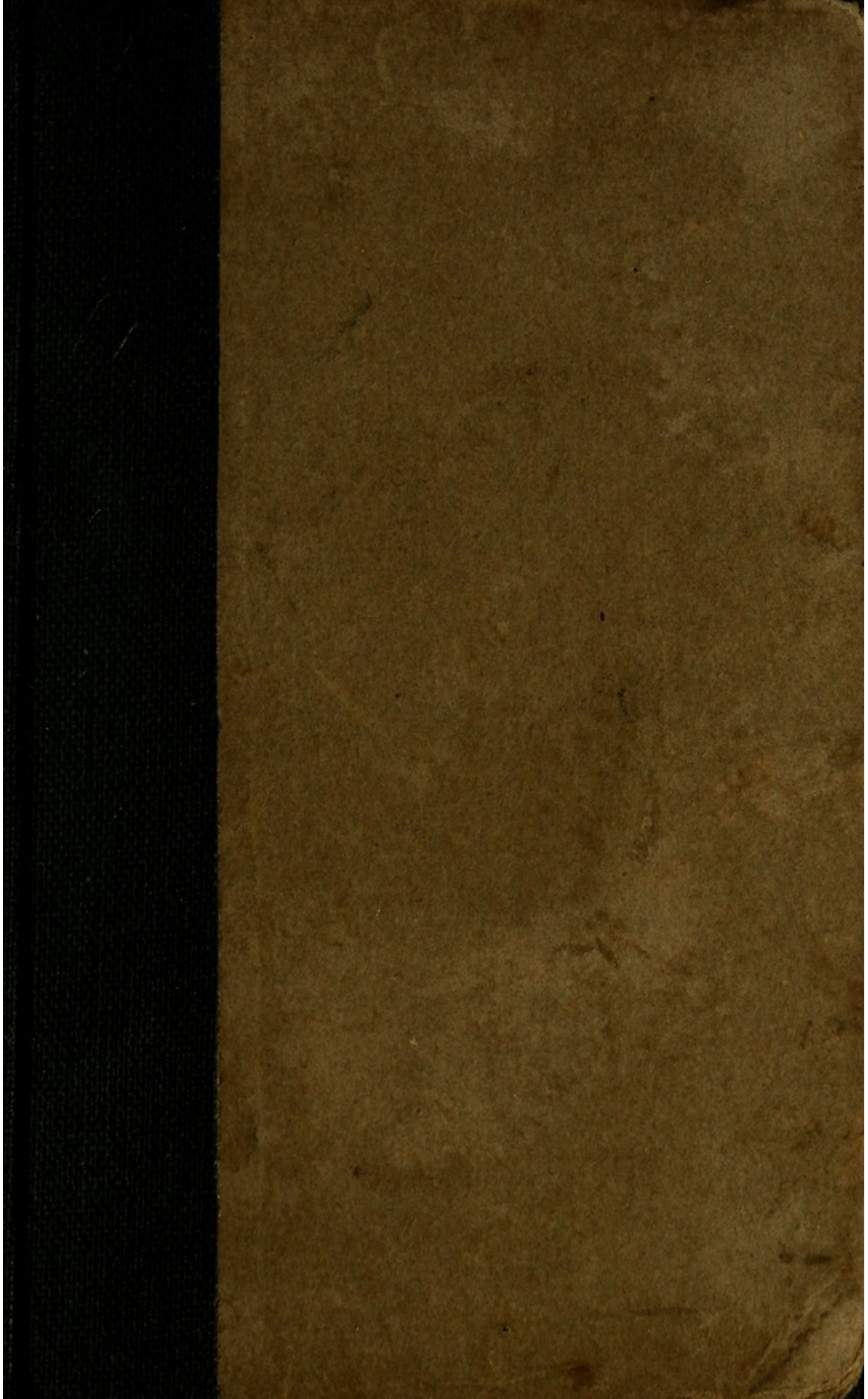
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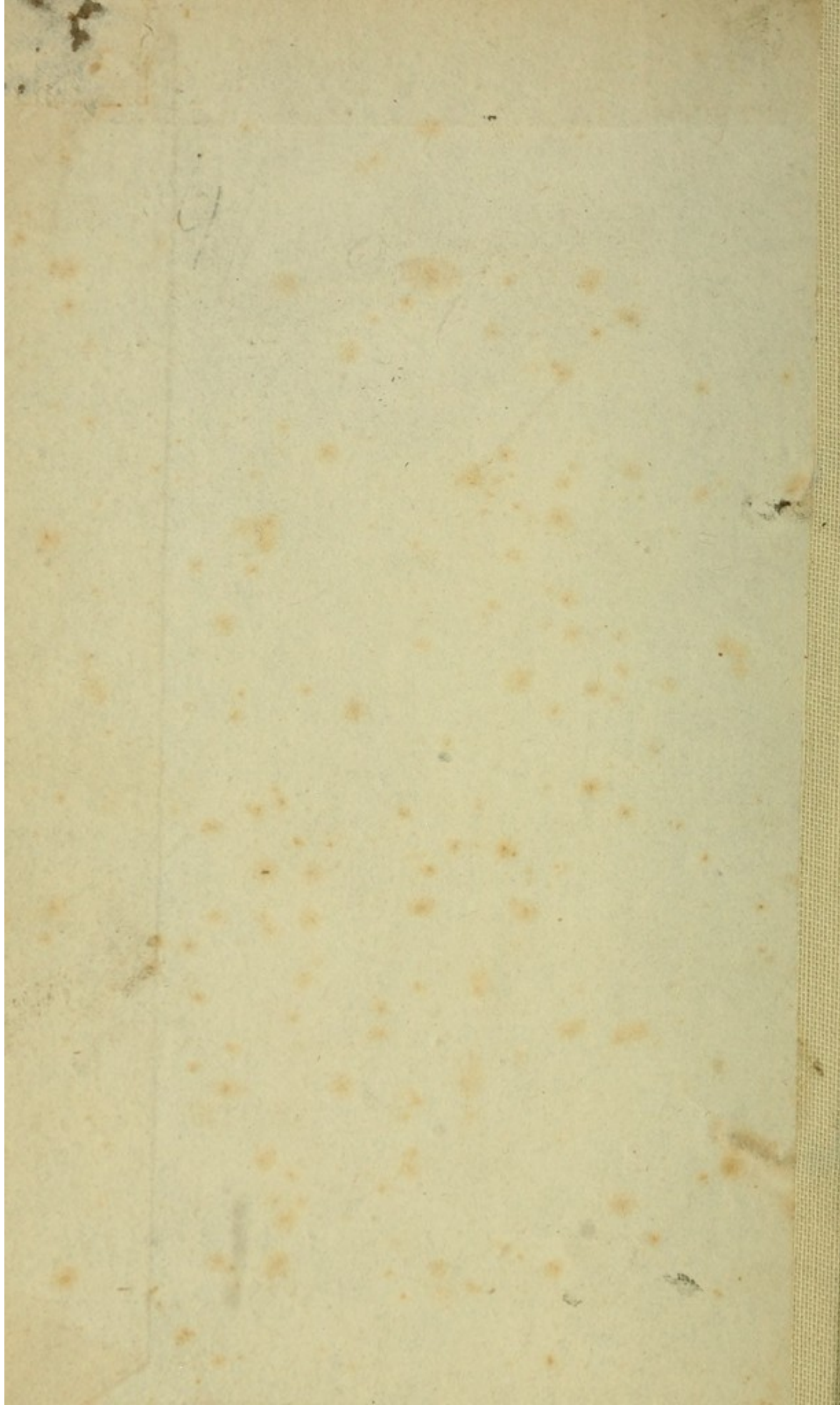
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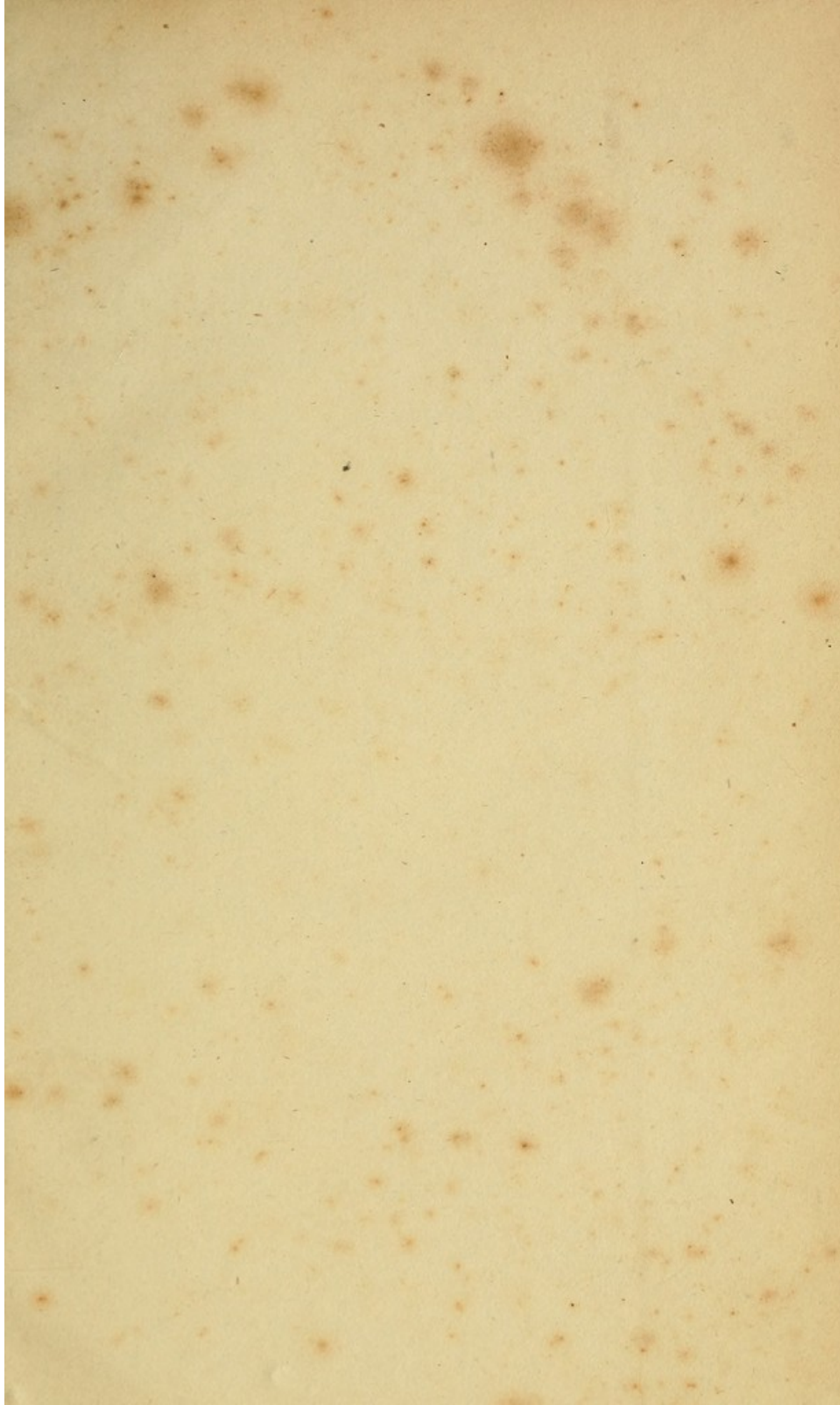
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The Proofs of Infanticide

CONSIDERED:

INCLUDING

DR. HUNTER'S TRACT ON CHILD MURDER,
WITH ILLUSTRATIVE NOTES;

AND A

Summary

OF

THE PRESENT STATE OF
MEDICO-LEGAL KNOWLEDGE

ON THAT SUBJECT.

By WILLIAM CUMMIN, M.D.

MEMBER OF THE ROYAL COLLEGE OF PHYSICIANS; FELLOW OF THE
ROYAL MEDICO-CHIRURGICAL SOCIETY; FELLOW OF THE STATIS-
TICAL SOCIETY; AND LECTURER ON FORENSIC MEDICINE AT
THE ALDERSGATE SCHOOL OF MEDICINE, LONDON.

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1836.

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3709^o

TO
ANDREW AMOS, Esq.

LATE PROFESSOR OF ENGLISH LAW AND MEDICAL JURISPRUDENCE
IN THE LONDON UNIVERSITY.

MY DEAR SIR,

I AVAIL myself of your permission to inscribe this little work to you. It is to you, and your excellent lectures, that I am chiefly indebted for having had my attention first called to the subject of Legal Medicine : and I shall be exceedingly glad if this slight testimony of my respect and esteem, make it in any degree known to the Public how much

I am, my dear Sir,

Your very obliged
and faithful servant,

W. CUMMIN.

24, *Great Russell Street, Bloomsbury,*
June 24, 1836.

ANDREW AMOR, Esq.

I have the honor to acknowledge the receipt of your letter of the 10th inst. in relation to the above named subject. It is so far from my intention to do so, that I am sorry to hear that you are so much interested in the subject. I shall be glad to hear from you again in a few days, and I shall be glad to hear from you again in a few days, and I shall be glad to hear from you again in a few days.

Very respectfully,
ANDREW AMOR, Esq.

W. C. B. 1851

PREFACE.

IN the whole range of subjects on which medical men are called upon to give their evidence in courts of justice, there is, perhaps, not one more complicated or embarrassing than that of Infanticide : it receives little or no illustration from the routine of ordinary practice, and requires considerable previous knowledge and patient inquiry for its due investigation.

An experience of some years in teaching Forensic Medicine, has, however, led me to believe that all the material points might be stated clearly and popularly within a moderate compass. The result of such a persuasion is the production of this little work.

It may appear, perhaps, somewhat singular, that Dr. Hunter's tract should be placed in the foreground : but all who are in any degree acquainted with the practice of our Criminal Courts must know that it were a very questionable office to undertake to compose a treatise on the subject, with any pretensions to utility, without referring frequently to the most influential and popular tract on Child-murder hitherto produced in this country. The judges quote it with implicit faith in its perfection : the bar study it, and cross-examine the crown witnesses on the difficulties which it suggests : and medical men

probably will not find it safe to venture into the witness box without being familiarly acquainted with its contents. Hence, it has been conceived expedient to set it fairly and in a complete form before the reader.

The tendency of Dr. Hunter's tract is to explode all the ordinary tests of child-murder: and being written in a plain and unpretending style, it is frequently found a convenient instrument for those engaged on behalf of the accused. It is known, moreover, that medical practitioners, many of them too indolent to make themselves better informed, have but too often implicitly acquiesced in the positions of Dr. Hunter, joining the lawyers in the cry that medical inquiry on the subject was incapable of attaining to any satisfactory conclusion. But it is hoped that the thorough perusal of this little volume will remove so erroneous an impression.

In the Notes and Illustrations subjoined to the paper of Dr. Hunter, an attempt is made to estimate the objections of that eminent physician at their true value. The Summary, by giving a comprehensive view of all the points specially connected with the investigation of the proofs, and the application of the tests, of infanticide, will, it is expected, show that however objectionable those tests may be in the hands of the incompetent, they are certainly capable of affording, when applied by diligent and skilful inquirers, a correct and decided answer in a vast proportion of cases,—perhaps that in ninety-nine out of a hundred, by careful and judicious management, they may be employed with almost infallible success.

CONTENTS.

	<i>Page</i>
DR. HUNTER ON THE SIGNS OF CHILD-MURDER	1
NOTES AND ILLUSTRATIONS	21
MEDICO-LEGAL SUMMARY OF INFANTICIDE	47
<i>Section I.—WAS THE INFANT BORN ALIVE ?</i>	50
Question of maturity	50
Sure signs of having survived birth	51
Indubitable signs of still birth	53
HAD THE INFANT RESPIRED?	54
Colour of the lungs	55
Volume of the lungs.	55
Consistence of the lungs	57
Absolute weight of the lungs	58
STATIC TEST	58
Specific gravity of the lungs	59
HYDROSTATIC TEST	59
1. Swimming of the lungs	60
<i>Objections</i> — (a.) Putrefaction may cause them to float	60
(b.) An emphysematous condition may cause them to float	61
(c.) Air may have been artificially introduced	62
(d.) The infant might have breathed in the passage	64
2. Sinking of the lungs	64
<i>Objections.</i> — (a.) The lungs may be diseased	64
(b.) The infant may have been too feeble to respire sufficiently	65
(c.) An infant may live for a short time without breathing	66
Modifications of the hydrostatic test	67

	<i>Page</i>
CIRCULATORY APPARATUS—Proofs of respiration from	
state of	68
Arterial Duct—(the Vienna Test)	70
Foramen Ovale	72
Venous canal	73
The Liver	74
<i>Resumé</i> of signs of non-respiration	77
— respiration	77
— partial respiration	78
 <i>Section II.—DID THE INFANT DIE A NATURAL OR A</i>	
VIOLENT DEATH?	79
 QUESTION OF NATURAL DEATH	79
Weakness or immaturity	80
Disease—congenital	80
— In the head	80
— In the chest	81
— In the abdomen	82
QUESTION OF VIOLENCE	83
Strangulation	83
Suffocation—Drowning	86
Fractures, Blows, and Wounds	87
Poisoning	90
Detruncation and Burning	91
Omitting to tie the umbilical cord	92
Exposure	93
<i>Resumé</i> of signs of natural death	94
— death by violence	94

ON THE
UNCERTAINTY
OF THE
SIGNS OF MURDER,
IN THE CASE OF
BASTARD CHILDREN.

BY THE LATE

WILLIAM HUNTER, M.D. F.R.S.

PHYSICIAN EXTRAORDINARY TO THE QUEEN, AND MEMBER OF
THE ROYAL ACADEMY OF SCIENCES AT PARIS.

Read to the MEMBERS of the MEDICAL SOCIETY,
July 14, 1783. (1)

24

OF THE
INDEMNITY

STIGMS OF MURDER

BASTARD CHILDREN

BY
WILLIAM HUNTER, M.D., F.R.S.

THE FIRST VOLUME OF THE HISTORY OF THE
STIGMS OF MURDER AND BASTARD CHILDREN

LONDON: ADAM AND CHARLES BLACK, 15, BLENHEIM STREET, W. 1868.

ON THE UNCERTAINTY,

&c. &c.

GENTLEMEN,

IN the course of the present year, one of our friends, distinguished by rank, fortune, and science, came to me upon the following occasion:—“In the country,” he said, “a young woman was taken up, and committed to jail to take her trial, for the supposed murder of her bastard child. According to the information which he had received, he was inclined to believe, from the circumstances, that she was innocent; and yet, understanding that the minds of the people in that part of the country were much exasperated against her, by the popular cry of *a cruel and unnatural* murder, he feared, though innocent, she might fall a victim to prejudice and blind zeal. What he wished,” he said, “was to procure an unprejudiced inquiry. He had been informed that it was a subject which I had considered in my lectures,⁽²⁾ and made some remarks upon it, which were not perhaps sufficiently known, or enough

attended to ; and his visit to me was, to know what these remarks were." I told him what I had commonly said upon that question. He thought some of the observations so material, that he imagined they might sometimes be the means of saving an innocent life : and if they could upon the present occasion do so, which he thought very possible, he was sure I would willingly take the trouble of putting them upon paper. Next day I sent them to him in a letter, which, I said, he was at liberty to use as he might think proper. Some time afterwards, he told me that he had great pleasure in thanking me for the letter, and telling me that the trial was over ; that the unfortunate young woman was acquitted, and that he had reason to believe that my letter had been instrumental. This having been the subject of some conversation one evening at our medical meeting, you remember, Gentlemen, that you thought the subject interesting, and desired me to give you a paper upon it. I now obey your command.

