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Barnet (G. J.)

# ESSAY

ON THE

## IODIDE OF STARCH,

AS A SUBSTITUTE FOR

## COD LIVER OIL,

IN THE TREATMENT OF

## PULMONARY PHTHISIS.

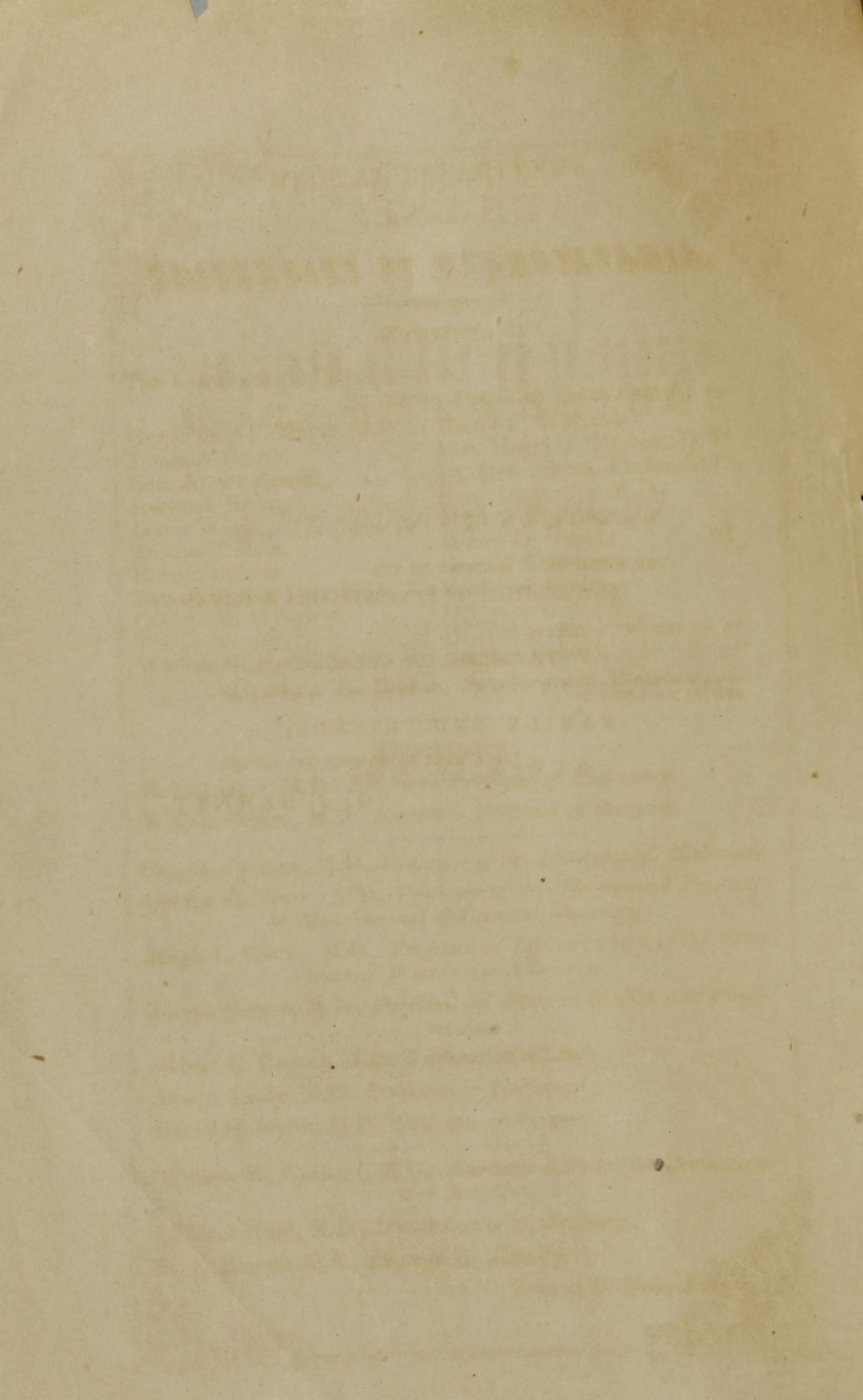


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A true copy of the original presented to the Faculty, and printed  
by authority of the Professor to whom it was referred.

