

An essay on rectal medication / by William Bodenhamer.

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RECTAL MEDICATION.

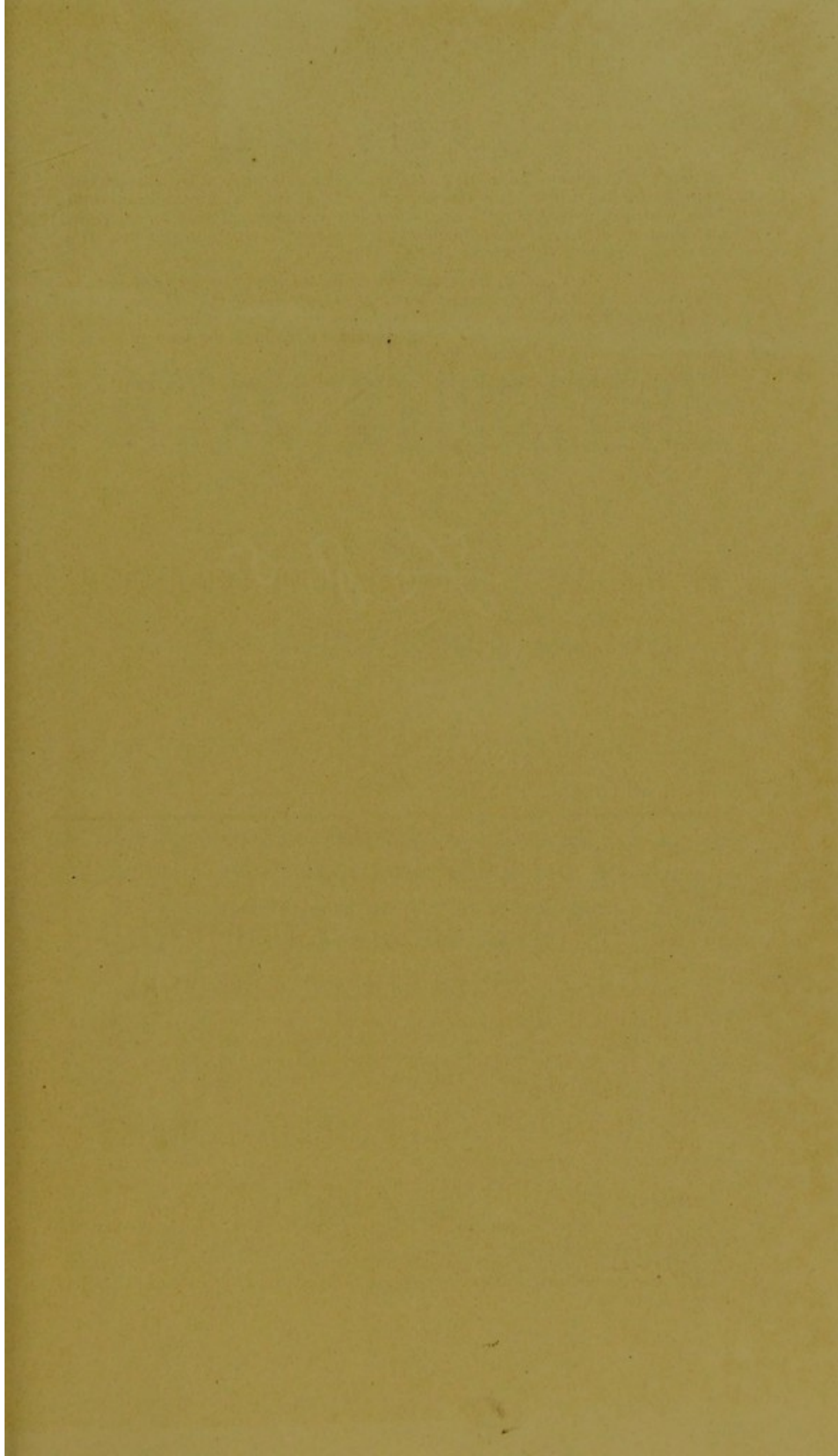
BODENHAMER.





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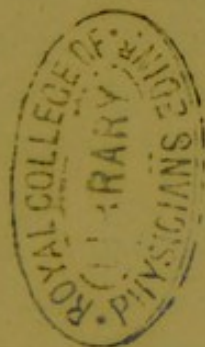




AN ESSAY
ON
RECTAL MEDICATION,

BY
WILLIAM BODENHAMER, A.M., M.D.

In the employment of an officinal therapeutic remedy, it is not only important and necessary to know in what case, in what dose, in what form, but also BY WHAT CHANNEL it should be administered.



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PREFACE.

The science of medicine extends its inquiries over so vast a range of knowledge, and comprehends such a multitudinous mass of detached facts and observations, that it includes a number of distinct departments. In any one of these the medical inquirer may employ his industry to advantage, either in collecting the valuable observations of his predecessors upon the subject, or in augmenting them by his own, using his own judgment and discrimination in their selection and arrangement. Now, if a medical man impressed with such views, and possessing a comprehensive knowledge of all the departments of the science, should direct his special attention to such a one, as his inclination, genius, and particular circumstances led him to select, he could scarcely fail, by study and by practice, to simplify, to enlarge, and to improve it. But, as a necessary consequence, unless he is accurately acquainted with the principles of the entire science, he is utterly incapable of elucidating or of practising it successfully in any one of its parts; for it is the establishment of all the principles of the science, alone as a whole, which can be truly serviceable to him in the practice of any one branch, and which can alone preserve him from the blunders and the disgrace which inevitably await a partial and a contracted knowledge of it.

As specialties and specialists in medicine are now the order of the day in our own country, the author must be pardoned for this little episode.

Rectal medication, the subject of the following essay, is a

branch of medical inquiry, which, although not new, being coeval with clysters, will nevertheless be found by the student to be highly interesting, as well as generally and immediately useful. Indeed, the subject of the administration of medicines *per anum* instead of *per os*, for the removal or the mitigation of diseases, besides those of the rectum itself, is of great importance. It is by no means as well understood as it should be, or as its merits demand, consequently it is well worthy of further investigation.

Scarcely any attention has hitherto been paid to the rectum as an absorbing, or as a digesting organ, or to the nature of the chemical reactions which take place between the components of the remedy introduced into it, and the products in the form of secretions and excretions which are peculiar to, or are found in it. But this lack of knowledge with regard to rectal medication is not surprising, when we take into consideration the fact that, even in stomachic medication, which all admit is of transcendent importance, a knowledge of the modifications which medicines undergo in the stomach, or the form or the manner in which through this medium they gain access into the economy, is as yet, far from being as well understood as it should be. In truth, this subject has not yet received its full share of attention, as a very slight glance at the writings of the most eminent therapeutists will show. Too little attention has been paid to some of the chemical as well as physiological points connected with this subject; consequently it may, to some extent, still be asked, Where can be found specific directions, either as to the most suitable solvent to be employed, or as to the proper dose of the remedy to be used, or respecting the most eligible place to which the remedy should be applied; or where can be found a satisfactory explanation of the manner in which the medicine gains access into the system? Since the publication, however, of the remarkable production of M. Mailhe,

(*Traité de l'Art Formuler, ou Notions de Pharmacologie appliquée à la Médecine. Paris, 1845*), the later very philosophic and satisfactory treatise of Mr. Headland (*On the Action of Medicines in the System. Fourth Edition, London, 1866*), and the no less able and important work of our own countryman, Dr. Tully, (*Materia Medica; or, Pharmacology and Therapeutics. Springfield, 1858*), rapid progress has been, and is being made in this direction. These three eminent authors, by their Herculean labors have placed the art of prescribing upon a sounder and a more scientific basis than it has hitherto occupied, and have done more towards elucidating the *modus operandi* of medicines, or correctly representing the changes to which they are subjected during their passage through the system, than any other therapeutists, so far as the author's reading extends.

Rectal medication, although next in importance to stomachic medication, is, as a general rule, seldom practised except in diseases of the organ itself; or in those cases in which, under certain morbid conditions of parts, it is impossible to administer medicines by the mouth. But if it can be demonstrated that it is highly beneficial and of great value, not only as a means of local, but of general treatment, and that many remedies act with greater promptness and with more efficiency when administered *per anum* than they do *per os*, then why not thus administer them? This method, however, is by no means offered as a complete substitute for stomachic medication, but only intended to properly restrict its use.

It will be observed then, from what has already been said, that rectal medication, the literature of which is very meagre, and affords but little satisfaction, opens a wide field for cultivation and improvement. The attention of the student is therefore respectfully called to its importance and future study.

The author having been engaged for a number of years in treating diseases of the rectum, was naturally led to watch

closely the effects of various remedies directly applied to its mucous surface, or thrown into its cavity in such a form as to be tolerated by it, with a view to their being absorbed or imbibed, and produce their therapeutic effects, both local and remote; consequently, he speaks from actual experience. He would observe, however, that in the investigation of this subject he has not had the facilities and the advantages of a hospital practice, which is so prolific of results, and which is the great source from which flow the numerous facts which constitute the statistics of medicine; yet the scope of the subject is such, that even from a prolonged experience in private practice, much important and useful information may be obtained, and go to augment the general amount of medical knowledge.

Some observations on colonic medication, and recto-colonic alimentation, have been made in connection with the subject of this essay, which seemed inseparable from it. The capacity possessed by the rectum and the colon for absorbing and digesting aliment, when properly prepared and introduced into them, is a problem not only of great interest to physiologists, but of far greater interest and importance to the medical practitioner. The extent to which these organs may be depended upon as the medium of introducing food into the system, is of vast importance in the treatment of disease, and is now being thoroughly investigated by some of our indefatigable German physiologists.

The author has not, in the brief limits of this essay, given a complete disquisition of the several important principles involved in this subject; but he has, to the best of his ability, given an outline of them, with a view to stimulate inquiry and to evoke further discussion. In it, however, the student will find sufficiently discussed, all the essential elements necessary to a thorough examination of the subject.

249 MADISON AVENUE,

NEW YORK, January 5th, 1878.