In those unhappy cases of the death of bastard children, as in every action indeed that is either criminal or suspicious, reason and justice demand an inquiry into all the circumstances ; and particularly to find out from what views and motives the act proceeded. For, as nothing can be so criminal but that circumstances might be added by the imagination to make it worse ; so nothing can be conceived so wicked, and offensive to the feelings of a good mind, as not to be somewhat softened or extenuated by

circumstances and motives. In making up a just estimate of any human action, much will depend on the state of the agent's mind at the time; and therefore the laws of all countries make ample allowance for insanity. The insane are not held to be responsible for their actions.

The world will give me credit, surely, for having had sufficient opportunities of knowing a good deal of female character. I have seen the private as well as the public virtues, the private as well as the more public frailties, of women in all ranks of life. I have been in their secrets, their counsellor and adviser in the moments of their greatest distress in body and mind. I have been a witness to their private conduct, when they were preparing themselves to meet danger, and have heard their last and most serious reflections, when they were certain they had but a few hours to live.

That knowledge of women has enabled me to say, though no doubt there will be many exceptions to the general rule, that women who are pregnant, without daring to avow their situation, are commonly objects of the greatest *compassion*; and generally are less criminal than the world imagine. In most of these cases the father of the child is really criminal, often cruelly so; the mother is weak, credulous, and deluded. Having obtained gratification, he thinks no more of his promises; she finds herself abused, disappointed of his affection, attention, and support, and left to struggle as she can, with sickness, pains, poverty, infamy; in short, with complete *ruin for life!*

A worthless woman can never be reduced to that wretched situation, because she is insensible to infamy ; but a woman who has that respectable virtue, a high sense of shame, and a strong desire of being respectable in her character, finding herself surrounded with such horrors, often has not strength of mind to meet them, and in despair puts an end to a life which is become insupportable. In that case, can any man, whose heart ever felt what pity is, be *angry* with the memory of such an unfortunate woman for what she did? She felt life to be so dreadful and oppressive, that she *could not* longer support it. With that view of her situation, every humane heart will forget the indiscretion or crime, and bleed for the sufferings which a woman must have gone through, who, but for having listened to the perfidious protestations and vows of our sex, might have been an affectionate and faithful wife, a virtuous and honoured mother, through a long and happy life ; and probably that very reflection raised the last pang of despair, which hurried her into eternity. To think seriously of what a fellow-creature must feel, at such an awful moment, must melt to pity every man whose heart is not steeled with habits of cruelty ; and every woman who does not affect to be more severely virtuous and chaste than perhaps any good woman ever was.

It may be said that such a woman's guilt is heightened, when we consider that at the same time that she puts an end to her own life she murders her child. God forbid that killing should always be murder ! It is only murder when it is executed with

some degree of cool judgment and wicked intention. When committed under a phrensy from despair, can it be more offensive in the sight of God than under a phrensy from a fever, or in lunacy? It should, therefore, as it must raise our horror, raise our pity too.

What is commonly understood to be the murder of a bastard child by the mother, if the real circumstances were fully known, would be allowed to be a very different crime in different circumstances.

In some (it is to be hoped *rare*) instances, it is a crime of the very deepest dye: it is a premeditated contrivance for taking away the life of the most inoffensive and most helpless of all human creatures, in opposition not only to the most universal dictates of humanity, but of that powerful instinctive passion which, for a wise and important purpose, the Author of our nature has planted in the breast of every female creature, a wonderful eagerness about the preservation of its young. The most charitable construction that could be put on so savage an action, and it is to be hoped the fairest often, would be to reckon it the work of phrensy, or temporary insanity.

But, as well as I can judge, the greatest number of what are called murders of bastard children are of a very different kind. The mother has an unconquerable sense of shame, and pants after the preservation of character: so far she is virtuous and amiable. She has not the resolution to meet and avow infamy.

In proportion as she loses the hope either of having been mistaken with regard to pregnancy, or of being relieved from her terrors by a fortunate miscarriage, she every day sees her danger greater and nearer, and her mind more overwhelmed with terror and despair. In this situation many of those women, who are afterwards accused of murder, would destroy themselves, if they did not know that such an action would infallibly lead to an inquiry, which would proclaim what they are so anxious to conceal. In this perplexity, and meaning nothing less than the murder of the infant, they are meditating different schemes for concealing the birth of the child; but are wavering between difficulties on all sides, putting the evil hour off, and trusting too much to chance and fortune. In that state often they are overtaken sooner than they expected; their schemes are frustrated; their distress of body and mind deprives them of all judgment and rational conduct; they are delivered by themselves, wherever they happened to retire in their fright and confusion; sometimes dying in the agonies of child-birth, and sometimes, being quite exhausted, they faint away, and become insensible of what is passing; and when they recover a little strength, find that the child, whether stillborn or not, is completely lifeless. In such a case, is it to be expected, when it could answer no purpose, that a woman would divulge the secret? Will not the best dispositions of mind urge her to preserve her character? She will therefore hide every appearance of

what has happened as well as she can ; though, if the discovery be made, that conduct will be set down as a proof of her guilt.

To be convinced, as I am, that such a case often happens, the reader would wish perhaps to have some examples and illustrations. I have generally observed, that in proportion as women more sincerely repent of such ruinous indiscretions, it is more difficult to prevail upon them to confess ; and it is natural. Among other instances which might be mentioned, I opened the bodies of two unmarried women, both of them of irreproachable and unsuspected characters with all who knew them. Being consulted about their healths, both of them deceived me. One of them I suspected, and took pains to prevail with her to let me into the secret if it was so, promising that I would do her the best offices in my power to help her out of the difficulties that might be hanging over her ; but it was to no purpose. They both died of racking pains in their bowels, and of convulsions. Upon laying out the dead bodies, in one of the cases a dead child, not come to its full time, was found lying between the unhappy mother's limbs ; and in the other, a very large dead child was discovered, only half born. Such instances will sufficiently shew what a patient and fixed resolution the fear of shame will produce. A young unmarried woman, having concealed her pregnancy, was delivered during the night by herself. She was suspected ; the room was searched, and the child was found in her box, wrapped up in wet clothes.

She confessed that the child was her's, but denied the having murdered it, or having had an intention to do so. I opened the child with Mr. Pinkstan, of St. Alban's Street, and the lungs would not sink in water. Her account of herself was this :—She was a faithful and favourite servant in a family, which she could not leave without a certainty of her situation being discovered; and such a discovery she imagined would be certain *ruin* to her for life. Under this anguish of mind, she was irresolute and wavering from day to day as to her plan of conduct. She made some clothes for the preservation of her child, (a circumstance which was in her favour,) and she hired a bed-room in an adjacent street, to be ready to receive a woman in labour at a moment's notice. Her scheme was, when taken in labour, to have run out to that house, to be delivered by a midwife, who was to have been brought to her. She was to have gone home presently after, and to have made the best excuse she could for being out. She had heard of soldiers' wives being delivered behind a hedge, and following the husband with the child in a short time after; and she hoped to be able to do as much herself. She was taken ill of a colic, as she thought, in the night; put on some clothes, both to keep her warm, and that she might be ready to run out, if her labour should come on. After waiting some time, she suddenly fell into such racking pain and terror, that she found she had neither strength nor courage to go down stairs, and through the street, in that condition, and in the night. In despair she

threw herself upon the bed, and, by the terror and anguish which she suffered, she lost her senses, and fainted. When she came to a little recollection, she found herself in a deluge of discharges, and a dead child lying by her limbs. She first of all attended to the child, and found that it was certainly dead. She lay upon the bed some time, considering what she should do; and by the time that there was a little day-light, she got up, put all the wet clothes and the child into her box, put the room and bed into order, and went into it. The woman of whom she hired the room, and who had received a small sum of money as earnest, though she did not know who she was, swore to her person, and confirmed that part of her story. Mr. Pinkstan and I declared that we thought her tale very credible, and reconciled it to the circumstance of the swimming of the lungs, to the satisfaction of the jury, as we shall hereafter do to the reader. She was acquitted; and I had the satisfaction of believing her to be innocent of murder.

In most of those cases we are apt to take up an early prejudice; and when we evidently see an intention of concealing the birth, conclude that there was an intention of destroying the child: and we account for every circumstance upon that supposition, saying, why else did she do so and so? and why else did she not do so and so? Such questions would be fair, and draw forth solid conclusions, were the woman supposed at the time to be under the direction of a calm and unembarrassed mind; but the

moment we reflect that her mind was violently agitated with a conflict of passions and terror, an irrational conduct may appear very natural.

Allow me to illustrate this truth by a case. A lady, who, thank God! has now been perfectly recovered many years, in the last months of her pregnancy, on a fine summer's evening, stepped out, attended by her footman, to take a little air on a fine new pavement, at her own door, in one of our most even, broad, and quiet streets. Having walked gently to the end of the street, where there was a very smooth crossing-place, she thought she would go over, for a little variety, and return towards her house by walking along on the other side of the street. Being heavy, and not unmindful of her situation, she was stepping very slowly and cautiously, for fear of meeting with any accident. When she had advanced a few steps in crossing the street, a man came up on a smart trot, riding on a cart, which made a great rattling noise. He was at a sufficient distance to let her get quite over, or to return back with great deliberation; and she would have been perfectly safe if she had stood still. But she was struck with a panic, lost her judgment and senses, and in the horror of confusion between going on or returning back, both of which she attempted, she crossed the horse at the precise point of time to be caught and entangled in the wheel, was thrown down, so torn and mashed in her flesh and bones that she was taken up perfectly senseless, and carried home without the least prospect of a recovery. This

lady was in the prime of life, living in affluence, beloved by her family, and respected by all the world. No imagination could suggest an idea of her intending to destroy herself; but if her situation in life at that time could have favoured such a supposition, we see in fact that the most unquestionable proof that she could have saved herself, either by going on, or by turning back, or by standing still, would have signified nothing towards proving that she had intended to put an end to her own life and to that of her child. One shudders to think that innocent women may have suffered an ignominious death from such equivocal proofs and inconclusive reasoning.⁽³⁾

Most of these reflections would naturally occur to any unprejudiced person, and therefore, upon a trial in this country, where we are so happy as to be under the protection of judges, who, by their education, studies, and habits, are above the reach of vulgar prejudices, and make it a rule for their conduct to suppose the accused party innocent till guilt be proved; with such judges, I say, there will be little danger of an innocent woman being condemned by false reasoning. But danger, in the cases of which we are now treating, may arise from the evidence and opinions given by physical people, who are called in to settle questions in science, which judges and jurymen are supposed not to know with accuracy. In general I am afraid too much has been left to our decision.⁽⁴⁾ Many of our profession are not so conversant with science as the world

may think ; and some of us are a little disposed to grasp at authority in a public examination, by giving a quick and decided opinion, where it should have been guarded with doubt ; a character which no man should be ambitious to acquire, who, in his profession, is presumed every day to be deciding nice questions, upon which the life of a patient may depend.

To form a solid judgment about the birth of a new-born child, from the examination of its body, a professional man should have seen many new-born children, both stillborn, and such as had outlived their birth a short time only ; and he should have dissected, or attended the dissections of, a number of bodies in the different stages of advancing putrefaction. I have often seen various common and natural appearances, both internal and external, mistaken for marks of a violent death. I remember a child which was found in a compressed state and globular form, and, like hardened dough, had retained all the concave impressions which had been made where any part of the skin and flesh had been pressed inwards. The jury had got an opinion that this moulding of the flesh could not have happened except the infant had been put into that compressed state while it was alive. My anatomical employments enabled me to remove all their doubts about the fact. I offered to make the experiment before them if they pleased ; the child should be laid in warm water, till its flesh should become soft and pliable, as in a body just dead ; then it should be compressed, and

remain so till cold, and then they would see the same effect produced. They were satisfied, without making the trial.

In many cases, to judge of the death of a child, it may be material to attend accurately to the force of cohesion between the skin and the scarf-skin; and still more, to be well acquainted with the various appearance of the blood settling upon the external parts of the body, and transuding through all the internal parts in proportion to the time that it has been dead, and to the degree of heat in which it has been kept.⁽⁵⁾

When a child's head or face looks swollen, and is very red, or black, the vulgar, because hanged people look so, are apt to conclude that it must have been strangled. But those who are in the practice of midwifery know that nothing is more common in natural births, and that the swelling and deep colour go gradually off, if the child lives but a few days. This appearance is particularly observable in those cases where the navel-string happens to gird the child's neck, and where its head happens to be born some time before its body.⁽⁶⁾

There are many other circumstances to be learned by an extensive experience in anatomy and midwifery, which, for fear of making this paper prolix, and thence less useful, I shall pass over, and come to the material question, viz. in suspicious cases, how far may we conclude that the child was born alive, and probably murdered by its mother, if the lungs swim in water?⁽⁷⁾

First, we may be assured that they contain air. Then we are to find out if that air be generated by putrefaction. (8)

Secondly, to determine this question, we are to examine the other internal parts, to see if they be emphysematous, or contain air; and we must examine the appearance of the air-bubbles in the lungs with particular attention. If the air which is in them be that of respiration, the air-bubbles will hardly be visible to the naked eye; but if the air-bubbles be large, or if they run in lines along the fissures between the component *lobuli* of the lungs, the air is certainly emphysematous, and not air which had been taken in by breathing.

Thirdly, if the air in the lungs be found to be contained in the natural air-vesicles, and to have the appearance of air received into them by breathing, let us next find out if that air was not perhaps blown into the lungs after the death of the infant. (9) It is so generally known that a child, born apparently dead, may be brought to life by inflating its lungs, that the mother herself, or some other person, might have tried the experiment. It might even have been done with a most diabolical intention of bringing about the condemnation of the mother.

But the most dangerous and the most common error into which we are apt to fall is this; viz. supposing the experiment to have been fairly made, and that we have guarded against every deception above mentioned, we may rashly conclude that the child was born alive, and therefore must probably have

been murdered; especially in a case where the mother had taken pains, by secreting the child, to conceal the birth.⁽¹⁰⁾ As this last circumstance has generally great weight with a jury, I will only observe, that, in fair equity, it cannot amount to more than a ground of suspicion, and therefore should not determine a question, otherwise doubtful, between an acquittal, or an ignominious death.

Here let us suppose a case, which every body will allow to be very possible. An unmarried woman, becoming pregnant, is striving to conceal her shame, and laying the best scheme that she can devise for saving her own life and that of the child, and at the same time concealing the secret—but her plan is at once disconcerted, by her being unexpectedly and suddenly taken ill by herself, and delivered of a dead child. If the law punishes such a woman with death, for not publishing her shame, does it not require more from human nature than weak human nature can bear? In a case so circumstanced, surely the only crime is the having been pregnant, which the law does not mean to punish with death; and the attempt to conceal it by fair means should not be punishable by death, as that attempt seems to arise from a principle of virtuous shame.

Having shewn that the secreting of the child amounts at most to suspicion only, let us return to the most important question of all, viz. if in the case of a concealed birth, it be clearly made out that the

child had breathed, may we infer that it was murdered? Certainly not. It is certainly a circumstance, like the last, which amounts only to suspicion. To prove this important truth to the satisfaction of the reader, it may be thought fit to assert the following facts, which I know from experience to be true, and which will be confirmed by every person who has been much employed in midwifery.

1. If a child makes but one gasp, and instantly dies, the lungs will swim in water as readily as if it breathed longer, and had then been strangled. ⁽¹¹⁾

2. A child will very commonly breathe as soon as its mouth is born, or protruded from the mother, and in that case may lose its life before its body be born; especially when there happens to be a considerable interval of time between what we may call the birth of the child's head, and the protrusion of its body. And if this may happen where the best assistance is at hand, it is still more likely to happen when there is none; that is, where the woman is delivered by herself. ⁽¹²⁾

3. We frequently see children born, who, from circumstances in their constitution, or in the nature of the labour, are but barely alive; and after breathing a minute or two, or an hour or two, die in spite of all our attention. And why may not that misfortune happen to a woman who is brought to bed by herself?

4. Sometimes a child is born so weak, that if it be left to itself, after breathing or sobbing, it might pro-

bably die, yet may be roused to life by blowing into its lungs, applying warmth and volatiles, rubbing it, &c. &c. But in the cases which we have been considering, such means of saving life are not to be expected.⁽¹³⁾

5. When a woman is delivered by herself, a strong child may be born perfectly alive, and die in a very few minutes, for want of breath; either by being upon its face in a pool made by the natural discharges, or upon wet clothes; or by the wet things over it collapsing and excluding air, or drawn close to its mouth and nose by the suction of breathing. An unhappy woman delivered by herself, distracted in her mind, and exhausted in her body, will not have strength or recollection enough to fly instantly to the relief of the child. To illustrate this important truth, I shall give a short case.

A lady, at a pretty distant quarter of the town, was taken with labour-pains in the night-time. Her nurse, who slept in the house, and her servants, were called up, and I was sent for. Her labour proved hasty, and the child was born before my arrival. The child cried instantly, and she felt it moving strongly. Expecting every moment to see me come into her bed-chamber, and being afraid that the child might be someway injured, if an unskilful person should take upon her the office of a midwife upon the occasion, she would not permit the nurse to touch the child, but kept herself in a very fatiguing posture, that the child might not be pressed upon or smothered. I found it lying on its face, in a pool which

was made by the discharges; and so completely dead, that all my endeavours to rouse it to life proved vain.⁽¹⁴⁾

These facts deserve a serious consideration from the public: and as I am under a conviction of mind, that, when generally known, they may be the means of saving some unhappy and innocent women, I regard the publication of them as an indispensable duty.⁽¹⁵⁾

END OF DR. HUNTER'S PAPER.

NOTES & ILLUSTRATIONS.

NOTES & ILLUSTRATIONS

NOTES AND ILLUSTRATIONS.

(¹) *Date, and other circumstances.*

It may not be unimportant to notice in the outset, that the preceding paper was a posthumous one. Dr. William Hunter died, in his sixty-fifth year, on the 30th of March, 1783; and this, among other productions of his pen, was read to the Medical Society in the subsequent July. It was first published in the sixth and last volume of the *Medical Observations and Inquiries*, in the year 1784.

