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AN
INAUGURAL DISSERTATION
ON
O P I U M.

SUBMITTED TO THE EXAMINATION
OF
JOHN EWING, S. T. P. PROVOST;
AND TO THE
TRUSTEES AND MEDICAL PROFESSORS
OF THE
UNIVERSITY OF PENNSYLVANIA;
FOR THE DEGREE OF
DOCTOR OF MEDICINE:

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ANNUAL DISSERTATION

OF

O P I U M

PRESENTED TO THE FACULTY

OF

JOHN BROWN UNIVERSITY

AND TO THE

PROFESSORS AND MEDICAL STUDENTS

OF

WEST VIRGINIA UNIVERSITY

IN

THE CITY OF MARTINSBURG

BY

WALTER W. WATSON, M.D.

OF MARTINSBURG

WEST VIRGINIA UNIVERSITY

1888

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TO
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WM. HARDENBROOK, FRED. STEYMETS,
WM. DE PEYSTER, AND
HENRY RIKER, WILLET SEAMAN,

Commissioners of the Alms-House in New-York.

In testimony of sincere thanks for their many services
rendered him in the course of his attendance
at the practical source of medical infor-
mation, which is under their
management.

AND ALSO TO

A D A M K U H N, M. D.
PROFESSOR OF THE PRACTICE OF PHYSIC,

AND

B E N J A M I N R U S H, M. D.
PROFESSOR OF THE INSTITUTES AND OF
CLINICAL MEDICINE, IN THE UNI-
VERSITY OF PENNSYLVANIA.

As an acknowledgment for the many obligations
conferred by their repeated favours,
during his studies under
their direction,

THIS DISSERTATION IS

Respectfully inscribed,

By their obliged friend,

V. SEAMAN.

ADAM KUNN, M. D.
Lecturer on the Principles of
Medicine in the University of
Zurich, Switzerland.


BENJAMIN RUSSELL, M. D.
Professor of the Principles of
Medicine in the University of
Zurich, Switzerland.

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Medicine in the University of
Zurich, Switzerland.



INTRODUCTION.

I CANNOT permit the reader to peruse this Dissertation, without previously solliciting him, generously to withhold any critical remarks on the little inaccuracies he may observe, as it is a first production, whose composition and publication were limited within a short time.

I must beg him likewise to excuse frequent repetition, as it originated from a desire of perspicuity, and although I may thereby have destroyed all beauty of composition, I shall not regret the sacrifice, if it has enabled me more fully to communicate my ideas; as clearness of sentiment, particularly in medicine, is always more to be wished for, than elegance of expression.

And lastly, as there are some opinions advanced in it, which are not universally received, I must also request him to suspend his judgment, until he has first disengaged himself from all prejudice; and calmly weighed the arguments, which are adduced in support of them.

MUSEO 8

AN
INAUGURAL DISSERTATION

ON
O P I U M.

THIS blackish brown, gummi-resinous substance, of a bitter nauseous taste, and faintish disagreeable smell, is the inspissated juice of the white poppy, *Papaver Somniferum* of *Linnaeus*: we generally obtain it from the Indies in small lumps, wrapped up in leaves.

For the particular manner of cultivating the poppies and of extracting the opium from them, I must refer the reader to a letter on that subject from J. KERR, surgeon, at Bengal, as communicated in the fifth volume of the medical observations and enquiries, and to Raynal's history of the Indies, where he will find it so fully treated of, as to require no further comment here, I shall therefore proceed to enquire into

Its most general effects upon the animal system at large, and more particularly upon that of the human species.

Previously to noticing the operation of opium on particular functions, a more general question arises; whether, when exhibited internally, it acts solely by its application

to the nerves of the *Primæ viæ*? or whether some part is also absorbed, and operates by being united with the blood? From the experiments of DR. A. MONRO,* whereby he found, that frogs, under the influence of opium, expired sooner when the heart was left in the body and the circulation free, than they did, when it had been obstructed by removing its ventricle, and tying its vessels, I am induced to believe, that it may operate in some degree by being absorbed and united with the blood, not as was formerly supposed, by rarifying or any way changing this fluid, (for the smallness of its dose, and its sudden operation, are sufficient proofs against such an opinion) but rather by its being suspended therein, it will have an opportunity of exerting its influence upon the nerves of the inner surface of the heart and blood vessels; and the smallness of the dose can be no objection to this opinion, for it is as easy to conceive that the one hundredth part of a grain may produce a considerable operation upon the inner surface of the vascular system, as that a grain shall produce such a general effect by acting only on the alimentary canal.