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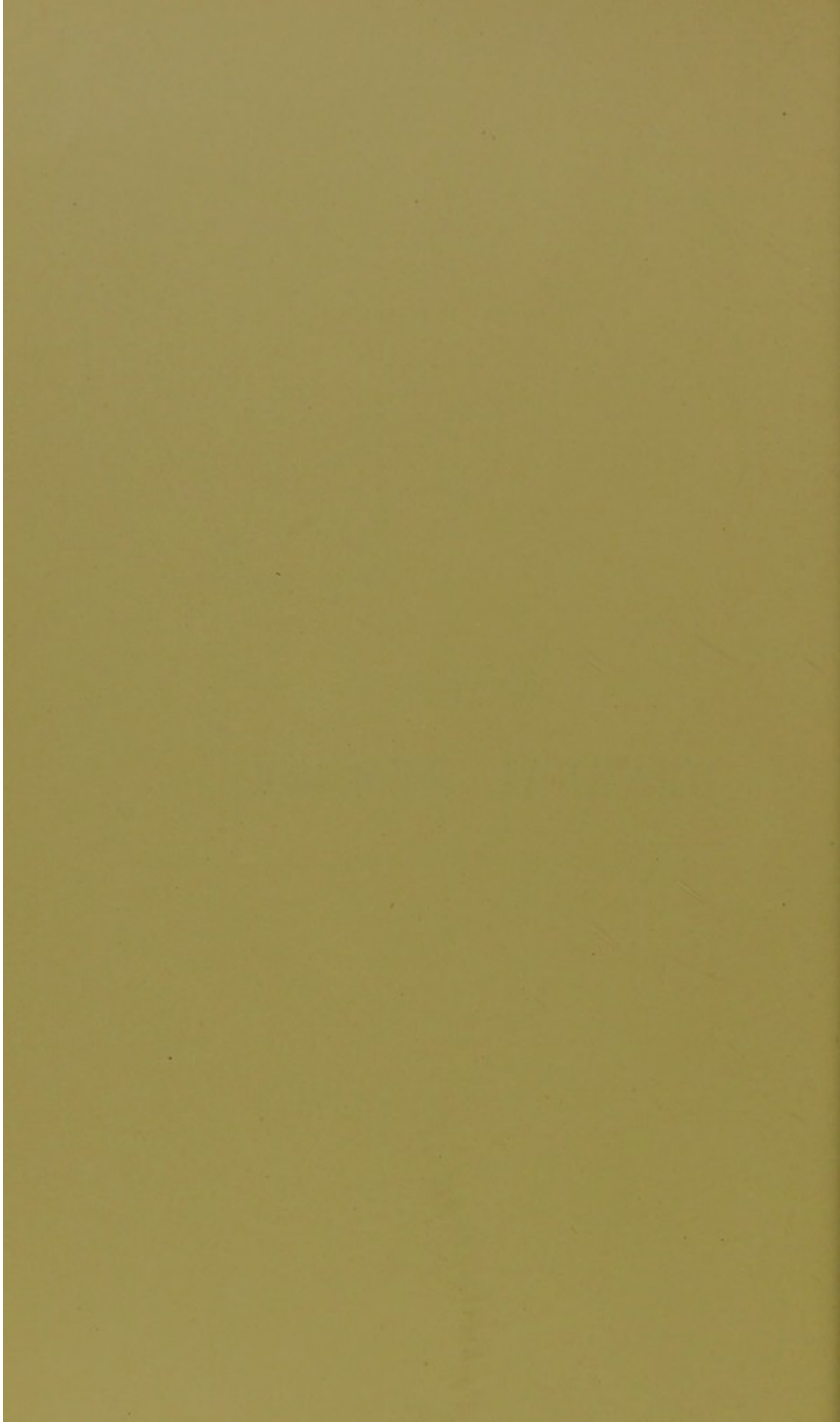
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SECTION I.

GENERAL REMARKS.



AN ESSAY ON RECTAL MEDICATION.

SECTION I.

GENERAL REMARKS.

1. In the employment of an officinal therapeutic remedy, it is not only necessary and important to know in what case, in what dose, in what form, but also by what channel, it should be administered; for a great point or desideratum in the use of all medicines, but more especially those that operate through the medium of absorption, is their rapid transmission, pure reception into the system, and their speedy and efficient effect, both local and remote. In many instances the principal object may be to allay excitement, to give ease, and to procure rest or sleep as soon as possible. The stomach may be too irritable to tolerate medicine or anything else, or in such a condition as to be incapable of absorbing it, or to do this very slowly and imperfectly, as is frequently the case. Some medicines, when addressed to the stomach, tend to impair digestion at a time when it is highly important to improve it, or, at least, not to interfere with it; whereas the same medicine, if it were administered *per rectum*, would not, perhaps, in the least interfere with digestion. Some medicines, too, are very liable to become decom-

posed or contaminated in the stomach. Patients frequently refuse to swallow medicine, or are unable to do so. These several circumstances, with many others that might be named, have pointed to the necessity in such instances, of a somewhat more certain, speedy, and efficient method than the ordinary one of stomachic medication. Hence, for ages, there has been more or less attention directed to the subject of the function, or the absorbing power which certain surfaces or parts of the body are endowed with for medicines; it having been almost always a prevailing idea, that before a medicine can exert any remote or ultimate action upon the system, it must first be received into the economy in some manner; that is, either by absorption or by some other process. To effect this important object, physicians in all ages have resorted to numerous and various methods and contrivances, of which the first, most important, and most common was stomachic medication; that is, the submission of the remedy to the influence or the power of the gastric mucous membrane, or the gastro-intestinal mucous membrane. The largest majority, however, have always considered the stomach to be the most eligible of all the parts of the body for the application of medicines, and some even consider it the only eligible part, or the only avenue through which to administer medicines and to make therapeutic impressions. But it is now well known that contact with a mucous surface is not an essential requisite for the operation of a remedy, inasmuch as a medicine introduced into the system elsewhere acts in the same manner as when taken into the stomach; as, for example, a moistened leaf of tobacco placed over the radial artery, at the wrist, and kept there a short time will produce vomiting; or tartar emetic injected under the skin will do the same. Those who contend that the gastric or gastro-intestinal mucous membrane is the most eligible part of the body for the application of medicines, assign as the chief reason for this preference that the secretions of the alimentary canal are charged with those very substances which are essentially necessary to the solution of all therapeutic agents: there being acids in the stomach, alkalies in the intestines, and saline compounds in every part of the canal. Consequently a medicine, accord-

ing to this theory, before it can be absorbed and enter into the economy, must be soluble, or susceptible of becoming so in the secretions or fluids of that part of the canal to which it is addressed, including, of course, the rectum. Many of those, however, who believe that medicines can only gain access into the economy by being first dissolved, contend that this solution can be just as easily and as certainly effected by the fluid secretions or humors of any other surface or parts of the living body with which they are brought into contact, as by those of the gastric or the gastro-intestinal mucous surface; as, for instance, they who address medicines to the mucous membrane of the respiratory apparatus, to the denuded dermis, etc. Mr. Brunton, one of the most energetic experimental physiologists of the present day, says that, "Absorption is quickest from a serous membrane, then from intercellular tissue, and lastly, from mucous membrane." (*Experimental Investigation of the Action of Medicines*, London, 1875.)

2. Some of the ancients had the same objects in view when they selected the *epidermis* as an eligible part of the body through which to make therapeutic impressions upon the system. This they did by rubbing into the skin medicinal agents in the form of oils, ointments, liniments, etc. This system of inunction was called *Iatraliptice*; that is, the cure of diseases by the application of remedies to the skin, aided by friction. The term *Iatralieptes*, from *ιατρος*, a physician, and *αλειφω*, to anoint, signifies one who cures diseases by ointments and friction. Hippocrates frequently uses the word *Iatralipta* to designate the *Medicus Unguentarius*, or *Uction Doctor*. Those who practised this system at that day were evidently of a very inferior order of physicians; and, according to Pliny, this order was first instituted by Prodicus of Selymbria, a disciple of Æsculapius. Galen makes mention of such physicians in his time, and especially of one named Diotas. Cicero remarks that this order attended the baths at Rome, and practised in all diseases of the skin. Celsus, the elegant and philosophic writer, does not bestow upon an *iatralipta* the dignified title *physician*, but evidently considers him a mere anointer. "Sanus homo, qui et bene valet, et suæ spontis est, nullis obligare se legibus debet; ac

neque medico, neque iatralipta egere." (*De Medicina, Lib. 1, Cap. 1.*)

3. In modern times the iatraliptic system of medication has been much improved. The medicinal substances to be applied to the skin are reduced to the finest possible state of division, or are suspended in a suitable vehicle, such as water, spirits, oil, gastric juice, saliva, or bile, all of which having been used, and in this state they are rubbed into the skin. M. Collard de Martigny, from numerous experiments which he made, arrived at the conclusion that the palms of the hands, soles of the feet, neighborhood of the joints, the chest, the spine, and the inner parts of the limbs, are to be preferred as the most eligible for the application of the medicine.

The epidermis was also chosen by many as a proper surface for the application of remedies unaided by rubbing. This method was denominated *enepidermic*; a term indicative of the method of applying medicines to the epidermis unassisted by friction, as when baths of various kinds, medicated or not, fomentations, cataplasms, sinapisms, plasters, and blisters are employed.

4. In our own day and times, several methods of medication have been introduced, among the most prominent of which are: *endermic*, a term indicating the method of applying medicines to the denuded dermis; *hypodermic*, a term which indicates the method of introducing medicines beneath the skin; *intra-venous*, that is, the injection of medicinal agents directly into the open veins; and *lingual*, the method of applying medicines to the tongue. Of these recent methods, the greatest attention, however, has been bestowed, and deservedly too, upon hypodermic or subcutaneous medication.

5. *Hypodermic Medication*.—This now very common and often misused method is of great and undoubted value in numerous cases, yet I am decidedly of opinion that rectal medication is of greater importance; indeed, it is greatly preferable in many instances, being much less dangerous, much more convenient and simple, and the remedies, too, act through this medium with almost equal celerity, as I have often verified. But very few remedies can be used hypodermically in comparison to those which can be used by the

rectum; and furthermore, the certainty of rapidly introducing into the system, *per rectum*, the most active narcotics and other remedies without having to resort to the operation of hypodermic injection, will prove valuable in those cases in which an operation, however inconsiderable, is always more or less dreaded, and also in cases in which it may be found highly necessary to keep the patient for a considerable length of time under the influence of the remedy, by frequently repeating it, as in persistent neuralgia, puerperal mania, mania-a-potu, hydrophobia, tetanus, etc. I have seen cases in which the operation of hypodermic injection had been so often repeated that all the eligible places of the body for the puncture were covered with cicatrices, so as to leave no place for new punctures except through the old ones. Another serious objection to hypodermic injections is the great liability to the formation of troublesome abscesses in the tegumentary walls, certain remedies especially being exceedingly prone to result in such abscesses.

It is, however, doubtless true, as Mr. C. Hunter says in a very able article on "Hypodermic Injection," that by this method, more than by any other, the whole effect of any given quantity of a medicine introduced is obtained; that it is a better test than any other of the exact amount of a medicine necessary to produce a desired effect, when taken by direct means into the general circulation. (*London Medical Times and Gazette for March and April, 1859.*) Dr. A. Ruppaner, physician and surgeon to the New York Dispensary for Diseases of the Throat and Chest, in a very practical work on "Hypodermic Injections," uses the following judicious language: "In all proper cases hypodermic injection is and ought to be to the physician what the splint is to the surgeon in fracture, one link only from among many in the chain of elements necessary to success." (*Hypodermic Injections in the Treatment of Neuralgia, Rheumatism, Gout, etc., p. 24. Boston, 1865.*)

6. *Lingual Medication.*—Mr. Wardrop has demonstrated the fact that there is a remarkable difference in the length of time occupied by the stomach in absorbing medicines, and that occupied by the tongue or mouth. He has established the fact that the absorption of medicines is much more rapid

from the tongue than from the stomach, and that the effect is more regular and more equable. The medicine is more certainly absorbed *en masse* from the tongue, and is taken directly into the general circulation, whereas, when it is absorbed from the stomach, it has to pass *en route* through the portal system before reaching the general circulation. This method, however, cannot be used for those medicines that are nauseating or are intensely bitter, nor for narcotics generally. It can only be used for tasteless remedies, or for those that are pleasant and agreeable to the taste. It cannot be used in cases of delirium, or in patients refusing medicines, etc.