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TO

THE FACULTIES OF MEDICINE OF THE

UNIVERSITIES OF PENNSYLVANIA & HAVANA ;

TO MY UNHAPPY COUNTRY,

THE ISLAND OF CUBA,

AND TO MY BELOVED

FAMILY AND FRIENDS ;

AS A MARK OF RESPECT AND ESTEEM.

G. J. BARNET.

MEDICAL DEPARTMENT  
OF THE  
**UNIVERSITY OF PENNSYLVANIA.**

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CAN THE  
IODIDE OF STARCH  
BE ADVANTAGEOUSLY SUBSTITUTED FOR  
COD LIVER OIL  
IN THE TREATMENT OF PULMONARY PHTHISIS ?

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*To the Faculty of Medicine of the University of Pennsylvania :*

GENTLEMEN :

With no other pretensions than those of a modest, but devoted student of the "*Materia Medica*," I wish to demonstrate to your honorable body my conclusions on the above subject, which has occupied much of my study, and of a disease to whose subtlety I shall devote the greater portion of what skill I may possess in medical science. And it is my object in this paper to comply as far as my poor abilities will permit with the "Rules of the University," and at the same time of winning your honorable approbation, should my thesis fortunately possess a sufficient degree of merit to entitle it to such an enviable distinction. For this distinguished approbation have I assiduously studied. It has been my fondest wish, my ever cherished hope ; and in receiving a Diploma, if such shall be my reward, from your honorable and enlightened Faculty, it will be the proudest moment of my life, the consummation of my student toil, and the crowning of my first ambition.

Permit me, gentlemen, before concluding these preliminary remarks to add that, although a passionate admirer of the land of the great and virtuous "*Pater patriae*," Washington, the

philosophical Franklin, the learned and mighty statesmen Jefferson, Adams, Clay and Webster, I am of a foreign land, and speak a foreign tongue. But I love this great country as truly, as sincerely, and as devotedly as her own native sons. I love her people, her political institutions and her social relations; but with all this great love, I am yet deficient in the language of her people, in the great English tongue I am not well versed, and if grammatical errors and crude sentences are at times manifested in this paper, for this reason, I throw myself upon the kind indulgence of your learned Faculty.

Having thus frankly exposed my ignorance of the English language, I now without further apology come to the subject of my treatise, viz:—

“ Can the *Iodide of Starch* be advantageously substituted for *Cod Liver Oil* in the treatment of *Pulmonary Phthisis* ? ”

I would not have it inferred from the selection of my subject, that I favor or advocate either the *iodide of starch* or *cod liver oil* as a positive remedy in tubercle consumption. My purpose is to analyze the two agents, and if possible, present that which is contained in them, which in my poor judgment is useless or beneficial. It will not therefore in this paper become part of my task to treat minutely of the *phthisis\* pulmonalis* further than incidental explanations on the pathognomonic symptoms of the disease when combatted by therapeutic agents, and these I shall give as I have received them from our medical authors, for I have not yet had personal experience in such cases. It is not my intention either to enter upon certain details of the two substances under consideration, viz: their history and chemical properties; I shall confine myself simply to their physiological effects and therapeutic action.

PHTHISIS PULMONALIS, we all know, is that subtle and formidable disease of the thorax, which consists of tubercles in the pareuchyma of the lungs. Authors who have written on the diseases of the throat and chest have augmented the numbers and varieties until they are almost innumerable and confounded, but that which I have defined is the one of my purpose, because, to my mind, it is the only disease commonly known as consumption, the others being merely symptoms of the disease *incipio*. These different symptoms ending in positive consump-

tion only when the *tubercles* have actually formed in the *parenchyma of the lungs*. These symptoms I shall not enumerate, or pause to investigate the causes which give birth to the disease; nor of the periods of time the changes in the stages take place. But it will be necessary to look at the state of the organ afflicted by the disease in order to note the results of the treatment by *Cod Liver Oil* or the *Iodide of Starch*.