Another question is, whether opium acts directly upon the part to which it is applied? or whether its effects are entirely owing to its operation upon the brain? From innumerable experiments it appears, that opium destroys motion most particularly in the part to which it is immediately applied, and that it has this effect also upon parts cut off from all communication with the brain; hence we are led to conclude, that it may operate upon the nervous

* *Physical and literary essays.*

system without the intervention of the brain ; but as opium, applied to the abdominal muscles of frogs, did not destroy the motion of the heart nearly so soon in those that had previously had their brain and spinal marrow destroyed, as it did in others in whom these parts were left entire, * we must also conclude, that the more general effects arising from opium must be produced mostly from its influence being communicated from the nerves of the part, to which it is applied, to the *sensorium commune*, and thence reflected back upon the system at large : I say mostly in this manner, because in the same series of experiments it is proved, that some general effects may be induced without this interposition of the brain, for notwithstanding the heart was not affected in those in which this organ was destroyed, to such a degree as when it remained entire, yet its force and frequency were evidently diminished, as appeared by comparison with others in a similar situation, that were not under the operation of this medicine.

Having established these fundamental principles, viz. 1st, That opium acts primarily and especially upon the nervous system. 2d, That it exerts its effects most particularly upon the part to which it is immediately applied. 3d, That the general effects which it exerts upon the system at large depend upon its influence on the brain ; but that 4thly, it may produce some general effects without its intervention, I shall go on to examine the effects of opium more particularly upon the animal economy.

* *Physical and literary essays and observations, Vol. II. Art. 20.*

In the ANIMAL FUNCTIONS, the operation of opium has always been remarkable for allaying pain, whence its general title of *anodyne* and *paregoric*; but as pain may originate from different causes, so the use of opium to relieve it has been attended with different results: thus in that pain, which arises from inflammatory distention as in *phrenitis*, *hepatitis*, *pneumonia*, &c. though it frequently will give some temporary ease, yet, as it has a tendency, as will be shewn presently, to encrease the cause of the complaint, the pain returns with augmented violence; indeed sometimes in these cases, it is said not even to give temporary ease, but to encrease the pain from its first operation. But in that species of pain which arises from irritation, as from *gravel* or a *stone* in the bladder, or from the *venereal*, or from the *cancerous virus*, &c. it is a sure and never failing palliative. In a third species of pain, that arising from *spasm*, as *gastrodynia*, *cholick*, &c. Opium is not only an effectual palliative, but frequently an excellent and sovereign remedy.

Opium does not relieve pain by its causing sleep, because it often has this effect without inducing that state, and when it does, the pain generally ceases first.

In the voluntary muscles, opium occasions a sluggishness and aversion to motion, and a weakness in their action, when attempted to be moved.

With these effects upon the body, opium also induces a placid tranquillity of mind, which is often followed by that weakened and depraved state of the intellectual powers, in which drunkenness consists, destroying all sense of propriety, reason, and prudence, and indeed almost every

distinguishing mark of man : hence in the Indies “ Those
 “ who are desirous of attempting some desperate action,
 “ intoxicate themselves with its smoke ; in this intoxica-
 “ tion they fall upon the first object that presents itself,
 “ upon strangers as well as upon most inveterate ene-
 “ mies.”*

The powers of sensation, motion, and thought, being thus diminished, soon terminate in that state which constitutes *sleep* : this constant attendant upon the use of opium, has been established, by the observations of physicians, from the time of HIPPOCRATES to the present day ; and it has been confirmed, by the general consent of mankind, ever true to their observations, in giving it the term of *soporific*, *hypnotic*, and *somnific* : Yet there are not wanting those who, by speculative reasoning and partial observation, deny its possessing this power, and assert a directly opposite operation, except with persons in a state of debility : That it induces sleep in a healthy person is a fact too firmly fixed to require any proof. I shall therefore only enquire into the foundation of the opinion of those, who contend that it sometimes induces wakefulness.

That in small quantities it will not always produce sleep, where there are powerful stimuli applied at the same time, or where the system is in a very irritable state, I allow ; and I believe it is this negative operation (if I may use the expression,) of opium, which has led many to suppose that it produces watchfulness, when in fact, this disposition was caused, either by the nature of the disease or by some stimulant applied ; I had an opportunity a few months since

* *Raynal's history of the Indies.*

of witnessing a case directly in point. A convalescent, from the great irritability of her system, having past one or two restless nights, was induced, on the succeeding evening, to take a dose of laudanum, and with as little sleep as before; here immediately the cause of her watchfulness was assigned to and indeed noted down in proof of the stimulant operation of opium, but unluckily for the idea, the following night was attended with the same degree of watchfulness, without its enlivening aid. Had this patient's irritability been so far overcome by the night succeeding the one on which she took the laudanum, as to have permitted her to enjoy a little sleep, or had the want of it on that night, not been particularly observed it would be considered an incontrovertable fact, that the person had been kept awake by opium; but from her previous and subsequent watchfulness, there can be no possibility of supposing that she would not have kept awake equally well without opium, and the only reason for its not producing sleep must evidently have been owing to the dose not being large enough to overcome the great irritability of her system.

