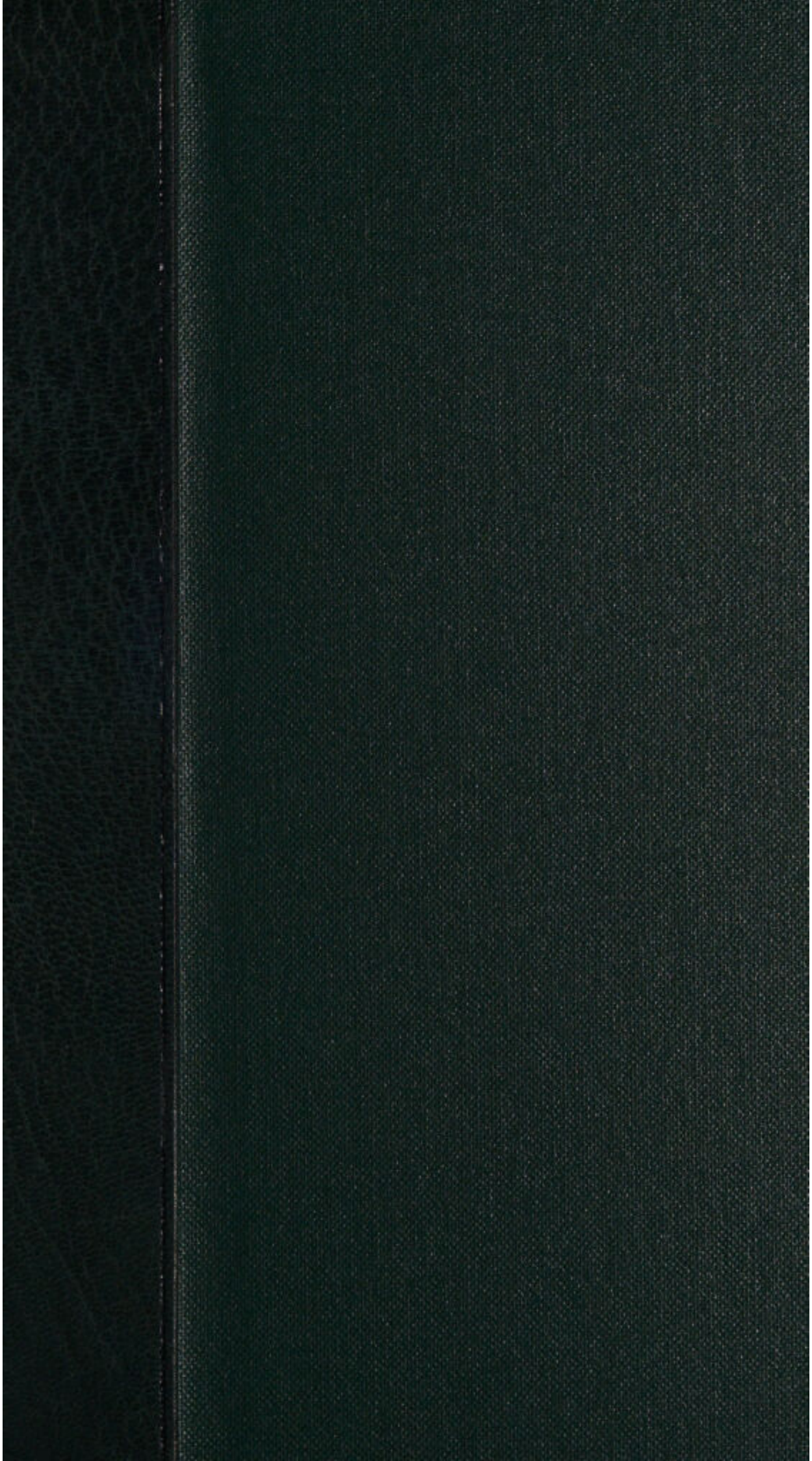
An experimental dissertation on the chemical and medical properties of the nicotiana tabacum of Linnaeus, commonly known by the name of tobacco / By Edward Brailsford.

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AN

EXPERIMENTAL DISSERTATION

ON THE

CHEMICAL AND MEDICAL PROPERTIES

OF THE

Nicotiana Tabacum

OF

LINNÆUS,

COMMONLY KNOWN BY THE NAME OF

TOBACCO.

By EDWARD BRAILSFORD,
OF CHARLESTON, SOUTH-CAROLINA, MEMBER OF THE MEDICAL AND CHEMICAL SOCIETIES OF PHILADELPHIA.

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1799.

To

Major Pierce Butler

with the best wishes of his friend

the

Author.

AN

INAUGURAL DISSERTATION,

SUBMITTED TO

THE EXAMINATION

OF THE

REV. JOHN EWING, S. T. P. PROVOST;

THE

TRUSTEES AND *MEDICAL PROFESSORS*

OF THE

UNIVERSITY OF PENNSYLVANIA,

FOR THE DEGREE OF

DOCTOR OF MEDICINE,

ON THE SIXTH DAY OF JUNE, 1799.

TO

ALEXANDER BARON, M. D.

OF

CHARLESTON, SOUTH-CAROLINA.

PERMIT me, kind Sir, thus publicly to avow my acknowledgment for the many civilities I have hitherto received from you and your amiable family, when under your tuition: a period that I ever reflect on with the warmeſt glow of pleaſure: and accept my aſſurances, that in every ſtage of life, I ſhall preſerve that friendſhip and grateful remembrance of your judicious council, which you have inſpired by your attentive concern for my welfare, and which ſhall never be eraſed from the mind of

Your affectionate Friend

And PUPIL,

EDWARD BRAILSFORD.

TO

SAMUEL WILSON, M. D.

OF

CHARLESTON, SOUTH-CAROLINA.

DEAR SIR,

I EMBRACE this opportunity, of avowing the lively ſenſe I entertain of your amicable diſpoſition towards me, when under your immediate care, and aſſure you in the language of truth, that a grateful recollection of your friendly admonitions will ever warm the breaſt of

Your affectionate Pupil,

EDWARD BRAILSFORD.

TO

JAMES WOODHOUSE, M. D.

PROFESSOR OF CHEMISTRY

IN THE

UNIVERSITY OF PENNSYLVANIA.

SIR,

ALLOW me to adopt this mode of expreſſing my acknowledgment, for the many teſtimonies of friendſhip I have experienced from you, and ſuffer me at the ſame time to declare that a grateful remembrance of the many favors you have conferred, will ever be retained by

Your affectionate Friend,

EDWARD BRAILSFORD.

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INTRODUCTION.

WHEN we explore the extenſive regions of the globe, and contemplate the many plants which the beneficent diſpoſer of all things has given as uſeful ornaments to the earth, and at the ſame time reflect that through the ignorance or indolence of man, many of thoſe valuable ſubjects are permitted to wither in our fields or foreſts, without ever attracting the attention of thoſe mortals, for the alleviation of whoſe corporeal infirmities they were indubitably intended, many unpleaſant ideas muſt naturally intrude themſelves on our minds—Regret is awakened in our breaſts at the inactivity of our anceſtors, whoſe unpardonable ſloth has ſuffered diſeaſes to exiſt as *opprobria medicinæ* for the relief of which many plants inconteſtibly flouriſh, and which from inattention or ſome other omiſſion equally culpable, die neglected, and anſwer no valuable purpoſe but to fertilize the ſoil which gave them birth.

The free inhabitants of the United States of America, would merit additional cenſure were they to evince a ſimilar ſupineneſs. Poſſeſſed of pre-eminent advantages for rendering valuable acquiſitions to the Materia Medica, their neglect of ſuch purſuits would prove a national diſgrace, and be conſidered by their poſterity equally criminal as the moſt heinous offence againſt civil government.

Inhabiting a vaſt extent of territory, it would be arraigning divine goodneſs, not to ſuppoſe, that he has beſtowed with a liberal hand, ſources of alleviation to thoſe miſeries, which were incurred by the loſs of our primeval innocence.

It has been juſtly obſerved by a very learned author,* that, "the ſtrength of a ſtate is not to be computed by extent of country, but by the number of its citizens, and the utility of their labour." This ſhould actuate us in the purſuit of uſeful knowledge, ſo as to render the extent of country which we inhabit more uſeful and more wealthy, whereby, not only our literary character as a nation, but alſo our liberty and independence will be effectually eſtabliſhed.

That there are plants diffuſed all over the great continent of America, endued with the moſt active medical virtues, is incontrovertible; but to uſe the words of the poet,

"Full many a flower is born to bluſh unſeen,
"And waſte its ſweetneſs on the deſert air."

The induſtry and wiſdom of man are now the only requiſites to develope thoſe virtues, and render them beneficial to mankind.

To the honour of our infant republic, the ſcience of medicine has been laudably promoted by the invaluable acquiſitions of the profeſſor of botany and materia medica in the univerſity of Pennſylvania, with a view to cultivate an intimate acquaintance with the indigenous plants of this country.—The literary fame of this gentleman is too well known to require any eulogy from my pen; he has with as much ingenuity as induſtry, paved the way to facilitate the future reſearches of men of ſcience, and in language peculiarly pleaſing and deſcriptive, has given an agreeable animation to uſeful facts, ſo as to render them not only grateful to the reader, but alſo truly beneficial and intereſting.

Were candidates for medical honours to purſue this laudable example of their preceptor, they would enrich the

* Rollin's Arts and Sciences.

Materia Medica with many valuable articles; but, unfortunately for this branch of ſcience, a depraved predilection for the thread worn ſubject of diſeaſes, tempts them to launch their bark into the dangerous ſea of controverſy, and frequently without the neceſſary implements for the effectual execution of ſuch an undertaking.

Attracted by the oſtentatious glare of hypothetical reaſoning, they frequently adopt with avidity theories the moſt extravagant and fallacious, and without examining the ſolidity of the opinions they embrace, confide entirely to the judgment of others, and with the greateſt temerity riſque their reputation on that unſubſtantial baſis.

When philoſophy ſhall be eſteemed an indiſpenſable appendage to the medical character, then ſhall ſuch inconveniences ceaſe to exiſt. The ſuſceptible mind of man, enlightened by the rays of philoſophy, will then diſſipate the clouds of ignorance, and experimental enquiries ſhall then be cheriſhed as the ſureſt vehicles to truth.

I have been prompted to adopt the ſubject of Nicotiana, not from any vain idea of my ability to do ample juſtice to the medical qualities of this plant, but from an anxious ſolicitude to contribute my mite towards the promotion of one of the moſt uſeful branches of ſcience, and I truſt that from this conſideration, my experiments and opinions will be examined with an eye of lenity, but, at the ſame time, with candour and impartiality. I have to regret extremely, that a ſerious indiſpoſition, for near two months, unfortunately precluded my entering as minutely into the analyſis of Tobacco, as I at firſt contemplated; but I have endeavoured to atone for this deficiency, by attending par-

ticularly to its influence on the ſyſtem, and alſo to the reſpective operations of its conſtituent parts.

The exhibition of Nicotiana, as a medicine, for the mitigation of many diſeaſes to which mankind are incident, has been unfortunately but little attended to by phyſicians.

The deleterious effects with which it is endowed, and the ſuppoſed danger of exhibiting it on this account, have led medical characters to depreciate the worth of a medicine, whoſe benign influence, by a judicious adminiſtration, in eradicating certain diſeaſes, has, in many inſtances, been evidently confirmed.

It has been declared, by ſome ſuperficial obſervers, to be uſeleſs, from the repeated proofs of its inefficacy in mitigating the violence of thoſe diſeaſes, in which, many more accurate inquirers have aſſerted it proved beneficial. Others have alledged, that the baneful powers, with which it is replete, diſſuade from an uſe of it. In conſequence of theſe chimerical aſſertions, a medicine which would prove a valuable acquiſition to the Materia Medica, has been almoſt entirely expunged from modern practice.

If we were to admit ſuch injudicious opinions to govern our reaſon, in ſelecting medical plants, how few would be the number which would engage the attention of the timid and injudicious practitioner! for in the hands of ſuch only are powerful medicines rendered injurious, and in the hands of ſuch alſo the moſt lenient prove obnoxious. The invaluable aphoriſm of Dr. Withering, therefore, merits the attention of every practitioner of medicine; he juſtly obſerves, that, "poiſons in ſmall doſes are the beſt medicines, and the beſt medicines in too large doſes are poiſonous."

It would be as inconſiſtent to ſtigmatize this plant with the appellation of poiſon, as it would be to pronounce a crum of bread noxious in its quality, becauſe it has in ſome caſes entered the trachea, and occaſioned inſtantaneous death.

The concluſions which I have formed on the ſubject which conſtitutes the ſubſequent pages of this diſſertation have been founded on experiments, and thoſe experiments, though few, have been conducted with accuracy. They have been mutually the ſources of much mental diſquietude, and the diffidence I now feel in ſubmitting them to the ſcrutiny of the learned, tends conſiderably to augment the diſagreeable emotions which, at this time, diſturb my tranquility : however, I ſhall conſider myſelf richly compenſated for every inconvenience, ſhould any word or thought contained in theſe pages prove propitious in exciting ſome more accurate obſerver to a more minute inveſtigation of this copious ſubject.

NATURAL HISTORY.

CHAPTER I.

