POPE (B. A.)

OPIUM

AS A

TONIC AND ALTERATIVE;

AND

ITS HYPODERMIC USE

IN THE

DEBILITY AND AMOROSIS

SOMETIMES CONSEQUENT UPON ONANISM.

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Reprinted from the February Number of the N. O. Medical and Surgical Journal.

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B. A. Pope M.D.

OPIUM

AS A

TONIC AND ALTERATIVE;

WITH

REMARKS

UPON THE

HYPODERMIC USE OF THE SULPHATE OF MORPHIA

AND ITS USE

IN THE

DEBILITY AND AMOROSIS

CONSEQUENT UPON ONANISM.

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Paper read by B. A. POPE, M. D., before the Medical and Surgical Society of New Orleans, January, 1879.

In using the word opium I shall consider it as synonymous with sulphate of morphia. In all my experiments with opium, upon which this paper is based, this was the form used; and the method of its administration was by hypodermic injection.

Of course, under some circumstances, its administration by the mouth, endermically, or in suppositories, would possibly be more appropriate; but as it is not my purpose to treat of the use of opium in general, I shall confine myself to the consideration of the results of that method best adapted to develop its special virtues, which are under discussion.

This subject cannot be better introduced to the attention of this Society than by quoting the words of the distinguished therapeutist, Gubler (Commentaire du Codex Médicamentarius.):

"Opium," he says, "is certainly the remedy the most used

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and most important of the whole materia medica. It has been said, with reason, that without it the art (practice) of medicine would be impossible."

The words tonic and alterative are used because they do not involve a definite physiological theory of the action of the drug, but only express the results of its use under certain circumstances; which in the present condition of our knowledge is often the most rational basis for a nomenclature.*

A tonic is usually defined as one of a class of medicines which gradually and permanently increase the tonicity of the system, strengthening and invigorating it when in a debilitated condition; they increase the appetite, assist digestion, and thus, by increasing nutrition, give firmness to the muscular and circulating systems.

Alteratives are such medicines as induce a favorable and gradual change in the system without any manifest operation or evacution.

It is true that such terms would be of little use were our physiological knowledge perfect; but imperfect physiological theories can but cloud the mind of the clinical observer, especially that of the beginner.

There is great prejudice against the systematic use of opium, both on the part of physicians and the public on account of the danger of contracting the "opium habit." In addition to this, the almost uniformly unpleasant effects of opium when first used, has greatly hindered its more extended study. Notwithstanding these objections, and its frequent irrational use, the literature of medicine abounds with testimony of its great virtues in many and often *seemingly* contradictory directions. This, however, appears less remarkable when we consider the manifold relations of the nervous system to all the organs of the body.

Gubler, in his work above mentioned (p. 229), says that

*Since this paper was read before the Society I have found tha Fothergill (Handbook of Treatment) and H. C. Wood (Therapeutics, Materia Medica, and Toxicology) both declare that the present physiological theories are inadequate to account for the well established clinical facts concerning oplum. If these high authorities do not express the same opinions as I do, they, at least, admit that some additional principle or principles are wanting to explain the accumulated facts, and thus, to a certain extent, place themselves in a position favorable to my opinions.

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"opium, when taken internally, in small doses of one to two centigrames, gives rise to a slight excitement of the circulation, animation of countenance, brilliancy of expression, a sensation of well being, alacrity of spirit, disposition to exercise and increased muscular force."

"In a stronger dose of 5 to 10 centigrams, the symptoms of the period of excitation, more pronounced than in the first case, and accompanied by frequency and fullness of pulse, are soon followed by depression of circulation, dryness of the throat, nausea, and sometimes vomiting, with loss of appetite, diminution of force, repugnance to movement, diminished impressibility of the senses, and confusion of ideas, and, finally, an invincible tendency to sleep accompanied by dreams happy or terrible."

"In an excessive or poisonous dose, opium determines at once the symptoms of the period of collapse."

"It is, however, not rare to see the scene open by movement reminding the observer of the effects of tetanising poisons," etc., etc.

"Opium paralyses sensibility and diminishes the tonicity of the capillary system; this seems to be its primitive and direct action."

"In our opinion, the hypnotic effects of opium are caused by the congestion of the cerebral substance and of the meninges, to which, we think, should be added, the stupefaction of the nervous centres, analogous to that of the nerves of sensation and movement."