What then is the particular condition of the lungs when suffering by tubercle developements? A cough is first observed, which may be slight or violent, according to the degree of inflammation existing in the lungs. This cough, which may be so slight as to be called what is commonly known as a *hack*, is accompanied more or less by the expectoration of a *vacid* or tough phlegm, with or without color, and in more or less quantity, according to the advancement of the disease, with *dyspnoea* (a difficulty of breathing), *hemoptysis* (spitting blood), oppression in the thorax, with pain more or less acute according to the portion of the lung afflicted. Although these two last mentioned symptoms may be wanting in many instances, still I mention them, as their presence has no influence in the administration of the *iodide* or *oil*. It will also be observed that there are some very important signs which subministrate the auscultation and percussion, and by which the *locale* of the disease can be determined with almost a mathematical precision. All the anterior signs and symptoms are known to fluctuate according to circumstances, and many of the symptoms of the disease do not appear at all.

Let us now come to the disease in its fatal stage. The appearance of fever in the positive state of the malady is one notable symptom, and its frequent degrees of intensity and intermitings with hectic flushes on the cheeks; the unnatural brilliancy of the eyes; a marked disarrangement of the alimentary canal, with the appetite capricious; vomiting at intervals, and more or less thirst; and diarrhea discharges varying in quantity and appearance, leaving the patient in a great state of prostration, and accelerating that total physical extenuation to which consumptive patients are invariably brought by the "fell destroyer" before dissolution. At times, in some, the brain becomes disordered, complicating the disease. Some writers have enu-

merated among these derangements those that are supposed to have taken place in genital organs; others however have noticed that far from having such exaltation, it remained in the normal state, or at least appearing in that in consequence of the general disorder of the organism. In regard to the female it is generally known that her menstruations diminish, and even cease entirely according to the degree of *pulmonary phthisis*. The same in the exaltation of the genital organs of man, I might say with M. Vernois to the nails, to which have been attributed a special character in the present case. According to that author it does not present any particular appearance, although it does evince a modification, that is also observable in other maladies which is owing undoubtedly to a general disordered state of the entire organism.

I now treat of the medicaments proposed in this paper and the study of their therapeutic action, giving preference to that which is the most generally used, and extensively known, *Cod Liver Oil*; and in this connection I will casually mention its therapeutic and physiological properties, and its physical and chemical action.

COD LIVER OIL, as a medicinal agent, has been known for a long time in the treatment of several diseases, and especially in scrofula affections; and of late years has been so constantly recommended in the treatment of pulmonary consumption, and is now so closely identified with the disease that the one can not be named without associating with it that of the other. And it has been so frequently administered latterly by men standing high in the profession that many now contend that it is the only specific for phthisis. Before treating its action and physiological properties, I shall casually say a few words in relation to its physical qualities which may not be uninteresting.

Among the three different extracts of the oil is one which is most generally used and considered more beneficial than the others, I refer to the *dark brown oil*. This extract possesses a most disagreeable odor, like that of the fish from which it is taken. (This fish is commonly known as the codfish or haddock, and is much used for food; is a species of the genus *Gadus*, and inhabits the northern seas, the Banks of Newfoundland and the shores of New England.) This odor is strongly empyreu-

matic, and as offensive to the taste as to the smell—leaving in the fauces a decided acrid sensation; it also acts as an acid. From the chemical analysis made by Messrs. Marden, DeLough and others, it is evident that in the different kinds of Oil there is a certain quantity of free phosphorus, with iodine, bromine, and several other chemical substances which I will not here mention as they have no immediate application to the principal aim of this thesis. It will be sufficient to add that it is generally admitted among the most respectable members of the profession, that iodine is the active principle of the oil owing to its having proved so beneficial in these diseases where it has been administered. It is true however, that there are some who, like Faufflied, deny this, and assert that the properties of the two are not identical, as the one succeeds where the other fails.

On the other hand, again, there are some who suppose that the therapeutic action of the oil is owing to the bromine it contains; and it is also thought, that the combination of both with the other constituents, produce the desired effect. Be these opinions correct or fallacious, the generally admitted one is, that the oil as a medicinal agent, owes its primordeal efficacy to the iodine, and for this reason is administered as a combatant in many diseases beside the phthisis pulmonalis, to which alone, it is my object to refer. I will now call attention to the physiological and therapeutic actions of *Cod Liver Oil*. Reister obtains in his experiments the following results:—"Sometimes it is observed that its action manifests itself upon the stomach, with nausea, vomiting, diminution, or loss of appetite, and a burning sensation in the organ, all which appear with a greater or less degree of intensity, according to the person and other circumstances in the case."