There is, in several respects, a considerable similarity between lingual and rectal absorption.

SECTION II.

METHODS OF RECTAL MEDICATION.



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Rectal medication is principally effected as follows:—1, by the introduction of simple or medicated fluids or semi-fluids into the rectum, in the form of enemata, by means of a syringe or other suitable apparatus. By this method, both medicines and nourishment may be introduced into this organ, and thence conveyed into the system. 2. By the introduction of medicated solids or semi-solids into the rectum, in the form of suppositories, by means of the suppository siphon. 3. By the introduction of air, gases, fumes, vapors, powders, etc., into the rectum, by means of the rectal insufflator; and, 4. by the introduction of electro-galvanic currents into the rectum, by means of a suitable galvanic battery and electrodes.

1. *Enemata.*

The terms *Enema* (*enema*, Latin, from *επιημι*, to inject), *Clyster* (*clysterium*, Latin, from, *κλυζω*, to cleanse), *Lavement* (*lavement*, French, from the Latin *lavo*, to wash), and *Injection* (*injectio*, Latin, from *injicio*, to throw or cast into) are synonymous, being severally used to signify, not only the liquid remedy to be administered, but also the throwing, injecting, or forcing of such into a natural or a preternatural passage or cavity of the body. Enemata are either laxative, stimulating, antispasmodic, anodyne, sedative, tonic, astringent, emollient, demulcent, alterative, or nutritive, according to the effect intended. It is scarcely necessary to point out the general efficacy of enemata, nor to show that in numerous cases they may be advantageously substituted for oral medicines, and that in others the benefits derived from them cannot be obtained by any other means. This is particularly the case with regard to certain medicinal substances, and warm or cold water, when employed for its topical influence on the pelvis and inferior abdominal viscera; but even sim-

ple laxative or abluent enemata are not only less injurious to the constitution, less disagreeable to the patient, and more speedy in their operation than purgatives by mouth, but in many cases far more efficacious; indeed, if an immediate cathartic effect is indicated, they are of indispensable utility. When a prompt stimulating impression is indicated to save the patient from sinking, some of the diffusible stimuli used as an enema will immediately afford relief. In the diseases of infants and children medicated enemata are invaluable.

2. History.

Rectal medication, especially in the form of laxative or purgative enemata, is of great antiquity. Hippocrates highly extols laxative or purgative clysters in certain cases, either as substitutes for, or auxiliaries to such medicines given by mouth. (*De Victus Ratione in Morbis Acutis Liber.*) He also recommends different kinds of clysters in dysentery. (*De Mulierum Morbis Liber.*) Galen has also written largely upon the composition and use of purgative clysters. (*De Clysteribus Liber.*) Oribasius has written so fully upon the subject of purgative clysters, their composition, and the cases in which they are indicated, that he may justly be said to have exhausted it. With regard to the quantity of simple fluid for an enema, he says a large clyster amounts to three *heminae* (three pints), a small one to one *hemina*, and a moderate one to two *heminae*. (*Collectorum Medicinalium, Lib. VIII. Basilæ, 1557, folio.*) Celsus, after making many highly appropriate observations upon the composition and the use of purgative enemata, concludes by saying that they should be given neither hot nor cold, lest they offend in either way; and that after their administration, the patient should remain in bed for a while, and resist the first inclination to evacuate, but at length to yield when pressed by necessity. (*De Medicina, Lib. II., Cap. 12. Amstelædami, 1687.*) Paulus Ægineta highly extols purgative clysters in some cases, and concludes by saying that they should not be constantly repeated, lest nature, becoming accustomed to their use, should forget to perform the evacuation spontaneously. (*Libri Septem. Græcæ et Latinæ, Lib. I. Sec. 44. Basilæ, 1532, folio.*) Ætius also speaks fully upon the subject of purgative clysters, giving the

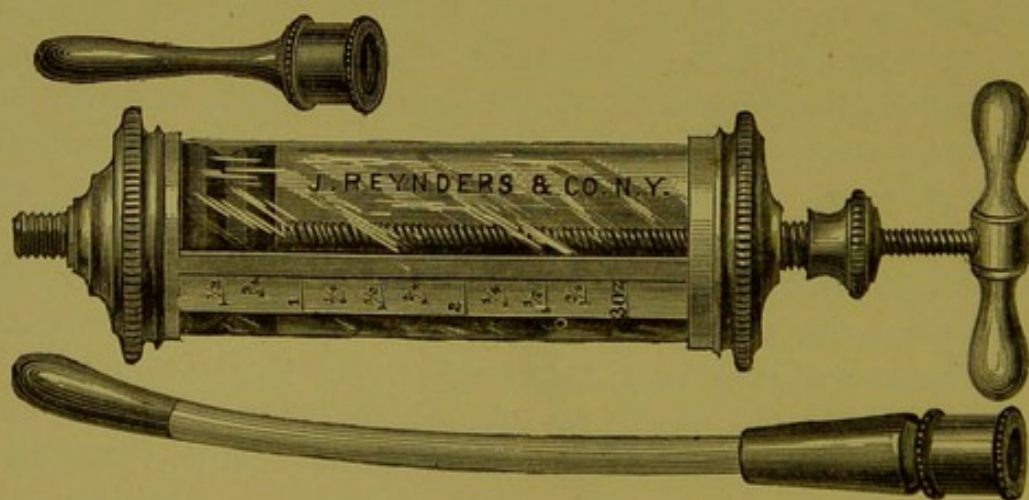
method of their administration, with a correct detail of the evils consequent upon constipation, for which they are especially indicated, and which, he very justly remarks, is the forerunner of most of the ills which break out in the human frame. (*Libri Medicinæ, Lib. III., Cap. 159. Basileæ, 1542, folio.*) Mesue of the ancients, however, recommends clysters for other purposes than that of producing catharsis merely. He used astringent and anodyne enemata, in hypercatharsis, tenesmus, etc. (*Opera quæ extant omnia. Venetæ, 1562, folio.*) Pliny intimates that the use of clysters was first suggested by the Egyptian bird, the Ibis, which on certain occasions, after drinking water, is observed to inject the same into its anus by means of its long beak, and thus produce an immediate evacuation of the residuum of digestion. (*Naturæ Historiarum Lib. VIII., Cap. 41. Hagæ, 1518.*) Christianus Langius, when writing on the same subject, says, that the ancient Egyptians learned the use of clysters from the Ibis, a celebrated bird of that country, which, when it became sick, would with its long bill inject the water of the Nile into its fundament. (*Opera Omnia, Lib. II., Epist. 2. Lipsiæ, 1704, folio.*) The great Historian Herodotus, speaking of the ancient Egyptians, says that their manner of life is this:—They purge themselves every month, three days successively, seeking to preserve health by emetics and clysters, for they suppose that all diseases to which men are subject, proceed from the food they use. (*Lib. II., Cap. 77.*) John Arden, an English surgeon of the 14th century, invented a syringe (*proclysteribus*) for giving injections, upon which he prided himself not a little, and in a copious treatise which he wrote on the manner of using it, recommends salt as the best material for injections. He explains at length the utility of such injections, not only in the cure, but also in the prevention of disease; and from what he says we are led to conclude that the practice of giving injections or *lavements*, as the French not inappropriately term them, was by no means common or well understood. He gives abundance of cautions on the subject, and says that the operator should neither administer them rashly nor negligently. The operation, according to him, is one which requires considerable dexterity, especially in cases of colic and intestinal obstruction. (*The History of*

Medicine, Surgery, and Anatomy, by William Hamilton, Vol. I., p. 391. London, 1831.)

Although the method of medication by clysters was held in the highest repute by the ancients, as well as by the moderns, as has been shown, it nevertheless did not fail to obtain a full share of reproach, having at an early day encountered more or less opposition and ridicule. Paracelsus bestowed upon it the epithet, "*Turpissimum Medicamentum*," and Van Helmont, that of "*Pudendum Medicorum Subsidium*." But the vagaries and the absurdities of these two old authors, master and pupil, were, however, inconceivable.

3. *Tolerance of the Rectum.*

It may be remarked that, as a general rule, the rectum will not tolerate exciting or irritating substances, or rapid distention, without resistance; consequently, medicated injections, except purgative ones, should be as small in quantity as possible, and be composed of the most bland materials, and should be introduced gradually, by means of a syringe having a screw piston, to avoid the too impulsive action of the common instruments, upon the principle of that which was recommended by Mr. Aitken more than a century ago. (*Elements of Surgery, Vol. II. p. 572. London, 1783, in 8vo.*) The following figure represents a graduated three-ounce glass



syringe, having a screw piston, a rubber nozzle, and also a rubber tube attachment, seven inches long. This instrument

which I have devised is a considerable modification of that recommended by Mr. Aitken, and may be used either with or without the screw piston. If these precautions be not taken, the acridity of the injection, and the rapidity of distention, caused by the use of the common syringe, would, in certain cases, be very apt to induce peristalsis, and occasion the expulsion of the injection, and thus in a great measure defeat the object intended. An ordinary small syringe, however, may be made to answer, if care be taken to inject as slowly as possible. The rectum, nevertheless, by repeated experiments, may sooner or later be instructed to bear irritating injections and rapid distention.

In order fully to answer the end for which enemata are intended, they should, as before observed, be accurately adapted, both in quantity and in quality, to the capacity and the tolerance of the rectum. Elegance of formula is less important when the enema is given with a view merely to the evacuation of the bowels; but when medicines of a different kind are injected, with a view to be retained, attention to their form and mixture is all-important; for instance, in the use of camphor it is requisite that it should be carefully divided and incorporated, lest portions of it should adhere to the mucous lining of the rectum, and cause such irritation as to result in unpleasant consequences; it is also necessary, in the use of turpentine, in order to avoid an inconvenient stimulus, that it should be carefully mixed with some mucilage and the yelk of an egg, or with some coarse brown sugar; these contribute to its perfect union with the watery fluid. I sometimes add a few drops of the liquor opii sedativus, or McMunn's elixir, to medicated or nutritive enemata, to aid in their retention. Before administering an injection to be retained, either medicated or nourishing, the rectum, if filled with fæces, should first be emptied by a relaxing enema, so as not to contaminate either the medicine or the nourishment, or cause either to be too soon rejected. After the administration of a medicated or nourishing enema, should there be a strong or irresistible desire to pass it, as is the case sometimes when there exists an exquisitely irritable state of the organ, a sponge or fold of cloth dipped in hot water, and firmly pressed against the anus for a while, will

generally appease the desire, and enable the patient to retain the enema.