"Opium (p. 232) acts both as a stimulant and a sedative, and I could add, as the result of the same dose and at the same stage of its action."

Bintz (Elements of Therapeutics) classes opium as one of the "Nervina Depresoria, whose special purpose is to produce a sedative effect." In speaking of the action of opium, he says: "Internally, when given in small doses, it causes transient excitement, but in large ones it quickly stupefies and paralyses, and its effects are slow in passing off. Its most marked property is that of paralysing the organs of sensation and perception.

"The functions of the spinal cord and its appendages are impaired by moderate doses. The striped muscular tissue is but little affected. In small and medium doses morphia stimulates the whole vaso-motor nervous system (Gscheidlin), the special result being contraction of the arteries and increase of the blood pressure. The frequency of the pulse is also usually increased. Morphia diminishes sensibility and movement in the human intestinal canal."

"Natural sleep is to be regarded as the result of fatigue of certain brain cells induced by the work they perform in receiving and reproducing impressions. In them, just as in any other animal cells, certain acid and chemically paralysing products

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of tissue change will be chiefly formed, and will partially or completely arrest the work done by these cells, until the blood and lymphatic vessels of the pia mater have removed them and restored the cells to their normal condition. Morphia has a similar property of temporarily paralysing the substance of the cell, and so inducing sleep. The contraction of the small vessels of the brain, and the anæmia thereby induced by the action of morphia upon the vaso-motor centre, are also adduced as a cause of sleep; but we must remember that certain narcotics, such as alcohol and chloral hydrate, produce a deep sleep, in which the blood vessels of the brain are not contracted, but more or less congested. Anæmia cannot therefore be a main condition of sleep, which is probably due to inactivity of the sensory organs induced by various other influences.

Fothergill, in his Handbook of Treatment, says:

"Even opium is not free from excitant properties, which counterbalance and even preponderate over its sedative properties with some individuals. Much depends, too, upon the manner in which it is given; if administered in frequently repeated but small doses, its excitant properties are brought out; if given in full doses, its sedative action is most pronounced. By habit, and long indulgence in it, opium may be converted into a nearly pure excitant."

"This combination of properties in a drug of so pronounced a character, demonstrates how difficult it is to form any arrangement or classification of neurotic agents which shall not, at some point or other, clash with acknowledged facts. In the present state of our knowledge, a strictly accurate classification is unattainable; still it is possible to adopt an arrangement which will so group neurotic agents as to make their action somewhat clearer than before, and, to a great extent, to elucidate their use in actual practice."

"At first opium increases the pulse rate and the arterial tension, but afterwards both are lessened below the normal point (Nothnagel, Gscheidlen). The first action of opium, then, is the production of excitement during which there is also increased vascularity of the encephalic arterioles (Max Schuler). Then follows contraction of the cerebral vessels, a fall in the blood pressure generally, and, with these, lessened activity in the nervous system takes the place of excitement. This lethargy following activity was at one time attributed to exhaustion of the stimulated nerve centres (A. Todd Thompson). We should scarcely say so now; but we know that this diminished functional activity is accompanied by distinct reduction in the cerebral vascularity—partly the consequence of the fall in the blood pressure, and the contraction of the encephalic arterioles; partly the outcome of the effect upon the cerebral cells, so that they do not attract the blood so actively."

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Rabuteau (Élémentes de Thérapeutique) says that morphia dilates the pupil and both Rabuteau and Trousseau assert the stimulant action of opium.

H. C. Wood (Therapeutics, Materia Medica and Toxicology) does not hesitate to say that the present theories do not account for all of the clinical facts as regards opium, and it is exactly to these facts that I refer when claiming for it tonic and alterative properties. We have not yet reached a perfect theory of the action of a single drug, and are consequently forced to seek for well observed facts at the bed side to guide us in practice.

It has sometimes appeared to me that the action of opium might not be confined entirely to the cells, etc., of the nervous system. There is no a priori reason to be urged against it, and the assertion of Gubler (p. 228) that it "stupefies the plants endowed with movement," would seem to justify the idea of its possibility. Certainly, unless we admit that these plants have some form of nervous structure, we must admit that it may affect other tissues than the nervous. Except for the results of experiment, we would not be able to judge that it would act more on the nervous than on the other tissues, and there is no direct proof that it may not have other physiological relations than those it bears to the nervous system.