From the experiment of DR. I. RAMSAY upon himself,* it appears that thirty drops of Tinct. Theb. did not make him drowsy immediately upon taking it, but seemed to have a contrary effect, for he felt more enlivened after it; this circumstance he imputes to the operation of the opium, but I rather suppose it was owing to a very different cause; for he was prosecuting his studies, became drowsy over them and then determined to take opium: to accomplish this, required some exercise, perhaps the necessity of go-

* See Leigh on opium.

ing into another room, either for laudanum, or liquid, or vessel in which to take it : if so it requires no stretch of imagination to conceive his being less disposed to sleep after it, than whilst he continued quietly dosing over his books, for it is by no means uncommon for persons who cannot resist a continued inclination to sleep, whilst sitting up unmolested, and at ease to lose all disposition thereto, by the time they have undressed themselves to go to bed : but even putting the case in the most unfavourable light possible, even supposing the laudanum and requisites for taking it all stood at his elbow, still it must be allowed, that the train of ideas which had admitted drowsiness, was broken in upon by introducing a new subject to the mind, which, besides its novelty, actually required particular attention, for says he “ I determined to try (and consequently to observe) the effects of opium.” And it is easily conceivable, how such a change of thought and active employment of the mind, should overcome, for a time, a considerable disposition to sleep : however in two hours notwithstanding his determination, he found it very difficult to refrain from sleep. He then took from ninety to an hundred drops of the same tincture, which soon roused him from his drowsiness, and not without cause, for the shock from the very thought of having taken such a quantity of opium, after observing such considerable effects from a much smaller dose, and which had yet but just began to operate, would I conceive have been fully sufficient to resist the influence of a much greater dose than thirty drops of laudanum ; but observe, in a short time, as soon, I suppose, as the second dose began to operate, he found himself delirious, which was soon succeeded by inability to walk, vertigo and finally sleep. From these

considerations I am led to believe, that this experiment, can no way support the opinion of opium's having any power of keeping a person awake; for even should we allow that the doctor had no fear or dread from taking such a large dose; yet his sanguine expectation of such an operation, (which he seems to have gained from an erroneous idea of the first's having drove away sleep) would alone be adequate to the production of such an effect. DR. KUHN mentioned in his lectures, a man, who after having been bit by a dog, that was wrongfully supposed to be mad, actually had all the symptoms of Hydrophobia supervene; if then expectation will bring on all the dreadful symptoms of such a disease, need we be surpris'd that expectation should suspend, for a time, the soporific operation of thirty drops of laudanum?

Opium exerts a particular operation upon the NATURAL FUNCTIONS. Inducing,

1st, In the *stomach*, a weaker action as is evinced by its destroying appetite; this has been established by many experiments, and confirmed by daily observation, particularly by the circumstance of its being purchased at exorbitant prices, by the unhappy sufferers in the famine of 1770, in China, to allay the cravings of hunger.* Here I cannot proceed without observing, how cautiously we should avoid being captivated with any particular opinion, for we are then not only blinded to its imperfections, but we also look upon its very blemishes as ornaments; as appears by a person's having lately brought this same fact, to support a favourite opinion, in illustration of opium's encreasing the appetite.†

* *Kerr's letter in medical observations.* † *Dr Handy's inaugural dissertation.*

2d, In the *intestines*, a diminution of their peristaltic motion, as appears by its constantly producing costiveness, as well as by experiments on the brute creation, in whom, (by opening their abdomens) after giving them opium, the intestinal action was not only found to be both slower and weaker than natural, but in a little time entirely to cease.*

3d, In the *secretories* and *excretories* of the body, a weaker action appearing in a diminution of all the secretions and excretions, except that of sweat.

The VITAL FUNCTIONS likewise suffer in their action by the operation of opium. The *pulse* and *respiration* become slower and fuller, and the *heat* of the body is diminished. I know that these effects are denied by some, but from an experiment made upon myself, whereby I found, that in about twenty-five minutes after taking thirty drops of laudanum, the heat of my body diminished 2° by the thermometer, and the frequency of my pulse, which until that time had suffered no perceptible change, was lessened four strokes in a minute, and continued so near forty minutes, when sleep terminated my observation; from the same effect of a diminished frequency of the pulse, only in a greater degree, being observed by DR. BARD in an experiment upon himself,† as well as from the experiments of DR. LEIGH, where, in all the cases in which opium was administered alone or in an aqueous menstruum, it uniformly produced this effect, even so as to lessen the pulse fourteen and fifteen strokes:‡ from these then, and many other observations, which

* *Edinburgh physical essays vol. II.* † *Dr. Bard's inaugural dissertation.* ‡ *Leigh on opium.*

might be adduced, if necessary, I must conclude, that this power of its diminishing the frequency of the pulse and consequently the heat of the body, is a general and constant effect of opium.