The natural history of Tobacco, and of its first introduction as an article of luxury.

WE have accounts, in different authors of several species and varieties of this plant, but as an accurate description of them may be acquired in almost every botanical book, it would be altogether useless for me to enter into an elaborate definition of each in particular. I shall therefore confine myself to that species which is thus designated by the great Linnæus, "*Nicotiana Tabacum:* foliis lanceolato-ovatis sessilibus decurrentibus, floribus acutis."

It is termed by Caspar Bauhin, *Nicotiana major latifolia.* According to the natural method of Linnæus, it belongs to the 28th order, called *Luridæ.* Among the aborigines of the continent of America, it was distinguished by the appellation of *pætum*, whilst those who inhabited the islands, called it *yoli**.

According to Sir Hans Sloane†, its original name was *picielt*, but was termed *tobacco* by the Spaniards, from the circumstance of its being brought from the island of *Tobago*, where it grew almost spontaneously.

Tobacco was first introduced into Europe in the year 1559 by John Nicot, lord of Villemain, who was agent

* Encyclopedia.

† Sir Hans Sloane's Natural History of Jamaica.

in Portugal for the King of France, from whence he brought the plant, and preſented it to the Queen : from this circumſtance it was called *Herba Regina*, and in honor of him *Nicotiana**.

Lobel and others accounted this, as well as the other ſpecies of Nicotiana, an *Hyoſciamus*†, and called it *Hyoſciamus luteus* and *dubius*, in conſequence of which ſome have given it the Engliſh name of *yellow Henbane*. It is arranged by Linnæus in his fifth claſs, *Pentandria Monogynia* the *ſtamina* conſiſting of five *ſubulated filaments*, topped with oblong *antheræ* ; the *ſtyle* riſes from the rudiment of the fruit ſingle. The flowers are large and of a beautiful red, and annexed to long and ſlender foot-ſtalks : they are of a *monopetalous tubelous* form, and grow on the tops of the branches, and of the main ſtalk ; the tube is longer than the cup, and the limb which ſpreads open is divided into five acute-pointed ſegments.

The *capſule* which ſucceeds the flower is bivalved and bilocular, is alſo large, and of an oval form : it opens longitudinally, and ſheds extremely minute ſeeds, but very numerous.

The root is divided into many parts, grows very thick and long, and is furniſhed with an infinity of ſmall fibres. The growth of this plant is generally from five to ſix feet in height, but ſometimes more, depending upon the ſeaſon, and fecundity of the ſoil. The ſtalk is ſubſtantial, round, very erect, and divided into branches. The leaves are large, numerous, and diſtributed in an alternate manner :

* Theatrum Botanicum, page 711.

† Theatrum Botanicum.

they are of a deep green, and have petioli, or foot-ſtalks, but ſurround the common ſtalk, in great part at their baſe.

Tobacco is a native of America, and was firſt ſent to Spain and different parts of Europe, for the purpoſe of ornamenting their gardens, but ſo great was the demand for the dried leaves, that it at length became an article of commerce, and is at this preſent period almoſt univerſally reſorted to as a *luxury*.

The Indians formerly made uſe of it as a *vulnerary*, and aſcribed many virtues to it as a medicine. They entertain an idea, that tobacco was brought them down from the heavens by the Great Spirit, who deſcended for the expreſs purpoſe of preſenting them with this plant, in order that it might be ſpread throughout the land for the benefit of their ſpecies. Hence many nations of that tribe, make uſe of it in certain forms of their religion.—It is called by them *Eche*.

Travellers aſſert, that they often reſort to the *great mountain*, where the angel appeared, and do homage to that ſpot, on which their anceſtors firſt received ſo divine a plant.

It is alledged by Sir Hans Sloane,* "that the prieſts of Eſpaniola, called *Bohitis*, who are medical characters as well as theologiſts, make a practice of chewing and ſmoking tobacco, until they become perfectly inebriated, and in this ſituation they perform many geſticulations, pretending likewiſe to recount for the will of God, what they have ſeen." They feign alſo to perfect radical cures among many of the diſeaſed, and ſo prejudiced are the people in their favour, as to imagine themſelves perfectly relieved. The form

* Sir Hans Sloane's natural hiſtory of Jamaica.

which they obſerve on this occaſion, as related by Sir Hans Sloane, is in the following ſingular manner; "when they attempt to cure, they ſhut themſelves up with the ſick, ſurround him, ſmoking him with the ſame; ſuck out of his ſhoulders what they ſay was his diſeaſe, ſhewing a ſtone or bone they kept in their mouths, which the women keep as relicks, thinking they facilitate birth."

Thevet affirms that the women among the Aborigines of America were led away with an idea, that indulging in the uſe of tobacco was not only injurious to the body, but that it alſo prevented *conception*, and tended greatly to diminiſh the *venereal appetite*; in conſequence of which, they forbore the uſe of it in any form whatever.

The Portugueſe attributed many virtues to this plant, and pronounced it a powerful *counterpoiſon*; hence they have given it the appellation of *Herba Santa*.

Sir Richard Greenfield, on his diſcovery of Virginia in 1585, obſerved that the Indians made great uſe of tobacco in clay pipes, for the preſervation of their health. Pleaſed with the novelty of the circumſtance, he took ſeveral of the pipes with him on his return to England, which were introduced into court: others were made agreeable to their conſtruction, and from that period the uſe of ſmoking ſoon became general.

It was firſt introduced among the Oriental nations by the Dutch* ſeamen, who uſed to carry pipes about them made of palm leaves, in which they ſmoked to eaſe their wearineſs, as well as ſuſpend a diſpoſition for food.

* Sir Hans Sloane.

The Indians after having gathered their crop of tobacco, hang it up in their houſes for the purpoſe of curing, after this is perfected, they take four or five leaves, and wrap them up in the great leaf of a tree, in the form of a funnel; they then apply fire to the extremity, and inhale the ſmoke, which being frequently repeated, cauſes them to ſubſiſt three or four days*, without partaking of any aliment. They practiſe this more particularly, when they contemplate going to war, or are about to predict the termination of future important events. It is conſidered by them as the moſt valuable offering that can be made to the beings that they worſhip. They uſe it in all their civil and religious ceremonies. When once the ſpiral wreaths of its ſmoke aſcend from the feathered pipe of peace, the compact that has been juſt made, is conſidered as ſacred and inviolable. Likewiſe when they addreſs their Great Father, or his guardian ſpirits, reſiding, as they believe, in every extraordinary production of nature, they make liberal offerings to them of this valuable plant, not doubting but that they are thus ſecured of protection‡.

* It is univerſally acknowledged that tobacco does not impart any degree of nouriſhment to the body, but on the contrary tends greatly to *reduce obecity*; yet ſuch is its ſtimulating quality, that it ſupports the ſyſtem for ſeveral days ſucceſſively, above what may be termed the *hungry point*. This is taken notice of by Mr. Kerr†, with reſpect to opium. "The eaſtern nations," ſays this author, "are ſo well convinced, by experience, of its powers in diminiſhing the appetite, that in the famine which prevailed in the Eaſt-Indies, in the year 1770, the wretched ſufferers purchaſed it at exhorbitant prices, to allay the cravings of hunger, and ſmooth the approach to death."

† *Kerr. Lond. Med. Obſer.* vol. v. art. 28.

‡ See Encyclopedia.

CHAPTER II.

A conciſe account of the influence of Tobacco, on living ſyſtems, illuſtrated by a few experiments.

That tobacco is both a powerful emetic and cathartic, when exhibited in any form whatever, is generally admitted: we find that all authors, who have written on its effects, have unanimouſly concurred in this opinion; ſome have alſo ſubſcribed to its being efficacious in promoting the renal diſcharge; but with reſpect to its *ſedative* or *ſtimulating* effects on the living ſyſtem, various opinions have hitherto exiſted.

Notwithſtanding the ſagacity and experience of Doctor Fowler in many reſpects, the influence of Nicotiana on the human ſyſtem, in regard to its ſtimulating quality, entirely eſcaped his attention.

After drawing ſeveral inferences, relative to the operation of this medicine, in a concluding part of his work*, he obſerves, that it poſſeſſes a ſedative quality†, and frequently proves laxative: on this account he ſuppoſes that

* Fowler on Dropſy.

† A ſimilar opinion was formerly entertained of opium; but the ingenious experiments of Doctor Crumpe, muſt ſufficiently demonſtrate, to every unprejudiced mind, the *ſtimulating quality* of that medicine; and that its *ſuppoſed ſedative effects*, are ſolely to be attributed to a ſecondary operation, or *indirect* debility induced by its immenſe ſtimulating property, when diſproportioned to the *excitability* of the ſyſtem.

it may prove ſalutary in many painful caſes, where coſtiveneſs may render opiates exceptionable.

That it is a laxative, I have almoſt uniformly obſerved, but with reſpect to its being endued with a ſedative quality the ſubſequent experiments will greatly invalidate.

It is not my intention or wiſh to enter into the field of controverſy on this head, and therefore I have attempted to define by experiments, the unequivocal operation of this plant. It is unqueſtionably the moſt ſubſtantial baſis on which we can found our arguments, and to ſuch we muſt ultimately appeal for the attainment of truth.

The ſtimulating effects of tobacco did not eſcape the diſcerning eye of Doctor Cullen, whoſe opinions ſhould ever be viewed with veneration and reſpect.

In treating of this plant, he obſerves, that "the infuſion of tobacco when it is carried into the blood veſſels, has ſometimes ſhewn its ſtimulating powers exerted in the kidneys; and very lately we have had it recommended to us as a powerful diuretic of great ſervice in dropſy‡."

That tobacco promotes the *renal* diſcharge, is beyond a point of controverſy. Every practitioner of medicine who has ever had occaſion to adminiſter it, either in the form of infuſion or ſubſtance, muſt have obſerved its *diuretic* influence on the ſyſtem.

‡ Cullen's Materia Medica, page 191.

This is ſufficiently exemplified in the work of Doctor Fowler*, to whom we are greatly indebted for the ſeries of experiments enumerated by him. He has clearly demonſtrated the influence of tobacco in promoting the urinary ſecretion, and has as perſpicuouſly evinced the utility of its exhibition in violent caſes of Aſcites, Anaſarca, and Dyſury.

Without a further diſquiſition relative to the operation of tobacco on the human ſyſtem, I ſhall proceed with enumerating my experiments, and will leave it to the candid reader to judge how far they may merit his attention; they deſerve at leaſt the credit of being faithfully related.

EXPERIMENT I.

In order to aſcertain the particular operation of tobacco, with reſpect to its influence on the pulſe, I took three hours after breakfaſting on toaſt and coffee, forty drops of a ſtrong decoction of tobacco† in a little water. My pulſe beat ſeventy ſtrokes in a minute. The following table manifeſts the ſtimulating quality of this plant, as I have particularly ſpecified the number of pulſations at the expiration of every 5th. minute.

In	5	10	15	20	25	30	35	40	45	50	55	60	Min.
P. beat	72	75	75	77	80	84	84	81	76	72	70	70	

* See Fowler on Dropſy, page 72, where he obſerves that out of one hundred and fifteen caſes in which he adminiſtered tobacco, in ninety-three of them it proved diuretic.

† Two drachms of the dried leaves of tobacco were put into four ounces of water, and boiled down to two.

For the firſt five minutes there was an aromatic warmth diffuſed all over my throat, which ſoon extended itſelf to my ſtomach, and continued thus for the firſt quarter of an hour. In fifteen minutes I experienced a little nauſea, which was promoted on the twenty-fifth minute; on the thirtieth minute my pulſe was greatly increaſed, both in tenſion and frequency; a conſiderable moiſture appeared on my forehead, and a ſlight degree of dizzineſs attended, which continued until near the fortieth minute.

On the forty-fifth minute, the ſymptoms abated, and my pulſe was diminiſhed both in fulneſs and frequency. At the expiration of the hour, I felt a kind of languor, and my pulſe was reduced to its natural ſtandard.

Soon after every inconvenience diſappeared, and I dined with my uſual appetite.

EXPERIMENT 2.

On the ſame evening, two hours after eating a little bread and milk, I took forty drops of a ſtrong infuſion* of the dried leaves of tobacco; my pulſe beating ſixty-eight ſtrokes in a minute, its natural ſtandard.

In	5	10	15	20	25	30	35	40	Min.
P. beat	70	73	74	76	80	83	83	81	

In	45	50	55	60	65	70	75	Min.
P. beat	79	75	71	70	70	68	68	

* Two drachms of the dried leaves of tobacco were infuſed in two ounces of water, for 24 hours, and then ſtrained off.

Immediately after ſwallowing the draught, I felt an evident ſenſation of warmth throughout my throat, which was ſoon communicated to my ſtomach, and continued to increaſe for fifteen minutes, but gradually diminiſhed at the expiration of the twentieth minute: I now experienced ſome degree of nauſea, which continued to increaſe until the twenty-fifth minute; it produced a conſiderable moiſture on my forehead, and in the palms of my hands, but no vomiting attended. On the thirtieth minute, my pulſe became tenſe, frequent and quick, but the perſpiration and nauſea began to ſubſide on the thirty-fifth minute; throughout the remaining part of the hour, my pulſe was diminiſhed conſiderably in regard to fulneſs, and when one hour and fifteen minutes had elapſed, it reſorted to its former ſtate; I diſcharged that night an unuſual quantity of urine, and had two copious diſcharges downwards.