Niemeyer denies that experiments made with medicines on the lower animals or healthy human subjects has been, or promises to be, of direct service to our means of treating disease.

I cannot fully assent to this proposition; but, up to this time, the *direct* benefit from such experimentation with opium can be, without hesitation, declared to be nothing. The great therapeutic powers of opium have only been discovered by direct experiment upon the diseased and suffering human subject.

Would physiology ever have taught us that it might be of benefit in the *collapse* of cholera, or the lowest and most desperate cases of typhus? Would physiological research have ever taught us, what I have frequently found, that, in *some conditions* of the *body*, it is the *most rapid* and *powerful restorer* of the *blood*, and of the *nerve force*, known to medicine; surpassing in the completeness of its action quinimine or iron, or both of

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them combined; and this where there was no pain or special irritation present; which, according to Bintz, are the only indication for its use? Were our physiological knowledge perfect, it might possibly do so, but not in its present stage of developement. I am not sure, but it seems to me that physiology has received more benefit from clinical observation than practical medicine has from physiology. We should not fall into the error of supposing that everything which in practical medicine accords with physiological theory is a debt owed to physiological research, it mostly being that this accord is the result of the readjustments of physiology to practical medicine and its suggestive teachings.

Bintz, in the above quoted work, says of its use: "Morphia is one of the most trustworthy remedies for diminishing irritation or peripheral excitement of the nerve centres, as well as of individual nerves, in inflammatory, septic, neuralgic, and convulsive states; hence it is given in pneumonia, bronchitis, acute intestinal catarrh, cystitis, and typhus fevers, delirium tremens, lead poisoning, colic, the eclampsy of pregnant and parturient women; in salivation and diabetis, in hæmorrhages, in all kinds of neuralgia, and, in a word, in the most various forms of general and local disturbance which exhibit the character of psychical, sensory, or secretory irritation."

"From the very beginning of this century opium has been recommended as an antidote in belladonna poisoning, and recently morphia has been used subcutaneously for this purpose."

It is obvious that the only mode of action for morphia (opium), admitted by Bintz, is the power of this medicine to allay irritation. To my mind there is no more striking illustration of the fatal power of imperfect physiological theories then this position of a so superior therapeutist as Bintz. Suppose that any gentleman present were called to a case of cholera in a state of collapse, and found one in charge of the patient who would decline to give him a good dose of sulph. morphia hypodermically, on the ground that it was a medicine that only had power to allay irritation; and was not therefore indicated in a state of collapse, so closely bordering on death? He might argue that it was a nerve sedative, and that the patient was already too much under the influence of the great nerve sedative—death.

Now, suppose this objector be dismissed, and the injection

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given, followed by revival from this state. Does any one present believe that this would have been due to the *sedative effect* of opium? Again, take a case of low fever in its worst stage, and observe the truly wonderful effects of opium, and ask yourselves whether this theory will account for all the results or for only a part. I shall here introduce some views of Ringer given in his Hand Book of Therepeutics.

Speaking of the furious delirium of certain fevers, and their former treatment by Graves with a combination of ludanum and tartar emetic, he says:

"Now-a-days, however, morphia hypodermically administered, is found to act more certainly and speedily, without deranging the stomach and intestines.

Laudanum may be given alone with signal benefit in muttering delirium, with muscular tremors, dry skin, and prostration. A grain of morphia or a drachm of laudanum is mixed with four ounces of water, and a teaspoonful is given every five or ten minutes, till three or four doses have been administered. If by that time the patient is not asleep, the medicine should be intermitted for half an hour; then if sleep does not come on, a few more doses should be given in the same way. This method often insured calm, refreshing, invigorating sleep, lasting for several hours, out of which the patient wakes free from wandering, refreshed, the tongue moister, the appetite and digestion improved, and the skin comfortably moist. Sometimes, however, it answers better to give a single moderate dose.

"Any one who has watched the action of opium on a patient in extreme weakness, with sleeplessness, twitching and tremor of the muscles, quivering dry brown tongue, and parched skin, must have been struck by the fact that the administration of laudanum, by producing refreshing sleep, helps a patient over this critical stage with far less consumption of alcoholic stimulant than would otherwise have been required."