Perhaps in every case it is to be regretted, where an author dies, leaving to the discretion of surviving friends the care of publishing his writings. Whoever is conversant with the press must know how a man's opinions are sobered down, and his judgment chastened, in the task of preparing his work for the critical eye of the public, and how rarely it happens, if ever, that an author is satisfied with his printed production, if he have not had the opportunity of revising, extending, and giving it the benefit of his mature and deliberate consideration. Just so, we are inclined to think, it would have been with Dr. Hunter, had he lived to superintend the publication of his celebrated tract—a tract which has had such influence in this country since the date of its first appearance. Its intrinsic merits, indeed, need no blazonry;

it is an eloquent composition, conceived in a pure spirit of human kindness, and admirably adapted for popular purposes, being unencumbered with more science than can be readily apprehended even by the most superficial. But still we shall probably do well to bear in mind that it was drawn up *for a special purpose*, only a short time before the author's death, and that it was never submitted to that critical and final scrutiny which a writer himself is perhaps best fitted to bestow on whatever he is about to publish.

(2) *He had been informed that it was a subject which I had considered in my lectures.*

How long Dr. Hunter had been in the habit of professing the opinions stated in the present tract, we have perhaps no means of ascertaining. He was a distinguished lecturer on anatomy and physiology for above thirty-five years previous to his death; and it seems probable that his views of the value of the hydrostatic test had, at least during the latter portion of that period, attracted the attention of the public. About the year 1773-4, it appears that the subject was treated, (probably by some disciple of Hunter's), in certain lectures delivered at Surgeons' Hall. This we learn from a communication signed W. P. in the 44th vol. of the Gentleman's Magazine, (p. 463,) where the writer denounces the lung test as "an error to be exploded out of all societies:" "that it has been proved to be such," he continues, "there are many gentlemen of the faculty can testify, who were present at Surgeons' Hall when it was lately declared to be so by a learned gentleman in full court, when on reading a lecture on the lungs he took occasion to break

off from the subject, and deliver himself in words to this effect." . . . W. P. then gives some passages in which the lecturer declares that the test is "not strictly true," for he had had an opportunity of trying it on *two* different births; one born alive, but which died soon after—the other dead,—“when behold, the lungs of the former sunk, and those of the other, to our great astonishment, swam:” he adds, that he also tried experiments on different animals, and was convinced “that there is no dependence upon what Dr. Gibson looked upon as infallible.” The lecturer, indeed, admits that the test *may* sometimes prove true; but still he holds that it should be looked upon as an uncertain and precarious proof of the fact: and for this reason he recommends it to be *exploded* out of practice.

Who this lecturer was, it were now perhaps not very easy to ascertain. Dr. Hunter, at the date in question, lectured chiefly, if not solely, at his school in Windmill Street. Could we only venture to presume that the writer was inadvertently mistaken as to the place in which he heard the remarks above cited, we should be much disposed to consider our author as “the learned gentleman, whose name and great merit are well known in London.”

But be it not for a moment supposed that Dr. W. Hunter, however popularly successful his opposition, was the first opponent of the hydrostatic lung-test: neither he nor any of his contemporaries could lay claim to that distinction, any more than the Dr. Gibson, above mentioned, can be looked upon as its first supporter. Not to go back to the time of Galen,—our illustrious Harvey, towards the earlier part of the 17th century, may be said to have made himself thoroughly acquainted with the nature of the changes undergone by lungs which have respired.

Bartholinus, in 1663, and Swammerdam, in 1677, with much success, pursued the same track of inquiry; but Karl Rayger, in the year last mentioned, was the first demonstrator of the fact that the lungs of a still-born child sink, while those of an infant which has breathed swim, in water: Rayger also *suggested* that this would afford a good means of attaining the truth in doubtful cases of child murder. It was Dr. Schreyer, of Zeitz, however, who first actually made the test available for the purposes of justice. This was in the year 1682; and we find that several of the medical faculties of Germany, as early as 1683 and 1684, confirmed the validity of the test, ascribing all the honour of its discovery to Rayger and Schreyer.

But scarcely was the test thus pointed out and recognized, when, like most novelties, it had to run the gauntlet of fierce opposition: it was attacked with considerable force by Zeller, in 1691; and by Bohn, so successfully, in 1711, that many converts even among the medical faculties were made by him. Bohn's arguments, by the way, against inferring the certainty of being born alive from the swimming of the lungs, are essentially the same as those of W. Hunter; namely, that those organs may be putrid, or artificially inflated. He was followed by numerous physiologists, who took the same view of the case, during the early part of the eighteenth century; and among the rest it may be mentioned that Morgagni and Haller are of the number, who hold that the lung-test ought to be had recourse to only with the greatest caution.

Thus was the hydrostatic test, in its strength and its weakness, known to the medical jurists of the continent nearly 100 years before Dr. Hunter thought of committing his remarks to paper. But if we thus deny our author

the merit of originality in regard to the scientific facts which he has brought forward, he has still a transcendent claim to our commendation on the score of his professional and moral illustrations, for the admirable ingenuity with which he states his views, and perhaps above all for so effectually attracting public attention to a point of legal medicine of such pre-eminent importance.

(³) *One shudders to think that innocent women may have suffered an ignominious death from such equivocal proofs and inconclusive reasoning.*

If the scientific portion of the tract be so brief and unmarked by novelty, as has just been stated, every body must admit and admire the cogent eloquence with which the other parts of it are drawn up. Where, in fact, shall we find a more splendid defence of the sex, or one more humanely indulgent to those unfortunate females who happen to lie under the imputation of the murder of their offspring? It is here shown that such a crime is abhorrent from the very nature of woman; that circumstances beyond their control may render some unhappy persons the involuntary slayers of their own children, at the birth, or newly born; and that the predicament in which they are often placed, overwhelmed with the terror of exposure, and enduring at the same time, perhaps, the stings of poverty and remorse, is capable of so far impairing their judgment and reason, as to render them wholly irresponsible beings.

(4) *In general I am afraid too much has been left to our decision.*

The modesty with which Dr. Hunter in this paragraph includes himself among the "physical people," whose evidence in questions of science ought to be taken with caution, and the address with which he compliments the judges as men "above the reach of vulgar prejudices," afford good examples of the rhetorical artifice, as well as of the earnestness, of the author. It might be questioned, indeed, whether he does not go a little too far in this avowal of incompetence on the part of himself and his brethren of the medical profession, and especially in charging some of the latter with more than mere ignorance—with a propensity to compensate for their limited acquaintance with science, by a forward and ambitious mode of giving their opinions. We should recollect, however, that this was uttered upwards of *fifty* years ago, when as yet no attention had been paid in this country to forensic medicine as a special department of knowledge. In how very backward a state the subject remained even for some time subsequently to the publication of Dr. Hunter's tract, may be gathered from the circumstance, that in Dr. Farr's *Elements of Medical Jurisprudence*, published in 1788—and, by the way, the first work on legal medicine in a systematic form ever produced in this kingdom—the hydrostatic lung-test is disposed of in the following laconic paragraph:—

"A great handle hath been made of the swimming or subsidence of the lungs. When other circumstances are taken into consideration, it may be a corroborating proof, but can by no means be absolute of itself; for the lungs

may swim from putrefaction, where a child is born dead, or from inflation by a blow-pipe, or other means. On the other hand the lungs may subside in a child that is born alive: *for a child may live, or have its circulation perfect, some time before it begins to breathe!*"

Yet at the time that this was written, Haller and Morgagni had terminated their labours, and the medical jurists of Germany had amply discussed the merits of the several tests for forming a judgment in questions of child murder. Dr. Farr, it should be added, professes to found his publication on Faselius's *Elementa Medicinæ Forensis* (Geneva, 1767), but he takes credit to himself for supplying several important omissions, and for new modelling the whole.

But though we have no pretext for attempting to vindicate the professional contemporaries of Dr. Hunter, whom he, no doubt, well knew, we must be permitted to express our surprise that in the succeeding paragraph, where he points out some of the requisites for a competent medico-legal examiner in cases of infanticide, instead of giving any instance of mistakes committed by *medical* men little familiar with the *post-mortem* inspection of infants, he contents himself with narrating a remarkable example of gross ignorance and prejudice on the part of a *jury* who had "got an opinion" that an infant which was found compressed into a globular shape, and of a doughy consistence, had been destroyed by being reduced to that condition while alive.

(⁵) *In many cases, to judge of the death of a child, it may be material to attend to the scarf-skin, &c.*

In this paragraph, and the one that follows it, the remarks of Dr. Hunter are concise enough, but very imperfect. With regard to the importance of attending to the state of the cuticle, for example, he does not say *why* the professional man ought closely to observe it. Will it be deemed superfluous in us to add, that the condition of the scarf-skin is a circumstance not to be overlooked,—inasmuch as it may enable the examiner to form an opinion as to *how long* the infant may have been dead, nay, perhaps how long it may have lived? There are, in fact, two states of the cuticle which ought to be well discriminated—one, its peeling off from putridity, the other its desquamation, owing to a vital process. The latter, however, is seldom or never observed except in the case of infants which have lived at least a day; and Dr. Hunter evidently only alludes to the possible peeling of the scarf-skin as an indication that the body has begun to be decomposed. The existence of putrefaction in a *new-born* child, examined recently after birth, must of course at once put a stop to the charge of infanticide,—for it could not have been a live birth.

From the outer integument Dr. Hunter directs attention to the state of the subcutaneous parts: he suggests that it is very material to notice any apparent effusions of blood beneath the skin. This, at least, is what we believe he means by “the various appearance of the blood settling upon the external parts of the body, and transuding through all the internal parts, in proportion to the time

that it has been dead, and to the degree of heat in which it has been kept." The enunciation of the remark is sufficiently vague, and what is worse, its want of perspicuity seems likely to render it fallacious. It is certainly not quite correct to say that the blood transudes through *all* the internal parts, in proportion to the time elapsed, or the degree of decomposition influenced by heat. The peculiar appearances alluded to (resembling the effects of bruises), are only observed in *certain* parts, viz. in those most dependent, the transudation being owing to simple gravitation: and this circumstance serves to distinguish them from those subcutaneous effusions which originate in injury or violence. May it not be presumed that this is one of the passages in the tract which would have been corrected, had the author lived to revise it in passing the press?

(⁶) *When a child's head or face looks swollen, and is very red, or black, &c.*

The simple appearances mentioned by Dr. Hunter in this passage would not be very likely to mislead a person of ordinary observation or experience: but there are certain adjuncts or circumstances which might give them a more than usual degree of importance. Thus, the livid and swollen condition of the head might be owing not to a merely *accidental* compression of the neck with the navel-string; there have been instances of *deliberate* strangulation effected in this way: in which case we should, of course, be warranted in demanding an inspection of the state of the lungs and air-passages; for we might possibly detect in them the signs of death by asphyxia, the funis having been employed as a common

cord or ligature. At all events, if the infant have perished from the mere accident of the girding of the neck with the umbilical cord, there should be no signs present of respiration having begun, much less of having been interfered with*.

(7) *How far may we conclude that the child was born alive, and probably murdered by its mother, if the lungs swim in water?*

This Dr. Hunter calls the "material question." But is it stated fairly? If it be, we can only express our surprise at the absurdity of the position maintained by the author's opponents; for surely no rational person at the present day would ever think of deducing such inferences from the mere fact of the floating of the lungs. Had Dr. Hunter to combat the hydrostatic lung-test in our times, he would probably modify his question in this manner:—Whether from the swimming of the lungs we are authorized to conclude that the child respired, and, in so far, lived?

He admits that if the lungs float, they must "contain air"—air which may be presumed to have been naturally inspired; unless it can be shown to be the result of putrefaction, or emphysema, or that it has been artificially introduced. These exceptions are little more than hinted at, or merely stated; yet they come before the reader with such weight—inasmuch as there is nothing suggested by which their force may be duly estimated, if not materially weakened, or modified—that it will be requisite to offer a few remarks on each distinctively.

* Annales d'Hygiène, tome xiv.

(8) *We are to find out if that air be generated by putrefaction.*

The method proposed by Dr. Hunter for satisfying this inquiry—namely, whether the air which floats the lungs is the gaseous product of putrefaction, or atmospheric air,—is simple, but not as practical as it might be. There is, indeed, no great difficulty in the investigation. In the first place the examiner can hardly mistake putrid for sound lungs; and perceiving them putrid, he will be prepared to find gases in them. These gases, moreover, when present, will be observed to be contained in vesicles, or air-bubbles, along the surface, as Dr. Hunter describes them, whence they may readily be expelled by pressure,—while the atmospheric air contained in sound lungs can by no pressure be wholly expelled. Whenever the objection, therefore, is made that the lungs of a new-born child float in consequence of putrefaction, one mode of meeting it is by trying whether the contained air may be pressed out: if it can, the objection is valid; if not, the reverse.

There is yet another point regarding alleged putridity on which we ought to be satisfied. The lungs are found to be one of the latest, if not *the* latest, parts of the body which become putrid. Before, therefore, we admit the propriety of the objection, we should see that all the rest of the body, or the greatest part of it, is already in a state of putrefaction; for otherwise, the allegation of putridity can only be considered as frivolous.

It may be observed that in the same paragraph in which the distinction just alluded to, between gases from putrefaction and atmospheric air, occurs, the term “emphysematous” is rather loosely employed. The con-

text serves to show that Dr. Hunter uses it in the sense of *puffy* or *inflated*, when applied to certain parts of the body, and as *gaseous*, when distinguishing the sort of air in question*. But it is worth noticing that more recent authorities have applied the term to the lungs in an acceptation somewhat different from our author's; to imply, in fact, that those organs may be in a puffy state *without putrefaction*. The lungs, according to the parties to whom we refer, (Chaussier, Orfila, &c.) may be emphysematous, owing to contusion of the chest (during tedious delivery, for example) from external pressure, the violence extending to the contained viscera. It ought, however, to be added, that such a state of emphysema of the lungs is exceedingly rare, and further, that where it is alleged to be present there ought to be some evidence of its cause,—either in the difficult nature of the labour, or the actual appearance of external injury corresponding to the internal lesion. In this kind of emphysema, besides, as well as in the gaseous state arising from putridity, the air will be perceived not to be contained in the air-cells or genuine pulmonary vesicles, but in the cellular tissue immediately beneath the surface.

* The meaning attached to the term by Dr. Hunter may perhaps be still more definitely ascertained by referring to another of his writings. In an excellent paper on "an Emphysema," written in 1757, and published in the second volume of the *Medical Observations and Inquiries*, we find the following passages:—"An *emphysema* happens to dead bodies from putrefaction. Thence it is that the fleshy parts of an animal, though specifically heavier than water, yet when macerated some time, float upon the surface; and that the bodies of drowned men, after some days, are buoyed up and swim. Putrefaction produces *emphysema* likewise in living bodies. Surgeons observe this in mortifications." He then cites a case in which he says, "The cellular membrane under the skin was very sensibly inflated every where, to some distance from the mortified part; and I could as easily mark the progress of the mortification from day to day, by the *emphysema*, as by the change of colour in the integuments."

Thus neither putrefaction, nor emphysema, can present any very formidable difficulty in determining the true reason of the swimming of the lungs. Not so where we may have to distinguish whether or not the pulmonary vesicles have been artificially inflated; a point which comes next to be noticed, and which deserves our most earnest attention.

(⁹) *Let us next find out if that air was not perhaps blown into the lungs after the death of the infant.*

This is beyond a doubt the most critical question connected with the subject of infanticide—to determine whether lungs that swim, containing air (not the product of putrefaction or emphysema), may not have been inflated by artificial means.

For it may happen to be stated in defence, by the unfortunate accused, that she attempted to resuscitate her infant by blowing into its mouth and lungs; and sometimes it may be pleaded by her advocates, that other parties, from humane, perhaps from mischievous, motives, have had recourse to artifice inflation. In either case it will be the duty of the medico-legal practitioner to examine how far such statements are probably true; and perhaps, notwithstanding the insinuation of Dr. Hunter to the contrary, it may not be always so very impossible to come to a satisfactory conclusion.

The question is, how may we distinguish the appearances produced by artificial inflation, from those caused by natural respiration? Experiment shows that the lungs of an infant, perfectly still-born, the moment the air is blown into them, undergo a remarkable change both in colour and bulk. Their colour, from being of

a dark chocolate hue, becomes a florid or bright scarlet, and their volume, instead of occupying a small portion merely of the contracted chest, is now, by the admission of air, considerably increased. When a blow-pipe is introduced into the trachea, the chest having been previously opened, these striking appearances are immediately produced. But when inflation is attempted by the mouth, the alteration of colour as well as increase of volume are only partial; and this affords one of the distinguishing characters between the two states of the lungs in question. While inflation tried on the still-born infant, with a view to resuscitation, is never found to operate completely the changes just mentioned, natural respiration, especially when the child is born mature, and there is no congenital disorder of the lungs present, renders those organs uniformly of a bright pink or rosy hue, and their volume throughout augmented.

There is also another distinction. Where natural respiration has taken place, the vessels of the lungs will be found to have admitted blood: the pulmonary circulation, in fact, may be observed to have commenced; and the weight of the lungs in consequence will sometimes be even doubled. The reason of this change is obvious: the heart of the live-born infant must be always more or less active, and, immediately on the commencement of the new process of inspiring and expiring air, will propel blood into the vessels of the lungs, which had hitherto been unexpanded: the result is, that the respiratory organs are increased in weight (by that of the blood admitted) as well as in volume. But the case is different with the lungs of the still-born. If, upon the artificial introduction of air into them, their vessels receive *any* blood, they do so only passively: there is no action of the heart to supply them, and consequently their weight is not materially, if at all, increased.

Upon this distinction is founded the *static* lung-test, first proposed by Ploucquet, about the year 1777, and which, corrected and regulated as it has been by several subsequent observers, is now generally admitted as well worthy of attention, and suited to render the deductions derivable from the *hydrostatic* test more equitable than they might otherwise be considered. In the practice of medico-legal examination of the lungs, it is indeed one of the first experiments had recourse to: having observed the bulk and colour of the lungs, then whether those organs float or sink in the water, *their weight* is next ascertained, *as compared with that of the whole body*; and as this proves to be more or less than about the 1-50th of the whole weight, so a judgment is formed as to whether natural respiration did or did not take place.

One other distinguishing peculiarity deserves to be noticed, and that is, the utter impossibility of expelling the air completely from lungs that have naturally respired, while the same degree of difficulty does not attend the expulsion of air which has been artificially introduced. It is found by experiment, that by strong compression—wringing, for instance, the lungs in a strong cloth—the air may be so perfectly expelled from the inflated lungs of a still-born infant, that they shall all and every part of them sink in water: whereas, in the case of lungs that have naturally respired, even the smallest particles still remain buoyant—as long, in fact, as there is any portion of them not completely mashed.

Such are the chief means at present available for solving Dr. Hunter's problem—whether air has been introduced into the lungs naturally or artificially; and we believe that all who are not obstinately prejudiced against fair physiological and experimental deduction will allow that they are calculated to lead to satisfactory

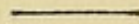
inferences. If such inferences, however, should fall short of strong presumption, the benefit of the uncertainty ought of course to be given to the accused: and it is only fair to add that this objection, set up as a defence, and supported in any degree by respectable testimony,—affirming that an attempt had been made at inflation,—is certainly the strongest that can be urged towards rebutting the assertion that the child whose lungs swim was born alive.