Acceleration of the urinary secretion with red sediment. The regenerator apparatus experiences on certain occasions sensible alterations, which are worthy to be remembered; the menstrual flux augments in such a degree, that it has been thought prudent to stop the use of the oil; the same phenomenon has been observed in a great number of cases. In only one instance has the restoration of the catamenial been observed; occasionally diaphoresis has taken place; in one case perspiration manifested itself in the lower extremities only, with an exudation of an

odor similar to that of the oil, preceded in some instances by heat over the entire epidermis; and cases are not wanting, in which the medicament has occasioned severe burning, itching, pain in the skin, accompanied at times by cutaneous eruptions in the presence of minute red spots, and this with itching also. Of the therapeutic action of *Cod Liver Oil* in the treatment of pulmonary consumption, there are wide differences of opinion existing among the most eminent of our practitioners: these differences are upon important points, and diametrical in conclusions, demonstrating to a degree the insecurity of the agent used. But with this diversity of opinions, they all agree upon one, and certainly a very important point, that the oil owes whatever virtues it possesses to the presence of *iodine*; and I doubt not that before its entire efficacy is positively manifested to the satisfaction of all, that it will yet have to be administered for some time to come in experimental forms. Among the number of physicians who accord to *Cod Liver Oil* a great value, but few agree in respect to its particular and distinct value. They greatly differ in respect to its component chemical properties—some advance that it acts in exalting the strength and stimulating the digestive vias, while others attribute to it a much greater efficacy, in maintaining that it tends to modify advantageously the local state, and at the same time effect a complete cure; among the latter, I will mention Mr. Williams, (*London Journal of Medicine*, June 1849,) who refers to its marvellous effects, in which he includes those patients who had been submitted to the treatment in the second period of the disease, where it was immediately observed from the first, the gradual ceasing of the crepitation, and shortly after also, of the dull sound and breathing murmur. These were most extraordinary results, and we certainly cannot interpose with consistency any sound objection to a physician who sustains his position by exhibiting facts. However, there are so many delusions in the treatment of consumption, the steps of the disease being so uncertain and changeful, and the different modes of treatment so contrary, that we are frequently compelled to entertain grave doubts in regard to results, even when facts are quoted.

Let me hope before pronouncing my opinion, that I shall

not commit the same fault of an eminent author, whom I am led to believe has labored under a most serious delusion in giving his opinion." "I have commenced this experiment," says M. Valleix, (*Guide du Medecine Practicien*), "and I now say, that the facts which I have obtained have given me a far less advantageous result than that by Mr. Williams, without being, however, like that of Mr. Bensen of Dublin." Cod Liver Oil in certain cases, has a determined tendency to promote congestion, and at the same time to inflame the lungs. M. Duclos, of Tours, has found that the oil arrests frequently the progress of the disease in its first period; alleviating it in the second, but in advanced cases, seldom detaining it, the applications proving thus entirely inefficacious. These results are different from those announced by English authors: according to these writers, one of the effects surprising in administering the oil, is, that its efficacy depends upon the manner in which the patient submits to the treatment. Thus we find ourselves in the end, in want of convincing facts in the therapeutics of Cod Liver Oil; and as in all cases, however, we must for the present be bound by the majority of authors who have written on the subject, else at once decide that their contradictions prove the insecurity and inefficacy of the medicament. And in conclusion upon the subject of the oil, I can only positively say, that it has been in common use for some years past among many practitioners, who consider it a remedy of great value in pulmonary consumption; and that the facts in relation to its efficacy are not very numerous or convincing in their conclusions. These results may arise, however, from a fear of these practitioners, who have availed themselves of the medicament in its administration. I believe that I can add nothing further in relation to the therapeutic action of the oil, and therefore I shall now treat of its proposed substitute, *the Iodide of Starch*, and shall be as brief in my analysis as the subject will admit. The Compound Iodide of Starch proposed by Dr. Buchanan of Glasgow, as a therapeutic agent in the diseases in which the iodine proves advantageous, is the result of the combination of this body and starch. In regard to its chemical and physiological properties, I have little to say, merely mentioning that it is of a deep blue color, possesses an acrid taste, and exhales a strong odor of