EXPERIMENT 3.

I gave to Peter Vallet, a robuſt healthy lad of about nineteen years of age, thirty drops of the tobacco infuſion,* in a little water; he was not accuſtomed to the uſe of tobacco in any form whatever.

His pulſe beat ſeventy, previous to his taking the draught.

In	5	10	15	20	25	30	35	40	45	50	55	60	min.
P. beat	72	76	78	79	80	78	74	73	68	70	70	70	

*Similar to that exhibited in the preceding experiment.

When ten minutes had elapſed, he complained of a conſiderable warmth in his ſtomach. In fifteen minutes he ſaid that he was a little giddy and ſomewhat exhilarated. In twenty he obſerved that he felt a little ſick, and that the room appeared to him to be turning round, as he expreſſed himſelf; his face was much fluſhed, and on the thirtieth minute, he complained of a tremor in his hands. In forty-five minutes the affection of his head and nauſea abated, but the tremulous motion ſtill exiſted. At the expiration of an hour he felt as uſual, excepting a ſlight degree of nauſea, and a kind of langour throughout his frame. In one hour and a half, he ejected the contents of his ſtomach, and had two large evacuations downwards.

EXPERIMENT 4.

About two hours after partaking of a light ſupper, I finiſhed, for the firſt time, the ſmoking of a ſegar; my pulſe beat ſeventy ſtrokes in a minute, and I felt uncommonly diſpoſed to ſleep. Recollecting the powerful effects of ſmoking, but a few minutes, on a former occaſion, I wiſhed now to aſcertain its operation on the ſyſtem, and its particular influence over the pulſe, the reſults of this experiment were as follow:

In	5	10	15	20	25	30	35	40	Min.
P. beat	75	77	81	85	90	100	104	102	

In	45	50	55	60	65	70	75	Min.
P. beat	93	85	77	70	67	70	70	

For the firſt five minutes, I experienced no evident effects; the pulſe raiſed only five. At the tenth and fifteenth minutes I had frequent eructations, and all inclination for

ſleep was totally diſpelled. At the twentieth minute my head felt light, my ſpirits were much elated*, and my pulſe more full, frequent, and quick.

I continued ſmoking without ceſſation, until the twenty-fifth minute, when I perceived a conſiderable nauſea at my ſtomach, and an evident moiſture on my forehead, accompanied with repeated eructations.

I now vomited very profuſely, and on the thirtieth minute my pulſe became frequent and low. Every thing appeared in a circuitous motion, and I was compelled to ſeek relief from my pillow for a few moments, until relieved of this dizzineſs. On the thirty-fifth minute the vomiting was repeated, and I took a draught of cold water, which mitigated every ſymptom. I felt ſo much relieved, that I got up and walked acroſs the room. I experienced at the fortieth minute a tremulous affection of my hands, and a giddineſs and pain in my head; ſo much ſo, that I was compelled to lie down again: the former of theſe affections continued for near two hours, but the latter was ſomewhat abated, after being in a recumbent poſture for a few moments. My pulſe ſtill continued depreſſed, frequent, and quick; at the ſixty-fifth minute my thirſt was urgent, my pulſe diminiſhed three, ſtill languid, and head-ach increaſed. I then drank a glaſs of water, and in ſeventy-five minutes, my pulſe was reſtored to its natural ſtate, but the pain in my head ſtill continued.

From the preceding experiments we may infer, that the *primary* effects of tobacco, are to accelerate the pulſe,

* Doctor Crumpe obſerved this to be the conſtant effect of opium.

and elevate the ſpirits ; and that its ſecondary operation is to depreſs the former, and ſubdue the latter : for it is to be uniformly obſerved in the preceding, as well as many of the ſubſequent experiments, that, after the firſt half hour had elapſed, the number of pulſations, in a given time, continued to diminiſh, until reduced to, and frequently below†, the natural ſtandard of health. Doctor Cullen‡, in ſpeaking of the *commotion* generated in the ſyſtem, from the exhibition of narcotics, obſerves, that to explain this operation, "it ſeems neceſſary to aſſign ſome other cauſe than the direct ſtimulant power of the ſubſtance applied ; and it appears to be that reſiſtance and conſequent activity, which the animal œconomy is ſuited to oppoſe to every application that has a tendency to hurt it. This power is well known in the ſchools of phyſic, under the title of the *Vis Conſervatrix et Medicatrix naturæ* ; which however difficult to explain, muſt, as a general law of the animal œconomy, be admitted as a matter of fact."

In contemplating the ſentiments of Doctor Cullen on this head, we muſt pay homage to his great ingenuity, but at the ſame time, muſt not allow our veneration for the abilities of this illuſtrious phyſician, to operate as a barrier to the admiſſion of truth.

We know that the ſyſtem appears perfectly tranquil when in the enjoyment of health, and that this depends up-

† This gave origin to the *ſuppoſed ſedative effects* of opium. Phyſicians were not aware of its *inſtantaneous* operation on the ſyſtem, and on this account attended ſolely to the *effects produced*, after its *primary* influence had ſubſided.

‡ Cullen's Materia Medica, vol. 2. page 151.

on a juſt ratio of *excitement* and *excitability*; but when either predominate, diſeaſe is invariably the conſequence. As this is admitted, would it not be more juſt to ſuppoſe, that this diſorganization of the human frame, depends upon the ſtimuli applied, being *diſproportioned* to the *excitability* of the ſyſtem?

Do we not ſee ſimilar commotions generated in perſons, on the immediate application of *heat*, after expoſing themſelves to intenſe *cold*, and thereby rendering their ſyſtems extremely *excitable?* And may not the ſame be extended to *narcotics*, when diſproportioned to the *excitability* of the ſyſtem?

With reſpect to the operation of tobacco on the mind, in producing hilarity, we ſee it ſufficiently exemplified in many who have recourſe to it in a certain degree.*

Moſt of the ancient authors who have written on this ſubject, avail themſelves of an opportunity to mention the exhilarating effects of tobacco; and Sir Hans Sloane in particular obſerves, that, "in all places where it has come, "it has very much bewitched the inhabitants, from the "more polite Europeans, to the barbarous Hottentots."

We find alſo that the like effects of this noxious plant, are ſpecified in Cortes's conqueſt of Mexico, where this

* A gentleman of this city informed me, that the ſmoking of two or three ſegars, ſeldom failed of occaſioning an evident degree of alertneſs for a few moments after; but if he carried the ſmoking to a greater extent, it generally produced a nauſea, and a giddineſs in his head.

author affirms, that Montezumo, or the Emperor, drank ſeveral ſorts of liquor, richly perfumed with ſalutiferous herbs; after his meals, he took a kind of chocolate, and ſmoked tobacco perfumed with liquid amber. The juice of this plant was one of the ingredients with which the prieſts intoxicated themſelves, whenever they were obliged to deliver an oracular anſwer.

Three or four buffoons generally attended at the table, for the purpoſe of diverting the Emperor, with their ludicrous talents.*

Theſe were the cuſtoms of the Indian tribes, and theſe alſo were the amuſements of many civilized nations.—It is to be much lamented, that even at this preſent enlightened period, the manners of the moſt civilized nations, in this reſpect, partake of thoſe of the ſavage. But to uſe the words of a much celebrated and eſteemed author,† "it would ſeem as if liberty and indolence were the higheſt purſuits of man; and theſe are enjoyed in their greateſt perfection by ſavages, or in the practice of cuſtoms which reſemble thoſe of ſavages."

We find that its indiſcriminate uſe as a luxury not unfrequently proves injurious. "Its *narcotic* fumes," ſays Dr. Leake, "will ſtupify the brain, and *deaden the invigorating power of the nerves upon the whole bodily ſyſtem.* The propenſity of perſons to the uſe of this noxious plant, after being once habituated to the impreſſion of its ſtimulus, is equally prevalent with that of dram-drinkers, to ſpi-

* Hernando Cortes's conqueſt of Mexico. page 274.

† Ruſh. See his medical obſervations, vol. 1. p. 11.

rituous liquors, without which, however pernicious, they become languid, and debilitated, and are affected with nervous tremor."*

As I ſhall have occaſion to ſpeak more particularly of its baneful influence in a ſubſequent part of this work, when treating of its noxious effects in ſmoking, ſnuffing, and chewing, I ſhall for the preſent ſuſpend my opinions on this head.

Notwithſtanding the deleterious effects of tobacco hitherto enumerated, its operation as a medicine frequently proves ſalutary; this has been clearly demonſtrated in many violent caſes of obſtinate diſeaſe, and as ſuch it is to be held in the higheſt eſtimation. Its influence on the ſyſtem is immenſe. It is beneficial in ſome diſeaſes from its *diuretic quality*; in others as a *ſudorific*, and it proves in proper doſes, a *gentle emetic*, and a *lenient purgative:* hence the propriety of its uſe in many other diſeaſes. But more of this hereafter.

Having now enumerated its reſpective operations on the human ſyſtem, I ſhall proceed with relating ſome experiments which were made on living ſyſtems, both internally as well as externally.—

EXPERIMENT 5.

I dropped a ſmall portion of the expreſſed juice into my right eye, which immediately imparted an excruciating pain, attended with a burning diffuſible heat, ſomewhat analogous to the introduction of an aqueous ſolution of opi-

* See Leake's practical Eſſays on diſeaſes of the viſcera, p. 72.

um:* This ſenſation continued to increaſe for the ſpace of thirty minutes, but gradually diminiſhed after this time; and totally ſubſided at the expiration of one hour, leaving the part extremely ſore and diſagreeable, and ſomewhat blood-ſhot, for the remaining part of that day.—

Experiment 6.

After boiling a large quantity of the leaves, in order to procure an extract, I frequently expreſſed with my hands the liquor which the leaves abſorbed, which occaſioned ſuch a degree of nauſea at my ſtomach, as almoſt to induce vomiting:† the ſenſation continued for ſome time, but gradually diminiſhed, as the application was not again renewed.—This was ſucceeded by a fluſhing of my face, a conſiderable pain in my head, a throbbing of my temples, a languor with diminution of appetite, and a diſpoſition to ſleep.

In order to ſatisfy my readers that this effect on myſelf was produced by no particular *idioſyncraſy*, I will relate a corroborating experiment communicated to me by my friend Mr. Dart.

" April the 20th, 1799. About 12 o'clock at noon, I applied to the internal parts of my thighs, and alſo the ſoles

* Crumpe, on opium, page 24.

† I am credibly informed, that many of the Dutch inhabitants of New-Jerſey, apply the leaves of tobacco, ſteeped in water, to the external part of the ſtomach, and continue the application until a vomiting is induced. This they frequently practiſe, in preference to an internal emetic when under the neceſſity of puking their children.

of my feet, a large quantity of the dried leaves of tobacco, well ſtewed in about a pint of water, previouſly waſhing the part with warm vinegar, ſo as to open the pores and promote abſorption.—In about two hours after the application was made, I felt ſome degree of laſſitude, accompanied with a dizzineſs and head-ach, which were evidently increaſed on the third hour; when it operated as a gentle cathartic.

At 4 o'clock, a nauſea at my ſtomach was very perceptible, ſo much ſo, that I removed the application for fear of vomiting,* which generally affects me materially, and, therefore, wiſhed to avoid it. I made ſeveral efforts to eject the contents of my ſtomach, but without effect. In half an hour after, this affection began to ſubſide, and I felt much relieved, but ſtill ſome degree of head-ach continued, together with a diſagreeable languor."

Experiment 7.

I made a ſtrong decoction of the dried leaves of tobacco, and gave twenty drops of it to a mouſe. In the ſhort ſpace of ten minutes it diſcovered ſtrong marks of an almoſt inſupportable pain, attended with tremor and convulſions, quickly ſucceeding each other; at the expiration of thirty minutes, with a few violent efforts, it ſuddenly expired.

Experiment 8.

I injected by means of an ivory ſyringe, a ſmall portion of the above mentioned decoction, into the rectum of

* Profeſſor Barton informed me, that he was called to a man, who had taken a large doſe of opium; he gave an emetic, but being deſirous of keeping up vomiting, he applied tobacco leaves, ſteeped in vinegar, to the ſtomach, which had the deſired effect.

another mouſe, which evidently exhibited all the ſymptoms of the former, and equally as vehement in degree, for the little animal fell a victim to this exhibition, in the courſe of twenty minutes.

EXPERIMENT 9.

After perforating the ſide of a mouſe, I injected a ſmall quantity of the ſtrong decoction of tobacco, taking particular care to avoid the introduction of air, by applying the mouth of the ſyringe inſtantaneouſly to the aperture. In ten minutes it diſcovered ſymptoms of a violent affection: the reſpiration became conſiderably increaſed, which was quickly ſucceeded by ſtrong convulſions; in fifteen minutes, a paralytic affection, agitated the whole frame, and in twenty, a violent corrugation of the body, cloſed the ſcene.

CHAPTER III.

Obſervations on the noxious effect of tobacco on the human ſpecies, when uſed in the form of ſmoking, ſnuffing, and chewing.