Should any one say, as indeed it has already been said, in opposition to this opinion, that from several of DR. LEIGH'S experiments, it appears that the pulse was accelerated after the exhibition of opium; I admit it, and the cause is very evident, when we consider the menstruum in which it was given, for in every case where this acceleration of the pulse was produced, the opium had been administered in alcohol, and there is not the least doubt, but that this stimulant effect must have arisen from that menstruum, since in all the other cases, as above observed, it had a directly opposite effect. And that it must have arisen from that cause I think is also incontrovertibly proved by FONTANA who having likewise observed the violent effects following the exhibition of opium in spirits of wine, resolved to make some experiments to ascertain the cause, from which he concludes, that it proceeded from the spirit, since, says he, this fluid, when exhibited alone produced all these effects more violently and quickly, than when opium was dissolved in it.*

From the operation of opium upon the heart being much less evident than upon the voluntary muscles, DR. HALLER concluded this organ to be entirely free from its influence; but from the above observations and experiments, and from the experiments of DR. MONRO, by which he found,

* *Traite sur le venin de la vipere et sur quelques poisons vegetaux.*

after laying bare the hearts of frogs and injecting a few drops of a solution of opium into their veins, that, "as soon as the solution had entered the ventricle of the heart, that organ was rendered incapable of expelling its contents, and in less than a minute thereafter became entirely paralytic," we are forced to differ from that great physiologist, and to conclude, that the heart as well as every other living part is subject to the operation of this medicine.

In short the general effects of opium are nearly as follows. Soon after being taken, it diminishes pain, except that from inflammatory distension, it brings on serenity and pleasantness of mind, followed by a state of ebriety, and attended with an indolence and aversion to all voluntary motion, succeeded by sleep; it lessens the frequency but encreases the fulness of the pulse, it diminishes the heat of the body; it also produces costiveness and a general diminution of all the secretions and excretions, except sweat; it destroys the appetite, and it also induces a fulness in the large blood vessels. It is observed of this medicine, that it loses its force by repetition; hence a person habituated to its use will frequently find no effect from a dose, which would kill a person unaccustomed to it.

The above observations apply most particularly to the effects of moderate doses of opium. When taken in large quantities, it is often immediately rejected by vomiting; if not, it soon produces symptoms of intoxication, confusion of the head, false vision, and delirium, which are shortly after succeeded by profound sleep, with a full and slow pulse, and great distention of the large superficial veins; at length convulsions* come on, which, if no relief is obtained, soon

* *Some cases terminate in death without convulsions.*

terminates in death. By dissection, the heart and large vessels are found greatly distended with blood, and there is generally a slight inflammatory appearance discernible in the stomach.*

Having pointed out the most general effects of opium, I proceed to deduce therefrom

Its Mode of Operation.

In entering upon which, I am conscious, that a man of fashion would not more surprize his modish brethren, in appearing without his hat crown reared four or five inches above his head, or without half a dozen buttons strung upon each sleeve, than I shall many of the faculty in not adopting the new and fashionable opinion, that opium is a direct stimulant.

I cannot agree to its being a stimulant—1st, Because such an opinion will not account for its effects. 2d, Because all the phenomena consequent upon its exhibition, may be accounted for satisfactorily upon a different principle.

It will not account for its effects; for it appears, that by opium we are enabled to alluage the racking torture of the *stone*, to allay the pain of *bubo*, and even to deaden the force, and render life, supportable under the darting stings of an inveterate *cancer*: How then does it produce

* *This appearance in the stomach, is very different from that highly inflamed and gangrenous state in which it is found after death from a strong stimulant; as arsenic or Mere. Corros. Sublim.*

this effect? How does it alleviate pain? It is answered, by being a more powerful stimulus to the system, than either *stone, venereal* or *cancerous virus*, it deprives us of their sensation, as the sun by its superior splendor drives from our sight the glimmering stars, or as the superior impression of a blow on the head, deprives us of the trivial sensation from the extraction of a hair at the same time; but here we meet with an insurmountable difficulty; where are we to find marks of the superior stimulus of opium? The sun does not hide the stars without shewing us his greater lustre, nor does a blow fail of shewing a superior when it frees us from a lesser pain; nor can any stimulus whatever, prevent sensation from a lesser one without shewing some evident marks of its superior operation; opium does not shew so great stimulant effects upon the system as stone, or venereal, or cancerous virus; therefore it cannot remove their effects by any stimulating operation. This with many others of the effects of opium above-mentioned, particularly the experiment of DR. MONRO, where it diminished the motion and force of the heart immediately upon coming into contact with it; as well as from its constant effect in diminishing the frequency of the pulse and heat of the body, and finally from its direct tendency to induce sleep; all oblige us to deny the possibility of explaining its operation from any stimulant power.