As it regards medicated enemata, a rule is, that it requires three times the quantity of a medicine to be administered *per anum* that it does *per os*. This, as a general rule, is pernicious. When, however, the purpose of the enema is simply to produce a cathartic effect, the rule, although even then bad, might be observed safely with regard to a few cathartic medicines. But in the administration *per anum* of narcotics, sedatives, and numerous other powerful remedies, the observance of which rule would certainly be attended with most serious, if not with most fatal consequences. It might be well to remark here that the effects of poisons, when introduced into the rectum, have received too little attention from toxicologists, when we take into consideration the fact that this organ is so very capable, as will be presently shown, of readily and rapidly absorbing some of the most powerful poisons, when addressed to it. It is therefore a subject well worthy of further investigation by both the toxicological and the medico-legal student.

4. *Enemata of Water, or Other Simple Fluid.*

The quantity of fluid to be used in an enema of this kind must, of course, be varied according to the intention proposed, and the age of the patient. If the design is to procure an evacuation of the bowel by exciting its peristaltic action by water, or by other simple fluid, from eight to sixteen ounces, according to circumstances, should be administered for an adult; for a youth of fifteen years old, from six to twelve ounces; and for an infant, about two ounces. In some cases of excessive torpor of the lower bowel, the quantity of the fluid, however, should be considerable, as it often stimulates alone according to its bulk. Enemata are often used either as substitutes for, or as auxiliaries to cathartics. They seldom reach beyond the sigmoid flexure of the colon, unless the force-pump and recto-colonic tube, expressly made for this purpose, are used. They operate chiefly by stimulation and evacuate to the extent only to which such stimulus is applied or reaches; therefore, in the administration of ene-

mata for the purpose of producing catharsis, it must be remembered that, independent of their composition, there are two circumstances, which will always more or less change or modify their activity, namely, *impulse* and *quantity*. By these are obtained both the stimulus of impression, and that of distention. The temperature of enemata should be regulated according to the indication required, as a general rule, these being neither too cold nor too hot.

5. *The Administration of Enemata.*

The administration of enemata is generally considered so very simple that any one is supposed to be capable of performing it. Hence its execution is too frequently confided to ignorant nurses, or to the patients themselves, who, being unacquainted with the anatomy of the rectum, or organs concerned, do not perform it with that care and attention which its importance demands; but often do it in such an awkward and bungling manner as greatly to endanger, if not seriously injure the delicate parts, as well as to entirely fail in obtaining the object desired. The operation, however, is one of much delicacy, and one which may be attended with danger if not guarded by proper precautions, and which requires a much greater amount of knowledge and skill than those possess to whom its performance is generally intrusted. It is therefore highly important, in many instances, that the practitioner or the student should himself, if possible, perform the operation. If, however, this is inconvenient or impossible, then he should at least know how to point out its exact rules to others, and be able to direct its proper and careful performance. A suitable instrument is also highly necessary to the success of the operation. Of the numerous enema syringes now in common use, a few have been brought to considerable perfection, such, for instance, as De Henrie's, Davidson's, Mattson's, and Arnold & Sons', of London, which certainly contrast very widely with the *bladder and pipe* of olden times, used more especially in Germany and Holland. The bladder was either that of the hog, sheep, or ox, and the tube or pipe was of ivory, bone, or a goose-quill.

A syringe throwing a continuous stream should always be used when the indication is the speedy evacuation of the bowel.

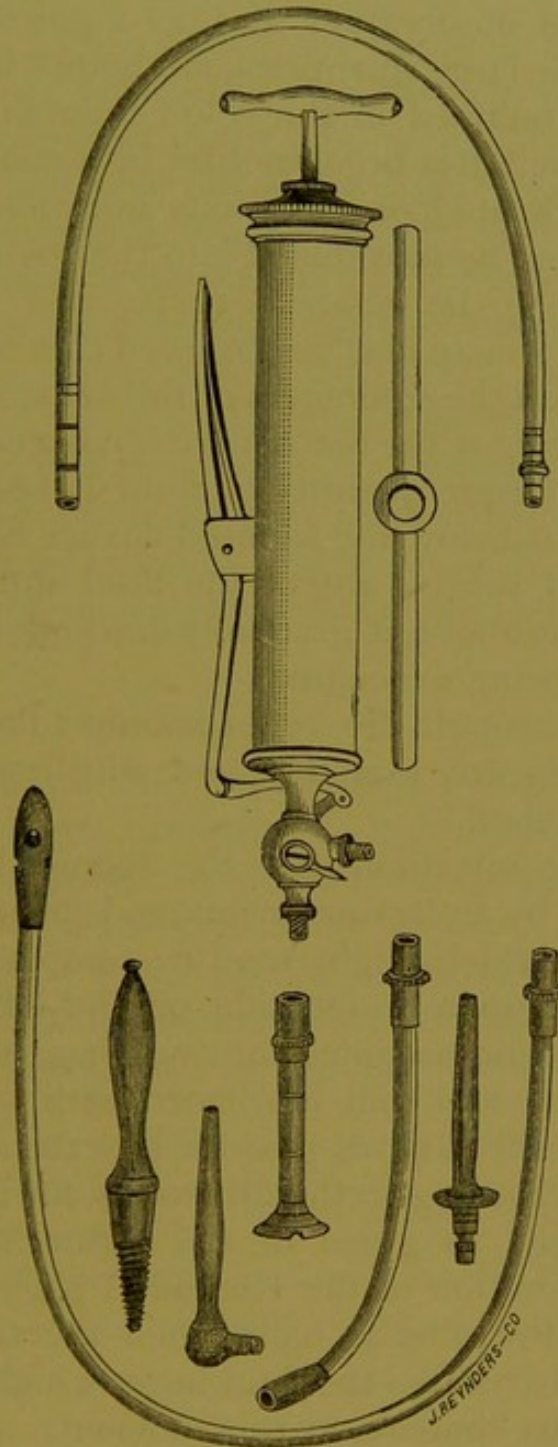
6. *Double-action Pump and Recto-Colonic Tube.*

The employment of the best enema syringes now in common use is quite sufficient for all practical purposes, so far as the rectum alone is concerned; but they are inadequate to force the fluid much beyond this organ. When the indication is the removal of accumulated fæcal matter impacted in the sacculi of the colon, solid concretions, intussusception and torsion of the bowels, spasmodic contraction, or other intestinal obstructions, the use of the recto-colonic tube and force-pump are invaluable, and cannot be dispensed with. I will also add that, in the following diseases, strangulated hernia, traumatic tetanus, aggravated hysteria, tympanites or meteorism, and obstinate constipation, the use of simple or proper medicated alvine injections, administered through the long tube into the colon, will sometimes act like magic in relieving the patient, as I myself have often witnessed.

I well recollect when, in 1836, I first read the very practical, highly valuable, and original remarks of Mr. O'Beirne, of Dublin, Ireland (*New Views of the Process of Defecation, Dublin, 1833*), on the use and importance of the long tube in introducing medicines into the colon in many diseases of the stomach, intestines, and nervous system. The impression made upon my mind then of their great value and importance has never been erased from it. This, together with the fact that these measures are so much neglected in general practice, must be my apology for devoting so much space to the elucidation of this peculiar method of medication.

Many lives have been lost for the want of a suitable apparatus for the easy introduction, or the forcing up of fluids beyond the sigmoid flexure of the colon, and a proper knowledge of its use. The following figure represents the best instrument of this kind I have ever seen; combining in itself the very valuable properties of a stomach-pump, an enema syringe, with an O'Beirne tube attached for injecting the colon. It can also be conveniently used as an aspirator. It is quite simple in its construction, and easy of execution,

and can be obtained at the surgical instrument house of Messrs. John Reynders & Co., No. 309 Fourth Avenue, New York.



7. Introduction of the Colonic Tube.

The insertion of the tube into the sigmoid flexure of the colon, and the subsequent injection of the fluid by the pump, are quite feasible and harmless procedures, provided they are judiciously and carefully performed. Indeed these colonic

injections are well borne, and even great distention of the bowels above may be obtained without being complained of by the patient, if the pump is worked slowly and cautiously.

It is worthy of observation that, as a general rule, alvine enemata, even in large quantities, are better borne, and can be more easily retained in the colon than in the rectum—hence, should the latter organ not be in a condition to tolerate either medicated or nutritious injections in sufficient quantity, they can be introduced into the colon through the recto-colonic tube, be retained there, and produce their desired effect. It may also be observed that by this method the pressure upon the sphincters of the anus, and the distention of the parietes of the rectum are obviated, and the retention of a much larger quantity of fluid is secured. Unless the obstruction is below the sigmoid flexure of the colon, the rectum need not receive any of the fluid until by the peristaltic action from above, it gradually descends into this organ, previous to its being evacuated.

Insufflation through the recto-colonic tube can also be much more efficiently executed, and with less pain than by the common method.

For a colonic injection, after the rectum has been completely emptied by a relaxing enema, and the patient divested of any clothing which might tend to compress the body, he should be placed upon his left side, on the edge of a bed or table, in the position occupied for sounding the rectum. The tube made warm and well lubricated with vaseline, should then be introduced as far as possible into the sigmoid flexure of the colon, according to the directions for introducing the sound or bougie, as given in the author's work on the "Physical Exploration of the Rectum," page 35. A proper vessel should always be at hand when the tube enters the colon, in order to receive the fluid fæces which generally pass with the gaseous contents at this moment. As soon as the tube has been introduced as far as desired, the position of the patient should then be changed from the left to the right side, and with his thighs flexed upon his abdomen, he should bend himself in the form of a semi-circle; for it will be

observed that in this position the fluid will the more readily and easily pass along the intestinal tract. The tube should now be attached to the pump, and the piston slowly worked, and the proper kind of fluid forced up by it. In this manner the fluid may be injected to the full length of the colon, and even be made to gravitate slowly through the *ileo-cæcal valve*, along the whole tract of the small intestine, into and through the stomach, and even out of the mouth. This effect of the passage of enemata through the whole tract of the alimentary canal I have never witnessed, but others have. The feasibility of it was long ago demonstrated by the illustrious Haller. *Primæ Linæ Physiologiæ. Cap. XXV., Section 749. Edinburgh, 1767.*) After a sufficient quantity of fluid has been injected, it should, if possible, be retained for ten or fifteen minutes, and in the mean time the patient should change his position from side to side, and to his back; and his abdomen should be most thoroughly manipulated by the nurse.