THE uſe of tobacco as an *article of luxury*, in all its noxious forms, comes now to be conſidered; but before entering into the particulars of each, I muſt beg leave to offer a few preliminary obſervations. It is generally admitted that "man is an imitative animal;" to adopt, therefore, from the example of others, what is pleaſurable to

our feelings, or ſubordinate to uſe, ſhould not be deemed ſtrange: but that a *rank and noxious weed*, at firſt loathſome to the ſenſe of taſte, as well as prejudicial to the conſtitution, ſhould, by habit become deſirable, is a circumſtance the moſt extraordinary, affording one ſtriking inſtance, among many, "of the folly and infatuation of the human mind, and the force, and prevalence of cuſtom oppoſed to ſenſe and nature."

Without entering further into an enquiry on this head, I ſhall at once commence with ſome few remarks on tobacco, when uſed in the form of ſmoking.

Perſons who habituate themſelves to the immoderate uſe of this plant, ſooner or later, experience its noxious powers, by the many diſagreeable emotions excited by its influence over the ſyſtem.

Smoking in particular, by its ſtimulating effects on the mucous follicles and ſallavary glands, abſtracts profuſely their contents, and excites immoderate expectoration: Hence its influence in inducing *dyſpepſia*; for by abſtracting that liquid,* ſo eſſentially requiſite for the purpoſe of digeſtion, it ſeems juſt to ſuppoſe, that here it muſt inevitably prove the direct inſtrument of ſo malicious a diſeaſe. It is alledged by Dr. Cullen in his materia medica,† that this plant evidently poſſeſſes a *narcotic power*, and through this

* Ruſh's M. S. Lectures. "That the ſaliva is requiſite for digeſtion, I infer, from its once being cuſtomary in Spain to make uſe of an aromatic gum to perfume the breath; this had a very pernicious effect, as it diffuſed dyſpepſia throughout that place."

† Cullen's Materia Medica, p. 189.

means, weakens the tone of the ſtomach in ſuch a manner as to preclude the performance of its reſpective functions.

From the preceding experiments, it has been aſcertained, that nicotiana poſſeſſes ſtrong *ſtimulant* qualities, and therefore, Dr. Cullen's *narcotic power*, is to be explained by the ſtimuly being carried too far, and thereby inducing *indirect debility*. To corroborate this poſition, I will relate the following ſingular fact, which not long ſince came under my own inſpection.

A young gentleman, after being ſomewhat intoxicated by drinking of wine, undertook for the firſt time, the ſmoking of a ſegar; after having inhaled it as long as he could with ſafety to his mouth, he obſerved that it was cuſtomary for gentlemen to fling away the remaining part of the ſegar; but, for his part, he thought it extremely inconſiſtent, and highly improper, and, as he expreſſed himſelf, to ſhew his œconomy, would put it to a better uſe, by chewing, rather than part with ſo *ineſtimable a treaſure:* but unfortunately for the poor youth, he had not gratified himſelf long in the enjoyment of his luſcious morſel, before he fell proſtrate on his back, to the great aſtoniſhment of all the ſurrounding company, until they recognized the cauſe of ſo unexpected a tranſition. He was conveyed to an adjacent room, where he remained apparently lifeleſs for a conſiderable ſpace of time, and would probably have fallen a martyr to his folly and imprudence, had not medical aid been near at hand: The attendant phyſician accurately inſpected his caſe, and very properly abſtracted twelve or fourteen ounces of blood from his arm;* when a vomiting en-

* Doctor Allſton, of South-Carolina, informed me, that he was called to a lady, who had intentionally taken a doſe of laudanum,

ſued, attended with a profuſe diaphoreſis, which happily diſſipated every doubt of his recovery, and ſoon reſtored the youth to his former ſtate of ſalubrity.

We may infer from this fact, the infinite power of nicotiana, when uſed by thoſe who have never been accuſtomed to its noxious effects.

Smoking has been alledged by ſome authors to have oftentimes proved advantageous in diſpelling contagion of almoſt every deſcription; but others have oppoſed this aſſertion, with ſuch valid arguments, and have produced ſuch ſubſtantial facts in ſupport of their opinions, that it is now almoſt univerſally believed, that tobacco poſſeſſes no ſuch virtue.

I ſhall now proceed with ſome few remarks on ſnuffing, another form in which the deleterious effects of Nicotiana are evidently depicted.

Snuffing, like that of ſmoking, may, by many repetitions, be rendered perfectly ſimple and harmleſs with reſpect to its nauſeating powers at firſt, ſo that its peculiarities may at length be totally diſſipated: tho' even this does not evade the force of its action over thoſe who practiſe its uſe in certain quantities, for we find that thoſe very perſons accuſtomed to the taking of ſnuff, by exceeding the portion limited, are attacked with every diſagreeable ſymptom,

for the purpoſe of deſtroying life. He haſtened to her aſſiſtance, and immediately adminiſtered a vomit, but without producing the deſired effect. The doſe was repeated and with the ſame reſult. He then abſtracted a few ounces of blood, and vomiting immediately enſued, which reſtored the woman to health.

which they ſo evidently experienced on the firſt employment of it.

" On this ſubject" ſays Dr. Cullen, " it is to be remarked that the power of habit is often unequal; ſo that perſons accuſtomed to the uſe of tobacco, a leſſer quantity, than what they had been accuſtomed to, will often have ſtronger effects than had before commonly appeared. I knew a lady who had been for more than twenty years accuſtomed to take ſnuff, and that at every time of day; but ſhe came at length to obſerve, that ſnuffing a good deal before dinner, took away her appetite: and ſhe came at length to find, that a ſingle pinch, taken any time before dinner, took away almoſt entirely her appetite for that meal. When however, ſhe abſtained entirely from ſnuff before dinner, her appetite continued as uſual; and after dinner, for the reſt of the day, ſhe took ſnuff pretty freely, without any inconvenience*."

This is further corroborated by an aſſertion of Doctor Ruſh's†. "I once attended a gentleman," ſays the Doctor, "who had been for ſome time troubled with pains in his ſtomach, attended with a diminution of appetite, and ſome degree of emaciation. I obſerved that he frequently practiſed the taking of ſnuff, to which I attributed his diſeaſe, and adviſed him to ſuſpend the uſe of it. He accordingly did ſo, and ſoon began to mend very faſt. I was informed by him, a few weeks after, that he had gained thirty weight in fleſh, and was at that period, in the enjoyment of perfect health."

* Cullen's Materia Medica, page 187.

† Profeſſor Ruſh's M. S. Lectures.

It greatly injures the organs of ſmelling, as the infinity of nerves, which are diffuſed throughout the mucous membrane of the noſe, on which depends its ſenſibility, and the acuteneſs of our ſmelling, become conſiderably impaired by the acrimony of ſnuff. "The uſe of this ſubtile powder, is further rendered odious by diſcolouring the ſkin contiguous to the noſe, and will taint the ſweeteſt breath with the rank odour of a tobacco-caſk. For this reaſon the ladies of faſhion in France, ſeldom take ſnuff till they are married; a very high compliment no doubt to their huſbands."

"The only advantage," ſays Dr. Leake*, "of taking ſnuff, is that of ſneezing, which, in ſluggiſh, phlegmatic habits, will give univerſal concuſſion to the body, and promote a more free circulation of the blood; but of this benefit, ſnuff-takers are deprived, from being familiar with its uſe."

Chewing, the moſt odious form in which nicotiana can poſſibly be uſed, next engages our attention.

The conſtant chewing of tobacco impairs the appetite, in a ſimilar manner to ſmoking, from a profuſe diſcharge of ſaliva by expectoration‡, ſo neceſſary for the preſervation of the body, particularly in perſons of a thin habit.

* Leake on the viſcera, page 69.

‡ Dr. Cullen obſerves that "this practice is alſo the occaſion of the greateſt waſte of ſaliva; and the effects of this in weakening digeſtion, and perhaps from thence eſpecially, its noted effect of producing emaciation may appear. Cullen's Materia Medica, page 190.

The nauſeous taſte of the plant being more immediately abſtracted by this proceſs, than either of the others hitherto mentioned, precludes its being carried ſo far by thoſe who have recourſe to it, without conſiderable danger attending ſuch a procedure. Perſons, therefore, who are deſirous of effecting their cuds in this *polite accompliſhment*, are compelled to be extremely particular in regard to the quantity, and time of uſing it, for if continued too long with a *novice in this art*, we find evident marks of its occaſioning extreme anxiety, vertigoes, ſtupors, and diſorders of the ſenſes. Notwithſtanding the greateſt caution of tobacco-chewers, a ſmall portion of the ſaliva, tinctured with this plant, will frequently inſinuate itſelf into the ſtomach, and thereby impair the functions of that viſcus.

As longevity depends on a healthy ſtate of this organ, being one of the moſt important throughout the animal œconomy, the habits of thoſe who addict themſelves to this pernicious cuſtom become vitiated, and conſequently, the number of their days are conſiderably ſhortened. But, as the uſe of tobacco in this form, moſt generally prevails among the vulgar, upon whom friendly admonitions are too frequently thrown away, I ſhall not dwell long on the ſubject; well knowing the great difficulty of eradicating prejudice from ignorant minds, though a circumſtance much to be regretted.

CHAPTER IV.

Of the prejudicial effects of the uſe of Tobacco on the moral faculty.

The general demand for tobacco, as an article of luxury, is owing, I am convinced, to a ſervile attachment for

imitation. Many cuſtoms equally odious, have of late become faſhionable from the ſame cauſe, and it is to be regretted, that men whoſe exalted ſituations in life ought to have rendered them ſuperior to ſuch weakneſſes, have been the principle propagators of theſe pernicious practices. The example of ſuch characters is, unfortunately, eſteemed by perſons in the more ſubordinate walks of life, as the ſtandard of human perfection; hence when vicious cuſtoms are brought into uſe by men of this deſcription, the impreſſion which is made on illiterate minds is more durable, and the proſpect of eradicating them more gloomy.

This plant was firſt introduced into England by Sir Walter Raleigh, about the year 1585; this nobleman uſed it in the form of ſegar, and hence the deſpicable habit of ſmoking was ſpeedily contracted by the inhabitants of that kingdom.

I preſume, our forefathers, muſt have borrowed this cuſtom from the aborigines of America, as we are informed, theſe Savages uſed it long before it was introduced into the civilized world.

Our anceſtors then, have entailed one of the moſt odious vices on their ſons and daughters; for ſorry am I to obſerve, that this plant is uſed by females, as well as males.

Their delicate habits, it was to have been hoped, would have prevented them from the luxurious uſe of ſuch a nauſeous weed, but fatal experience has taught us, that our expectations were merely the reſults of benevolence; with exalted notions of female delicacy, blended with a natural affection for the ſex, we fondly anticipated, that they would

preſerve themſelves aloof from ſuch a deteſtable cuſtom, and therefore expected that a ſegar would never find admittance within their ruby lips.

How far theſe expectations have been realiſed, experience will declare.

The uſe of this plant is not ſolely confined to thoſe ladies, who have paſſed the meridian of life, for in ſuch a caſe the evil would not be ſo great, but the young and the blooming alſo delight in inhaling the fumes of tobacco; from this ſource we may expect much miſchief, for as habit will render this weed as eſſential to their happineſs, as their daily food; ſo alſo we will naturally ſee the riſing generation, fondly allured to a ſimilar attachment.

It is granted that ſmoking, or chewing, univerſally produce thirſt, therefore a deſire for ſtrong drink is excited; and as theſe, when taken between meals, are generally the forerunners of intemperance and drunkenneſs, ſo alſo is vice univerſally the conſequence. This is proved beyond the poſſibility of doubt, by Dr. Ruſh* in his obſervations on the uſe of tobacco; he obſerves its influence in promoting intemperance, in the following words—"One of the greateſt ſots," ſays the Doctor, "I ever knew, acquired a love for ardent ſpirits, by ſwallowing cuds of tobacco, which he did, to eſcape detection in the uſe of it, for he had contracted the habit of chewing, contrary to the advice and commands of his father. He died of a dropſy under my care in the year 1780."

* Ruſh's Eſſays, page 270.

From this fact we ſee, in the moſt undiſguiſed manner, the pernicious effects of this weed, not only on the morals, but on the health, and ought we not then to endeavour to wean ourſelves from the uſe of a plant, which evidently impairs our ability for living as rational beings, and inſures for us an early grave?

We daily witneſs the horrid effects of inebriety, in our intercourſe with the world; a train of evils are produced, which totally diſqualify the ſlaves of it from living in the poliſhed walks of ſociety; they become objects of pity, and contempt, by men of genius and worth, and being excluded from the ſociety of ſuch, they fly to the haunts of vice, and frequently end their days, in a tavern or a brothel.

Idleneſs is alſo generated by the uſe of tobacco, and though it cannot be conſidered ſo immediately deſtructive to health and moral rectitude, as the habit of drunkenneſs, yet the effects are equally extenſive, though ſlower in their operation. The ſocial duties of life are neglected, and every thing valuable and intereſting is totally diſregarded. Our country, our connections, and our friends become objects of but little regard, and finally we attain to ſuch perfection in indolence, that even the neceſſary duties of life, which only extend to ourſelves, are conſidered as burthenſome, and at laſt totally neglected.