(¹⁰) *The rash conclusion that the child was murdered, because it had breathed, and because its birth was concealed.*

The solemn warnings of Dr. Hunter in this and the subsequent paragraph, we are sure are wholly superfluous at the present day, however appropriate they might have been when originally published. In the first place, who, even where an examination of the loosest kind was instituted, would infer that an infant had been murdered, from the circumstance of respiration having been, however clearly, made out? We must be permitted to doubt also, whether, even in Dr. Hunter's time, the insinuation was quite fair that such a rash inference was very likely to be drawn. Secondly, concealment of the birth has long since ceased to involve the penalty of death: that charge now forms the subject of a distinct indictment for misdemeanor: and if our author were living at present, he would no doubt rejoice to find the law altered to what he could desire it to be,—so that his appeal to humanity might be expunged, as perfectly needless.

It deserves to be noticed, in passing, that in the para-

graph to which this note more immediately refers, an admission is made that the hydrostatic experiment *may* be fairly instituted, with the inference that the child had respired: "supposing," says Dr. Hunter, "the experiment to have been fairly made, and that we have guarded against every deception above-mentioned," we must then take care how we rashly conclude, &c. The passage we conceive to be worth noticing, inasmuch as it is so commonly thought that our author denied *in toto* the efficacy of the hydrostatic test.



The five objections (or "facts," as he calls them,) adduced by Dr. Hunter, as possible modes of accounting for the deaths of children confessedly live-born, are so plausible, and set forth with such positiveness, that we deem them entitled to particular attention. We must offer special notes on at least three of them.

(¹¹) *If a child makes but one gasp, . . . the lungs will swim as readily as if it had breathed longer.*

Not so: our author happens to labour under a mistake; for this certainly is not a "fact". Observation and experiment are wholly at variance with it. So far from a single gasp, much less a dying gasp, being capable of rendering the lungs buoyant in water, children have lived for hours, days, nay weeks, and yet their lungs have not been sufficiently expanded to render them specifically lighter than water. It no doubt often happens that an infant breathes vigorously, and even cries in the act of birth: yet in every case the inflation of the

lungs by natural respiration is more or less a gradual process. The right lung is generally found to receive the air first, and that in its upper lobe; and the last portion of the lungs inflated is the lower lobe of the left side. But even though Dr. Hunter's *fact* or objection were admitted, it would still, in a case of infanticide, remain to be proved how a child which had gasped so effectually and so soundly, had come by its death.

(¹²) *A child will very commonly breathe as soon as its mouth is born, and yet may lose its life before its body is born.*

That a child *may* breathe as soon as its mouth is born, nay, as soon as its mouth presents (if it be a face presentation) at the expanded *os uteri*, the membranes being ruptured,—and, if we dare trust what seems to rest on good authority, even *before* the membranes are ruptured,—in short, that an infant may respire ere the labour be accomplished, and yet be dead on the completion of it,—this most assuredly forms a very plausible objection to the hydrostatic test, and one which, if admitted in every case without further inquiry, would put a stop to all judicial investigations respecting infanticide, as in the instance cited below*.

But before such a plea as this should be admitted,

* WINCHESTER, 6th March, 1835. Ann Simpson was indicted for the wilful murder of a child of which she had been delivered.

ROBERT CLARKE, examined.—I am a surgeon at Farnham. On the 21st Oct. I was sent for to Col. Spinks. I saw a child taken out of the privy. Observed no external marks of bruises: the umbilical cord was torn off close to the body. I examined it more particularly at the

some grounds for it ought to be alleged. However common it may be for respiration to commence as soon as the mouth is born, the other event stated in the objection occurs by no means so frequently. It is, we believe, rather unusual, at least it is allowed not to be a very common occurrence, for an infant to die during the act of birth. When death is said to have taken place under such circumstances, we have a right to inquire what might have been the cause. Dr. Hunter suggests one cause, and that of the simplest kind, namely, the lapse of a considerable interval between the protrusion of the head and that of the body. Now we should say that if this were given as the reason, or urged as a probable ground, of the alleged occurrence, it ought to be shown that there was some remarkable deformity of the child's body, or that the navel-string was pressed upon so as to cause death by stopping the circulation (though this were very unlikely, as respiration had begun), or that strangulation had taken place, the umbilical cord being twisted round the infant's neck and tightening as the head advanced, in which case there should be present the characteristic signs of this kind of death, together with the appearances mentioned by Dr. Hunter, (p. 13, *ante*,) and probably a mark of the pressure of the cord round the neck.

Our author might have suggested also another train of accidents leading to this catastrophe, namely, the child being born by the feet, and the head remaining locked in the pelvis for some time (owing to malformation of either

inquest. Found the lungs had been inflated (contained air), which would not have been the case if the child was still-born.

By the JUDGE (Baron GURNEY).—If the child had died in the birth, the lungs might have been inflated.

His LORDSHIP immediately said that the case could not proceed.
Acquittal.

infant or mother), and respiration under these circumstances having commenced. But in all such cases, there surely ought to be, if not moral evidence, at least marks and tokens on the body of the infant, that the labour was a protracted one. If the head, for instance, or any other part, had become fixed, there should be appearances indicative of that fact. The plea, besides, of the child dying in the birth, will be the less admissible as there may be deficiency of moral evidence that the labour was protracted: a labour of this description can seldom be carried on in secrecy; and if there were witnesses, what may be the amount of their evidence? And are their statements consistent with the *post-mortem* appearances? These are points on which it would seem only fair to procure some trustworthy information, ere the course of justice should be suffered to be at once blocked up, by admitting a groundless, however plausible, plea.

(¹³) *The means of saving life (the infant being feeble) may have been wanting.*

If the infant have really perished through feebleness, or the exhausting effects of the labour, the medico-legal inspection will most likely discover certain appearances to corroborate the plea. The same remark will apply to the objection, that the child was lost for want of those attentions commonly required by most infants on coming into the world. If, along with the usual signs of debility, there be found mucous matter in the child's mouth, obstructing the air-passages, the plea would seem good and admissible.

(¹¹) *I found the child lying on its face, in a pool which was made by the discharges, completely dead.*

The last objection suggested by Dr. Hunter is founded on the possible case of a strong child, born perfectly alive, yet suffocated in a few minutes, for want of removal from the natural discharges, or owing to other matters accidentally preventing its respiration. His illustration, we must say, however well it may be calculated to affect the feelings, is not exactly suited to satisfy our reason. The interesting story which he relates of the lady lying-in with all her servants and attendants about her, yet suffering her infant to perish through over-anxiety to preserve it, can scarcely be considered as a medico-legal example — except, indeed, we venture to attach some criminality to her proceedings, as undoubtedly we might, had this lady been already a mother; for in that case her conduct would seem not a little suspicious. But to return to the objection: it is quite true that a woman may be reduced to the predicament described, and so lose her child. A woman, after having given birth to an infant, may be so exhausted as to be unable to place it in safety. She may even be ignorant that any such care is necessary. Or again, what with her confusion and her over-anxiousness, she may occasion the death of her healthy offspring. All that can be said respecting the admissibility of such a plea is, that it will be the more valid and cogent the more it corresponds with the medico-legal appearances.

(¹⁵) *These facts deserve a serious consideration. . . . I regard the publication of them as an indispensable duty.*

It is, no doubt, the duty of all, to save, when in their power, the innocent from unmerited ignominy and punishment. But there is also another duty, which Dr. Hunter, on the present occasion, seems to have wholly lost sight of—namely, that of bringing the guilty to deserved condemnation, by stripping them of the assumed garb of innocence, which would otherwise be instrumental in their escaping justice.

But what after all has Dr. Hunter done? His avowed object was to impress the public mind—to rescue, if possible, some unhappy and innocent women. He has accordingly shown in his paper that a woman *may* be innocent, although the presumption of her guilt amount to a high degree of probability. He has ingeniously proved that most of the circumstances connected with the *floating* of the lungs may be accounted for without supposing the child to have been murderously treated. He has dexterously stated in his own peculiar way, and with all the weight attaching to his high reputation, every objection he was acquainted with, *against* the hydrostatic test. Such is the amount of public duty which our author has, in the present instance, discharged.

It must not be denied, that, to a certain extent, the strictures of Dr. Hunter, on the hydrostatic test, have done good. In his day there is reason to fear that it was used by unskilful hands, as an instrument of much mischief: but it is also to be feared, that the reaction that took its rise with our author against the popularity of the test, has been for many years, and even still continues to be,

the means of throwing a shield over many a guilty person. Practitioners, moreover, it is well known, who through pure laziness never gave the subject any adequate degree of attention, have found it convenient to join in the general decial of the test adopted by the disciples of Hunter.

May it not, however, be fairly asked, whether Dr. Hunter has not here exhibited himself rather more as a partisan than as a man of science? Either through want of sufficient acquaintance with its value, or strong prejudice against its imputed efficacy, he has put forward most of the strong objections against the hydrostatic test,—and there he leaves them, as if they were unanswerable. Nor does he say one word about any of the other tests by which the question of live or still birth may be determined.

The truth is, that though Dr. Hunter takes credit to himself for so conscientious a discharge of a public duty, it would not be difficult to show that, in certain other respects, he has left undone things that he ought to have done. He could have proved, for instance, (if it were his pleasure so to do,) that a woman *might* be guilty of child murder, although the indications of her crime, by the hydrostatic test, were wholly absent; as, for example, the lungs *sinking* in water, the child having never *breathed*,—for it might have *lived* notwithstanding. And so with other points, which it might be thought a sense of public duty would have prompted him to touch upon. But it is evident that his resolution was deliberately formed: his purpose was to show, as strikingly as possible, the *uncertainty* of the signs of child murder; and this he has done with all the skill and ingenuity of a special pleader. It is only to be regretted, that it is so often forgotten by those who adopt his opinions, how

very special and one-sided is his mode of treating the subject, and above all, that the great name and authority, which he still enjoys, should have so long and so effectually screened the *demurrers* in his pleading. The remark of Cicero, no doubt, will remain an eternal truth, "*Quin etiam obest plerumque iis qui discere volunt, auctoritas eorum qui se docere profitentur: desinunt enim suum iudicium adhibere; id habent ratum, quod ab eo, quem probant, iudicatum vident.*"

In the preceding Notes, some of the most important points connected with the question of Child Murder have been discussed; yet, owing to the limited view of the subject taken by Dr. Hunter, and the peculiar line of argument which he thought proper to pursue, it was impossible in following him, to give more than a very partial account of the several bearings of the question. To supply that deficiency is the object of the following sketch, in which all the principal facts relating to Infanticide are comprehensively, and, it is hoped, clearly, stated.

SUMMARY
OF
MEDICO-LEGAL FACTS
CONNECTED WITH
INFANTICIDE.

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SUMMARY
OF
INFANTICIDE.

INFANTICIDE, or murder of the new-born child, is contemplated by the law simply as a form of homicide; and the amount of the crime is estimated according as it appears in evidence that it was committed voluntarily or involuntarily, with or without malice.

It is generally pleaded for the defence, where a party is indicted for child-murder, that the child did not live—that it was born dead; in which case the indictment falls to the ground, unless it can be proved that the child actually survived birth, and died in consequence of certain violence offered to it.

For this purpose medical evidence is required;—first, to show whether or not the infant was born alive; and secondly, whether death was occasioned by natural causes, or by the infliction of violence.

The chief questions connected with the proofs of live or still birth are—*first*, whether the child died *before* the act of delivery, *during* the birth, or *afterwards*.

That evidence on these points is required in cases of *infanticide*, appears from the negative provision made in the statute 9 Geo. IV. 31, xiv., where the nature of the crime of *concealment of the birth* is determined: it is there stated, that in substantiating the latter charge,

“it shall not be necessary to prove whether the child died *before, at, or after* its birth;” clearly intimating that such evidence is necessary when *infanticide* is to be proved.

The same clause of the statute just quoted seems to authorize the production of proof that the accused was *really delivered*: if such a question should arise in a trial for infanticide (for it is not essential to the establishment of the crime), the evidence for its decision is to be sought in those principles of forensic medicine which have a special reference to the signs of delivery.

SECTION I.

WAS THE INFANT BORN ALIVE?

Our laws draw no distinction regarding *viability*, (or the capacity to continue to live) as those of other countries do. The fact of an infant betraying *any* signs of life renders it an object of protection to the magistrate; and voluntarily and maliciously to deprive it of existence, is held to be murder. Yet, no doubt, in administering justice impartially, it will always be considered as at least an extenuation of the alleged crime, if it can be shewn that the infant said to have been murdered was immature, or not likely to have lived.

Question of Maturity.

One of the first points to be attended to in the medico-legal examination of an infant found dead, is, whether it was mature or not. The following are among the principal characters belonging to the infant born about the 7th, the 8th, and the 9th month of pregnancy.

Between the 6th and 7th month, the length of the infant is about 12 or 13 inches; the middle point of its whole length is just beyond the lower extremity of the sternum; its weight is about 3 or 4lbs. The skin has a purplish tinge; there is very little hair on the head; the nails just beginning to be formed, thin, soft, and short. The eyelids scarcely opening; the pupils still partially closed by a membrane, which, however, usually disappears about the seventh month.

Towards the 8th month, the length is about 15 inches, the middle point nearer to the navel, the weight between 4 and 5lbs. The skin has become of a brighter hue, with a sebaceous or tallowy deposition beginning to be formed upon it. The hair is longer, the nails more firm.

The infant born at the 9th month, or mature, in general measures about seventeen or eighteen inches in length, the navel being exactly at the middle point. The head is usually at least a fifth of the whole length. The weight of the infant is estimated in this country at an average of about seven pounds. The nails are fully formed, firm, and reaching the end of the fingers. The sebaceous secretion is copiously formed on the skin. In males, the testicles will be commonly found deposited in the scrotum.

Other and more exact characters of maturity or immaturity may be derived from the state of the osseous system and its development: but, in this brief summary, it is perhaps needless to enter into minute detail.

Sure Signs of having survived Birth.

Still keeping in view the main subject of inquiry—whether the infant was born alive,—there are one or two

other external peculiarities worth noticing, as capable of throwing much light on the question. For example, the state of the umbilical cord, and the condition of the cuticle. Should it appear that the umbilical cord has sloughed off,—not from putrefaction,—not only was the child born alive, but it must have lived four or five days: if the cord has not only sloughed off, but the navel has been cicatrized or healed, the infant must have lived about ten days. As to the cuticle, a certain process, that of *desquamation*, begins to take place when the child is a day old: if, then, desquamation of the cuticle (which must not be confounded with peeling off of the skin from putridity) be observed, the infant cannot exactly be considered as *new-born*, but as having certainly come into the world alive, and continued to live above a day at least. In either of these cases, the labour of the medical jurist is materially abridged; he need not apply the tests, hereafter to be mentioned, for live or still birth, but merely confine himself to the question, whether the death of the infant was natural or owing to violence.

Another obvious case of the same kind would be, when, upon examining the stomach, it should prove to contain milk or other food partially digested. Such cases have happened: the body of a child has been found, evidently dead for some time: before applying any other test, the stomach has been opened, and, in consequence of the appearances there observed, further inquiry has been deemed unnecessary—the fact of survival of the birth being indubitable.

Should the bowels be found destitute of meconium, this also would denote that the child had lived for a time. Other distinctive characters, chiefly anatomical, may here be omitted, as we shall have to notice them farther on.

Indubitable Sign of still Birth.

Previously to entering on the important question, whether a new-born infant, found dead, had ever respired or not, it is to be observed, that there are some cases in which it is obvious and proper to presume that the infant *could* not have been born alive—in fact, that it must have died, perhaps some time, before birth. There is one appearance which serves to remove all doubt, namely, that of *uterine putrefaction*. When a child dies in the womb, and is expelled, as it generally is, after some days, it is found to have undergone changes, as striking, and as characteristic, as if it had been exposed to the open air. There is a looseness and flaccidity of all the structures; the bones, especially those of the head, have no firmness in their union with one another; they yield with their own weight, and that of the contents of the skull. The skin is decomposed, the epidermis peeling off, and when newly removed, leaving the integuments beneath of a bright reddish colour. The belly is generally of a brownish hue, without any mixture of green. The umbilical cord is wholly relaxed, untwisted, and full of a brownish liquor. Beneath the scalp, also, will generally be found an effusion of serum, which has been compared to a thickish raspberry vinegar*. But all these appearances will be better appreciated by an experienced eye, or by a person who has even only once or twice observed them, than from any mere description. The preceding detail applies to the case of the dead infant not being expelled for several days; but suppose the infant born on the

* It is said that in some instances the dead fœtus, ere it has been expelled from the uterus, has been converted into *adipocire*.

same day, or the day after, it has died — what then becomes of our indubitable sign? It does not hold good: we can then only have recourse to the ordinary tests of live or still birth.

HAS THE INFANT RESPIRED?

This, after all, is usually the main question to be determined, where the inquiry is, in *criminal* cases, whether the infant was born alive. In *civil* cases, where tenancy by the courtesy of *England* is at issue, it is sufficient proof of live birth that the infant has exhibited any sign of voluntary motion; nay, mere muscular irritability seems, in one instance, to have been held decisive*.

The proofs of respiration are founded on the phenomena which are observed to take place when uterine is exchanged for extra-uterine life. An alteration occurs in the structure and functions of several parts of the body; but the lungs, the heart, and the liver, are the viscera chiefly affected.

Before proceeding to an internal examination, *the external condition of the chest* ought to be noted. In a child which has never breathed, this part of the body is narrow and flattish; where respiration has taken place, on the contrary, the chest is ample and arched.

With respect to the lungs, the principal points to be attended to are, 1st, their colour; 2dly, their volume; 3dly, their consistence; 4thly, their absolute weight; and 5thly, their specific gravity.

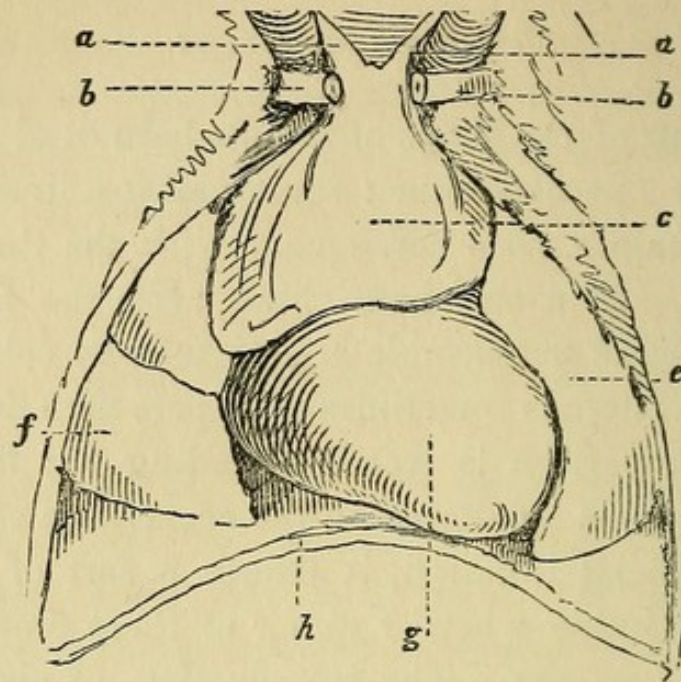
* The law of *Scotland* requires proof that the child has *cried*.