Who can read the above graphic and true pictures without seeing that something more than sleep and diminution of irritation are necessary to account for the patient's awaking with "appetite and digestion improved" in desperate stages of typhus fever. Were this produced by quinine there would be no question as to its tonic action.

Gubler, while exalting opium and recommending its use in a great variety of cases, is opposed to its use in all sthenic forms of disease, or where congestion may be suspected, especially of the brain, spinal cord, or of their membranes. Whether as a stimulant, sedative, anodyne, or hypnotic, he only uses opium

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in asthenic and anaemic cases, believing that its almost essential effect is to congest and do harm in the opposite states. It is impossible to follow this author in all the details of his opinions, and I will only say that his theory of the action of opium causes him, in my opinion, to restrict its use too much. Local blood-letting and its combination with other treatment, enables us to use it freely and with great benefit, in many cases in which his theory would prohibit its use.

It may be well here to give somewhat in detail some of the diseased conditions in which opium has been found beneficial by most authors who have written upon the subject. I do not propose to give a classification, and shall only comment upon them in so far as it may be necessary to enforce the theory of the stimulant, tonic and alterative action of opium.

It has been used with undoubted benefit in obstinate and severe neuralgia, in certain cases of insanity, in the delirium of the wounded, in certain cases of nervous deafness (Toynbee, Diseases of the ear), in amaurosis, by the writer, in hysteria of very anæmic women, in intermittent fever, in the advanced stages of small-pox, in the lowest stages of typhus fever (by Graves and Stokes), in cholera, in the exhaustion of heart disease, in senile gangrene, in extensive suppuration, in great loss of blood, in desperate and almost hopeless chronic diseases of the intestines, in chronic irritable ulcers, in certain forms of (apyretic) rheumatism, in acute vomiting, in diabetes melitus and insipidus, in so-called colds, in amenorrhœa, in uterine and pulmonary hemorrhage, in spasm of both systems of muscles, as an antiphlogistic, in several forms of dyspepsia, and in a variety of other conditions.

The influence of opium in subduing pain and irritation in their *various forms*, and in procuring sleep, attracts most strongly the attention of the observer, and by some are considered its most important, if not its only (Bintz) virtues. These are doubtless properties of great importance, but by no means equal its value as an antiphlogistic, and as a sustainer and builder-up of the system, in the most desperate conditions.

Certainly the cessation of pain and the procurement of sleep are factors of great importance, but it is impossible to conceive that these results should be obtained without other profound

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influence being exerted on the vital processes going on in the tissues which are the seat of the inflammation or other diseased processes.

These are not isolated facts, however little we may be able to understand the subtle changes which attend and follow them. Nor do we obtain the good results in the same degree when sleep and cessation of pain are obtained by other means in the same conditions.

There is also no doubt that in the critical stages of exhausting diseases its power over organic changes in the diseased tissues, and in the whole system, so acting as to conserve and increase its forces, may decide a favorable result. Taken properly under such circumstances it may be considered in one sense as both food and medicine.*

Its antiphlogistic powers, its remarkable influence in low stages of typhus fever, its great and exceptional influence in diabetes, and, as I shall show by example later, its power in restoring the health of the blood, and of the nervous system, certainly justify the claim advanced for opium as being a tonic and alterative, as well as a stimulant and sedative.†

It is almost certain that the idea that opium has tonic effects would never have entered my mind so clearly had it not been for its hypodermic use. This method of introducing medicine into the blood is one of the greatest improvements in modern therapeutics. I have demonstrated to my own satisfaction that we cannot always obtain the good effects of opium in the same degree or in the same space of time when administered by the mouth. This rules applies, probably even more strongly, to some other drugs than to opium. This fact calls for a readjustment in the therapeutic teachings as regards such drugs as can be used hypodermically. It actually *seems* as though there were in the case of some remedies a difference in *kind*, as well as in *degree*, in the effects produced by this method, as compared with the method of administration by the mouth.

* Wood (H. C.) when speaking of the power of opium as an antiphlogistic, says: "By allaying irritation and pain, opium affords relief in most cases of inflammation, but in certain varieties of the affection it seems to do more than this, exerting in some way at present difficult to explain, a life saving influence.