iodine. To dwell here upon its therapeutic action were useless, as the compounds of iodine, and those of other bodies in which it is found, are of an active principle. The Iodide of Starch, according to Dr. Buchanan, when administered in large doses, frequently induces constipation and intestinal pains, and afterwards white evacuations. The color of the medicament is often disliked by many patients. It is said by good authority, that the large doses administered by English physicians, are a confirmation of the great imperfection of the preparation, viz. :—that it is not *absorbed*, and therefore lacks action. In persons not laboring under any dyspeptic ailment, or constitutional derangement of permanent duration, Dr. Buchanan commences with half an ounce for a dose, increasing it to an ounce, three times a day ; this however, at times, produces purging. It will be observed, that the Iodide of Starch as well as the Cod Liver Oil, presents inconveniences in its therapeutic application, notwithstanding its being so highly recommended and celebrated by a large number of the profession. However, it is with the Iodide of Starch as with the Cod Liver Oil, it is administered in consequence of the *iodine* it contains. Employing iodide in the treatment of consumption, with a view of obtaining the benefits of the iodine it possesses ; and bearing in mind, that the one as the other, produces no effects worthy of attention, and that they also cause grave inconveniences, the question naturally arises—which of the two is preferable to combat the disease in which we would wish to employ it ? This is what I shall endeavor to demonstrate. Having reviewed the different chemical properties and therapeutic actions of the two medicinal agents, and the pathology of the disease in which they are especially recommended, I repeat the proposition, viz. :—Can the Iodide of Starch be advantageously substituted for Cod Liver Oil in the treatment of pulmonary consumption ? Impartially considering both remedies, and the attending circumstances in their administration, and that they both have advocates as efficacious therapeutic agents in the treatment of phthisis pulmonalis ; and that the great virtue of either depends on the amount of iodine it contains, and its beneficial effects resulting in accordance with the number of times the medicament has been administered, and depending on the stage of the disease

at the time, and that both have manifested results contrary to those anticipated; and that the majority of physicians recommend the oil, while others prescribe the iodide. To what conclusion in this conflict of opinions are we led? The question is certainly of difficult solution, notwithstanding the many able opinions which have been given—they are far, very far from being satisfactory in their conclusions. Before giving my opinion in favor of either, it will be necessary to make a few passing observations in relation to them, by way of comparison, and so make what deductions my limited knowledge may suggest. Beside the inconvenience (I speak from the experience of others,) which the Cod Liver Oil seems to present, and which I have alluded to, there is another, which is considered important and worthy to be mentioned here—that body being an oil, manifests some difficulty in passing to the circulation, giving for this same reason, in cases of consumption, great disorder to the digestive canal; a fact which acts contrary to the benefit of the patient, who must be able to acquire as much strength as possible to sustain himself when struggling with this complaint. What is the effect of Cod Liver Oil in the lungs? It is a fatty substance, and as such greatly activates the functions of the respiratory apparatus, producing more carbon; the oil, like similar bodies, furnishes much more carbon, and herein the increase of strength employed by the lungs, which in my judgment is very injurious, and contrary to that law which says, that a precious, useful and desired condition of that organ is to obtain rest, to ensure a cure; or as much repose if possible, as when in a normal state. We find in the traffic of drugs much of the medicament that is pernicious, and that the signs and names so conspicuously labelled on the bottles in which it is sold, are simply ridiculous pretensions so exhibited for the purposes of trade. But the majority of those engaged in the traffic, care little whether the article be genuine or not so long as it is saleable, and puts money in their coffers. Poor suffering humanity must endure the imposture without complaint. How low, how degrading, and how criminal is this act of him who deals in the drugs; but how much more so is he, the physician, who for a pecuniary consideration will recommend this pernicious stuff to the patient. What words are adequate to express our disgust, our contempt

of him? I am grieved to know that there are many such in our profession who practice this abominable charlatanry. It has been asserted that the Iodide of Starch is inefficacious, and that the Cod Liver Oil has been demonstrated beneficent. This, be it not forgotten, only refers to the treatment of consumption. According to what I have stated above, it has been supposed by some French authors, that the use of the Iodide of Starch in large and repeated doses, which cause no injury, proves that it is not absorbed, and therefore simply harmless and inefficacious. In this, we have to consider or oppose:

*First.* That even bearing in mind the abuse in relation to *quantity*, it is not to be wondered at that there are persons who have resisted the medicament in consequence of circumstances, age, temperament, and the particular disposition of the individual.