8. *The Quantity and the Quality of the Enema.*

The amount of fluid for a colonic injection may vary from four to eight pints, according to indications, and may consist simply of warm water, of warm linseed infusion, or the decoction of either marshmallow or starch. When, however, a stimulating or an antispasmodic enema is indicated, either one or the other of the following can be used, in whole or in part, as circumstances may require:—

Recipe, Olei Terebinthinæ optimi, uncias duas,
—— Olivæ, uncias tres,
Vitelli unius ovi,
Infusionis Seminum Lini tepidæ, octariis sex.
Fiat enema. To be administered secundum artem.

Recipe, Olei Terebinthinæ optimi,
—— Olivæ,
Magnesia Sulphatis, ana, uncias duas,
Tincturæ Assafoetidæ, drachmas tres,
Infusionis Seminum Lini tepidæ, octariis quatuor.
Misce et fiat enema secundum artem.

These alvine injections, even in the largest quantity, may

be retained fifteen or twenty minutes, and in some instances longer. They tend to relax spasm, soothingly stimulate the intestines, promote free and easy evacuations without tenesmus or pain, and maintain the peristaltic action in a favorable condition, neither unduly exalting nor depressing it. They will be found to be efficacious for general use.

There can be no doubt that, in certain cases of obstruction of the bowels in children, the injection of warm fluid or of air as above directed, during or followed by the inversion of the body, and, if indicated, whilst the patient is under the influence of an anæsthetic, will generally be succeeded by complete relief, even when the symptoms are of a very grave character. The reduction of intussusception of infants by copious injections of warm water, with the body inverted, has been successfully practised lately, as several cases of this description are reported in the *London Lancet* for January, 1876.

A proper quantity of warm water, or of warm linseed infusion, in such cases, should be injected into the rectum, while the child is held up by the feet, or the pelvis elevated. This method of relief should always be thoroughly tried before the operation for abdominal section is resorted to.

Gaseous enemata have lately been recommended as highly valuable in intestinal obstruction, by Dr. Bernardino Terres, of Alcazarde de San Juan. He was successful in relieving a desperate case of intestinal obstruction, in which there was stercoraceous vomiting, by the injection into the rectum and colon of a solution of bicarbonate of soda and of tartaric acid, separately, in the proportions of eight grammes of the former, to four grammes of the latter, which he increased to thirty grammes of the former, to fifteen of the latter. (*London Medical Record*, June 6, 1875.)

9. Rectal Suppositories.

The term *suppository* (*suppositorium*, Latin, from *sub*, under, and *pono*, to put) is applied to a solid but homogeneous medicated mass, of a conical or oblong shape, for introducing into the rectum, and to remain there for the purpose of being dissolved or absorbed, and of producing its desired effect. Suppositories, like enemata, are composed of different medi-

cinal ingredients, according to the intention of the prescriber. Formerly suppositories were much used to procure alvine evacuations; enemata, however, are always preferable for this purpose, when it is possible to administer them. In some of the diseases of the rectum, such as rectitis, neuralgia, carcinomatous degeneration, etc., they are often used. They are also indicated and resorted to with advantage in some of the diseases of the uterus and the bladder.

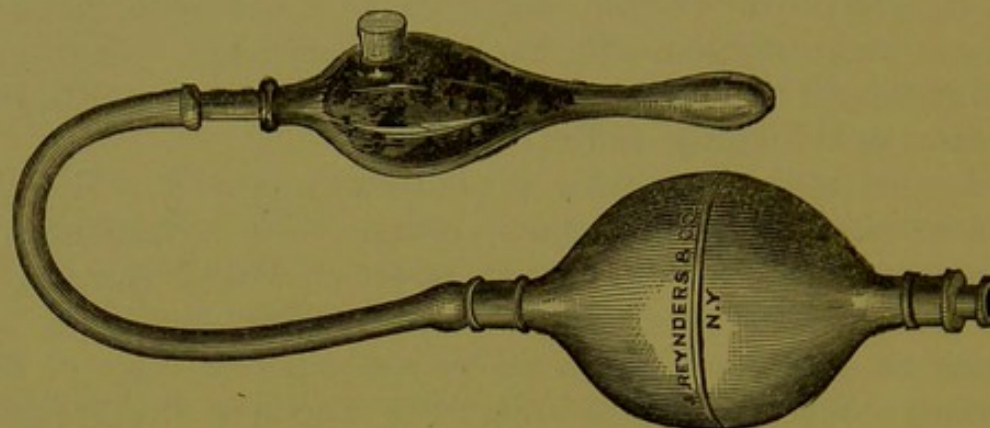
In order to produce their proper effect, they should be as free as possible, in their composition, from irritating substances, and they should also be smooth on their surface, or the rectum will not tolerate them. They should by all means be deposited clearly above the superior edge of the internal sphincter; for, if suffered to remain in the grasp of either one or both sphincter muscles, they will either be involuntarily expelled, or cause a great deal of unnecessary pain and irritation for some time after. Until recently they were introduced into the rectum by the index finger of the right hand, an operation sometimes painful, often impossible, and always very awkward and disagreeable. Now they may be administered with great facility, and seldom with any pain, by means of the suppository siphon.

The use of suppositories in the practice of medicine, like that of clysters, may also be traced to remote medical times. Hippocrates makes frequent mention of them in his works; so also do most all the ancient authors I have quoted. Dioscorides mentions the fact that the ancient physicians, for the purpose of inducing sleep in phrenitis, introduced the juice of poppies on wool into the rectum, as a suppository. (*Opera quæ extant Omnia. Francofortie, 1598, folio.*)

10. Rectal Insufflation.

The term *insufflation* (*insufflatio*, Latin, from *in* and *sufflo*, to blow into) signifies the act of blowing a remedy, such as vapor, gas, fumes, air, powder, etc., into any cavity of the body, as when tobacco fume is blown into the rectum, or air into the rectum or the lungs, etc. Hippocrates recommended inflating the intestines with a bellows, in cases of volvulus or intussusceptio. (*De Morbis, Lib. III. Cap. 13.*)

By this method many valuable remedies, properly prepared for the purpose, may be introduced into the rectum and colon by means of the rectal insufflator, represented by the following figure.



The insufflation of common air even is highly valuable in many cases of intestinal obstruction. I could here give many instances of the almost miraculous good effects of the insufflation, or injection of air into the rectum and colon, in cases which were considered almost hopeless. When the intention is to inflate the colon, the recto-colonic tube must first be inserted into the sigmoid flexure of the colon, and then the nozzle of the insufflator must be attached to its proximal end.

SECTION III.

RECTAL ABSORPTION.



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RECTAL ABSORPTION.

The mucous membrane of the rectum, like that of other portions of the alimentary canal, possesses all the requisites, more or less, for the exercise of absorption. Any one can assure himself at once, not only of the power of the rectum to absorb, but also of the rapidity of that act, by injecting four or eight ounces of warm linseed tea, or barley water, into the rectum, and retaining it for a few hours, and at the end of that time, should an evacuation of the bowels take place, not a drop, perhaps, of the injected fluid would be found in the fæcal dejection. Liebig states that a solution of common salt, in the proportion of one part of the salt to eighty parts of water, disappeared so completely in the rectum that an evacuation one hour afterwards was found to contain no more than the usual portion of salt. (*Animal Chemistry, edited by Mr. W. Gregory, p. 77. London, 1842.*)

1. *The Absorbents of the Rectum and Colon.*

The absorbents of the large intestine are much less numerous than those of the small. They are also superficial and deep. Those especially of the rectum, however, are much more numerous than those of any other portion of the large intestine. The rectum has a much larger number of blood-vessels than the cæcum and the colon, consequently its absorbents are numerous in the same ratio. They are sometimes of considerable size, and terminate laterally in the hypogastric, posteriorly in the sacral, and superiorly in the meso-colic and lumbar ganglia.

2. *The Follicles of Lieberkühn.*

These follicles are so denominated from their discoverer. (*Dissertatio Anat. Physiol. de Fabrica et Actione Villorum Intes-*

tinorum tenuium Hominis. Lugduni, 1782.) They are abundantly distributed throughout the cæcum, the colon, and the rectum, but by no means so numerous as in the small intestine. Their function, according to the opinion of Lieberkühn and others, is secretion merely. In accordance, however, with the minute researches of that eminent anatomist, the late and lamented Prof. Horner of Philadelphia, the office of these numerous crypts is not secretion, but absorption. This fact, in my opinion, he fully demonstrates by their peculiar structure, it being entirely different from that of any of the secreting organs. The absorption in these follicles, as in the villi, Dr. Horner considers is effected without the intervention of patulous ducts, upon the well-known principle of endosmosis. He thinks the number of these structures is far greater than necessary for the mere secretion of mucus; especially as the mucous membrane is already so very abundantly supplied for this purpose by the glands of Brunner and of Peyer. (*Special Anatomy and Histology, 8th edition, vol. II., p. 48. Philadelphia, 1851.*)

3. *Nervous and Venous Influence in Rectal Absorption.*

The rectum receives nerves directly from the motific and sensific columns of the spinal marrow, and it is the only portion of the alimentary canal which is thus supplied with nervous influence directly from the great source of motion and sensation. This fact at once explains the very remarkable sensibility and irritability which attend some of the very painful affections of this organ. It also tends to explain the circumstance why many medicinal substances act more energetically when applied to the rectum than when received into the stomach; and besides, it likewise tends to explain the principles upon which such remedies act in relieving such affections. The inference, therefore, derived from this source is very strong, that these nerves perform other functions, more vital than those merely of supplying volition and of bestowing sensibility.

With regard to venous action in rectal absorption, I would remark that it is by no means improbable that the venous plexuses of the rectum may perform an analogous office to

those of the small intestine, of absorbing the perfectly soluble and more homogeneous fluids that come in contact with them. The great excess of blood-vessels, nerves, and absorbents supplied to the rectum, over that of any other part of the large intestine, accounts satisfactorily for its greater power of absorption.

Dr. Tully has declared positively that the rectum and the colon are illy fitted to receive therapeutic impressions. (*Op. cit.*, p. 18.) The numerous evidences, however, which have been presented of the ability of the rectum and the colon to absorb properly prepared medicinal agents, contrast most widely with this declaration of his.