Theſe are generally the effects of a ſervile fondneſs for tobacco; and I could enumerate many more, if my time would admit, which are equally diſguſting in their nature; however, as cuſtom has rendered this plant ſo eſſen-

tial to the happineſs of many of our fellow citizens, it cannot be expected that theſe, or any other remarks, would have a tendency to diſcourage the uſe.

CHAPTER V.

Of the analyſis of tobacco, and the operation of its conſtituent parts on living ſyſtems.

EXPERIMENT 10.

I boiled two pounds of the dried leaves, in ſix quarts of water, down to four; the liquor was then ſtrained, and carefully evaporated, over a gentle fire, to the conſiſtence of an extract, which weighed four ounces.

EXPERIMENT 11.

To two ounces of the above extract, I added four ounces of pure alcohol*, and triturated them together, for ſome time in a mortar; after which I poured off the menſtruum, and by the affuſion of diſtilled water, precipitated the reſin, from the alcohol; this I evaporated with a gentle heat, and then weighed the reſiduum, which proved to be three drachms of pure reſin.

EXPERIMENT 12.

Half a pound of the dried leaves of tobacco, put into a crucible, heated red hot, and calcined in the open air

* As the ſpirits of wine is frequently adulterated by the apothecaries, I was at the trouble of diſtilling it myſelf, ſo as to procure it as concentrated as poſſible.

yielded an ounce and an half of white aſhes; to this I added boiling water ſeveral times, and filtered the whole. The reſiduum, when dried, weighed one ounce; ſo that the water took up half an ounce of the vegetable alkali, as is ſufficiently exemplified in the following experiments.

EXPERIMENT 13.

In order to aſcertain whether the ſubſtance taken up by the water, in the preceding experiment, was of the nature of a vegetable alkali, I ſubmitted it to the following teſts.

1ſt. To a ſmall portion of this mixture, I added an aqueous ſolution of *Corroſive ſublimate*, which was inſtantly precipitated of a brick-duſt colour.

2d. I added a few drachms of this filtered mixture, to a ſolution of the *ſulphate of iron**, which inſtantly rendered it of a black turbid colour, ſomewhat tinged with a darkiſh green.

4th. It precipitated the *ſulphate of copper*† of a greeniſh hue.

5th. A piece of paper, ſtained yellow with *turmerick*, was ſtained of a browniſh hue.

6. Litmus paper was changed, to its priſtine blue colour, after being turned red by the *nitric acid*.

7. A piece of paper, ſtained red by the braſil wood was changed from its original colour, to a beautiful purple.

* Green Vitriol, or Copperas.

† Roman, or Blue Vitriol.

All the above teſts, were made individually with an aqueous ſolution of pot-aſh, and preciſely with the ſame reſult, which inconteſtibly confirms the analogy of the two.]

Experiment 14.

The water which was poured on the aſhes of the tobacco, was laid aſide to evaporate ſpontaneouſly, when it yielded cryſtals of the carbonate of pot-aſh, and common ſalt.

Experiment 15.

To the ſubſtance which remained after the affuſion of hot water, weighing one ounce, I added half an ounce of ſulphuric acid, diluted with water, and ſuffered the mixture to boil for a few minutes, over a gentle fire; I then poured it off, and when filtered very clear, it was placed in a ſhallow veſſel, to evaporate; in a few days, cryſtals of the ſulphate of alumine, were obtained. The reſiduum conſiſted of ſilicious earth, and weighed ſix drachms.

Experiment 16.

To half an ounce of the extract, I added four ounces of concentrated nitric acid, which were boiled together over a gentle fire. A large quantity of nitrous gas eſcaped, but as ſoon as the whole was evolved, the mixture was taken off, and it yielded cryſtals of the oxalic acid.

Experiment 17.

Half a pound of the dried leaves were calcined in a red

hot crucible, which emitted a conſiderable vapor. I covered the veſſel cloſe, and ſuffered the ſmoke to paſs through a tube, which was condenſed in a receiver: by this proceſs, I procured ſeveral ounces of the diſtilled water, and near half an ounce of an empyreumatic oil, which trickled down the ſides of the veſſel, and floated on the ſurface of the water.

In order to aſcertain the difference in ſtrength between the reſin and the gum, I made the following experiments.

Experiment 18.

To Thomas Howel, aged fifty, whoſe pulſe beat 66 ſtrokes in a minute, I adminiſtered two grains of the reſin, obtained by the means particularized in experiment eleventh, ſuſpended in a little water, about two hours after he had breakfaſted on bread and chocolate. The reſult of this experiment was as follows.

In	5	10	15	20	25	30	35	40	45	50	55	60	Min.
P. beat	66	66	69	69	70	71	75	72	71	70	66	66	

He complained of conſiderable nauſea at his ſtomach, but no vomiting. He ſhortly after had a paſſage, and voided a copious flow of urine.

Experiment 19.

To John Wheelder, a man of the ſame temperament, I gave four grains of the extract, deprived of its reſin. His pulſe beat 68 ſtrokes in a minute, and the following was the reſult.

In	5	10	15	20	25	30	35	40	45	50	55	60	Min.
P. beat	70	73	74	75	77	78	78	76	73	70	70	68	

In fifteen minutes, he complained of a nauſea; in 25, the nauſea increaſed, attended with a little head-ach. In 30 minutes he perſpired, and felt ſomewhat giddy. About the fortieth minute, he had a copious evacuation downwards, which relieved him conſiderably. At the end of the hour, he felt much better, though ſtill ſome nauſea at his ſtomach, which wore off in the courſe of two or three hours.

I was favoured with the following intereſting experiment, by my ingenious friend Mr. Lee, aged about twenty, an apothecary to the Philadelphia Hoſpital.

EXPERIMENT 20.

At 9 o'clock, P. M. three hours after drinking ſome tea, and eating bread, I took two grains of the reſin, that you gave me, made up into a ſoft pill, with a ſmall portion of flour, and drank water after it, ſo that there was no taſte perceived. From ſeveral previous examinations, my pulſe beat ſixty-eight ſtrokes in a minute, and the alterations produced in it, are marked, in the following table, viz.

In	5	10	15	30	40	45	55	60	65	70	75	Min.
P. beat	73	78	90	94	90	87	90	89	85	80	78	

In	80	85	95	100	105	110	115	120	125	130	135	min.
P.B.	76	74	77	77	77	75	74	74	73	67	66	

" In five minutes I felt a good deal of pain at my ſto-

mach, which continued conſtant for two hours. This continuation of the pain, induced me to carry on the experiment, as far as I did, to ſee more particularly the reſult of its operation. In eight minutes, I began to perſpire, and in fifteen and eighteen minutes, the perſpiration increaſed moſt profuſely, particularly on my upper extremities, and forehead. At ten minutes, I felt giddy, and ſoon became vertiginous, with an evident tremor throughout my frame. Theſe effects went off at thirty five minutes. I vomited four times, viz. at the 20th, 35th, 50th and 90th minutes. This vomiting was as violent, as I have ever experienced from tartar emetic. During the whole time I belched a great deal. After theſe affections ſubſided, I voided urine, and felt diſpoſed for a paſſage downwards, but being late at night, I did not indulge myſelf.

" This laſt affection I attributed ſolely to the purgative quality of the medicine, as I had a paſſage this forenoon, which generally attends me in the four and twenty hours, when in a healthy ſtate; but ſeldom more, and ſometimes, I paſs the whole day without ſuch an evacuation.

" N. B. I took particular care not to examine my pulſe after vomiting, until the expiration of five minutes; and always before noting it, I remained ſtill in one poſture, at leaſt two minutes, in order that it might not be increaſed by exertions of any kind."

Mr. Lee informed me, that he does not uſe tobacco in any form whatever, to which may be attributed, the violence of the ſymptoms, as well as great increaſe of pulſe, for we find the ſame quantity did not produce ſuch violent affections in Thomas Howel, who occaſionally indulged himſelf in the taking of a little.

EXPERIMENT 21.

I gave three drops of the diſtilled water,* as procured in the 17th experiment, to Thomas Howel, on whom the 18th experiment was made. His pulſe beat 68 ſtrokes in a minute, and it affected him in the following manner.

In	5	10	15	20	25	30	35	40	45	50	55	60	min.
P. beat	69	71	71	73	75	78	76	76	74	71	70	67	

In fifteen minutes, he ſaid that his ſtomach felt a little warm, as if he had drank brandy and water. At the 25th minute a nauſea occurred. In thirty-five minutes, ſtill ſome ſickneſs at his ſtomach, but not ſo perceptible as before. In 55 and 60 minutes, he experienced no further inconvenience from the doſe.

EXPERIMENT 22

To aſcertain more particularly the operation of the diſtilled water, I took three drops in a little cold tea, on an empty ſtomach, my pulſe beating 68 ſtrokes in a minute, and the following was the effect.

In	5	10	15	20	25	30	35	Min.
P. beat	70	70	72	73	77	80	80	

In	40	45	50	55	60	65	70	75	Min.
P. beat	80	80	76	72	66	66	68	68	

* This water was extremely acrid, and ſomewhat impregnated with the oil.

In ten minutes, I felt a warmth throughout my throat and ſtomach; in twenty minutes my head became a little confuſed, and the nauſea increaſed. At the thirtieth, I made ſeveral efforts to eject the contents of my ſtomach, but without effect, and in forty minutes this diſpoſition for vomiting ſubſided. There was a conſiderable moiſture on my forehead, until the forty-fifth minute, but diſappeared on the ſixtieth. In an hour and fifteen minutes, every ſymptom totally vaniſhed, and I remained perfectly compoſed for the remainder of the evening.

Experiment 23.

Five grains of the extract were diſſolved in water, and given to a cat, which induced vomiting in the courſe of five minutes; this continued for near half an hour, with intervals of ſix or eight minutes. After this time the vomiting ſubſided, and the animal perfectly recovered.

Experiment 24.

Five grains of the extract were diſſolved in one ounce of water, and injected into the rectum of a ſmall dog: in three minutes it began to be extremely reſtleſs; in five it ran about the room, and apparently in great diſtreſs; it continued thus for ſeven or eight minutes, when a copious evacuation took place, which relieved it conſiderably; the animal was diveſted of every indication of pain in the ſpace of thirty minutes.

Experiment 25.

I injected ten grains of the extract diſſolved in half an ounce of water, into the rectum of a full grown cat, which

produced ſlight convulſions in the abdominal muſcles, and a great degree of diſquietude for the ſpace of thirty minutes; a copious evacuation ſucceeded theſe ſymptoms, which leſſened them conſiderably; at the expiration of an hour, they were evidently diminiſhed, and, to every appearance, totally ſubſided in the courſe of two hours and a half.

EXPERIMENT 26.

Three hours after performing the above experiment, I adminiſtered to the ſame cat, ten grains of the reſin ſuſpended in water, which produced violent contortions of the abdomen, in the ſhort ſpace of ten minutes: free and repeated diſcharges were the reſult of this exhibition; and the poor animal diſcovered by its mewing, and grimaces, ſuch exquiſite torture, that at the 20th minute, I injected the like quantity into its mouth, in order to put an end to its exiſtence. In leſs than thirty minutes, theſe affections were greatly increaſed, and a violent vomiting enſued, attended with great commotions of the ſtomach, and repeated diſcharges of its contents. In forty minutes the convulſions of the abdominal muſcles, were conſiderably augmented, and an inceſſant tremor pervaded the whole frame. In this deplorable ſituation it continued for ſome time, when it ſprung up, and hobbled acroſs the room. In an hour and ten minutes, it foamed conſiderably at the mouth; the reſpiration became quick and extremely laborious, and it aſſumed, in every reſpect, the appearance of a rabid animal; the ſpaſmodic contractions of the ſtomach and abdomen were greatly promoted, and the poor animal appeared for a time, as if it would eject the very ſtomach itſelf.* In this dreadful ſtate it remained until near the 2d hour, when death as a benign attendant cloſed the lamentable ſcene.

* Similar ſymptoms took place from the exhibition of two drachms

EXPERIMENT 27.

I gave to a large dog, thirty grains of the extract, conſiſting of the gum and reſin, which produced no ſenſible effects for the firſt hour; in an hour and fifteen minutes, he diſcovered ſome commotion in the ſtomach, by the ſaliva which run from the mouth, and alſo by ſeveral convulſions of the body, as if inclined for vomiting. Nothing was ejected from the ſtomach, but the dog had copious and repeated diſcharges through the medium of the rectum, for ſeveral hours after. The enſuing day he had perfectly recovered, and ſuſtained no apparent inconvenience from his bolus.

EXPERIMENT 28.

Fifteen grains of the reſin were given to a dog of the ſame ſtrength, which cauſed an inclination to vomit in the

of camphor, and as the analogy is ſo great, I will give the extract from the London medical obſervations, as related by Mr. Hoffman. "I gave," ſays Mr. Hoffman, "to a large grey hound, two drachms of camphor, in a ball of hogs lard. Three quarters of an hour after, the dog began to look wild and furious, lolled out his tongue, worked in his flanks, as if exceſſively fatigued. I found the nervous parts ſo violently contracted, their rigidity ſo great, and the dog when attempting to walk, inſtead of advancing, recoiled backwards, dragging his forelegs after him, as if he dreaded by going forwards, to fall down a precipice. He then fell into convulſions. After a little time he got up, began to walk, ſtriking his head againſt any thing, that happened in his way; tumbling and tottering as if intoxicated. When I offered him ſome water to drink, notwithſtanding he appeared very thirſty, he refuſed it. The ſymptoms reſembled the *hydrophobia*. In about twenty-four hours every appearance of madneſs, gradually ſubſided, and left the dog in a quite weak and feeble condition; but afterwards he recovered gradually.