Colour of the Lungs.

The colour of the lungs of infants born dead is a dark purplish or chocolate hue : some call it a liver colour ; and it certainly does correspond with the tints of the adult liver. In a still-born child, also, the lungs are generally found to resemble the thymus in colour ; and though the latter is sometimes more pale than the former, yet the comparison is worth attending to : for as the thymus remains unaltered on the occurrence of respiration, or artificial inflation, it affords a sort of standard whereby to judge whether either of these processes has taken place or not. The introduction of air into the lungs completely alters their colour : they become a florid red on inflating them by a tube fixed in the trachea, and natural respiration gives them a bright red or rosy hue. Very frequently, the exact portions of the lungs into which air has been admitted can be easily distinguished from the other parts, by their difference of colour. But it must be kept in mind, that if the lungs be diseased, or gorged with blood, the appearances just mentioned may be greatly modified.

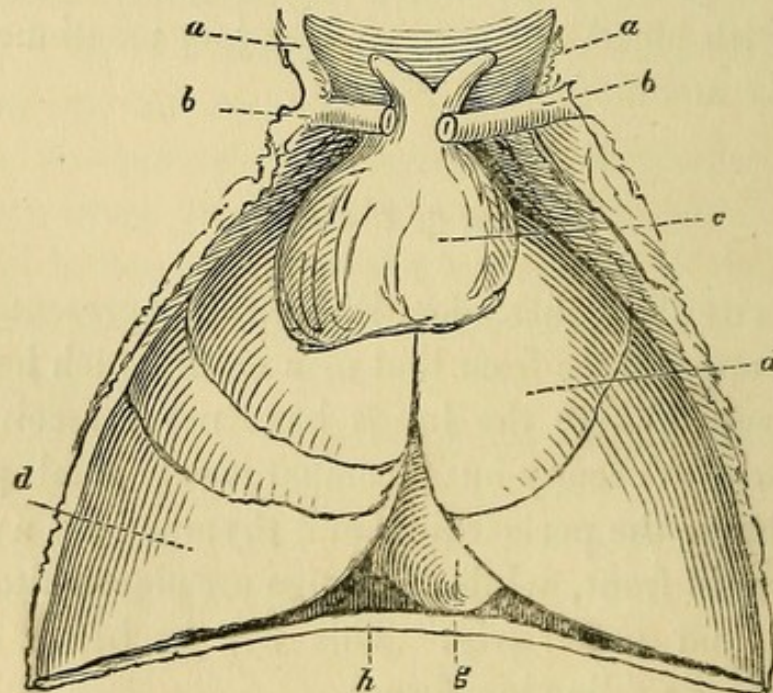
Volume of the Lungs.

The cavity of the chest of a still-born child presents a very different appearance from that of a child which has been born alive. Where the lungs have never received air, they appear to occupy but a comparatively small portion of the chest ; the pericardium and thymus hold a prominent place in front, while the lungs are placed altogether laterally and posteriorly. This will be better understood from the following figure.



* In this figure, *a* and *a* represent the horns of the thymus; *b b*, the clavicles, with their anterior portions removed; *c*, the body of the thymus; *e f*, the lungs; *h*, the diaphragm; and *g*, the pericardium.

On the other hand, the change effected in the volume and situation of the lungs, by the admission of air, may be readily comprehended from this sketch.



It will be seen that the pericardium is here nearly

covered; the diaphragm is less convex; and the lungs (*d d*), in every direction, more voluminous, and largely extending over the latter.

Let it be recollected, however, that in forming a judgment respecting respiration from the volume of the lungs, as well as from their colour, disease may materially interfere in preventing a diagnosis. Thus the lungs of still-born children may be filled with a serous fluid, which considerably increases their volume, and might lead an inexperienced observer to fancy, without further examination, that they were filled with air. In such cases our acquaintance with pathology must come to our aid.

Consistence of the Lungs.

Lungs that have been inflated with air, naturally or artificially, acquire a spongy and crepitous character; they feel soft and light; their edges are rounded off; they appear vesicular, and frothy fluid may be squeezed out of them. Putrefaction or emphysema will also render their surface vesicular; but the vesicles, in this case, are large and irregular, and confined to the surface; being contained, not in the air-cells, but in the cellular substance beneath the pleural lining: and, moreover, the gaseous product of putrefaction, or emphysema, may be totally expelled by pressure, while atmospheric air in the air-cells cannot. The lungs of the still-born are dense, and their edges sharp (particularly the left upper and right middle lobes), and nothing can render them of the consistence and appearance just now described but natural breathing or artificial inflation. If there be reason to know that the latter process had not been had recourse to, the soft spongy feel, the vesicular character, and the discharge of air-bubbles by pressure

under water, will strongly indicate that the child had breathed.

Absolute Weight of the Lungs.

When respiration begins, it is not merely air that enters the lungs, another fluid gains admittance also—blood which is propelled by the action of the heart. This, by the way, is a circumstance which does not attend artificial inflation, unless it be practised ere the motion of the heart has ceased. But confining ourselves to the effect of the admission of blood into the lungs of the live-born infant, it obviously increases the weight of those organs—in many cases it is found to double it; that is to say, if the lungs, previous to respiration, weighed an ounce (which is about the average weight in the still-born), they weigh, after breathing is established, two ounces. Ploucquet, of Tubingen, thought that this change occurred so generally that it would afford a good test of the fact, whether respiration had or had not taken place. He accordingly founded upon it what is commonly called

THE STATIC TEST.

Ploucquet's device was to compare the absolute weight of the lungs, with that of the body, of the infant; and in doing this, he found that, in the case of still-born children, the lungs were no more than about one-seventieth of the weight of the body, while, in the live-born, they weighed one-thirtyfifth. From this he inferred that respiration doubled their weight.

But his inference was deduced from too few facts to

warrant its general acceptance as a truth. Other observers and experimentalists came after him, and found that his conclusion was not very correct. Schmidt, at Vienna, and Chaussier, at Paris, entered into a special scrutiny of the nature of the true ratio, and the result of their researches (for they correspond pretty closely) has been, that, in the still-born, the average weight of the lungs is about 1-50th of the weight of the body, while, in the live-born, it is the 1-40th. M. Devergie, however, who has lately inquired into this subject with much ability, thinks that the averages would be more exactly stated at $\frac{1}{51}$ and $\frac{1}{38}$.

It will be seen, therefore, that the *static* test, taken singly, cannot afford us decisive evidence in any case; yet the presumptions that may be founded on it are valuable; so that it ought never to be overlooked in medico-legal investigations respecting infanticide, for it has its peculiar worth, in combination with the other tests, and may serve in no small degree to adjust them.

Specific Gravity of the Lungs.

The lungs of still-born children are dense, and heavier than water; those of infants born alive, in consequence of the admission of air, are of a less specific gravity, and will float in water. This distinction forms the essence of

THE HYDROSTATIC TEST.

In order to apply this test properly, we ought to have a vessel (such as a glass jar) of sufficient capacity to contain both the lungs and heart, and to suffer them freely to float or sink, according to circumstances. Pure river or rain water should be used, and its temperature should neither

be too low nor too high—say 60° Fahr. The vessel being nearly full, let the lungs and heart and the thymus be removed from the chest (taking care previously to tie the large blood-vessels), and let the whole be placed in the water together.

We should then observe whether the parts, thus collectively, swim or sink. If the latter, whether they reach the bottom quickly or slowly. The lungs may then be separated from the heart, and tried one after the other, as to their tendency to sink or remain buoyant. They may next be cut in pieces, and examined in detail as to their gravitating properties; and ultimately the fragments may be pressed so as to expel the air as completely as possible.

Now the chief and most obvious inferences derived from the hydrostatic test, are, 1st, that if the lungs swim, the infant breathed, or was born alive; 2dly, that if they sink, the infant did not breathe—it was still-born.

1. *Swimming of the Lungs.*

If the lungs, wholly or in part, swim, the inference is, that respiration to some extent, more or less, has taken place; but there are certain doubts or objections which may be raised, and are to be removed before our absolute decision is pronounced.

Objections.

(a.) *Putrefaction* may cause the lungs to float. This is true, in certain circumstances: when the lungs are in that state of putrefaction in which gases are generated, and cannot immediately escape, they are buoyant, and swim on water. But putrid lungs do not always float;

their putridity may have attained such a degree as to keep them at the bottom, even though they had once contained air in their air-cells. In the latter case, by the way, the hydrostatic test is of no use; and neither will any other test avail; for the infant's body must, in such a state of things, be one mass of corruption.

But in ordinary cases submitted to the medico-legal examiner—say within a few hours or days after birth—there can be no room for even supposing the presence of putrefaction. In fact, the lungs are known to be among the last, if not the very last, parts of the body which become putrid; and it has often happened, that when the body of an infant has been found in a state of putridity, the lungs have still been fresh, and fit for the application of the proper tests.

When, however, there is reason to suspect that the lungs float owing to this cause, let them be examined; and if putrid gases are really developed, rendering them specifically lighter than water, those gases will be seen, in large blister-like vesicles, on the surface and between the lobules of the lungs; whence they may be readily expelled by pressure under water. For greater certainty, the lungs may be cut in pieces, and each piece pressed separately: such pressure will not destroy the buoyancy of the parts, if they have ever received atmospheric air into their cells; whereas they sink at once if they had floated through mere putridity.

(*b.*) *An emphysematous condition* may cause the floating of the lungs. It sometimes happens that infants suffer violence in the birth; the labour, perhaps, being tedious, and the mother malformed. The sides of the chest may be so pressed against the substance of the lungs as to do those organs injury: they become inflamed and puffy, containing air in large vesicles on their

surface; and this is what some authors call emphysema. When such a state does exist, it may be recognized by the experienced eye, and by the superficial air expelled, as in the case of the putrid gases. No serious obstacle consequently can arise from this cause to the application of the hydrostatic test.

(c.) *Air may have been artificially introduced.* In the notes to Dr. Hunter's tract (p. 35, *ante*), this objection has been pretty fully considered. The *static* test may here be brought to our aid. Air blown into the lungs of a still-born child never produces all the changes which follow natural respiration. The moment the atmospheric air is admitted into the lungs of a living child, those organs are expanded, and their vessels filled with blood from the heart. Their weight consequently is increased, —doubled, as we have seen in some instances: so that by comparing the weight of the lungs with the weight of the body, a presumption of much importance may be formed. Again: another peculiarity by which the effects of inflation may be distinguished from those of respiration, is, that strong and energetic pressure will cause to sink every particle of lungs artificially inflated, while no mere pressure, short of absolute breaking up and mashing of the parts, will cause those lungs wholly to sink with which an infant has naturally respired*.

The objection that artificial inflation might have been practised, it must be confessed, may sometimes present the medical jurist with more than ordinary difficulty. But the circumstances of the case ought to save him from vexatious and needless investigation. The truth is, that such a plea on behalf of an accused mother is extremely

* For this method of testing artificial inflation (already noticed, p. 37, *ante*), we are indebted to Mr. Jennings, of Leamington. See *Trans. Prov. Associat.* Vol. II. p. 435.

rare, not only because, in most cases, it has no foundation in truth, but because, to render it probable, evidence of many collateral facts ought to be forthcoming. The female who would endeavour to save her child by inflating its lungs, should have given other proofs, besides, of her maternal tenderness: she should not have concealed, at least from some intimate friend, the fact of her pregnancy; her delivery should not have been secret; she should have prepared for the birth—the living birth—of her infant; there should be no marks of wilful violence on the body: in short, it is easy to judge from the history of any given case, whether the accused *wished* the life or death of the child, and therefore whether it is likely she *would*, (even allowing that, with sufficient strength and self-possession at such a moment, she *could*) inflate the infant's lungs.

Another plea, for *humanity's* sake, suggested by Dr. Hunter and others, is that inflation might have been practised by some malicious person, in order to trump up a charge of infanticide against the mother. Now there happens never to have been, as we trust there never will be, an instance of this kind of malice. Only consider all that would be required to make it in any degree effective. The diabolical perpetrator of such a deed should have some medical and medico-legal knowledge; his interference, too, could hardly have been premeditated—at least it must be contingent on the infant being born dead. In this case, too, there should be no collusion, or semblance of guilt, about the mother; no secrecy, no feigning, nor dissembling: in fine, no violence on the body of the child; or should there be marks of violence, they should be such as were probably inflicted *after* death, not before it, as the infant is presumed to have been still-born; so that, on a little reflection, it must be seen how purely

frivolous and gratuitous—how almost utterly impossible, it would be to substantiate a plea of this kind, were it ever set up in a trial for infanticide. But, as we have said, we are not aware that it ever has been.

(d.) *The infant might have breathed in the passage.* It is beyond a doubt that an infant *may* breathe before it is wholly expelled from the mother; but if it be so vigorous as to commence respiration thus early, what may have caused its death before it was wholly born? Such cases are universally admitted to be rare, and when they do occur, to be owing to tedious delivery, or some physical obstacle on the part of the child, or the mother, in the way of malformation. If anything of this kind have caused the infant's death, it ought so to appear in evidence. Respiration in the passages may also take place, where the child is born by the feet, and the head is detained for some time; or where the hand is introduced to accelerate a tedious labour. But neither of these cases is likely to occur in the practice of legal medicine, for they imply the presence of medical or other assistance; at least the circumstances preclude the idea of concealment. The objection, therefore, of breathing before delivery, ought not to be admitted without some feasible ground.

2. *Sinking of the Lungs.*

The sinking of the lungs, wholly and every part, proves that the infant never respired—provided the following doubts or objections cannot be plausibly urged.

Objections.

(a.) *The lungs may be diseased.* No doubt there are diseases which begin even in foetal life; and the lungs

of an infant may be so studded with tubercles, or gorged with blood or other fluids, that even though respiration have partially begun, they sink when put in water. But this state of things can scarcely lead into error; the eye of the pathologist can judge of the presence of disease; and, besides, if respiration have taken place, the lungs cannot be so complete a mass of disorganization, in a new-born infant, as that *every* part of them should sink. Cut these organs, then, in pieces, and observe whether they *all* sink: if they do, there can have been no respiration.

(b.) *The infant may have been too feeble to respire sufficiently to cause the lungs to float: those organs sink because their air-cells have only been very partially expanded. Granted that they may sink in their totality or integrity, yet, unless upon dividing them into small pieces, every portion sinks, the efficiency of the hydrotatic test rests unimpaired. Both experiment and theory warrant the deduction that it is impossible the lungs, in whole and in part, should sink, if they once received air. There is, however, one case, and we believe only one, on record, in which the lungs, and every part of them, are said to have sunk—the subject being an infant known to have lived and breathed for a time*. But, with all due deference to the authority on which this fact is stated, it may be doubted whether the experiment was carried sufficiently far to ascertain that every portion, however small, sank under the given circumstances. At all events, the most rigorous conclusion respecting the present objection can amount only to this—that here is a solitary*

* Dr. Bernt, of Vienna, relates the case. In a seven months' child, which lived *two hours*, the lungs, he says, were ten and a half grains heavier than their volume of water, and *every fragment sank*.

instance in which the hydrostatic test does not show that air had been admitted into the lungs, even where respiration is known to have taken place.

Whenever the medical jurist finds himself in this difficulty—which confessedly will very rarely happen—he must only rest his decision on the application of the other tests—the colour, consistence, and volume of the lungs; their absolute weight as compared with that of the whole body; the condition of the vessels of the liver and heart; the state of the stomach, umbilicus, &c. From all these, with a proper regard to their relative and combined value, he will be able to derive a satisfactory conclusion.

(c.) *An infant may live for a short time without breathing.*—The English law distinctly recognizes this fact—though the Scotch does not. A child may be born in the membranes—or with a *caul*, as the vulgar designate it—and in that state it may be destroyed; yet the hydrostatic test give no evidence that it had survived birth. This is true: for the hydrostatic test only indicates that breathing did, or did not, take place; and, of course, in the circumstances in question, does not apply. But neither do any of the other tests with which we are acquainted. The only means, therefore, by which this objection can be removed, is, by moral evidence of the fact that the infant never moved.

Such are the peculiarities of the hydrostatic test, and such the precautions to be used in applying it. Now may we not safely ask, after this general view of its merits and applicability, whether there can be a doubt but that, when carefully practised, it is capable of yielding a high degree of presumptive evidence, if not absolute certainty?

Modifications of the Hydrostatic Test.

Two methods have been proposed, and one of them actually put in practice, whereby the common mode of observing the specific gravity of the lungs might be improved. Daniel, in 1780, contrived a balance, one scale of which was suspended in a graduated glass vessel, large enough to permit the free immersion of the organs of the chest. First, the lungs, heart, and thymus, were carefully removed from the body, tying the large blood-vessels; they were weighed in the usual manner: the heart and thymus were then weighed separately—the difference of weight, of course, giving that of the lungs. The lungs were then weighed in water, being caused to sink, if necessary, so as to ascertain their volume in connexion with their weight. The object of the whole proceeding was to distinguish, if possible, between the effects of respiration, and those of artificial inflation. But the utmost that could be gained by the practical use of this method, would be the formation of tables, whereby certain averages might be determined for resolving doubtful questions concerning respiration. No such tables have ever been constructed: and even if they had been, it is extremely questionable how far they would prove satisfactory.

Professor Bernt, of Vienna, some years ago, devised another plan for perfecting the hydrostatic test. He took a glass jar, a foot in height, and three and a half in diameter. Two pints of distilled water were introduced into the vessel, and the level of the fluid marked all round accurately and permanently on the glass. Three double columns were then drawn in the same manner vertically on the vessel; each for male and

female fœtuses of seven months, eight months, and nine months. The lungs and hearts of fœtuses of these ages were then procured, under circumstances exactly known as to their having never respired, imperfectly respired, or respired perfectly. By the careful immersion of the organs of the chest, in each case, a scale in the respective columns was formed, which was to serve as a standard of comparison for the lungs and hearts of other fœtuses, the history of which might be unknown, but the fact of whose respiration might be hereby determined.