† Dr. H. C. Wood, of Philadelphia, says again:

"Opium appears in low fevers, and in various protracted adynamic illnesses, to afford actual support to the system, in some way not as yet made out. This is especially the case when, from any reason, sufficient food to keep up life cannot be taken or retained."

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The explanation of these facts is not yet to be found, but they are none the less true, even though physiology cannot as yet solve the problem. I have experimented upon an appropriate case, first by the mouth till the full physiological effects have been reached, without having attained a curative (tonic or alterative) effect; when upon giving the same, or a smaller dose hypodermically, the effect sought for followed rapidly. It may be that the suddenness of its action (being, as it were, in one blow), and the elimination, to a great degree, of the disturbing effects upon the organs of digestion and the nerve centres will account for the difference in the effects of the two methods of administration. Certainly it would be useless to hope for a tonic effect should the whole system be disturbed and upset. One thing is certain, namely: that the most important of the medicines adapted to hypodermic use are much better borne when thus used. The doses required are smaller, and do not require such frequent repetition, nor do they require to be used for so long a time. All authors agree that the appetite is not so much diminished, that the bowels do not become so much constipated, and that the effect is more rapid and permanent when opium is used hypodermically. This is as far as I find that authors writing upon the hypodermic method go in their expressions of preference for this method.

If what has been said above as to the *comparative benefits* of the *hypodermic* method be true, it is, so far as I know, the *assertion* of a *new principle* in *therapeutics* — applicable to strychnia, opium, and possibly mercury and some other drugs.

I will conclude my paper by giving in a few words the history of a case illustrative of the tonic and alterative effects of the sulphate of morphia in small doses.

The patient, a youth of about 14 years old, was led to my office by his father. His sight was so far lost that he could not walk unguided, and he presented a striking picture of anæmia and mental weakness. It was with great difficulty I discovered that he had contracted the habit of masturbation, and this was only accomplished by his own confession. The patient promised to discontinue the habit, and in about a week after his father brought him to me for treatment, in the same condition as described above.

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Ophthalmoscopic examination showed that the loss of sight was of cerebral origin, the retinæ and optic papillæ being healthy. Treatment was commenced by the hypodermic use of the nitrate of strychnia, in doses of 1-60 of a grain, increased to about 1-40 of a grain after about five days. This treatment was continued for ten days, with a slight improvement in the sight, which, however, began to retrograde on about the sixth day. The general condition was but little improved, and I determined to give up this method of treatment as a failure.

I now decided to make trial of such nervous agents as might give most promise of benefit, commencing with opium, on account of the cause of the trouble, which seemed to approximate the case to some of those above enumerated as being benefited by its use.

This treatment was commenced by the injection daily of 1-16 of a grain of the sulphate of morphia into the arm. After ten days the dose was increased to 1-12 of a grain, and after three weeks the dose was gradually diminished to 1-30 grain a day. At the end of a month the patient was dismissed from treatment the picture of health, having fattened very much, and lost every trace of anaemia and mental imbecility. There was a marked improvement in the sight after the first dose of medicine, and the patient showed some improvement in the expression of his face, and looked less depressed and weak. At the end of a week he could read ordinary print, his appearance and mental faculties had greatly improved, and his appetite had also improved in an astonishing manner. At the end of three weeks his sight was perfect, though he could only see the fingers at six inches from the eyes when first seen. No other medicine was used, and no change was made in the diet or otherwise, except as to the habit of masturbation. The most striking feature was the suddenness of the improvement, the first dose giving a marked change. I have not gone into the minute details, nor been particularly technical, because this case will be utilized specially elsewhere.

The results in this case were to me amongst the strongest evidences of the power of medicine that ever came under my observation, more striking in my opinion than the effects of quinine in intermittent fever; for here we have the renovation

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of the blood, the renewal of moral and intellectnal power, and the restoration of the well nigh abolished sight.

This case was observed about two and a half years since, and led to a long series of experiments continued to this moment, with the result of increasing my confidence in the power of opium for good in appropriate cases.

I cannot, however, too strongly warn against its careless or inappropriate use, for I have seen great disturbance lasting for weeks caused by a single moderate but inappropriate dose.