ſpace of half an hour. In three quarters, he threw up the contents of his ſtomach, and appeared for ſome time in great anxiety. In an hour, he had a large evacuation from his bowels; and the medicine operated various times, both as an emetic and cathartic.

For the ſucceeding part of the day, he appeared as uſual, and no further inconvenience attended this exhibition.

EXPERIMENT 29.

Thirty drops of the diſtilled water, as procured in experiment 17th, was given to a cat, which occaſioned convulſions in five minutes. In ten it ſprung about, and contorted its body in a variety of forms; the convulſions, in twelve minutes were ſo much augmented, that it was affecting to behold the torture of the animal, and in this exquiſite pain it ſuddenly expired.

EXPERIMENT 30.

I applied three drops of the oil of tobacco to the tongue of a cat, which almoſt inſtantaneouſly produced convulſions, and in ſix or eight minutes, its breathing was ſtertorous, accompanied with tremors, and conſiderable pain.* It recovered conſiderably in the courſe of an hour, and in about an hour and an half, ſeemed to enjoy its priſtine compoſure.

EXPERIMENT 31.

After laying bare ſeveral muſcles of the leg of a pige-

* This is taken notice of in the new Royal Encyclopedia, under the head of *Nicotiana*.

on,* I applied two drops of the oil of tobacco, which almoſt inſtantaneouſly occaſioned a ſpaſmodic affection, and ſuch a degree of rigidity in the whole of the extremity, as to induce an inability for motion; a quick reſpiration accompanied the whole, attended with a violent palpitation of the heart, and a conſiderable tremor, throughout the extremity.

Theſe ſymptoms continued for twenty minutes, but after the expiration of half an hour, gradually diminiſhed and totally ſubſided in the courſe of an hour. In attempting to catch it, it walked acroſs the room, but with ſome difficulty. In an hour and fifteen minutes, it ejected† the contents of its ſtomach, which relieved it conſiderably, and occaſioned its aſſuming a more lively aſpect.

No diſagreeable conſequences enſued, and it perfectly recovered theſe affections.

EXPERIMENT 32.

The muſcles of the lower extremity of a frog, were laid bare, and four drops of the oil of tobacco applied to them, which occaſioned, in five minutes a paralyſis of the limb,

* I am conſcious of the apparent inhumanity of many of the experiments here inſerted; but when we reflect on the neceſſity which frequently occurs of our reſorting to them in particular enquiries, relative to the various operations of medicines, I flatter myſelf that I ſhall be deemed ſufficiently excuſable for practiſing them as often as I have done.

† The Indians poiſon their arrows, with *the oil of tobacco*, which, infuſed into a freſh wound, occaſions ſickneſs, and vomiting, or convulſions and death.

and ſmall tremulous motions throughout the whole body: the limb remained perfectly inactive; the iſchiatic nerve was then pricked, in order to aſcertain, whether the part was deprived of its contractile power, but no viſible effect was produced: upon touching the iſchiatic nerve of the other extremity, a violent contraction of the leg inſtantaneouſly took place.

This experiment was repeated divers times, and with the ſame reſults.

Experiment 33.

An opening was made in the teguments on the back part of the neck of a pigeon, and raiſed without injuring the fleſhy part of it. Four drops of the oil of tobacco were then introduced. In five minutes, it indicated ſome degree of pain, by a flapping of its wings, and on the ſeventh minute, it was attacked with a tremor, when its feet became rigidly extended, and on the tenth, it inſtantly expired.

Experiment 34.

The breaſt of a pigeon was punctured, and the orifice filled up with ſeveral drops of the oil of tobacco. In five minutes the legs were ſeized with an inability for motion. The breaſt was now its only ſupport, and it continued in this ſituation, for forty minutes. It indicated great pain the whole of this time, and was ſurpriſingly convulſed. It made ſeveral efforts to vomit, but its ſtomach being empty from a long confinement, nothing was ejected. At the expiration of an hour, it aroſe, and walked acroſs the room.

The pigeon ſuſtained no further injury, and was perfectly lively, two days after.

Obſervations on the Experiments.

AS I have already taken notice of the particular operation of tobacco, on the human ſyſtem, in a preceding part of this work, I ſhall avoid prolixity by referring to thoſe pages,* where an accurate definition has already been offered; the inferences of which are drawn from ſeveral of the preceding experiments. I ſhall, therefore, without further comment paſs them over, and proceed to an examination of the fifth experiment, where we have an opportunity of obſerving the ſtimulating effects of tobacco, when applied externally to an irritable ſurface.

In reviewing the ſixth experiment, we find that Nicotiana proves a gentle emetic, when externally applied to the body, which fact is alſo corroborated, by an experiment of my friend Mr. Dart's, already taken notice of. In caſes where internal emetics may be objected to, this application may be adopted with little or no inconvenience, particularly as its operation is of a very lenient nature.

In regard to the experiments made on the mice, it is to be obſerved, that death was almoſt an immediate attendant on each. I diſſected ſeveral of theſe animals after the extinction of life, in order to ſee if I could trace any marks

* Pages 30 and 33.

of inflammation. In two or three that I opened, no viſible effects were produced; in others, the minute blood veſſels throughout the inteſtines, were ſomewhat florid, but perhaps this might have proceeded from ſome other cauſe. Here it may be preſumed, that the *exceſſive ſtimulating quality* of this plant, was diſproportioned to the *excitability* of their ſyſtems, and conſequently death was induced, before any *inflammatory type* could poſſibly have taken place.*

With reſpect to the conſtituent parts of tobacco, we find, agreeable to the eleventh experiment, that it poſſeſſes an extract conſiſting of a gum and reſin, two ounces of which afforded three drachms of pure reſin. From the ſeveral experiments that I have made, the moſt active property of this plant conſiſts in the reſinous portion.

The aſhes obtained from the twelfth experiment, yielded a large portion of vegetable alkali, as is ſufficiently confirmed from the teſts enumerated. The fourteenth experiment afforded cryſtals of the carbonate of pot-aſh and common ſalt; from the fifteenth was obtained the ſulphate of alumine.

Cryſtals of the oxalic acid, were procured from the ſixteenth experiment. The ſeventeenth afforded a water extremely pungent when applied to the tongue, and the oil which floated on its ſurface was very acrid, when in contact with a denuded ſurface of the body. We may perceive from

* Dr. Ruſh remarks that the ſame frequently occurred, with perſons who died ſuddenly of the yellow fever. "It is owing," ſays this acute phyſiologiſt, "to a *ſudden proſtration* of the ſyſtem, before the *exiſtence of morbid action*, without which no inflammation can take place."

the reſults of the 18th and 19th experiments, the difference exiſting between the gum and reſin, for both of the men on whom theſe experiments were performed, were of the ſame temperament, and occaſionally practiſed the chewing of tobacco. From the twentieth experiment, which was performed by Mr. Lee, we ſee clearly manifeſted the immenſe power of the reſinous portion of the extract, and its virtue as a medicine, occaſioning nauſea, a profuſe perſpiration, and at length vomiting.

Tobacco appears to be unequivocally a powerful diaphoretic, and as ſuch it has proved efficacious in a variety of diſeaſes. It is to be regretted that its exhibition is not oftener repeated; for there are teſtimonies of its ſalutary influence in many obſtinate fevers, which predominated over the moſt powerful remedies which are eſteemed valuable for exciting a ſpeedy and profuſe perſpiration.

The twenty-firſt and twenty ſecond experiments, evince the immenſe power which the diſtilled water poſſeſſes: phyſicians formerly made uſe of it with advantage, and I entertain not the ſmalleſt doubt, but that, with a proper dilution, it may now be adminiſtered with much efficacy.

The twenty-third, twenty-fourth, and twenty-fifth experiments, clearly demonſtrate the emetic and purgative qualities of this plant; and the twenty-ſixth, twenty-ſeventh, and twenty-eighth, again elucidate the difference exiſting between the gum and reſin; for, agreeable to theſe experiments, we find that one half of the latter, operated more powerfully than twice the quantity of the former.

The immenſe acrimony of the diſtilled water, is evi-

dently depicted in the twenty-ninth experiment, for the ſmall quantity of thirty drops produced convulſions and death in a cat, in the ſhort ſpace of twelve minutes. The thirtieth, and the ſucceeding experiments ſufficiently evince the power with which the oil of tobacco is endued, occaſioning a univerſal tremor throughout the whole frame, and a paralyſis of the parts to which it was applied.

An account of its medical virtues, in eradicating certain diſeaſes.

THE medical powers of tobacco were generally known among phyſicians, at an early period, who aſcribed many virtues to it in certain obſtinate diſeaſes. With reſpect to its operation as a general evacuant, I may, from my experiments, and the corroborating aſſertions of various authors, pronounce this medicine a valuable acquiſition to the materia medica; and that its evident operation on the ſyſtem, is that of *a ſudorific*, an *emetic*, a *cathartic*, and a *diuretic*. Hence the propriety of its uſe, in a variety of diſeaſes.

In caſes of aſcites and other dropſical affections, it appears to be an invaluable remedy.

As a diuretic, I would venture to aſſert, that it is excelled by few, if any of our indigenous plants. The *digitalis purpurea*,* which grows luxuriantly in South-Caroli-

* Purple Fox-glove.

na, has been much celebrated for its diuretic quality, by medical characters ; but I have ſeen inſtances where the tobacco has eradicated ſeveral violent caſes of *aſcites*, where this had proved but of little effect. " Diuretics," ſays a much celebrated character,† " have ſo long been employed with benefit in the treatment of dropſies, that it becomes a matter of conſequence, to increaſe the number of the medicines of this claſs, and to learn how to exhibit, with more advantage, thoſe which are already known." In how great eſtimation then ſhould we hold that plant, which is evidently endowed with a power of evacuating the accumulated water by a natural diſcharge, for the relief of aſcites and other dropſical affections, in lieu of reſorting to a ſurgical operation, which is painful and diſagreeable to the afflicted patient; that nicotiana poſſeſſes this quality, no one will pretend to deny.

Every practitioner of medicine, who has attentively peruſed the publication of the ingenious Doctor Fowler, on the effects of Tobacco, with reſpect to its diuretic quality, muſt candidly acknowledge its ſalutary effects, in caſes of dropſy and dyſury. The uniform reſult attendant on his experiments, together with the many proofs of its virtues which have come under my cognizance, clearly evince the indefinite worth of this plant, and the neceſſity of adminiſtering it in thoſe caſes of dropſy, which ſeem to triumph over medicines of leſs efficacy, although held in the greateſt repute.

To illuſtrate this ſtill further, I have been informed by ſeveral perſons of unqueſtionable veracity, that a variety

† See profeſſor Barton's eſſay towards a *materia medica* of the United States. page 34.

of the moſt violent caſes of dropſy, many of which had baffled the ſkill of the moſt eminent phyſicians, were perfectly eradicated by an old negro fellow. His remedy was, for a time, unknown to any but himſelf, until, by ſome accidental occurrence, it was diſcovered to be a ſimple decoction of tobacco, diſguiſed with ſome odoriferous herb. As an additional proof of the efficacy of this plant in the various ſpecies of dropſy, I ſhall take the liberty of introducing the opinion of Dr. Cullen, when conſidering the effects of vomiting, in promoting abſorption, and thereby relieving patients affected with dropſy. "Spontaneous vomiting," ſays the Dr. has ſometimes excited an abſorption in hydropic parts, and thereby drawn off the waters lodged in them, it is reaſonable to ſuppoſe, that vomiting excited by art, may have the ſame effect; and accordingly it has been often practiſed with advantage*." The doctor then proceeds with obſerving, "that there are no means we can employ to procure a copious evacuation of ſerous fluids, with greater certainty than the operation of purgatives, and it is upon theſe accounts, that purging is the evacuation which has been moſt frequently, and perhaps with moſt ſucceſs, employed in dropſy†." He further remarks "that the kidneys afford a natural outlet for a great part of the watery fluids, contained in the blood veſſels; and the increaſing the excretions by the kidneys‡ to a conſiderable degree, is a means, as likely, as any other of exciting an abſorption in dropſical parts. It is upon this account that

* Cullen's Firſt lines Vol. II. page 407.

† Cullen's Practice of Phyſic. Vol. II. page 408.

‡ It is remarked by Dr. Sydenham, when treating of diuretics in dropſical caſes, "that where the waters are not to be diſcharged by ve-

diuretic medicines have been always properly employed in the cure of dropſy. It happens however, unluckily, that none of *them* are of a *very certain operation**". He then proceeds by announcing the utility of ſuderifics, in many caſes of dropſical affections, and affirms, that they have proved ſalutary in many inſtances.