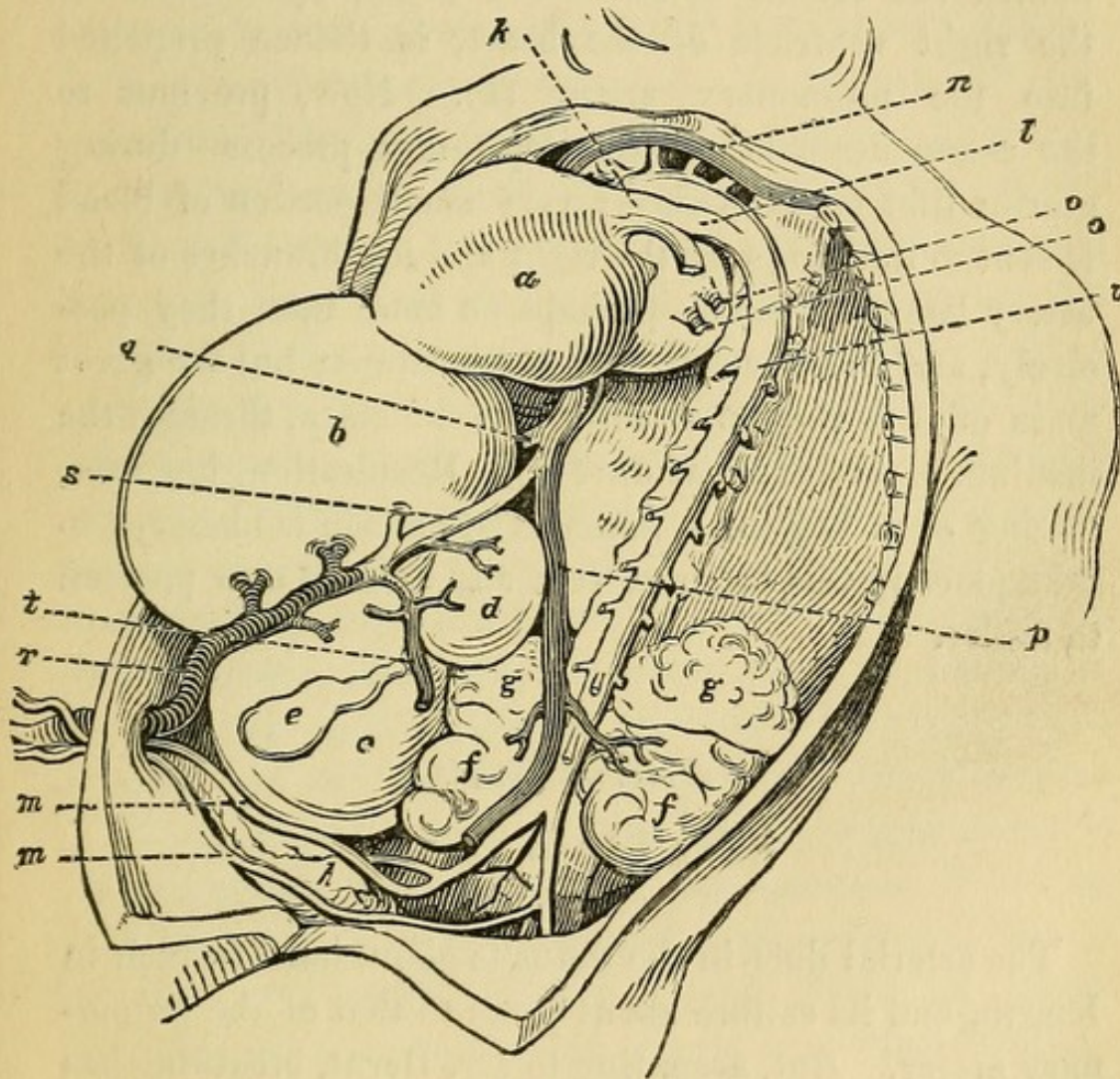
Several objections have been made to the efficiency of this instrument, and even to its accuracy; inasmuch as it is founded on principles which are rather more theoretically than practically true. It will not be necessary for us, in the present brief summary, to enter into an examination of these points: suffice it to say, that while Bernt's method is perhaps more simple, and better suited to practical purposes than Daniel's, it is still very far from being so free from faults, (independently of the difficulty of procuring the required vessel,) as to render it likely ever to be adopted by medical jurists in this country. Even in Germany it has never, I believe, been more than once employed in a court of justice; and in France it seems to have met with no reception.

Proofs of Respiration from the state of the

CIRCULATORY APPARATUS.

When an infant has begun to breathe, certain changes immediately take place in the organs subservient to the circulation of the blood. A change, for example, occurs

in the shape and size of the arterial duct, in the position of the foramen ovale, and in the venous canal. Each of these we shall separately notice; but first we would request the attention of the general reader to the locality of the principal parts to which we refer: they are represented in the following figure of the *peculiarities of the fœtus* :—



Blood is supplied from the placenta (supposed to be on the left hand side of the page), through the umbilical vein (*r*), to the liver (*b, c*), heart (*a*), and thence to the whole of the body of the fœtus. The vein, just mentioned, having sent several branches into the liver, communicates directly with the ascending cava (*p*), by the vessel (*s*) which is peculiar to the fœtus, and is named the *venous canal*. The blood, upon reaching the right ventricle of the heart, is thence propelled into the pulmonary artery (*h*). Now, previous to the commencement of the respiratory process—during uterine life, for example—a very small portion of blood is sent to the lungs by the right and left branches of the artery last mentioned—perhaps no more than they passively, and in their collapsed state, admit; but the great mass of it is thrown directly into the aorta, through the medium of the *arterial duct* (*l*). Respiration, however, having once begun, a material alteration is observed to take place in this latter vessel; and this we now proceed to notice.

Arterial Duct.

(*The Vienna Test.*)

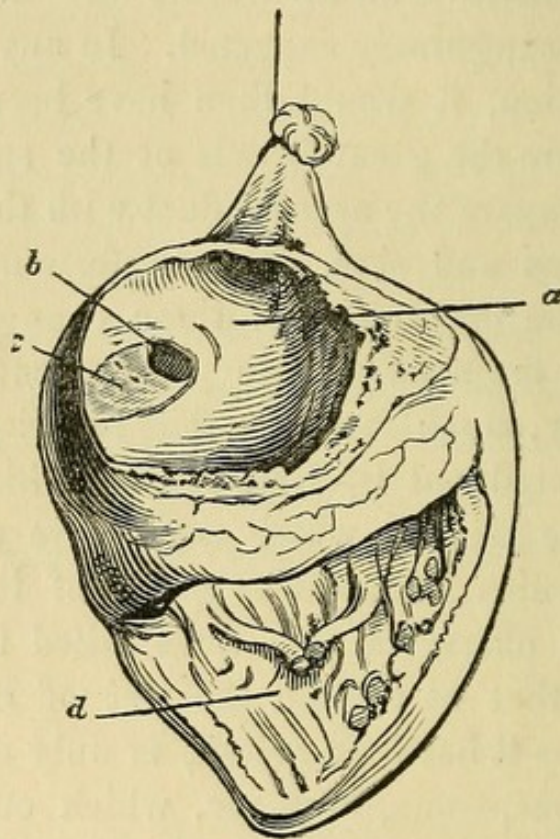
The arterial duct in the fœtus is about half an inch in length, and its calibre about equal to that of the pulmonary artery. But, according to Dr. Bernt, breathing has no sooner begun than the shape of the duct alters; from being cylindrical it becomes conical; the aperture by which it enters the aorta becoming contracted and oval. This happens, says Dr. Bernt, even in the course of a few moments. If the child has breathed for some hours,

or days, the duct is found once more cylindrical, but much contracted, and shorter; so that it is now, perhaps, not larger than one of the pulmonary branches. After respiration for a week, the arterial duct is dwindled to the size of a crow-quill, having been, before breathing commenced, fully as large as a goose-quill.

If these changes invariably took place, at the epochs, and after the manner, described by the Vienna professor, they would constitute an invaluable test—as was, indeed, at first, most sanguinely expected. In any case of disputed respiration, it would then have been only necessary to lay bare the great vessels at the summit of the heart, and compare the arterial duct with the pulmonary artery in shape and size. But, unfortunately, though the fact of the occurrence of these changes is unquestionable, they are not found to proceed with that order and regularity, much less with that rapidity, in the first instance, pointed out by Bernt. Even his own cases, related in the tract in which the nature of the test is described, furnish sufficient evidence of its precariousness. Other observers, too, have failed in finding it correct: so that at present the test of Bernt, or the *Vienna* test, as it has been called, is only considered as a secondary one,—one, however, which ought never to be overlooked in investigating the question of live or still birth; for however inexact it may be in enabling us to state the length of time during which an infant breathed, it has considerable weight in serving to determine, in conjunction with other tests, whether the infant *ever* respired or not.

Foramen Ovale.

The state of the foramen ovale may also serve in some degree to shew whether foetal life had ceased, and extra-uterine, by respiration, had begun. The situation of this aperture, between the right and left auricle of the foetal heart, is represented in the subjoined figure.



The heart is supposed to be suspended by the superior cava. The interior of the right ventricle (*d*), and of the right auricle (*a*) is shown: *c* is the valve, and *b* the foramen ovale.

Through this opening (*b*) a portion of the blood from the right side of the heart is sent to the left side, without being previously circulated through the lungs. In some infants it becomes closed as early as the first

day after birth ; but this is not very usual : more frequently several days elapse, and in certain instances even years, without its closing. For medico-legal purposes, therefore, the fact of the closure of the foramen ovale can be of little or no value ; but there is another fact connected with the same opening, which is rather better deserving of notice. The position of the foramen on the valve (*c*) is said to change gradually after birth. It is originally situated in the centre ; but as soon as respiration begins, it is on the right side, whence it subsequently proceeds, from below upwards, towards the left side ; thus revolving, as it were, round the right edge of the valve. It must be confessed, however, that the ascertainment and appreciation of these facts require a degree of anatomical dexterity not commonly met with among practitioners,—which must be a bar to the practical utility of the test, even though it were better recommended to us than it is by the experience of good observers ; for such have not always found the reality to correspond with the doctrinal statement.

Venous Canal.

This vessel is very rarely found impervious before the fifth day after birth, and its changes consequent on respiration occur so slowly, as to be scarcely, if at all, available for the purposes of the medical jurist. It must be recollected, that the question in reference to infanticide generally is, whether the infant was still born, or lived a few moments or hours. Now the process of obliteration does not begin to be observable in the venous canal till about the second or third day.

The Liver.

It has been attempted to found upon the changes undergone by the liver in consequence of respiration, another test for ascertaining whether an infant ever respired or not. The liver, during foetal life, is known to be an important organ; it is comparatively larger and heavier at this period than it is afterwards; it forms a large reservoir for the blood, where perhaps some important alterations are effected in this fluid before it is sent on to the heart. Now, when the lungs are expanded by respiration, they receive a large quantity of the circulating blood, and it is generally supposed that in this way they take upon them, in some measure, certain functions which the liver had previously performed: at all events, the latter organ is found, in most cases, to be more contracted in size, and less loaded with blood, than it usually is anterior to birth. Hence it was suggested* that probably a static *liver-test*, on the principle of Ploucquet's *lung-test*, might be contrived—by determining the ratio of the weight of the liver to that of the whole body.

The Medical Faculty of Tubingen actually proposed it as a prize question, a few years since, to ascertain whether there was not a constant ratio between the weight of the liver, before and after birth, and that of the body. Some very valuable dissertations were the result. But the conclusions respecting the question were unfavourable to the establishing of a *liver-test*. And such a test, obviously, were it possible to establish one, must always be second-

* First, we believe, by Autenrieth, of Tubingen, in 1806, and afterwards, in America, by Dr. John Beck.

ary and subordinate to the lung-test; for not only is the lessening of the absolute weight of the liver dependent on the increase of that of the lungs, but the alteration can never be so strongly marked in the liver as in the lungs; the latter bearing originally so small a proportion to the weight of the body, and not being, on an average, above a third part of the weight of the liver. It has already been shown that the static lung-test is sufficiently precarious; but from a few examples it will readily be understood that a static *liver-test*, were there one, must be infinitely more so: for it appears to be materially modified by the kind of death which the infant suffers, and to have some special relation to the size and condition of the placenta.

Dr. Koch, of Hamburgh, author of one of the Tubingen prize dissertations*, supplies us with the following facts:—

	Liver to Body.	Lungs to Body.	Lungs to Liver.
Still-born, heavy and large child, labour very difficult	1 : 13	1 : 57	1 : 4
Died in birth—arti- ficial labour	1 : 94	1 : 87	1 : 1
Born dead, child large, pelvis deformed, su- gillations	1 : 40	1 : 80	1 : 2

These cases Dr. Koch confesses were the most striking and remarkable among the 79 (26 still-born and 53 live-born) which he examined; but then it appears that of the entire number no more than 17 approached to what

* Diss. inaug. medico-forensis, &c. Tubing. 1831.

is commonly allowed to be about the average standard, namely—

	Liver to Body.	Lungs to Body.	Lungs to Liver.
In the still-born	1 : 22	1 : 65	1 : 3
In the live-born	1 : 25	1 : 30	1 ; 1

From these circumstances we may fairly conclude that no regular liver-test, exact enough for medico-legal purposes, has hitherto been, or is likely soon to be, established. Yet though our observations on the state of the liver may not of themselves warrant us in forming a reasonable presumption for or against the fact of respiration, they should by no means, in inquiries of such vital interest as those relating to infanticide, be neglected; for the inference they would authorize, however slight in itself, might have much force, taken in conjunction with other deductions from other premises. In short, that rule applies here, which can scarcely be too frequently repeated, that the medical jurist, in his researches respecting the serious charge of infanticide, must never rely upon any one test, or particular mode of proof, but observe how far this corresponds in its evidence with the other tests, for in the multitude of these, consentient and combining, there is safety.

Having now noticed the several tests by which the question of respiration is usually determined, it may form a useful conclusion to this section to sum up the principal points which would warrant a medico-legal practitioner in giving a positive opinion,—as he *may* do in certain circumstances.

Signs of non-respiration.

The appearances of uterine putridity would of course be decisive ; but putting these out of the question, and taking the more ordinary circumstances occurring in practice for our data, we conclude that an infant has not respired,

1. When the form of the chest is flattish and contracted ;

2. When the lungs are seen to occupy but a small portion of the chest, and the diaphragm is remarkably convex ;

3. When the colour of the lungs is a dark liver tint, and their texture dense and compact, with sharp edges ;

4. When the lungs are not above a fiftieth of the weight of the body ;

5. When, immersed in water, wholly and in part, they sink—not being putrid, or diseased ; facts which observation can readily determine ;

6. When the foramen ovale of the heart, and the arterial duct, have evidently undergone no change—the latter being cylindrical in shape, and in calibre nearly equalling the pulmonary artery ; and

7. When, in addition, there are none of those signs present which would indicate some continuance of life after birth—such as incipient inflammation about the root of the umbilical cord, or the intestines being void of meconium.

Signs of Respiration.

Not to enumerate those signs which would obviously

show that life had subsisted for some hours, and consequently that breathing must have occurred, we should say, with confidence, that an infant has respired—

1. When the chest is full, and arched externally ;
2. When, on opening the chest, the diaphragm is not strikingly convex, but the lungs are voluminous, of a bright red or pinkish colour, and crepitous to the touch ;
3. When the lungs, heart, and thymus, taken together, swim in water, and all the fragments of the lungs float, even though strongly compressed by the fingers under water, and persist in floating, though reduced to the minutest fragments ;
4. When the arterial duct appears to be diminished in size, and perhaps altered in shape, being conical towards the aorta ; and
5. When, in addition, the meconium is found to have been expelled, and certain changes appear to have begun about the umbilicus, which are conclusive of the fact of some survival of the birth.

Signs of Partial Respiration.

Unless there be reason to believe that the lungs have been *artificially* inflated, we may infer that an infant has partially or imperfectly breathed, from the following circumstances :—

1. That the lungs are but partially expanded, not filling as much space as they usually occupy in the chest ;
2. That the colour of the lungs is not uniform, part being of a dark red or chocolate hue, and part of a lighter or pinkish tint ; the latter portions at the same time vesicular and crepitous, while the former are dense ;

3. That at least *some* portions of the lungs float in water, though strongly compressed between the fingers previous to their immersion ;

4. That the arterial duct is found to be somewhat altered, at least in shape, if not in size ;

5. And that there is no marked appearance of any vital process having begun about the root of the umbilical cord.

SECTION II.

DID THE INFANT DIE A NATURAL OR A VIOLENT DEATH ?

Supposing the fact of respiration, or of live-birth, to be determined, there still remains a most material question to be decided—namely, whether the infant's death resulted from violence? Unless this can be established in the affirmative, the charge of infanticide must be held to be unfounded.

QUESTION OF NATURAL DEATH.

Humanity suggests that before entering on an investigation of the proofs of murder, we should first be satisfied as to whether the infant might not have died a natural death.

There will, of course, be a strong presumption in favour of this supposition, when there is a total absence of marks of violence on the body. But such a conclusion must be founded on a very strict and minute search: for wounds of a deadly kind have sometimes been so ingeniously inflicted as to escape discovery on a mo-

derately careful examination : of this, however, we shall have something further to say presently.

1. *From Weakness.*

The infant may have perished from weakness. The labour may have been tedious and severe, and the child, consequently, though born alive, may have sunk through exhaustion. Of the probability of this, we must judge from the circumstances. Are there marks of a difficult birth on the infant?—the allegation of a tedious labour is admissible. Does the infant, judging from principles already laid down, appear to have been immature?—the plea that it perished through exhaustion and debility is a fair and valid one.

2. *From congenital Disease.*

An infant in the womb may labour under certain diseases, which possibly may become aggravated at birth, and cause death soon after. Where this is supposed to be the case, the medico-legal examiner must exercise his skill in appreciating the morbid appearances which may be present: and he will not only have to satisfy himself of the actual presence of disease, but of disease arrived at such a height as to occasion death. We shall briefly notice the chief maladies found to affect the new-born infant.

(a.) *In the Head.*

Hydrocephalus, or “water in the brain,” may exist in

different degrees of intensity: the fluid may be simply effused into the cavity of the arachnoid membrane, without influencing in any manner the substance of the brain itself: again, in addition to the effusion into the membrane, just mentioned, some may have made its way into the ventricles; in either of these cases, life is not necessarily compromised; the infant, unless there be some other obstacle to its surviving, or the "water" be present in very large quantity, can scarcely be supposed to perish immediately after birth, from either of these contingencies. But suppose the quantity and quality of the serous fluid such as manifestly to have interfered with the development of the brain,—this must be equivalent to an incapacity to live, and in the absence of signs of violence may be considered as having led to natural death.

In its ordinary state the infant brain is very soft, and the white substance is comparatively more vascular, or richly supplied with blood-vessels, than in the adult. This fact is worth remembering in medico-legal examinations.

A *morbid softness* of the infant brain is characterized by an almost semi-fluid condition of the parts, of a yellowish, sometimes a blood-stained colour, and having a fœtid odour, much resembling that of rotten eggs. The same sort of softening is sometimes observed in the spinal marrow: and this state is generally accompanied by extensive marks of disease in other organs of the body.