*Secondly.* That the medicament has action, whether beneficial or to the contrary, as is proved by the experience of many physicians, among whom we find Buchanan, since in many cases they speak of the diminution in the doses, and the disorders that have taken place in the stomach and other organs, which are not in immediate relation with this. If these opinions are not admitted as positive and truthful, we must of necessity deny the consideration of those referred to in relation to Cod Liver Oil, and that it acts with a more irritating influence upon the stomach than the Iodide of Starch.

I shall add now in drawing this thesis to a conclusion, that the opinion I entertain in regard to these subjects are not held as against other preparations of iodine which are frequently recommended in the therapeutic treatment of consumption, since I believe them to possess also in an eminent degree qualities decidedly beneficial in their character on account of their containing iodine. My silence in regard to the iodide of iron and potassium, is not owing to any ignorance of these chemicals, but from a belief that their composition is less beneficial to the vital and chemical acts of the economy, and are more complicated in entering into the circulation as useful agents in the affected organs. I may be told that I have endeavored to avoid these, which I grant, but for the reason that the beneficial agent which they contain is found in a greater degree in Cod

Liver Oil; and for this same reason have I treated of the Iodide of Starch, and to the best of my ability analyzed it, for the purpose of demonstrating its virtuous and specific qualities, and to bring in comparison the other specific to show that its marvelous virtues are not so great or positive as it has been supposed.

Concluding the subject of my treatise at once without entering further into details, I say that I am of the opinion that the *Iodide of Starch can advantageously be substituted for Cod Liver Oil in the treatment of Pulmonary Phthisis.* I say this not because I think it more efficacious than the other, not because experience may have banished the doubts and uncertainties of its action, which surrounded it, but for the reason that in its application it appears to have produced less injurious results, and to possess less inconvenience in its administration than the other.

This is my sincere and candid opinion, and to which I shall cling until more convincing and undoubted results have been demonstrated in the use of these medicaments, and which shall dispel the obscurity and conflicting doubts which now exist in relation to these important agents of Applied Therapeutics.

Gentlemen, I have concluded the analysis of the subject of my proposed thesis, and it remains with you to say how creditably or inadequately I have performed my task. That I have fallen into many faults I take for granted, my want of knowledge has prevented me from detecting them, but I trust they are faults of so trivial a nature that they may be overlooked, and that from the experience of the past I may improve in the future. I trust that I have fulfilled my task to the satisfaction of the Faculty, for I commenced and concluded it in a spirit of sincerity and with an honesty of purpose. If I have evinced no scientific erudition, no method of analysis in my paper; if I am not up to the standard of other neophytes who are struggling with me in the same field of medical science, attribute the deficiencies not to a want of enthusiasm or ambition, but to the want of ability. But I hope that I have acquitted myself in a manner worthy of a student of this learned University, and that I have succeeded in complying with her Rules in such a manner that I may be considered worthy to be

called before her Faculty to undergo the required examinations which follow the approbation of my effort. And should she, my medical *Alma Mater*, bestow upon her son who has so endeavored to obey her behests, the vellum, ribbon, signatures, and seal, that moment will be the most grateful of his life.

Born in a beautiful but unfortunate country (the island of Cuba), "the Gem of the Ocean," a land, oppressed and downtrodden by an illiberal and tyrannical government, he sought this home of liberty to enjoy his rights as a man, to bask in her sunlight of Independence, and repose in her shades of peace. He directed his study to the glorious science of Medicine, and sought your hallowed halls for instruction; he has been a devoted student, and if she ratifies the bond and pledge he gave her, and sends him forth in his medical career an acknowledged son, never shall she blush to own him, for he shall always remember the advice, the knowledge and the blessings which she has bestowed upon him—his great, good and generous foster mother, the UNIVERSITY OF PENNSYLVANIA.