4. *Recto-Colonic Alimentation.*

The rectum as an absorbing and digesting organ, as before observed, has been but little studied. It is described and considered as being merely the reservoir or terminal depot of the residuum of digestion, preparatory to its final expulsion from the body; that it absorbs to some extent, but does not digest. It is true that digestion is not its especial function, like that of the stomach and small intestine, but that more or less digestion, in a feeble manner, does take place in the colon and rectum cannot be successfully denied. Numerous examples could here be given to prove that the rectum and the colon are capable, under certain conditions, of digesting, absorbing, or imbibing sufficient nourishment to maintain life, if properly prepared nutriment is addressed to them. I will here mention, in connection with this matter, that the interesting and very important subject of rectal or recto-colonic feeding has lately been investigated by Dr. W. O. Leube, of Erlangen in Germany, in an able paper published in the "*Deutsches Archiv für Clinische Medicin*," May, 1872. In this article Dr. Leube, however, does not speak of physiological or normal digestion, nor of the power, however feeble, possessed by the rectum and the colon to digest, but proves beyond doubt that artificial digestion to a great extent may be produced in them by a large use of pancreatic substance in the composition of properly prepared nutritive enemata, and that life can be sustained by such. It

is, however, a fact long since known and established, that nutritious elements properly prepared, even without the addition of pancreatic substance, and thrown into the rectum or the colon, and retained there, are taken up by the absorbents, and by them conveyed to the *receptaculum chyli*, and thus soon find their way into the economy, and produce their assimilative and nutritive effect. Whether this process should be called *digestion*, *absorption*, or *imbibition* matters not, as the effect upon the system is the same. Dr. Tully, however, dissents widely from this opinion. He says that, inasmuch as there are no lacteals in the colon and in the rectum, the idea of introducing nourishment into the system by means of *enemata nutrientia* is a perfect chimera (*loc. cit.*). But this dogmatical assertion of his cannot be sustained, for it is well known that there are lacteals, both in the colon and in the rectum, as they can now be easily demonstrated, and have been, more than a century ago. The illustrious Haller demonstrated the fact that lymphatic vessels existed along the whole tract of the colon and rectum; and in numerous instances, chyle was found in these vessels instead of lymph, proving that even in these remote portions of the alimentary canal, digestion can and does take place. (*Primæ Lineæ Physiologiæ, Cap. XXV., Sec. 747. Edinburgh, 1767.*) Winslow, the celebrated anatomist of the 18th century, when speaking upon the subject of the lacteal vessels of the colon, says:—"I demonstrated to the Academy of Sciences of Paris several of these vessels filled with chyle." (*An Exposition of the Structure of the Human Body. English version. By G. Douglas, M.D., Vol. II. p. 152. London, 1732.*) These facts of themselves are a sufficient explanation of the good effects of nutritious elements if addressed to the colon and rectum, and a complete refutation of the erroneous assertion of Dr. Tully.

The recent researches and experiments of Dr. Marckwald of Heidelberg, on the absorption and digestion of the colon, are highly important and deserve the highest consideration, as ultimately leading to good results in this direction. Those of Dr. Steinhauser must also be considered of great value in the same direction. The chief questions of Dr. Marckwald, to be answered, are—first, Does the large intestine secrete a

substance capable of transforming starch into sugar; second, Has its secretion a digestive action on albuminous bodies; third, Does any absorption of nutritive substances take place in the colon, and if so, in what condition must they be? (*London Lancet*, Jan. 8, 1876. *From Virchow's Archiv.*)

I have the greatest confidence in the absorptive and digestive powers of the rectum and colon to sustain life indefinitely, Dr. Tully's assertion to the contrary notwithstanding; and I could here give numerous examples, both from abroad and at home, to prove this beyond all doubt. Three of such cases came under my own immediate observation. But it was not contemplated by me, in this essay, to enter into the subject of recto-colonic alimentation fully, but merely to give the principal facts, and to notice it in connection with rectal medication, as they bear to each other so close a relation. I will, however, refer to the good effects of *enemata nutritia* in one remarkable case, reported by the eminent Italian Professor Bernardin Rammazzini, nearly two centuries ago. He saved a female patient by means of nourishing clysters, who could neither swallow food nor drink for the space of sixty-six days. (*Constitut. Epidem. Urb. a. 1691. N. 22.*)

I will now conclude the subject of recto-colonic feeding by the following pertinent remarks of Mr. Theodore Williams, who says: "Rest to the stomach is of the highest importance in some of the diseases of this organ. In such cases we possess in the rectum an effective second stomach, which, if it does not afford us the pleasure of digestion, spares us many of its pains." (*London Lancet*, October 24, 1874.)

Since writing the above, I am much pleased to see in the *New York Medical Record* of January 19th, 1878, that Professor Austin Flint, Sr., on the 20th of December, 1877, read an able and interesting paper before the New York Academy of Medicine on "Rectal Alimentation." The discussion which followed the reading of this paper was participated in by Drs. Barker, Peaslee, A. H. Smith, and G. M. Smith. These gentlemen reported several important cases, and made some highly interesting remarks on the subject.

Feeding by subcutaneous injections, a new and novel method of forcible alimentation, is now recommended and practised in Germany by Dr. J. Krueg and some other Ger-

man physicians. (*Weimar Medizinische Wochenschrift*, August 21st, 1875.) This barbarous method might, in such cases, be tolerated, only after the complete failure of the more simple, safe, and expeditious methods of feeding by the nose and the rectum.

The latest, boldest, most startling, and most convenient measure, however, yet advocated for the introduction of nutriment or medicine in case of unconquerable intolerance of the stomach, is that of Dr. J. R. Chadwick of Boston. His method is the injection of nutritious or cathartic fluids into some portion of the small intestine, through the walls of the abdomen, by means of an aspirator needle!! (*American Journal of Obstetrics*, November, 1875, p. 399.)

5. *Rapid and Decided Effects of Medicine per Rectum.*

In directing medicines to the rectum, they necessarily come in contact with a mucous surface, from which they are absorbed into the blood, if they are absorbable; consequently three kinds of effects may be taken into consideration: *first*, the local effects of the medicine upon the mucous membrane itself; *second*, the topical effects of the remedy upon the substances or products existing in the rectum, and in contact with its mucous coat; and *third*, the remote effects of the remedy upon the blood and vital processes after absorption has taken place.

The several physiological facts which have been presented in the previous part of this section, go far to account why many medicines introduced into the rectum or the colon, frequently produce a more rapid, a more decided, and a more favorable effect than the same medicines do when taken into the stomach. Baron Dupuytren, in a clinical lecture on nervous delirium, accounts for this by saying that the rectum *absorbs*, but does not *digest*. The medical agent, says he, in consequence of the absence of digestion, passes more directly, more purely, and more surely to its destination, than the same medicine does when taken into the stomach. M. Orfila asserts that those medical agents which operate through the medium of absorption, such as opium, tobacco, etc., are much more active by the rectum than by the stomach; and

assigns as a reason the greater venous absorption of the rectum, and its less digestive power. (*Médecine Légale. Paris, 1821.*)

It has been established beyond all doubt by Mr. W. S. Savory that strychnine is absorbed much quicker by the mucous membrane of the rectum than by the stomach; that a small dose will act with greater energy in the rectum than a much larger dose in the stomach. (*London Lancet, 1866.*)

Those who are familiar with the absorbing power which the rectum possesses for medicines, have repeatedly observed that certain medicinal agents, properly prepared and carefully introduced into the cavity of the rectum, would act with extraordinary rapidity, and with the most satisfactory result; whilst an equivalent dose administered by the stomach would be entirely useless, and sometimes even prejudicial. It has been ascertained by numerous experiments that it does not, as a general rule, require more than one-third the quantity of a narcotic or a sedative remedy to act quicker, and with greater energy, when introduced into the rectum, than treble the quantity of the same when taken into the stomach. It may be repeated then, that, besides the normal or physiological absorption of the rectum, which is always in regular activity, I have myself often observed that, whenever foreign matters are addressed to its mucous surface, many of them are immediately absorbed and carried into the economy.

Narcotics, sedatives, stimulants, diuretics, tonics, and other medicinal substances, when thrown into the rectum, have the decided advantage of those directed to the stomach by being transmitted simultaneously into both the portal and systematic circulation, and of acting upon the organs which they specifically affect with more certainty and promptness. This method is therefore invaluable for the immediate introduction of diffusible stimuli into the system, for the recovery of suspended respiration from drowning, suffocation, etc.; of relaxing medicines, in strangulated hernia, in ileus, in tetanus, etc.

Through the medium of the rectum the most decided impressions may be transmitted by medicines to the various important viscera contiguous to it, and contained in the pel-

vis : the uterus, the vagina, the bladder, the prostate gland, the urethra, the seminal vesicles, etc.

Professor F. Barker, in cases of menorrhagia associated with the climacteric period, recommends rectal suppositories made of Squibb's aqueous extract of ergot, after the following formula :—

Recipe, Extracti Ergotinæ Aquos, unciam,
Butyri Cacao, sesquiunciam.

Fiat massa, in suppositoria duodecim dividenda.

“One of these,” says Dr. Barker, “is to be introduced into the rectum, morning, noon, and night ;” and he always gives positive directions that they shall be carried far up into the bowel, and the patient must keep the recumbent posture for at least one hour. These are to be continued for a week previous to menstruation, and also through its duration. “I prefer,” says he, “to use ergot in this manner rather than by the hypodermic syringe, for the reason that the remedy is easily handled by the patient or nurse, and you avoid the risk of troublesome abscesses in the tegumentary walls of the abdomen, which in my hands have frequently followed the use of the ergot by the hypodermic syringe.” (*New York Medical Record*, January 29, 1876, p. 66.)

I have myself frequently witnessed the immediate and decided good effects of ergot upon the uterus, after introducing into the rectum, as an enema, a mixture composed of the concentrated extract of ergot, glycerine and mucilage of gum arabic, in cases in which the stomach was too irritable to retain the ergot.

The able and distinguished Dr. Brown-Séquard, in an article, “On the Absorbing Powers for Medicines Possessed by Certain Parts of the Body” (*London Lancet*, 1866), says, “I have found that ointments of belladonna and opium, employed against neuralgic and other uterine pains, act with greater rapidity and much more benefit when pushed up on a small lint ball in the rectum, than in the vagina, showing that absorption is more rapid by the mucous membrane of the rectum, than by that of the vagina.”

Chloral hydrate, which is found to be so valuable a remedy in many cases, can always, when indicated, be administered

per rectum with entire safety and certainty, and it is also absorbed much more rapidly by the rectum than by the stomach. It is frequently contra-indicated by the stomach, and in many patients it produces either excessive nausea or vomiting; and all seriously object to its disagreeable pungent flavor. It may be administered by the rectum in traumatic tetanus with the most happy effect; in chorea, it is invaluable when administered *per rectum*, in doses of from two scruples to one drachm, twice daily, until the movements entirely disappear, which they generally do in two or three weeks.

Mr. Griffith of London, in a case of puerperal mania attended with great irritability of the stomach, witnessed the most decided good effects of the following mixture, administered *per anum*, in promptly allaying the mania:—

Recipe, Chloral Hydrate, drachmam dimidiam,
Potassii Bromidi, drachmam,
Vitelli Unius Ovi,
Lactis Vaccina, uncias tres.

Misce et fiat enema.

Mr. Griffith thinks that, in many cases, this method of administering these remedies will be found most useful, as there is less liability to vomiting than in giving them by the mouth. In this case, he says, no diarrhœa or other irritant effect was produced on the rectum. He also reports the case of a lady suffering from the passage of biliary calculi, in whom the inhalation of chloroform and the hypodermic injections of morphia, had failed to secure rest and sleep; but both of which were immediately obtained by the injection, *per rectum*, of half a drachm of chloral. He also uses this remedy successfully, in this way, in cases of menstrual pain and sickness, and in cases of uterine and ovarian irritation, attended with pain. (*British Medical Journal*, May 8, 1875.)