I have said all the phenomena resulting from the use of opium may be accounted for upon a different principle: I mean a direct sedative power, whereby it lessens the sensibility and irritability of the system, and consequently the motion, and the powers of motion.

in it ; or in other words, that it has a direct operation upon and immediately diminishes the mobility of the nervous power. And in the first place, of its power of diminishing pain ; this effect, as before proved, it could not produce by any stimulant operation ; but upon this principle, it is easily accounted for ; it does it in the same manner as an intervening cloud deprives us of the sight of the stars, viz. by diminishing the power of the medium of communication ; by diminishing the mobility of the nervous power, rendering it unfit for transmitting the sensation of stimuli. It was observed above, that pains arising from inflammatory distention, oftentimes are not relieved by opium, and when they are, it is but temporarily, and they afterwards are augmented ; this is no more than what we would expect, for from its encreasing the fulness of the vessels, by diminishing the excretions, and also, as will be shewn hereafter, from its encreasing the quantity of fluids in the deeper-seated vessels, by diminishing more particularly the action of those on the surface, notwithstanding it may, by diminishing the sensibility of the system, in some degree allay the pain, yet as it tends to increase the cause, we need not be surpris'd if instead of relieving, it should even encrease the pain.

Opium has been extolled for inducing a serenity and cheerfulness of mind, in those who have taken it, even to such a degree sometimes, as to make them express that "they feel as though they were in heaven." This state arises chiefly from the relief from pain, for which the opium was given, for LOCKE very well observes, that pleasure always is the consequence of the remo-

val or lessening of pain, * and hence SOCRATES expressed his having a great sense of pleasure in that part which had lately been freed from the painful impressions of his galling fetters, and hence also is that same enraptured expression of “feeling as though they were in heaven,” so frequent in the mouths of women, on being relieved by delivery from the distressing pangs of a painful labour.

Should it be said that this pleasant state of mind is induced in persons who do not suffer under any particular pain or distress, yet, as has been observed, † from the ordinary necessities of our lives, accidental harms, and fantastical uneasinesses, which habits, acquired by fashion, example and education, have settled in us, and a thousand other irregular desires, which custom has made natural to us, we are seldom at perfect ease, for no sooner is one uneasy action dispatched, but another is ready to set us to work: Therefore it is very possible, that in persons labouring under no evident distress, opium may bring pleasure by suspending these many little uneasinesses.

Should it be even asserted that in an actually indifferent state of body and mind, a state entirely free from pleasure or pain, opium will induce pleasure, I admit it; for as pleasure clearly consists in a certain degree of relaxation of the system, as has been shewn by an ingenious author, ‡ it would be no way surprising that opium in transporting the system over to sleep, should carry it through the limits of this pleasurable state. The luxurious use of

* *Locke on the human understanding.* † *Ibid.* ‡ *Burke on the sublime and beautiful.*

the warm bath by the ancient Romans, and also by many of the eastern nations at this day, as a great source of pleasure, produces this effect, in a somewhat similar manner to opium, viz. by its relaxing and enervating power, and the same delicate pleasure, that follows the use of opium, DR. RUSH in his lectures mentions, often also arises from blood-letting, and it is by nearly the same means, viz. by debilitating the system.

This pleasant situation is not permitted to be long enjoyed, for opium still continuing its deadly influence, goes on encreasing weakness in the mental powers, bringing on an irregular train of unconnected thoughts, as is evinced by a stammering and almost inarticulate speech. This is the state which the East-Indians bring on when they “are desirous of committing some desperate action,” for the moral faculty ceases to restrain them, and all their sense of conscience is extinct, the powers of memory also fail them, they cannot recollect the object of their vengeance, for they fall upon the first that presents itself whether strangers or enemies. It is this state of mind in which the Turks are said to shew their greatest courage, and I do not doubt but that in this foolish situation, they may be led up to the muzzle of a cannon, like an ox to the slaughter; ignorant of the consequences, they run on and are punished, whilst in their sober moments, like wiser men, they would have foreseen the danger and avoided it.

During this effect upon the mind it also gradually diminishes the powers of the body; the weakened muscles first become indolent and sluggish in their motion, until at length, if a person attempts to walk, he finds them unable to support his tottering body; these, accompanied with

imperfect sensibility, are followed by stupor and terminated by sleep. Here then we find that opium in the ANIMAL FUNCTIONS, gradually and regularly lessens their strength, until finally it forces them down into the quiet bonds of sleep.