I have known a patient so sensitive to the effects of opium, that a hypodermic injection of 1-30 of a grain of the sulphate of morphia once a day produced nausea and occasional vomiting for several days. In this case, however, there were no precautions used, the patient being allowed to walk about as though no medicine had been taken. This nausea is, however, often beneficial in acute inflammations.

It seems to me that the following propositions are worthy of cosideration:

1st. Opium acts as a sedative on all healthy persons but as a tonic it cannot act, because only the sick need a tonic, and but a limited number of these require the tonic effects of opium. Just here it is that the doubt enters as to the possibility of *physiological theories* ever acting any other than a *suggestive role* in the practice of medicine.

Clinical observation has taught me that opium may be considered as a *tonic;* and, when we consider its curative powers in most desperate conditsons of disease of the most varied kind, it seems that it must possess *truly alterative* virtues.

The expressions sedative, allaying irritation, stimnlating the vaso-motor nerve centres, etc., are quite as vague as the terms tonic and alterative, and need quite as much explanation as to the processes by which they are brought about. The truth is that not one admitted fact as regards opium has as yet received a thorough physiological explanation. Just as it is claimed that opium paralyses nerve cells, so I think that it acts on the same cell under certain conditions as a tonic and alterative when given in doses suited to the person and to the dis-

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ease. I have the same proof, viz: observation of its effects in disease.

2d. The most marked benefits observed from the use of opium are in cases of the asthenic type, in the anæmic, and in the most desperate forms and stages of disease, as in typhus fever in its lowest form, in cholera, in great loss of blood, in such cases as the one above detailed occurring in my own practice, in severe inflammatory diseases, and in certain conditions of the *blood* in *syphilis.*

3d. We have in the *sulphate* of *morphia, hypodermically* used, a *new remedy* in a *certain form* of *amblyopia* and *amaurosis.* It is *highly probable* that the *amaurosis which sometimes follows great loss of blood can be prevented by a proper use of opium continued for a sufficinely long period of time* I have now in my mind a case of hæmorrhage, thought to be fatal at the time, which made a complete recovery by its use, combined with iron. *The only case of amblyopia in consequence of diabetes melitus which has occurred in my practice was readily cured by opium and diet.*

4th. *We may find in opium a new and important aid in the treatment of the victims of the habit of masturbation by means of which their moral and physicat forces may be so increased thot they may be enabled to enter the true physiological path.* The condition of these cases preventing often the proper exercise of the sexual function, it would seem that any medicine would be a great boon which would render them the necessary moral and physical aid under the circumstances. This class of cases is more numerous that is generally known, even to physicians.

5th. The sulphate of morphia when hypodermically used (and this is probably more strongly true of strychnia), seems to have in a *practical*, if not in a *physiological* sense, new virtues.

6th. As a rule, the tonic and alterative doses of opium are comparatively small, but there is upon this point a great difference, some cases, as in great loss of blood, etc., etc., requiring large and often repeated doses. The dose varies from 1-60 to ½ of a grain for adults.

7th. As a rule the *unpleasant effects* of opium, if given in

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suitable doses to patients in whose case it is *truly indicated*, are *much less marked* than in *healthy* persons, or those in whose diseases the drug is *contraindicated*. In the large majority of appropriate cases its effects are pleasant as well as beneficial, though the exact dose required is determined by constitutional peculiarities, as well as the nature of the disease, and the condition of the patient.

8th. It seems that by using opium hypodermically the physician has more power to prevent the "opium habit," though I find that Bintz holds the opposite opinion. Certainly the physician has it in his power to diminish the dose without the knowledge of the patient, and thus wean him from the habit. *If opium be given in proper doses in cases where it is really indicated, it is much easier for the patient to discontinue its use when it is no longer indicated than in cases where its use was unnecessary or contraindicated. Ordinarily when a very debilitated case has been restored to health by the use of opium it can be discontinued, even abruptly, without much disturbance to the nervous system, and in many cases without inconvenience, even where very large doses have been used.* In most cases the fact of the use of opium need not be revealed, and when this is the case there is no trouble for the physician to discontinue the use of the drug.*

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* I would here protest against the custom which is certainly adopted by some physicians in America, of teaching patients the use of the hypodermic syringe. This is only proper in exceptional cases, which suggest themselves readily to the mind of the physician.

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