Dr. D. B. Simmons, of Yokohama, Japan, in an article on the Use of Hydro-chloral by the Rectum in the Vomiting of Pregnancy, recommends thirty grains of the hydro-chloral in mucilage to be injected into the rectum, night and morning, as a certain remedy in arresting the vomiting of

pregnancy in forty-eight hours. It, in his hands, proved successful in three cases, when all other remedies had failed. (*New York Medical Record*, June 1, 1874, p. 284.)

Quinine will cure an intermittent fever as speedily, as certainly, and as permanently when given by the rectum as when given by the mouth; and it only requires about one-half the quantity. The aqueous solution is to be preferred. Whatever dose is determined upon should be dissolved in three or four ounces of warm water, or infusion of linseed, and given as an enema; and to be repeated, *pro re nata*. The rectal method of administering quinine should always be decidedly preferred to that of the hypodermic, in consequence of the danger attending its use hypodermically.

Iodine administered *per anum* in the form of the ethereal tincture will be found highly valuable in amenorrhœa, leucorrhœa, gonorrhœa, etc. The following is an eligible formula for administering it by the rectum:—

Recipe, Tincturæ Iodini Æthereæ, guttas quinque,
Pulveris Acaciæ, drachmas tres,
Aquæ Destillatæ, uncias quatuor.

Misce pro enemate.

Balsam copaiva will cure a gonorrhœa sooner by introducing it into the rectum, in the form of enemata or suppositories, than if taken into the stomach. This being true, why do not those, then, who use this remedy in this disease, instead of subjecting the stomach to its nauseating and sometimes deleterious influence, administer it at once *per anum* instead of *per os*? The following emulsion, given as an enema, is an excellent form for administering the copaiva in gonorrhœa. The formula may be varied to suit the case:—

Recipe, Balsami Copaibæ, drachmas duas,
Pulveris Opii, granum unum,
Vitellum Unius Ovi,
Mucilaginis Acaciæ, uncias quatuor.

Fiat emulsio secundum artem.

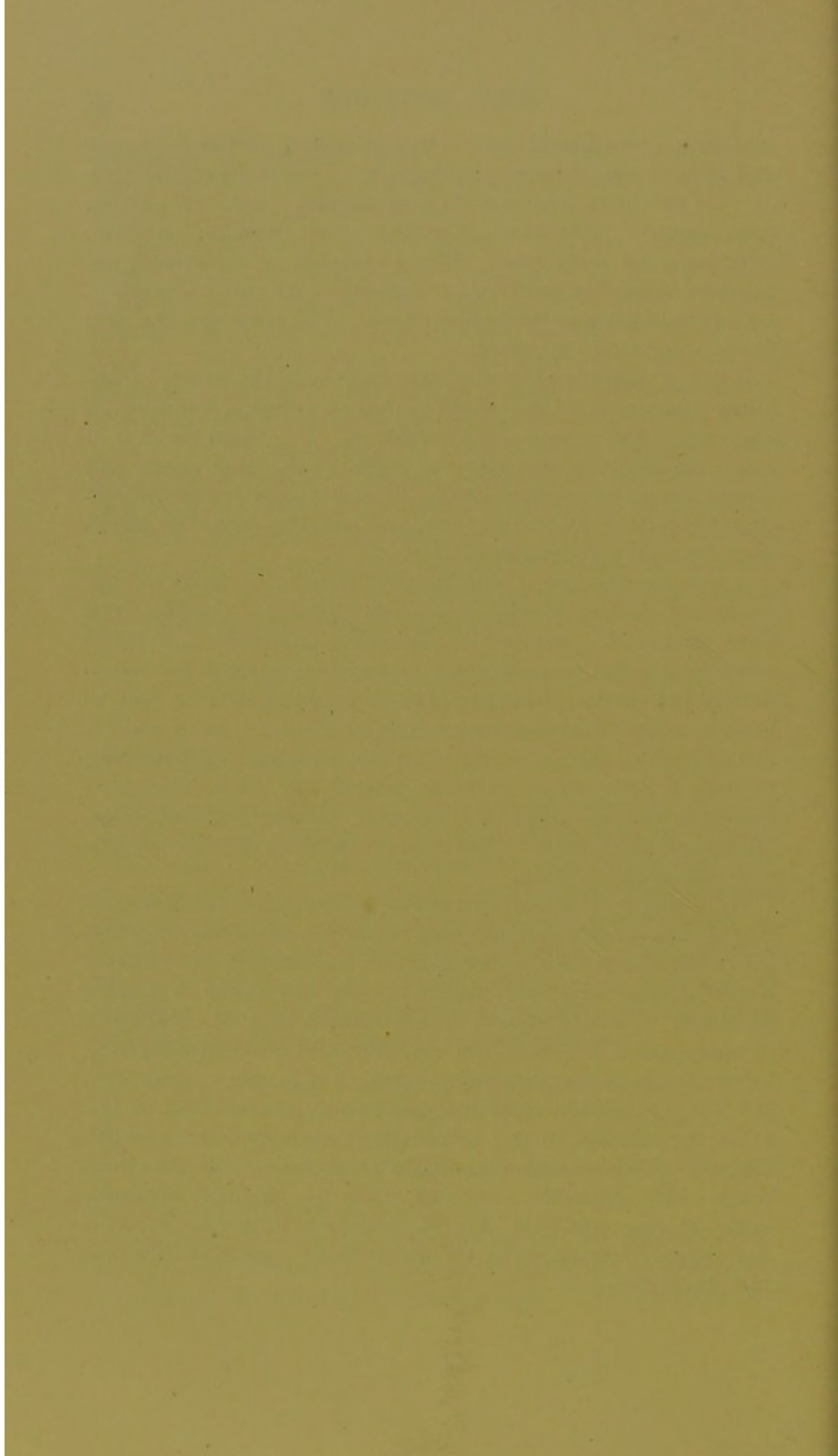
The aqueous solutions, extracts, infusions, and decoctions of medicinal agents, if properly prepared, are preferable to tinctures for medicated rectal injection. They produce less

irritation, consequently are better tolerated, and more easily and rapidly absorbed by the rectum. This is especially true of the narcotics and sedatives generally—such as opium, hyoscyamus, belladonna, digitalis, nux vomica, conium, tobacco, *et hoc genus omne*. When morphia is employed, the sulphate should be selected on account of its ready solubility, and its not being so liable to irritate. The same may be said of the sulphate of atropine.

It is a well-known fact that narcotics have the power of fulfilling two indications; namely, that of exciting, and that of depressing the powers of the system. To obtain the first of these results, it is necessary to begin with small doses and repeat them frequently; while in order to arrive at the second, a full dose must be given, and not be resorted to again for a considerable length of time.

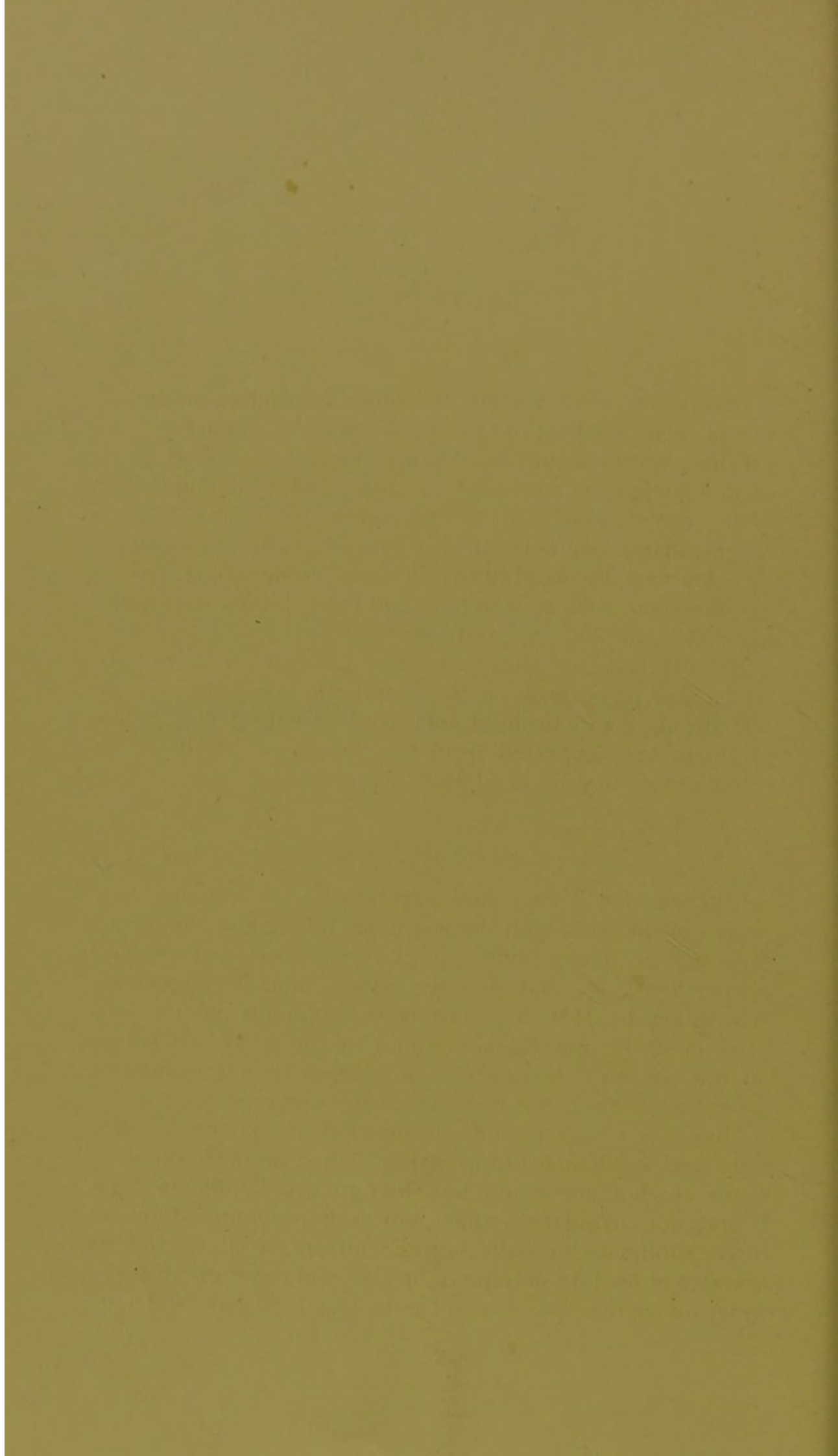
A few months ago, I commenced the use of some of the medicinal *discs*, of Messrs. Savory & Moore, of London, who have prepared a number of narcotics, sedatives, and other medicines in the form of discs, especially intended for hypodermic injection. They are said to be pure, soluble, and to keep in a dry place for any length of time. I have used a few of each of the following for rectal injection, by dissolving them in a little warm water or linseed tea for an enema:—morphia, codeia, strychnia, atropia, quinia, ergotine, digitaline, and elaterium. I have found these preparations very convenient and certain.