(b.) *In the Lungs.*

When mentioning the objections sometimes urged to the hydrostatic-test, the existence of certain diseases of

the lungs was alluded to. There may be *tubercles* found in those organs in a considerably advanced state: but this will rarely constitute a cause of death soon after birth. Not so with *engorgement* of the lungs. An infant, to all appearance, may be well formed in every respect, and maturely born: yet it dies immediately after birth, though the delivery may have been easy. The lungs will here most probably be found very voluminous, but gorged with a colourless serous fluid preventing respiration. Sometimes the lungs are, wholly or in part, filled with sanguineous fluid; they are generally at the same time flaccid, and of a granular texture.

Hepaticization of the lungs is not uncommon in new-born infants: it is supposed to be the result of inflammation during uterine life. The pulmonary tissue is hard and compact, heavy, sinking speedily in water, and not imparting any considerable colour to that fluid when left immersed in it. In short, the lung in this condition strongly resembles the liver: nor is it in general difficult to distinguish such a state of the organ from its natural state, either before or after respiration.

The mucous membrane of the trachea and bronchia is often found red in new-born infants, the pleura is occasionally injected, and the pericardium not unfrequently contains a lemon-coloured serum.

(c.) *In the Abdomen.*

The stomach and intestines, as well as the œsophagus, sometimes present appearances which betoken the existence of disease anterior to birth. Certain marks of inflammation in the œsophagus might even be mistaken for the effects of a ligature applied externally before death, were

there other reasons for suspecting that strangulation were attempted. In the stomach, also, it deserves to be noted, ulcerations have been observed, attended with ruddy or dark-coloured discharges, which might readily give rise to suspicion of poisoning.

Such are the principal morbid appearances which might induce the medical examiner to form an opinion relative to the probable occurrence of natural death. It is scarcely necessary to add how much it behoves him to be scrupulous in his inferences, and to recollect that his pathological inquiries may be the means of saving the life of the accused. We now come to consider the

QUESTION OF VIOLENCE.

There are many ways of destroying the new-born infant; yet the methods usually adopted are not numerous, the deliberate murderer generally taking care to leave as few marks of injury as possible. The mode most commonly had recourse to is

Strangulation.

It will be kept in mind, that in considering the question of violence offered to the new-born infant, we suppose the fact of respiration already established, and that the child had begun to have an independent existence. The signs, therefore, of the present mode of death must be expected to resemble those indicative of strangulation in the adult, but of course in a less strongly marked form, in consequence of the diminutive size of the parts affected. It

were out of place here to give a general description of the appearances characteristic of death by strangulation : the gorged state of the lungs, and right side of the heart, filled with dark-coloured blood, may almost always be observed.

But the outward signs—will there always be some mark of ligature or pressure on the neck? This is a point upon which much has been said by modern authorities. It was thought, and therefore fairly objected, that marks on the neck, resembling those produced by wilful violence, might be owing to the compression of the mouth of the uterus during labour, or to the umbilical cord encircling the child's throat. But experience contradicts such an hypothesis. An eminent German authority (Klein) whose opinion on the subject, founded on the most extensive observation and experience, is now generally adopted by the most celebrated medical jurists, thus expresses himself on the point:—"I have never met with an instance of marks of injury of the kind supposed—ecchymoses or sugillations—produced by the orifice of the uterus, or by the umbilical cord, although I have known a great number of cases in which the neck of the infant had been strongly girded by the funis once or twice twisted round it, strangulation having thus been either actually produced, or rendered most palpably imminent." He then goes on to speak quite as decidedly regarding the pressure of the neck of the uterus; not a bruise, as he tells us, nor mark of any kind, being left on the infant which has perished in this way. We are indebted to the same authority, as well as subsequently to M. Esquirol and others, for a knowledge of the important medico-legal fact, that, even in the adult, strangulation by suspension may be effected in many instances without

leaving any appearance whatever of a depression, attended with the least ecchymosis or lividity, on the part of the neck to which the ligature has been applied.

When, however, certain appearances indicating violence are observed on the neck of a new-born infant, we should satisfy ourselves respecting their nature: whether they are marks of fingers, or of a cord used for murderous purposes. We should scrutinize well the form and position of these marks, and note whether they seem to have been principally directed to the compression of the air-passages.

Whether pressure has been exercised on the parts during life, or after death, is only to be determined by the appearance of some effusion of blood into the subcutaneous tissue, which is usually met with in the former case.

The following is M. Orfila's summary of the signs of strangulation in the new-born:—1. That a circular mark round the neck, with a corresponding effusion into the subjacent cellular tissue, indicates strangulation during life. 2. That though it be impossible to deny that this mark was produced by the orifice of the uterus, or the umbilical cord, yet since no well-authenticated case warrants us in admitting it, it is a natural supposition that the mark in question is the result of criminal violence. 3. That if this mark be combined with appearances denoting that respiration had been previously completely established, our inference must be so much the stronger; for stricture by the neck of the uterus, or by the funis, cannot be supposed to have proved fatal with such appearances. 4. That dark spots on the neck, without corresponding subcutaneous effusion, do not warrant the conclusion that the infant was strangled; but, 5. That, on the other hand, neither does the absence

of such spots, or such effusion, or of both together, strictly authorize us to conclude that strangulation did not take place.

Suffocation—Drowning.

Considerable difficulty may sometimes attend the investigation of death by suffocation. But the circumstances of the case will, in general, throw much light upon it. A child, for instance, may be suffocated after birth by smothering in the bed-clothes; by the face falling into the mother's discharges; or by being accidentally dropped into a privy or a night-stool: such accidents are not rare, nor perhaps, in general, will they present any intricacy to the medical jurist. *Smothering in the bed-clothes*, however, is an accident which, in suspected cases, there is no possibility of distinguishing from the same kind of death produced designedly. There is not (in the opinion of an eminent northern critic*) a more easy, effectual, or secret mode of committing child-murder, than this; but fortunately it is hardly ever resorted to; for here, as in most cases of homicide, a great deal more mischief is done than is required to effect the purpose in view.

Where substances have been found thrust into the back part of the mouth, with the supposed design of causing suffocation, it is important to determine whether they have been introduced before or after death. When the former is the case, there are generally marked appearances of congestion about the fauces. Suppose a plug or pledget of linen cloth pushed into the pharynx,

* Edinburgh Medical and Surgical Journal.

it must exercise compression on the parts, in proportion to the force employed in introducing it. Hence a peculiar appearance of the mucous membrane—a difference of colour in the situation of the fore and back part of the plug: the membrane is white, and destitute of its natural quantity of blood, where the compression has been greatest—that is, in the farthest situation; whereas, anterior to this, it is red or violet-coloured, thickened, and swollen.

Drowning in the discharges, or other fluids, may be recognized by the ordinary signs of death by drowning, together with the peculiar appearance of the contents of the mouth, gullet, stomach, and air-passages.

It will not be expected that we should here enter into a detail of the signs of death by drowning: they are very various, and a discussion of their value would more appropriately occupy the pages of a larger work. Let it suffice, that on dissection, the lungs and right side of the heart will generally be found full of blood, the brain will probably be congested, and in the air-passages a watery froth will be perceived. This last sign is not always present; but when it is, it indicates unquestionably the fact of death by submersion. Also the presence of fluid in the stomach, of the same kind as that in which the body has been found, is a strong proof that deglutition was effected, and therefore that the infant was still living when submerged.

Fractures, Blows, and Wounds.

Infants have frequently been found with extensive fractures of the skull, such as to raise the strongest pos-

sible suspicion that murderous violence had been employed. But in such cases it has commonly been alleged that the fractures were the result of accidental injury—the child, for example, having been expelled from the mother by a sudden labour pain. The late M. Chaussier made a series of experiments to determine whether falls of this description were capable of causing the serious injuries referred to. Fifteen still-born children were allowed to fall perpendicularly, and head foremost, from a height of eighteen inches, on a paved floor. In twelve of them one or other of the parietal bones was broken. When the height was three feet and upwards, the fractures were proportionably greater.

This would seem to show that, in sudden labours, fatal injury might befall the child from the simple accident of its dropping from the mother. But actual experience does not bear out this conclusion. Dr. Klein, lately quoted, availed himself of the opportunity he possessed, by his official station in the kingdom of Wirtemberg, to procure returns of all such labours occurring within his jurisdiction. The result was, 183 well authenticated cases, in 150 of which the mothers were suddenly delivered standing; yet there was not a single case of death among them, nor of fracture of the skull, or other mischief happening to the infant; though some of the children had fallen on bare boards, and some on the *pavé*. The reason of the difference between the experiments and the cases actually occurring in nature, is, probably, that in the latter the direction in which the body of the infant is projected is oblique, and the fall is not so instantaneous as in the experimental essay. We must not, however, deny the *possibility* of fracture thus occurring during a natural labour.

In connexion with this subject it ought to be mentioned, that M. Chaussier made some further experiments, to show the difference between fractures caused by accidental falls, or during labour, (for the contraction of the uterus, during labour, is supposed to be sometimes capable of fracturing the bones of the head), and those produced by violence. The chief differences are, that where wilful violence has been employed, the injuries will most likely be found much more numerous and extensive—for the murderer generally goes on striking till the child expires; and fractures and bruises in this case will commonly be found in parts of the head where the accidents alluded to could not possibly produce them: for example, the bones of the face may be found fractured, or the frontal and occipital bones, or even the base of the skull itself.

There is a species of injury which kills an infant at once, and yet might elude the observation of a moderately diligent examiner; namely, the effect of *twisting the head on the vertebral column*. Here there would probably be not the slightest external mark to engage the attention of the medical jurist, nor would the loose moveable condition of the neck form any better guide,—for this is common to all new-born children, especially when the weather is not very cold. The only practical caution that can be given on this point is, that an opportunity of inspecting the internal state of the upper part of the neck ought never to be neglected.

The wounds inflicted on the new-born infant, for murderous purposes, are generally confined to the head and neck. Punctures, however, of the heart have been detected, as well as similar injuries done to the head. The story of the diabolical French midwife, who used to

despatch her victims by thrusting a long needle into the fontanelle as soon as it presented, is well known. In cases of detected puncture, the wound should be carefully traced in all its extent, when it will be generally found that it widens as it departs from the surface, the murderer employing a rotatory motion of the instrument the more effectually to accomplish the purpose intended.

A very important inquiry respecting blows and wounds is, whether they were inflicted before or after death; nor must it be denied, that there is considerable difficulty, if not an utter impossibility, to decide the question—when, especially, there is reason to suppose that the injuries were inflicted *soon* after death; for then there will be little or no appreciable difference between such injuries and those done a short time *before*. But suppose the wounds produced some twelve or fourteen hours before death, there ought then certainly to be decided appearances present; swelling and redness, for instance,—and still more marked phenomena, if the injuries were of longer standing.

Another point worth attending to is, to ascertain by what sort of weapon, or instrument, the wound was made; the form, length, breadth, and depth of each wound should be carefully examined; likewise whether its edges are smooth, or lacerated, or bruised. Too much care, indeed, can scarcely be bestowed on the examination of wounds.

Poisoning.

Poisoning has sometimes been enumerated among the acts of fatal injury practised with a view to infanticide.

But there is, probably, not a single case on record to show that such a mode of murdering the new-born infant has ever been had recourse to. It is, however, by no means impossible that such a case *may* occur; and therefore the examination of the contents of the stomach, where there is room for suspicion, ought not to be neglected. Chemical analysis will, of course, be necessary for establishing the proofs; but the particular processes to be adopted, it would carry us far beyond the scope of the present work to describe.

Detruncation and Burning.

Deeds of violence of this nature are usually perpetrated for the purpose of conveniently getting rid of the body of the infant. It may be urged that such methods have been taken with the simple object of concealment, the child having been born dead. The question then is, can we say whether the body was thus treated anterior or subsequent to death?

Proofs of death by *detruncation* can only be ascertained on the principles already stated with reference to wounds generally: the signs will be the more manifest the more tedious the process, and the more early begun before dissolution.

Of death by *burning* we are better supplied with the means of proof. Experiment and observation show that the appearances of burns, as inflicted before death and after, are very characteristically distinct. After death, the application of fire, or red-hot irons, merely chars the part; and if blisters be produced, they are filled only with air, unless the subject be dropsical or anasarcaous,

when they may contain fluid. But when burns are effected before life is extinct, decided marks of vital reaction are observable; a blush of redness forms round the part in a few seconds, which, though not wholly permanent after death, never fails to leave a deep crimson line of redness round the burn, not removeable by pressure. Blisters also are generally raised, which are found to be filled with serum.

THERE are two other modes of wilfully procuring the death of the new-born child, a notice of which must not be omitted, although they cannot be immediately classed with the preceding forms of criminal violence, nor do they amount to infanticide, in the interpretation, or perhaps the spirit, of our laws. Most of the continental medical jurists divide infanticide into two kinds—as it is effected by commission or by omission. But infanticide by omission, implying that the infant has been wilfully lost through gross negligence, or by denying it certain necessary attentions, is not recognized as a crime by our penal statutes: we indict for murder, or concealment, or not at all. Yet wilfully

Omitting to tie the Umbilical Cord,

though it does not always prove fatal, deserves to be considered as a very criminal act, especially when taken in connexion with concealment. Much controversy has existed relative to the importance or non-importance of

putting a ligature on the funis after it has been lacerated, or cut. But though it were proved that in ninety-nine cases out of a hundred no mischief followed the omission, the fact of its proving fatal, even in a single instance, is sufficient to show the danger of omitting it. The infant may perish by hæmorrhage, the signs of which are obvious in the blanched and almost bloodless state of the body, both internal and external; a state which is more likely to occur, after the cord has been severed in the usual way, than when torn by the hand.

Exposure.

Death procured by wilful exposure of the living infant, though not absolutely amounting to child-murder within the meaning of our law, must greatly aggravate the crime of concealment of the birth. The signs by which the medical jurist is guided in forming an opinion in such cases, must chiefly be gathered from the circumstances,—such as the time and place, together with the appearance of the body—destitute perhaps of covering, and (though the meconium be all expelled) having no alimentary matter in the stomach.

As we closed the first section with a short *resumé* of the signs by which the fact of respiration or non-respiration may be determined, so we shall here conclude by giving a brief statement of the points which serve chiefly to distinguish the manner of the infant's death.

Signs of Natural Death.

We infer that there is no ground for the charge of infanticide, but that the child, though born alive, sunk in the course of nature—

1. When there is a complete absence of marks of violence; or when those discovered may fairly be attributed to accident, or can be proved to have been occasioned after death.

2. When the child is malformed, weakly, or immature, and has apparently perished in consequence of a tedious labour.

3. When there are evident marks of disease, and of a character likely to have terminated fatally.

Signs of Death by Violence.

Some of these are so obvious as to need no particular description: but where the circumstances are such as to warrant at least suspicion in the first instance, we may be led to a more determinate view of the case—

1. When, with or without distortion of the features, or unnatural aspect of the body, the internal examination shows that some foreign substance was introduced, by means of which respiration was impeded.

2. When the signs of asphyxia, or smothering, are found in the chest, with traces of injury—pressure, with ecchymosis, for instance—about the throat.

3. When, together with the appearances of asphyxia, there is froth in the air-passages, and water, or some of the fluid in which the body was found, in the stomach.

4. When the marks of wounds or blows are observed on such parts of the body as would not be likely to suffer from accidental injury ; and when such wounds or blows indicate, by the appearances of vital re-action, that they were inflicted during life.

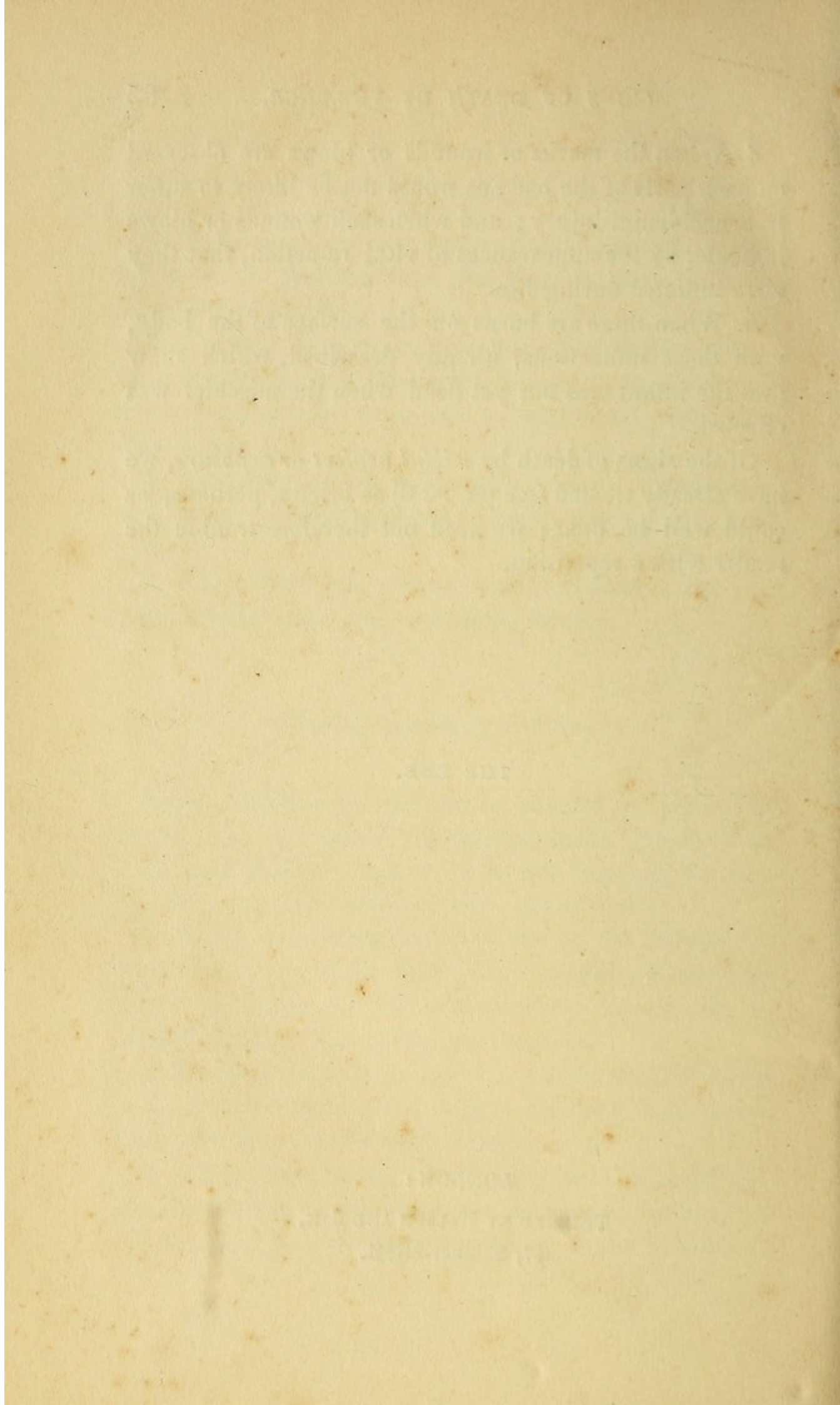
5. When there are burns on the surface of the body, with those indications, already described, which show that the infant was not yet dead when the mischief was effected.