As I have had ſome opportunities of witneſſing the happy effects of tobacco, and its various operations on the ſyſtem, I would beg leave to obſerve that all theſe virtues hitherto enumerated by Doctor Cullen, appear to be, under certain circumſtances, concentrated in this plant; from my experience, I may venture to aſſert, with ſome degree of confidence, that it has proved of ineſtimable worth for the relief of patients afflicted with dropſy.

In reviewing what I have written on the medical properties of this plant, I perceive that my limited information has prevented me from doing ample juſtice to the ſubject: in order, therefore, to extenuate my deficiencies, I ſhall

miting or purging; for inſtance in weak conſtitutions, and hyſteric ſubjects, they cannot be evacuated by *purgatives*, and much leſs by *vomitives*, but are to be carried off by *diuretics*. Several of this kind are extolled in the writings of phyſicians, but the moſt, if not the only efficacious ones, in my opinion, are thoſe prepared from *lixivial ſalts*, from whatever plant the aſhes be obtained". Doctor Wallis obſerves that the aſhes of tobacco, has oftentimes proved efficacious in the relief of dropſy. Wallis's Sydenham. Vol. II. page 289.

* Doctor Fowler obſerves on this head, that ſuch conſiderations firſt induced him to make trial of a greater variety of diuretic medicines in dropſical caſes, than have generally been uſed; in hopes of finding ſome one, more efficacious than the reſt: and he flatters himſelf, he may recommend, as ſuch, the celebrated Indian plant commonly called Tobacco.

apply to the learned pages of Doctor Fowler* for aid, in accompliſhing the deſign of this undertaking.

In this work ſo replete with medical information, many intereſting facts may be collected; and I truſt that it will be found on an impaſſioned examination of our experiments, that I have not departed from truth, nor built my opinions on conjecture.

Doctor Fowler obſerves that a paragraph, in the third volume of Dr. Duncan's very valuable medical commentaries, firſt induced him to adminiſter tobacco. It was part of a letter, from Dr. Garden of Charleſton South-Carolina, to Dr. Hope of Edinburgh; wherein he ſays—" Here we uſe with ſurprizingly great efficacy, in dropſical caſes, the alkaline fixed ſalt of tobacco, &c.

Doctor Fowler remarks that a variety of operations, in different authors, have been aſcribed to this plant, and that he was led from this circumſtance to aſc.rtain more particularly its virtues; being ſolicitous of eſtabliſhing his opinions on a more ſubſtantial baſis than the aſſertions of others, he reſolved on entering into a minute inveſtigation of the ſubject, and conſequently founded the poſitions there ſtated, on his own experience and obſervation.

The reſult of this enquiry, has afforded him very favourable ideas upon the ſubject, and from the number of facts enumerated by him, we may infer, that tobacco, under proper regulations, may be adminiſtered internally, not only as a ſafe, but as an efficacious, and valuable remedy; eſpeci-

* See Doctor Thomas Fowler's Medical reports of the Effects of Tobacco.

ally as a *powerful diuretic* in caſes of dropſies and dyſuries*.

* To illuſtrate the manner of its exhibition, and alſo its ſalutary effects in many caſes, I will take the liberty of inſerting a few extracts from Dr. Fowler, as related by him, and which were the reſults of his own obſervations.

It appears from many experiments, ſays the Doctor, that the average doſe for an adult, ſufficient to produce the deſired effect, will be about eighty drops of the infuſion; or to ſpeak with ſome latitude, from ſixty drops to one hundred, and to be repeated twice a day.

The propereſt times for adminiſtering the medicine, are two hours before dinner, and at bed-time; it being obſerved to diſagree the moſt with the ſtomach, in a morning faſting. And ſuch is the difference between morning and night, that almoſt every patient will require to take one fourth, and ſome even one third leſs, in the forenoon, than in the evening; in order to enable them to bear the doſes, with equal convenience. The infuſion ſhould always be adminiſtered in ſome vehicle; which may either be water, or any other ſimple drink.

The common doſe juſt mentioned, relate only to adults of an ordinary conſtitution; for it deſerves particular notice, that between conſtitutions, which are very nervous and irritable, and thoſe which are very robuſt, or torpid, or long accuſtomed to the uſe of tobacco, the doſes will admit of very great, and ſurpriſing variations.

As an illuſtration of this point, I ſhall here annex a comparative view of the doſes of the infuſion, adminiſtered in ninety four caſes of adults; taking the medium-doſe of each caſe, and reducing the whole into four claſſes, according to the number of drops.

Firſt Claſs. Medium doſes.

21 Caſes (3 men, and 18 women), from 35 to 60 drops.

Second Claſs,

57 Caſes, (29 men, and 28 women), from 60 to 100 drops.

A medicine poſſeſſing this quality in an eminent degree, has long been acknowledged to be a deſideratum in phyſic; and let it be conſidered as a further recommendation, that it is found in a vegetable. Becauſe the productions of nature are generally conſtant and uniform; while thoſe of art, are too often variable and uncertain; which is the caſe in ſome of our moſt powerful chemical remedies.

In Fever.

AS it is not my intention to enter into a particular diſquiſition relative to the nature of fever, I ſhall only obſerve that ſuch medicines as promote a profuſe diaphoreſis are frequently reſorted to by phyſicians, and I have no doubt but that the infuſion of tobacco, in naufeating doſes, ſo as to induce copious ſweating, would be attended with very ſalutary effects.

Third Claſs.

13 Caſes, (9 men, and 4 women), from 100 to 150.

Fourth Claſs.

3 Caſes, (3 men), from 150 to 300.

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Seeing the diverſity of doſes is ſo great, I would lay it down as a rule, by way of caution, to begin with ſixty drops, or three fourths of the medium-doſe, in a caſe of a delicate conſtitution; and to increaſe the number of drops, by five, eight or ten at a time, till by their obvious effects on the ſyſtem, the proper doſe ſhall be aſcertained.

But if the patient ſhould be a male, and the conſtitution robuſt, torpid, or accuſtomed to the uſe of tobacco, we may ſafely venture to begin with eighty, ninety, or one hundred drops; and thus, with more expedition, regulate the future doſes according to the effects.

In the cure of fever, various means are reſorted to by medical characters; ſome appear to be more particularly attached to the uſe of the lancet, others to vomiting, ſome to ſweating, and many prefer the uſe of purgatives, but their objects, it may be preſumed, are ultimately the ſame, viz. *depletion*. Is it not probable then that the complicated operation of tobacco would render its exhibition beneficial in many caſes of fever? And would it not, on this conſideration, be expedient for phyſicians to practiſe the uſe of it more often than they do?

In teſtimony of its efficacy, I have a well authenticated fact, where the external application of the leaves to the wriſts of a child, produced conſiderable nauſea, a profuſe diaphoreſis, and at length vomiting, with repeated evacuations downwards. This child had been for ſome time afflicted with an obſtinate fever, and the uſual remedies were made uſe of without any benefit attending them; but by the virtues of tobacco, in the manner above ſpecified, the diſeaſe was totally ſubdued, and the child was happily reſcued from impending death.

Doctor Shannon remarks, "that the Africans make uſe of a ſort of poultice of wild tobacco chopped up green, with green *capſicum**, applied to the wriſts for the cure of fever, with a decoction of herbs that promote a copious ſweat†."

* A ſpecies of Pepper.

† R. Shannon, M. D. on Medicine, page 380.

In Nephritis.

IN caſes of nephritis calculoſa, or gravel, the infuſion of tobacco has been given with very good effect; and Dr. Fowler affirms, that he has ſeen many caſes where it proved of infinite utility, and in ſome inſtances perfected radical cures. Phyſicians many years back, were not ignorant of its virtues in ſuch affections, for they have aſſerted that it has proved "profitable for thoſe who are troubled with a ſtone in the kidney, both to eaſe pain, and by provoking urine to expel gravel and the ſtone engendered therein.†"

Aſcarides.

A SPECIES of worms, thus termed from their inceſſant troubleſome motion, which excites an itching. They are ſmall and white, with ſharp pointed heads, and generally exiſt in the rectum.

They oftentimes occaſion ſuch uneaſineſs in ſome people as to induce fainting, and frequently prove ſo troubleſome throughout the night, as to deprive them of ſleep. They are ſo completely enveloped in mucus, that it is with difficulty they can be eradicated, and frequently they reſiſt the moſt powerful anthelmintics; but practical authors obſerve, "that the fumes of burning tobacco injected clyſterwiſe into the rectum, is of ſingular efficacy."

Farriers are aware of its immenſe virtues in ſuch affections, for they generally pronounce it to be infallible in expelling thoſe ſmall worms, commonly called *bots*, which ſo frequently prove mortal to many horſes.

† Theatrum Botannicum, p. 711.

In Aſthma.

IN aſthmatic caſes, this medicine has frequently afforded relief, by its expectorant quality ;* for agreeable to the diſcharge of mucous, we find the remiſſion of coughing more or leſs conſiderable: but ſhould an inflammatory type prevail, which generally occurs in the recent ſtage of this diſeaſe, its uſe ſhould be protracted, until proper depletive remedies have had the effect of reducing the ſyſtem to that ſtate, which would render its exhibition the more efficacious.

In Odontalgia or Tooth-ach.

IN ſuch affections, the ſmoking of a ſegar, has imparted conſiderable relief. A piece of lint, impregnated with the expreſſed juice of tobacco, has often, in ſome inſtances, acted as a charm, in mitigating the violence of the tooth-ach. The oil of tobacco,† dropped on a piece of cotton, of ſufficient magnitude to occupy the concavity of the affected tooth, has proved almoſt inſtantaneous in its relief. In theſe various forms, tobacco acts by its ſtimulating quality, deſtroying the ſenſibility of the nerve, and thereby encountering pain. Opium oftentimes acts in like manner, but neither perfect permanent cures; for the pains frequently recur, and the only radical remedy to which we muſt ultimately reſort, is the extraction of the affected tooth.

* Dr. Fowler obſerves, that he has tried the infuſion in many caſes of aſthma, where it proved expectorant, and procured relief.

† It muſt here be remarked that this remedy ſhould not be

In Colic.

THE decoction of tobacco, exhibited in the form of an injection, has afforded almoſt inſtantaneous relief, after other medicines had proved ineffectual. Particularly as Dr. Sydenham obſerves, " when the violence of the vomiting do not yield to mild purgatives; for it avails not to exhibit a gentle cathartic, unleſs perhaps, the patient be eaſy to work upon, which ſhould be carefully inquired into, becauſe ſuch a medicine, being too weak to make its way through the inteſtinal tube, does more miſchief: the vomiting and pain being increaſed by its languid and ineffectual motion.*" There was a violent caſe of this diſeaſe, which came under the immediate inſpection of Dr. Deas, in South-Carolina; where the beneficial influence of tobacco was very demonſtrative. Several powerful cathartics were adminiſtered without the ſmalleſt effect; and the diſorder was degenerating faſt into an iliac paſſion. Recourſe was then had, as the laſt reſource, to a ſtrong decoction of the dried leaves of tobacco; immediately after the exhibition of it, through the medium of the rectum, a violent commotion pervaded the whole abdominal viſcera; the patient became extremely reſtleſs†, and it was with

adopted by perſons unaccuſtomed to the uſe of tobacco, as the oil is extremely nauſeous, and will oftentimes induce vomiting.

* Wallis's Sydenham, p. 277.

† Dr. Fowler remarks, that by a proper adminiſtration, theſe violent effects may be avoided. An ounce of the infuſion he obſerves, will be found a medium doſe, in the form of an injection, for an adult of an ordinary conſtitution; and the general rule by which he was guided, is as follows: Suppoſing a common injection to have been adminiſtered without effect, I would order one of an

the greateſt difficulty that two perſons could keep him in his bed. At length a profuſe diſcharge enſued, and relief was afforded in a very ſhort time.

In the Iliac Paſſion.

" IT is highly proper," ſays Dr. Sydenham, " to give a ſtrong purging glyſter, an hour or two after bleeding*." In ſuch caſes, I have ſeen the tobacco infuſion made uſe of with conſiderable advantage. The Doctor himſelf remarks the ſalutary effects of tobacco in this diſeaſe. " The ſmoke of tobacco," he obſerves, " forced up thro' a bladder into the bowels by an inverted pipe, has been attended with very beneficial conſequences."

It is aſſerted in the Royal Encyclopœdia, that a ſtrong decoction of tobacco thrown up the rectum, has proved of good effect in what is uſually called the *ſtone-colic*, and alſo in the iliac paſſion.

ounce of the infuſion, agreeable to the preceding obſervation, in half a pint of milk, or common gruel, to be immediately injected. If this procured no relief, or excited no giddineſs, or nauſea, continuing for the ſpace of thirty, forty, or ſixty minutes; theſe laſt effects in obſtinate conſtipations, moſt frequently preceding its laxative operation, then I would gradually increaſe the ſtrength of the future injections, till one or other of theſe effects ſhould take place.

By this mode of proceeding, the powers of the medicines, whether ſucceſsful or not, will be fully tried in the ſpace of a few hours; a matter of ſerious conſequence, where ſuſpenſe is diſtreſſing, and delay dangerous.

* Wallis's Sydenham, p. 443.

In Hernia.