This sedative operation is particularly observed in the *stomach* and *intestines*, diminishing their actions and producing want of appetite and costiveness: it also diminishes the operation of the *secretory* and *excretory vessels*, by rendering them insensible to the usual stimulus of their contained fluids.

The effects of opium upon the VITAL FUNCTIONS are very clearly elucidated upon our idea of its action. In the former part of this dissertation it appeared, that notwithstanding opium produced some particular operation on the part to which it was immediately applied, yet that its general effects mostly proceeded from its influence upon the brain: we conclude then, that when taken into the stomach, it particularly lessens its tone, and also diminishes the energy of the *sensorium commune*, which must be felt without doubt most especially in the parts most distant from its seat; whence, as well as from their sympathy with the stomach, the vessels of the superficies must be most particularly weakened in their action, which must of course give rise to an accumulation in the larger vessels; hence the large veins appear distended; from this accumulation of blood in the larger vessels, an increase of its natural stimulus is applied to the heart, from whence in conjunction with the *vis insita* which this organ possesses in a great degree, we can easily account for its not being so evidently affected by opium, as the voluntary muscles are; yet by

the diminished frequency of the pulse, we find that the motion of the heart is lessened: its irritability being diminished, it suffers a greater dilatation from the accumulated blood, before it contracts; this, with the relaxation of the arteries, gives rise to the great fulness of the pulse. The slower circulation sufficiently accounts for the diminished heat of the body.*

That the motions of the extreme vessels are more particularly affected, and that a preternatural accumulation takes place in the larger ones, are not mere conclusions from speculative reasoning, but facts established by actual observation; for Dr. MONRO, by the assistance of his microscope, found the action of the extreme vessels in frogs, under the operation of opium, entirely to cease, while that of the heart still continued; and Dr. WHYTT† says, by opening a frog, that had taken opium, he found the heart and large vessels leading to it unusually filled with blood.

From an increased quantity of fluids in the system, by an obstruction of the other evacuations, and from the above mentioned causes supporting the force of action in the heart and large vessels, with a loss of the resisting power in those of the surface, the sweating, induced by this medicine is easily and satisfactorily explained.

Convulsions often follow from a large dose of opium; they also follow profuse hæmorrhages; here then we see same effects induced by the abstraction of a stimulus, as

* *This diminution of the heat of the body may also be owing in some degree to the evaporation of perspiration induced by opium.* † *Essay on the vital and involuntary motions.*

by diminishing its force, by rendering the system insensible to its application.

By dissection after death, the stomach appears slightly inflamed; the convulsive pressure of the muscles, as also the before mentioned causes, force the blood internally, whereby the vessels of this organ, which are particularly relaxed by the immediate contact of the medicine, are especially distended, and give rise to this appearance.

The effects of opium being diminished by continued use, perfectly correspond with an established law of the animal œconomy, whereby “all impressions which do not excite to action lose their force by repetition.”

Should it be asked, since there are so many facts, directly in proof of the sedative operation of opium, and since all its effects are so clearly and rationally accounted for upon such a principle; what has given rise to, and what has supported the doctrine of its being a direct stimulus? I answer that it originated chiefly with a person, who has endeavoured to make himself eminent in medicine, by boldly hazarding some new opinions, in opposition to ancient and well established truths.*

Novelty, which is so powerful in influencing the human mind, even, as Dr. HUXHAM observes, to have held Asclepiades out in his absurd and cruel practice of denying drink to persons in a fever, gained also supporters to this doctrine.

Let us examine the arguments advanced in favour of the

* *Dr. Brown.*

Note—

Though opium may have been looked upon as possessing some stimulant operation, by persons previously to Dr. Brown, yet he was the first who asserted, that it was a simple direct and most powerful stimulus, and anti soporific.

stimulant operation of opium. Such an operation has been inferred from its analogy with spirituous liquors; thus say they, do spirits produce a pleasant disposition of mind? do they make the distressed “forget his poverty and remember his misery no more?” do they “overthrow the minds and understandings of all that will be trying masteries with it?” do they make men forget their friends and familiar acquaintances, and finally to draw their swords upon their nearest relations? they surely do, and so in some degree does opium. This may be, and yet it is no proof of any stimulant operation in opium. Should any one ask whether I deny spirits being possessed of a stimulant power? I answer, no, but that they also exert a powerful sedative operation particularly on the mental faculties, every one of the above effects clearly proves; and hence the wisest of men SOLOMON, says, “It is not for kings to drink wine nor princes strong drink, lest they drink and forget the law and pervert the judgment of any of the afflicted.”* It was from their weakening the mind, and exposing every flaw and imperfection in it, that the poet observed,

Wise were the kings, who never chose a friend,
Till with full cups they had unmask'd his soul,
And seen the bottom of his deepest thoughts.