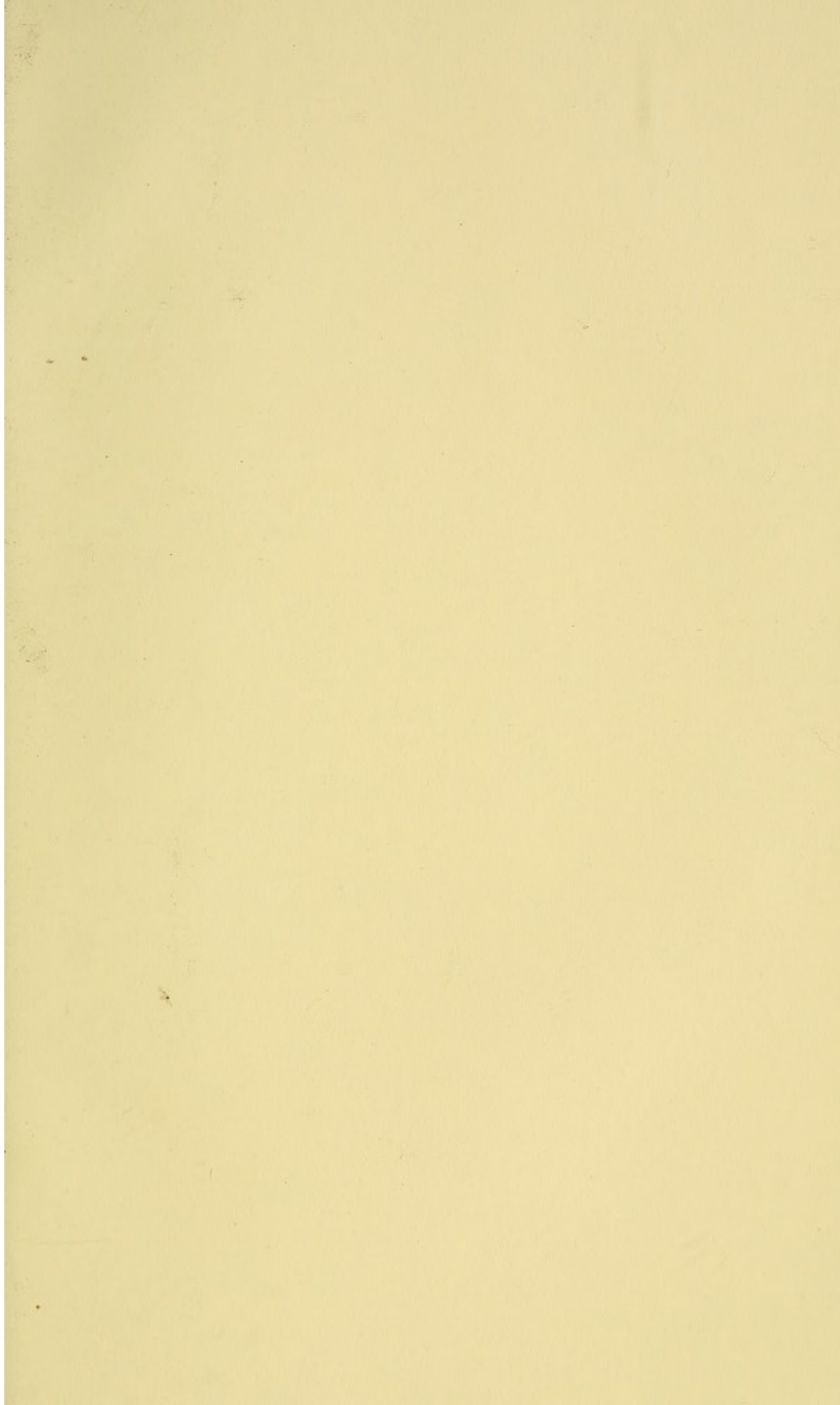
Of the signs of death by *wilful neglect* or *exposure*, we have already treated (see pp. 92-3) as briefly, perhaps, as could well be done ; we need not therefore trouble the reader with a repetition.

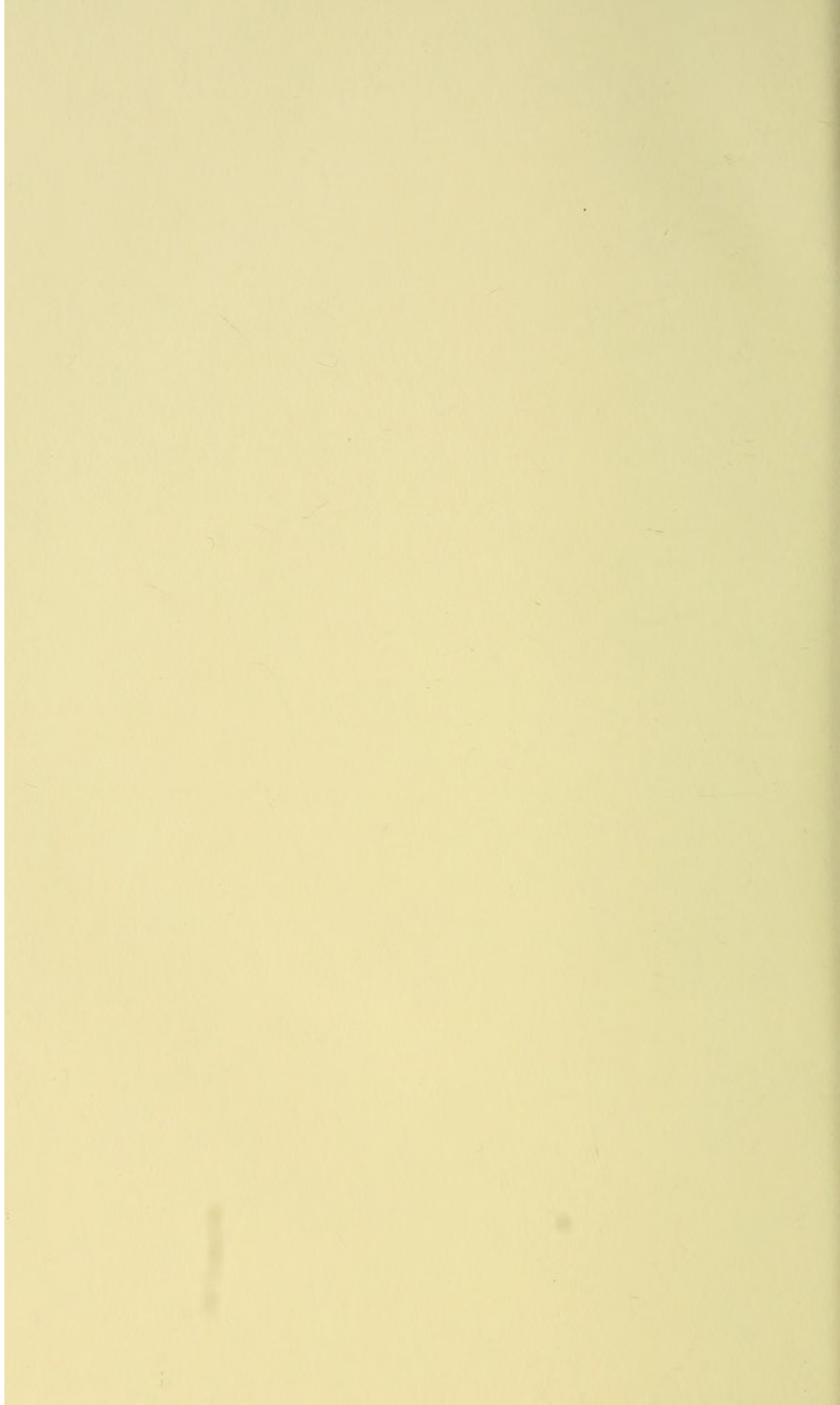
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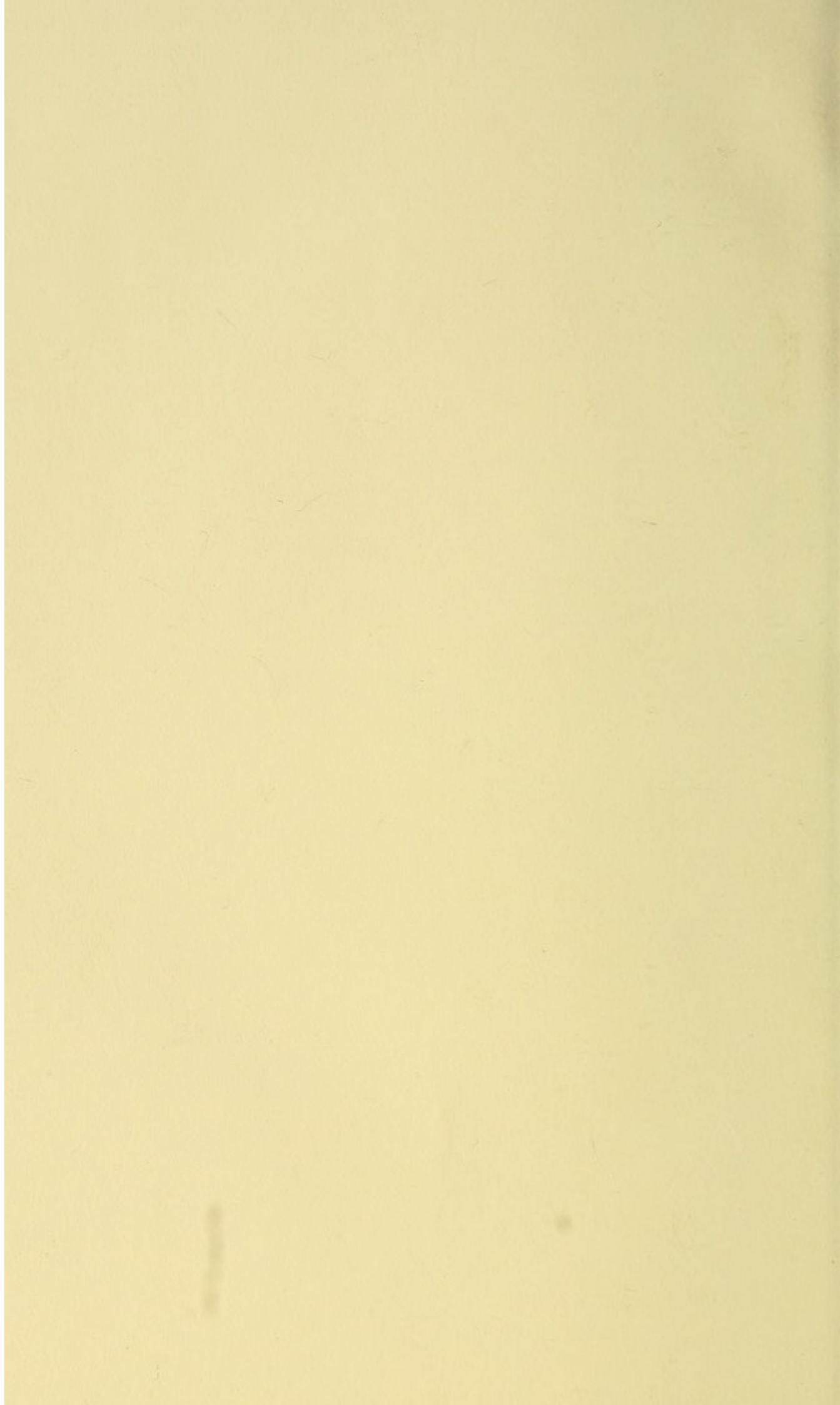
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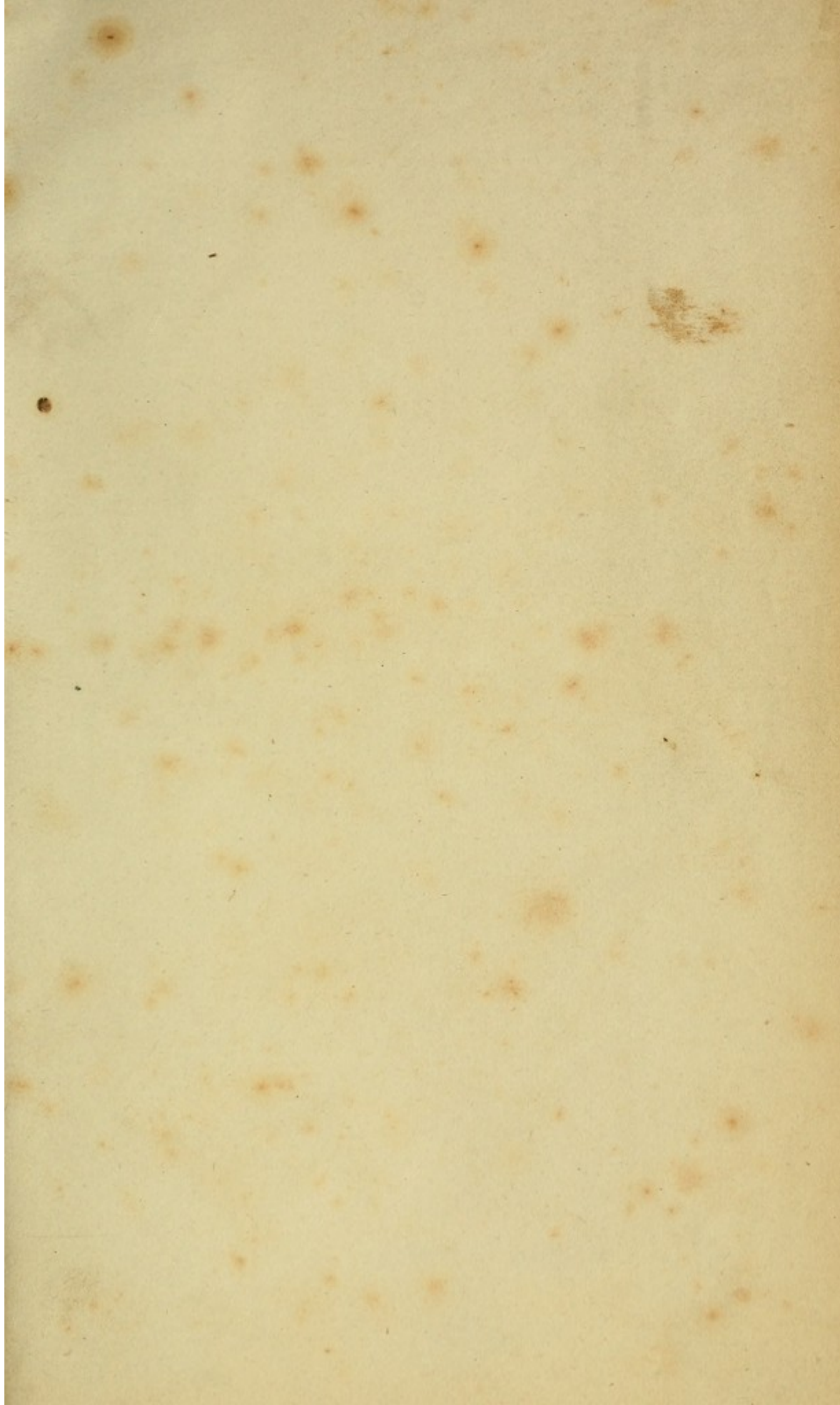


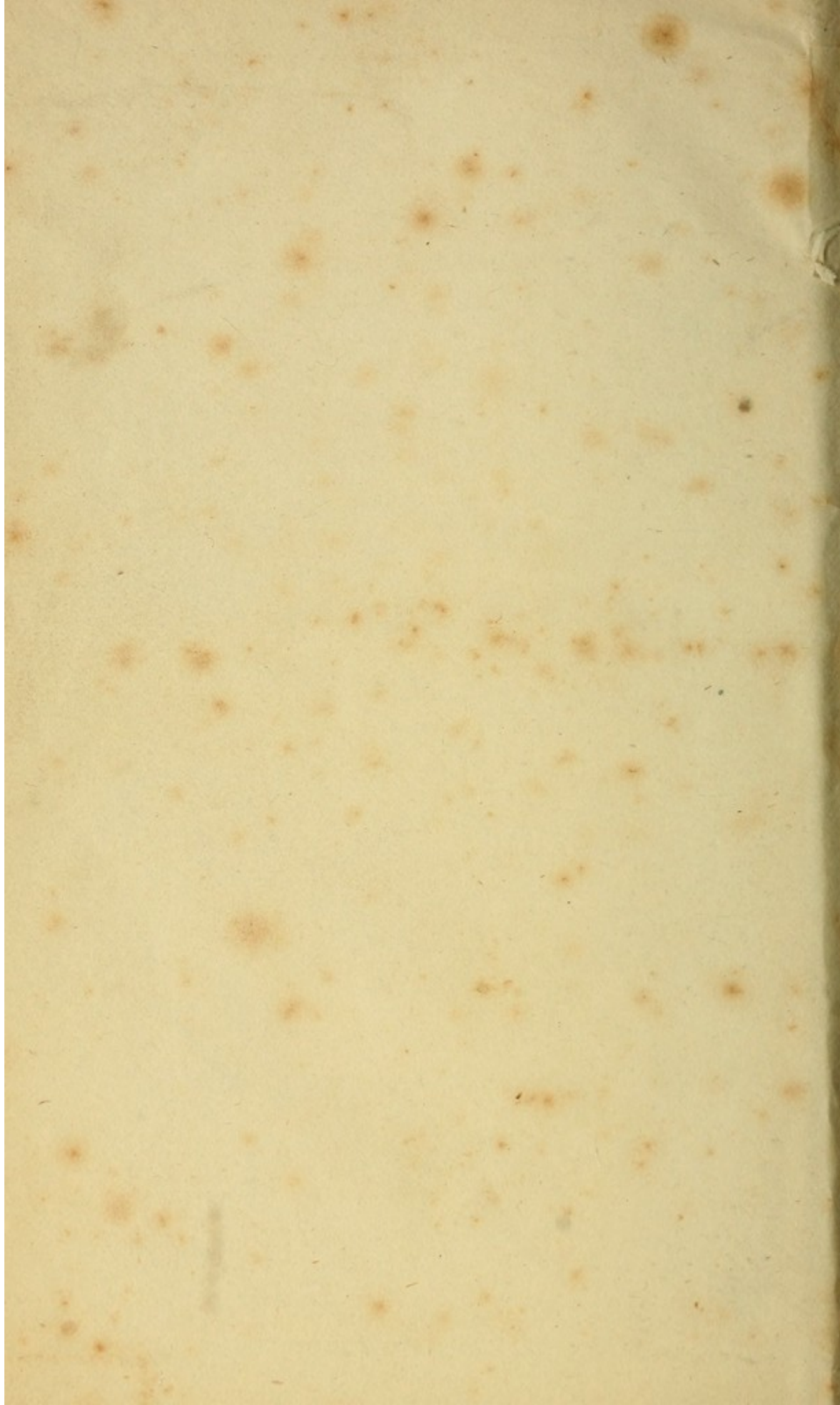












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