IT generally occurs that coſtiveneſs is one of the moſt alarming ſymptoms attendant on this diſeaſe, for the relief of which, ſtimulating purgatives are generally adminiſtered; but it not unfrequently happens that they do much injury, for when they have not the deſired effect, they produce a conſiderable naufea at the ſtomach, and ſometimes vomiting, which promotes the pain and tenſion of the tumour.

"In ſuch affections," ſays Mr. Bell, "I would recommend tobacco ſmoke thrown up in the form of injections, as preferable to every other remedy.*"

In Tympanites Inteſtinalis.

This is termed a flatulent dropſy, the abdomen frequently becomes conſiderably diſtended, and in ſuch caſes the chief intention is to diſcharge the flatulencies: various remedies have been indicated for this purpoſe, and there have been inſtances where the infuſion of tobacco has proved efficacious after the failure of many of them.

"A caſe of two years continuance," ſays Doctor Fowler, "after the trial of various remedies, has been ſurpriſingly relieved by glyſters of tobacco prepared in a very ſtrong manner. Their operation was moderately purgative, accompanied with naufea, vertigo, a copious perſpiration, and much diſcharge of wind."

* Bell's Surgery, vol. I. p. 162.

In obſtinate Ulcers.

The dried leaves of tobacco, ſteeped in water and applied to the parts affected, have ſometimes been attended with beneficial effects.

Mr. William Bartram informed me, that he knew of ſeveral long ſtanding ulcers, after having reſiſted the uſual remedies, that were entirely cured by the uſe of tobacco, in the manner above ſpecified. Doctor Earle, of Maryland, communicated to me the caſe of a child, who had been for ſeveral months afflicted with an obſtinate eruption on its head, which evaded the ſkill of ſeveral eminent phyſicians, that was ultimately cured by an old woman, who daily dreſſed it with an ointment of tobacco, previouſly waſhing the part with a decoction of the ſame.

In the Itch.

This fulſome diſorder has frequently been cured by the application of tobacco to the affected parts. Mr. Jacobs, a gentleman from Paris, informed me, that the French phyſicians, make great uſe of the tobacco waſh * in obſtinate

* The waſh is prepared in the following manner.

To one pound of the dried tobacco leaves, add four quarts of water; let theſe boil ſlowly over a gentle fire, for the ſpace of half an hour, then pour off the liquor, and add to it one ounce of ſoda or mineral alkali. The parts affected are to be well rubbed with a ſufficient portion of this mixture, and to be continued from one to three weeks, according to the virulency of the caſe. Though it muſt be remarked, that, in conſequence of the irritability of many conſtitutions, great caution is requiſite, with reſpect to its uſe, as it has, in ſome inſtances, occaſioned vomiting, and ſometimes convulſions.

caſes of cutaneous eruptions. The ſame, he avers, ſeldom fails of curing the itch: the eruptive parts are to be waſhed three or four times a day, until every appearance ſubſides; in this way radical cures have been effected, even after the diſeaſe had reſiſted the moſt powerful medicines.

A ſtrong decoction of the ſtalks with ſharp-pointed dock and alum is ſaid to be of good ſervice, uſed externally, in cuticular diſtempers: this is alſo ſaid to be infallible in curing the mange in dogs.*

In Phtheiriaſis.

This is a *louſy* diſtemper, to which moſt children are generally ſubject, adults alſo at times, are afflicted with it. Moiſt and warm ſituations promote the increaſe of theſe deteſtable vermin; but a cold and dry one very ſoon exterminate them. Four ſpecies are peculiar to the human body, viz. 1ſt. The *pediculi*,† ſo called from their being more troubleſome with their feet, than from their bite. They generally infeſt the head, particularly if ſore.

2d. *Morpiones* or Crab-lice. They are thus called from the analogy which they bear to a crab-fiſh. 3d. Body-lice. Theſe are generated in the apparel of the filthy. 4th. A ſpecies which breed under the cuticle, and are called by ſome

* The New Royal Encyclopedia, by George Selby Howard.

† A gentleman informed me, that when young, he was neglected by his attendants, and for a time was much afflicted with the firſt and third ſpecies of theſe fulſome vermin, which occaſioned obſtinate eruptions, in his head, and on various parts of his body. Many

authors, *cyriones*. They are of a round form, extremely minute, and are generally found in the hands and feet. By creeping under the ſcarf-ſkin they induce an intolerable itching, and when the ſkin burſts where they lodge, cluſters of them are found depoſited in a ſmall concavity.

A good diet, and attention to cleanlineſs contribute much to the deſtruction of theſe fulſome vermin. Mercurial ointment, and a ſolution of corroſive ſublimate are held in the greateſt eſtimation; but I have heard of inſtances, where theſe have failed, and an infuſion of tobacco,* perfected a radical cure.

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medicines were tried for his relief, but without any benefit whatever. Recourſe was then had to a ſtrong decoction of tobacco, which was applied three or four times a day, to the parts affected, and in a fortnight or three weeks he was radically cured.

* It may here be neceſſary to remark that, I have often heard it aſſerted that, the tobacco decoction proves very deſtructive to flies, when ſprinkled about a room. The ſame is corroborated in the Theatrum Botanicum, where the author obſerves, that a decoction of tobacco was frequently made uſe of for the purpoſe of deſtroying flies.

Doctor Shannon aſſerts that, there is a large fly in ſome parts of Africa, that produces often a dreadful diſeaſe, by depoſiting its ova in the mouth or noſe.

It happens frequently to negroes, and there are ſeveral examples of it among the common ſoldiers. While they are ſleeping in the open air, the fly depoſits its ova moſt commonly in the noſe, but ſometimes in the mouth. The pain, ſwelling, and inflammation about the face, after the maggots are formed and ready to break forth, are very great, and the poor ſufferers are almoſt diſtracted. The number of living maggots that come away, is often conſiderable, and they are of a large ſize, being nearly half an inch long. The uſual remedy in ſuch caſes is, inhaling the ſteam of a ſtrong decoction of tobacco through the mouth and noſe, according to the ſeat of the diſeaſe; it procures relief: perhaps waſhing the mouth and ſyringing the noſe, might be equally or more effectual.

See Shannon on medicine. p. 382.

Errhines.

Theſe are medicines which excite a preternatural diſcharge from the mucous follicles of the Schneiderian membrane upon the internal ſurface of the noſe, and adjacent concavities; by which they frequently relieve rheumatic congeſtions, and particularly violent tooth-ach. As an errhine, the tobacco powder, commonly called ſnuff, has been long in great repute: its uſe is frequently practiſed, and has been ſtrongly recommended for the relief of head-ach, pains of the ear, and opthalmias. Its ſalutary influence in ſuch affections is ſufficiently confirmed by the pains again recurring as often as its uſe was ſuſpended for a day or two.

How far the effects of errhines may extend, ſays Dr. Cullen, cannot be exactly determined; but it is probable, that they may operate more or leſs on the whole veſſels of the head, as even a branch of the internal carotid paſſes into the noſe: and independent of this, it is not improbable that our errhines may have been of uſe in preventing apoplexy,* and palſy; which at leaſt is to be attended to ſo far, that whenever any approach to theſe diſeaſes is ſuſpected, the drying up of the mucous diſcharge ſhould be attended to, and, if poſſible reſtored.

As much virtue has been attributed to nicotiana, in expelling worms, I made the ſubſequent experiments, with a view to elucidate an intereſting ſubject, and to aſcertain the foundation for ſuch an opinion.

Theſe experiments were made with accuracy; and in my opinion ſubſtantiate the anthelmintic powers of this plant.

* Cullen's materia medica, vol. 2. page 295

Exp. 1. I immerſed a common worm,* taken out of the earth, into a ſmall quantity of the tobacco infuſion,† and in three minutes it became convulſed, which continued for the ſpace of twelve minutes, but at the expiration of fifteen minutes, no ſymptoms of life were diſcernible.

Exp. 2. Ten grains of calomel were ſuſpended in a ſmall quantity of water. Another worm of the ſame ſpecies was introduced into this mixture, which was conſiderably affected in three minutes, in ten ſtill more ſo, in fifteen began to ſubſide; in thirty it remained perfectly dormant.

At the expiration of an hour, ſtill alive, but continued inactive, unleſs diſturbed.

Exp. 3. In a ſolution of white ſugar I introduced another worm, as above; it was convulſed in five minutes; in ten theſe ſymptoms were ſomewhat diminiſhed; in fifteen remained quiet at the bottom of the veſſel, and in forty it appeared perfectly inanimate.

Exp. 4. In the diſtilled water of tobacco, which was extremely pungent, I immerſed another worm, which almoſt inſtantaneouſly contorted itſelf into a variety of forms, exhibiting ſtrong marks of violent pain, and in the ſhort lapſe of three minutes it expired.

Exp. 5. Five grains of corroſive ſublimate, diſſolved in water, produced convulſions in two minutes, and a torpor in twelve.

* I ſelected this ſpecies of worm for my experiments, in conſequence of the analogy which exiſts between it and that generated in the human ſyſtem.

† One drachm of the dried tobacco leaves was infuſed in an ounce of water, for the ſpace of twenty-four hours, after which it was filtered off.

Exp. 6. Molaſſes produced convulſions in five minutes, and inactivity in twenty-five.

Exp. 7. A ſtrong decoction of pink root, brought on convulſions in ſeven minutes, and a torpor in thirty.

We find, from the ſeveral preceding experiments, that tobacco, as an *anthelmintic*, is deſerving of being held in high repute.

Several of the moſt powerful medicines, whoſe virtues as a vermifuge, are in the greateſt eſtimation, appear to be but feeble in their operation, when compared with the great influence of tobacco in the expulſion of worms.

The celebrated Spigelia Marylandica of Linnæus, it muſt be acknowledged, is very generally deſtructive to worms; but, agreeable to the firſt aud ſeventh experiments, under the head of anthelmintics, we find that tobacco appears to be more inſtantaneous in its operation, though, perhaps ultimately, not more effectual. Yet, from its more immediate effect on thoſe animals, I ſhould rather preſume, that it merits the particular attention of phyſicians, as a valuable medicine, and that, on this conſideration, it would, unqueſtionably be expedient to give it repeated trials in thoſe caſes, which may reſiſt the more feeble operation of other anthelmintics.*

* Dr. Shannon,† after enumerating ſeveral diſeaſes peculiar to the Africans, obſerves, that the *Guinea-worm* is another evil attendant on the negroes in Africa, and is generally cured by anthelmintics.

It may be juſt, therefore, to infer, that *the tobacco infuſion* may be adminiſtered with very good effect.

† Shannon on medicine. p. 380.

As a Cathartic.

In caſes of conſtipations of the abdominal viſcera, the infuſion of tobacco has ſometimes been adminiſtered, and often with immediate relief by occaſioning a ſpeedy expulſion of the obſtructing indurated fœces. The ſmoke,* ſays Dr. Cullen, thrown up the rectum, will operate in like manner, and has proved beneficial, after the failure of many violent cathartics; it enters much further into the inteſtines than injections commonly do, and is thereby applied to a larger ſurface, by which means it may be rendered much more powerful than the infuſion.

It is to be regretted, ſays Dr. Fowler, that injections of tobacco are not in more general uſe, for I am thoroughly perſuaded, that in caſes of the colic, they would prove more ſucceſsful than any other kind with which we are acquainted.

From the many facts and obſervations which I have hitherto adduced, relative to the medicinal influence of tobacco, it is, doubtleſs, reaſonable to infer, that it may prove efficacious in many diſeaſes.

* A gentleman of my particular acquaintance informed me, that he was not in the habit of ſmoking much, but whenever he was troubled with any degree of coſtiveneſs, it was only reſorting to a ſegar to obviate this inconvenience, which never failed of acting as a lenient purgative, and imparted immediate relief. This method he preferred to the taking of phyſic, as it was mild in its effects, and left his body agreeably compoſed.

If the generality of perſons were to relinquiſh the perpetual uſe of this plant, and only to have recourſe to it for its medicinal virtues, when neceſſity demanded, is it not more than probable, that many diſeaſes may be eradicated, or at leaſt their violence mitigated by its ſalutary influence?

That it is of great ſervice in dropſical affections, has been clearly demonſtrated; and, in caſes of dyſury, it has, in many inſtances, proved ſalutary, by ſucceſsfully promoting a copious diſcharge of urine. In ſhort, much may be ſaid of its virtues as a medicine, but as it is not my wiſh to prove prolix, by profuſely extending encomiums on an indigenous plant, ſo univerſally known, I ſhall conclude by obſerving, that the errors and imperfections of this eſſay, are, no doubt, eaſily diſcernible: but, at the ſame time, I am buoyed up, with the flattering idea, that the candid reader will readily excuſe a juvenile attempt.

As an expanded field lies open before us, for inveſtigation, I would wiſh, that the ſubject might be hereafter taken up, by ſome more adequate experimentaliſt, as I am perſuaded that the complicated operative effects of tobacco on the human ſyſtem, would render it an invaluable medicine in many obſtinate diſeaſes.

ERRATA.

In Page 8, line 2, for interior, read anterior.
18, 2, from the bottom, for exhorbitant, read exorbitant.
24, 11, for langour, read languor.
34, 6, for ſtimuly, read ſtimulus.
38, 6, for cuds, read ends.
55, in the bottom, for pages 32 and 33, read 25 and 26.
77, 4, for obſtructing, read obſtructing.