HORACE.

I have said I do not deny that spirituous liquors are stimulants, and should it be asked, whether opium like them, increases the appetite, produces strength of body, watchfulness, an increased force and frequency of the pulse, with quick breathing, and raises the temperature of the body? I answer, no; and I trust the foregoing observations have fully proved it to have a directly opposite effect.

* *Prov. chap. xxxi. 5. 6.*

The above first mentioned analogy of the operation of opium with spirits, (at the same time considering every effect of the latter as arising from a stimulant power) assisted by partial observation where the nature of disease in producing watchfulness has been assigned to its operation, as also by results of experiments, where it has been charged of producing effects, that have been clearly proved, to have arisen from the stimulating menstruum in which it was exhibited, is the only slender basis upon which the doctrine of the stimulant operation of opium is supported, and which I trust must give way to the superior evidence of a contrary opinion, as soon as time shall have worn off its dazzling tinsel of novelty, so as to permit the cool eye of reason to investigate its inherent quality.

I do not think, with the eminent Dr. CULLEN, (whose name I mention with respect, and from whose opinion I vary with diffidence) that any of the effects of opium even require us to call in the aid of the *vis medicatrix naturæ*, for their explanation; and since “wherever it is admitted, “it throws an obscurity upon our system,”* and also as “no more causes of phenomena are to be admitted than “are sufficient to explain them,”† and as I think all the phenomena from the use of this medicine have been satisfactorily explained upon its simple sedative operation; I have therefore entirely rejected that *facultas incognita* from this dissertation.

The Uses of Opium.

The limited nature of my dissertation, will particularly affect this part of my subject; for to do justice to it

* See Cullens first lines, vol. I. page 25.

† Sir

Isaac Newton's maxim.

alone would require more pages than this treatise would consist of; having however enumerated its general effects, and thence deduced its *modus operandi*, I shall proceed to give, what I conceive, a rational explication of its use in medicine.

In the first place, *From its power of diminishing the sensibility of the system to stimuli*, it is usefully employed in allaying the pains from the *venereal disease*, *cancers*, *stone* in the bladder, when extraction may be improper, and also to soothe the pungent *pain* following chirurgical operations, attending *compound fractures*, &c. &c. also *nervous head aches*, &c.

From its power of diminishing the irritability of the muscular fibres, it has been attended with the happiest effects in allaying any preternatural action in them; thus in the *heart* it relieves *palpitation*, if it is not symptomatic of a disease that may forbid its use; in the *lungs* it cures *asthma* when it is purely spasmodic, and is of use in the *chin-cough*, after the febrile symptoms are gone off.

In the *stomach* it is the best remedy for *pyrosis* and *gastrodynia*, and for *vomiting*, when this does not proceed from any matter proper to be evacuated, or when it is not accompanied by any affection which may be augmented by its use. In this organ as well as

In the *intestines*, it relieves *cholera morbus*, is a powerful assistant in the *cholic*, in the *dysentery* it also allays the pain and troublesome tenesmus, takes off the constriction of the colon and thus paves the way for the more sure operation of gentle purgatives, as a radical cure. The action of the intestines in *simple diarrhoea* seems to be continued, by the increased irritability to their contents, from an abrasion of their natural mucous covering from the

original cause of the disease, and possibly also in some degree by habit; here then we would at once conclude opium to be, as in fact it has proved, a very valuable remedy, for by its first diminishing the irritability of the bowels, it allays for a time their encreased action, thereby counteracting the powers of habit, during which time, it also by its peculiar operation of thickening excreted fluids, as is particularly evinced in catarrh, it furnishes them with their proper defensive coat; thereby proving not only a palliative, but often a radical cure.

In the *uterus*, it quiets the efforts threatening *abortions*, after the plethora has been removed by bleeding, also *false pains* and *spasms* during labour; it is a sovereign remedy in pains following delivery called *after pains*, it relieves the pains that sometimes attend menstruation; it has also proved of great use in taking off the increased action of the uterine vessels, which arises from great irritation, and thus checking the immoderate flow of the catamenia.

Opium, by its relaxing power, is very useful in favouring the expulsion of *calculi* from the ureters and urethra, and *concretions* from the biliary ducts, also in taking off the constriction and permitting the return of *incarcerated herniæ*.

In the *voluntary muscles*, opium has been used in *tetanus*, and from its antispasmodic power, it may prove a palliative; yet, as the celebrated Dr. RUSH* has proved, that this disease originates in debility, we should not expect it to give any permanent relief, therefore it should be accompanied with proper stimulants and tonics. As *epilepsy* is so often owing to a turgescence of the vessels of the head, and as opium greatly favours this, not only by its general operation of accumulating the blood in the larger and internal vessels, but also by its particularly filling those of the

* *Rush's medical enquiries and observations.*

head, by obstructing the refluent blood by a slow respiration, it must of course frequently be injurious; but when the disease arises from a particular irritation, as from an *aura epileptica*, great pain, or from passions of the mind, it has proved a valuable remedy, and when given a little before an expected accession, it has frequently put off the fit. † In *convulsions* not attended with coma as particularly the *chorea sancti viti*, it has generally been found of great service.

To its procuring sleep, it owes many of its virtues in certain diseases, but in none more particularly than in *typhus fever*, where a constant watchfulness seems to be hurrying away the fleeting powers of life: opium checks this fatal career by bringing a refreshing sleep, the want of which wears down the strength faster than almost any other circumstance whatever; it may therefore frequently be advantageously combined with other medicines in this disease.

From its increasing the fulness of the vascular system, opium must be injurious in all diseases accompanied with an *inflammatory diathesis*, for this is supported by, (and every indication of cure is to remove) the too great quantity of fluids already in the vessels. But as with this operation, it also often procures a free perspiration, by overcoming the resisting power of the cutaneous vessels, it has even been proposed in *inflammatory fevers*, and where this effect can be rendered certain, by the union of emetics and neutral salts, it has frequently been found a valuable remedy particularly for the cure of the *acute rheumatism*. From this power of overcoming the resistance in the extreme vessels, it proves so effectual in taking off the burning heat and shortening the hot fit of *intermittents*. ‡

From its effect in allaying the operation of the secretory

† Tissot traite de l' epilepsie.

‡ Lind on hot climates.

and excretory vessels, it is usefully employed to check a salivation from mercury, and it very probably, from this power of diminishing the irritability of the excretories at large, may expedite the cure of the *venerical disease* by mercury, by allowing the system to retain more in it at a time, than it otherwise would. By this operation it also renders excreted fluids of a much thicker consistence; hence, as observed before, it is of use in *catarrh* and *diarrhœa*; and it is from this cause, that it changes the ichorous discharge of *irritable ulcers* to a well concocted pus, and hence its great use, as observed by SYDENHAM in the suppurative stage of the *small pox*.

Notwithstanding my having arranged the diseases in which opium is employed, as being relieved by some one of its effects, yet I do not thereby mean to assert that its usefulness in them solely depends upon such a particular part of its operation, for every one the least conversant in medicine must conceive, that a diarrhœe and catarrh, beside the particular effects, under which they are mentioned, may also in part owe their cure to opium's determining to the surface; a cholera morbus, to its diminishing the secretion of bile; a typhus to its relaxing the spasm of the extreme vessels, &c. &c. all I had in view, was to shew on what particular quality of opium the cure of certain diseases chiefly depends.

There are many other diseases in which opium may be employed, but having shewn from what particular effects we are to expect advantage in some, and also from what effects we are to fear its use in other important complaints, I flatter myself the ingenious reader will not be at a loss to decide upon the propriety of its use in diseases in general.

This medicine may be employed either internally or externally: internally either by the *mouth*, in doses from one

grain to a much larger quantity, the dose is however to be governed chiefly by the force of the irritation, which it is to allay, for in great pain, as from chirurgical operations, as well as from violent spasms, as in tetanus and from incarcerated herniæ, &c. patients will bear and often require such doses of opium, as would have destroyed persons in health. Or in the *rectum*: in this way it is proper, where a continued vomiting prevents its retention in the stomach, as also in tenesmus, and more particularly in the dysentery, where by being more directly applied to the part, it will allay the encreased action of this intestine and take off the constriction of the colon, without so materially preventing the operation of purgatives, as if exhibited by the mouth. When opium is given in this manner it must be in double the quantity that would have been necessary if taken into the stomach.

It has been *externally applied* to the abdomen to relieve spasms of the stomach and intestines: to the mouth to check salivations: * to the cheek to relieve tooth ache, &c. &c.

When a person has taken too large a dose of opium, we should endeavour to procure its evacuation as soon as possible by exhibiting a quick emetic as twenty or thirty grains of *vit. alb.* and tickling the fauces with an oiled feather; we should use all means in our power to keep him awake. *Blisters* and *sinapisms* should be applied; and vinegar has been recommended to be exhibited internally, but from some experiments by LEIGH its utility is rather doubtful; I should put more dependance on the stimulus of *vol. alk.*

Since severe pain has been observed greatly to resist its operation, may it not be induced with advantage to prevent its deleterious effects in this case?

* *Hunter on venereal disease.*

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