Here might be given numerous formulæ for the preparation of both soluble and insoluble remedies, especially intended for rectal and colonic administration and absorption, but this would extend this essay much beyond the point originally intended. I would merely add, however, that M. Mailhe is of opinion that, if a medicine is soluble, and is not decomposed by the fluids of the alimentary canal, it is at once absorbed; but if it is insoluble, then it requires the intervention of the acids, the alkalies, or the saline compounds contained in the digestive fluids, in order to obtain an entrance into the circulation. All insoluble remedies, such as calomel, bismuth, oxide of zinc and iron, should, therefore, be given in small and repeated doses, so as to insure their complete solution and absorption.



SECTION IV.

RECTO-COLONIC PRODUCTS.



SECTION IV.

RECTO-COLONIC PRODUCTS.

In order to have a more thorough knowledge of the subject of rectal medication, the nature and the character of the various secretions and excretions or products found in the rectum and colon, should be studied and well understood. With regard especially to the secretions, if it is true, as taught, that a medicine can only gain access into the economy by being first dissolved in the fluid secretions of that part of the intestinal canal to which it is addressed, then it is highly important, not only to study the composition and nature of such secretions, but also the nature of the chemical reactions which take place between them, and the components of the remedy used and brought into contact with them. These products are separated from the vessels or glands of the colon and rectum by exudation or secretion.

1. *Recto-Colonic Mucus.*

Mucus is one of the chief secretions of the mucous membranes of the body, and the mucus of the rectum and colon does not in general differ, in its composition and chemical properties, from that of any other mucous membrane. According to MM. Fourcroy and Vauquelin, mucus is the same in all the mucous membranes of the body. Berzelius, on the contrary, however, is of opinion that it is variable, according to the point from which it is secreted.

Mucus is a transparent glutinous fluid, having a saltish taste, and reddening litmus paper. It is neither soluble in water, alcohol, nor ether; but, like gum, is soluble in acids. It does not coagulate by heat, nor is it precipitated by corrosive sublimate or galls, but the nitrate of silver and the acetates of lead do precipitate it. It contains a great deal of water, muriate of potassa and soda, lactate of lime, soda, and

phosphate of lime. The following table will give the analysis of *nasal* mucus, according to MM. Berzelius, Fourcroy, and Vauquelin, and will afford an idea of the character of mucus in general :—

TABLE.

| | |
|---------------------------------------|--------|
| Mucus..... | 5.33 |
| Water..... | 93.37 |
| Osmazome with Lactate of Soda..... | 0.30 |
| Phosphate of Soda..... | 0.35 |
| Soda..... | 0.09 |
| Hydrochlorate of Potash and Soda..... | 0.56 |
| | <hr/> |
| | 100.00 |

(*Elements of Physiology* by A. Richerand. English version by G. F. M. Lys and J. Copeland. Appendix, p. 90. New York, 1833.)

2. *Fæcation and Fæces.*

It is in the large intestine that occurs the last series of digestion, or processes through which the alimentary matters pass for the complete evolution of the nutritive elements they contain. The result of this is *fæcation*, and the entire separation of all the nutritive principles from the innutritive matters. The first are absorbed, and the last are rejected.

The term *fæcation* may be applied to that function of the cæcum, the colon, and the rectum, by which the alimentary mass, after having been deprived in the small intestine of almost all the chyle and a portion of its more aqueous parts, is in the large intestine entirely changed in character and consistence, being regularly formed, and acquiring the peculiar fæcal odor, and thus presenting the distinctive characteristics of *fæces*. The process of *fæcation* commences in the cæcum, and terminates in the rectum.

Human fæces or excrement contain those portions of the food which have been digested without being dissolved; all substances not changed by the action of the stomach or the cæcum, or that have not been broken down by the organs of mastication—such as seeds of various kinds of fruit, covered with their husks, as of figs, tomatoes, strawberries, rasp-

berries, blackberries, etc. ; the stones of various kinds of fruit, as of cherries, of grapes, etc. ; the fibrous parts of plants and of animals ; the epidermis of various substances, as of potatoes, of apples, of plums, etc. ; all of which resist the action of the gastric and other intestinal juices. Fæces also contain what has been precipitated from the bile ; undecomposed and unabsorbed bile, mucous and serous remains, and residuary salts.

The following table gives the analysis of human fæces according to Berzelius :—

TABLE.

| | |
|---|-------|
| Water..... | 73.3 |
| Soluble in water { | |
| Bile..... | 0.9 |
| Albumen..... | 0.9 |
| Extractive matter..... | 2.7 |
| Salts..... | 1.2 |
| Insoluble residue of digested aliments..... | 7.0 |
| Mucus, resin, fat, etc..... | 14.0 |
| | <hr/> |
| | 100.0 |

The relative proportions of the salts are :—

| | |
|-------------------------------------|-------|
| Carbonate of Soda..... | 3.5 |
| Chloride of Soda..... | 4.0 |
| Sulphate of Soda..... | 2.0 |
| Phosphate of Magnesia and Lime..... | 6.0 |
| | <hr/> |
| | 15.5 |

(*Traité de Chimie Animale. Traduit par M. Esslinger, p. 265. Bruxelles, 1833.*)

3. Fæces of Infants.

Dr. Wegscheider, of Berlin, makes known some interesting facts with regard to the various changes which go on in the digestive tract at the early period of life. These facts were based upon the microscopical and chemical examination of the fæces of a number of healthy infants, between two and three months old, whose diet consisted entirely of breast-milk.

The color of the fæces of healthy infants varies between

that of the yolk of eggs and a greenish yellow. Their reaction is always acid. Their consistence is very variable, and ranges from an almost completely dry, to a thin liquid character. Their smell is never offensive, but resembles that of sour milk. The fæces always contain whitish fibrinous-looking flakes, which are proved to consist of fat, with probably some intestinal epithelium. The fats consist of palmitin, stearin, and olein. Besides fat, the fæces appear to contain traces of peptones. Sugar was not found in any appreciable quantity. (*London Medical Times and Gazette*, March 25th, 1876. *From the Centralblatt für die Medicinischen Wissenschaften*, No. III., 1876.)

4. *Quantity and Consistency of the Fæces.*

The power of assimilation and absorption is so great in healthy persons, that the quantity of the fæcal residue which is evacuated, bears but a small proportion to the solid ingesta of the stomach. In a highly interesting article by Dr. Dalton, it is shown that in a healthy middle-aged adult, living regularly, the solid evacuations vary from a seventh to an eighth part of the solid food taken into the stomach, and to amount daily to about five ounces avoirdupois. As it regards the proportion of urine to the liquids consumed, it varies according to the warmth of the weather, and the constitutional habits of the individual's skin. The quantity of pure carbon in thirty-six ounces of solid food daily consumed, exclusive of liquids, equal to fifty-four ounces more, is computed at eleven ounces and a half, of which only half an ounce is found to be contained in the evacuated fæces. About the same quantity is voided in the daily urine, leaving about ten and a half ounces to be eliminated by the lungs and the skin, and to be taken up for the maintenance and the growth of the body. (*New Philosophical Journal*, Edinburgh, November, 1832. *Also Black, on the Bowels*, p. 45. London, 1840.)

A great variety, however, doubtless exists in the daily amount of fæces evacuated, in proportion to the food consumed. It is a fact that large eaters are sometimes spare in body; such, consequently, must have large evacuations, or have more than one in twenty-four hours. Those of a dry

and bilious temperament eat less and have slower and more sluggish bowels, consequently greater absorption and desiccation take place, while their urine is generally secreted in greater abundance than in those of a sanguine or phlegmatic temperament.

In consequence of the absorption to which the fæces are exposed in the colon and rectum, they sometimes become very hard, and if it were not for the mucus which is secreted along the whole course of the large intestine, these hardened fæcal masses would become unduly irritating to the mucous membrane, and most difficult to forward on and to expel.

The contents of the cæcum are of the consistence of children's pap, or the ordinary rye or corn-meal mush, but by the time they have reached the descending colon, they have attained sufficient firmness and consistence to be moulded into nodules or irregular balls, about the size of ordinary plums, or as small sometimes as filberts, or hazel-nuts; before these, however, are passed from the rectum, they are generally agglomerated and compressed into one flat cylindrical bolus. The nodulated form of the fæces in the colon is owing to their becoming divided, and as it were insulated, in the numerous sacculi, or pouches of this organ, in which they become harder and drier, and so retain their peculiar forms, till they reach the open and uninterrupted canal of the rectum. When, however, these nodules have been long retained in the colon, they become so hard and dry, that they sometimes pass through the rectum and by the anus, without in the least changing their form or their hardness, and are termed *scybala*.

These several conditions of the fæces, I have myself often observed in the dead body, as well as in the discharges induced by the administration of very stimulating and relaxing enemata, in persons suffering from obstinately constipated bowels. In these instances, after the administration of the enema, the large flattened fæcal cylinder from the rectum will first be passed; then the firm nodules, after having been dislodged from the sacculi of the colon, will be ejected, and subsequently, especially if the enema is repeated, the thinner fæcal matter from the cæcum will make its exit.

The consistency of fæcal matter, however, varies very

much, depending greatly upon the nature of the food taken, and the mode and extent of chymification and chyfication, to which it has been subjected in the stomach and in the small intestine.

5. *Odor and Color of the Fæces.*

The foetor common to natural, ordinary, or healthy fæces, is to a considerable extent imparted to them by the sensible properties of the peculiar secretion from the follicular glands of the cæcum, colon, and rectum. It may also depend to some extent upon the incipient putrefaction of the fæcal matter, which may, if possible, take place in the large intestine; for during this process or decomposition, there is always more or less extrication of gases, of which the sulphuretted hydrogen is in the greatest abundance. This gas impregnates the fæces, as well as large portions of it sometimes escape. According to the opinions of MM. Tiedemann and Gmelin, the characteristic odor of fæces depends upon a volatile oil, principally secreted in the cæcum. (*Récherches Experimentales Physiologiques et Chimiques, sur la Digestion, considérée dans les quatre classes d'Animaux Vertébrés. Traduites d'Allemand par A. J. L. Fourdan. 2 Parties, 8vo. Paris, 1826-7.*)

Evacuated fæces have not the odor peculiar to those in the cæcum; their characteristic odor, originally due to the cæcum, is greatly modified in the colon and in the rectum.

In the cæcum the fæces are of a light-brown, or brownish yellow color, but when evacuated, or as found in the pouch of the rectum, they are of a very deep-brown color. Their color, however, varies according to the nature of the food taken. The coloring matter of vegetable substances is sometimes imparted to the fæces, as the red of beets, the green of spinnage, the yellow of rhubarb, etc. The several preparations of iron also impart color to them. The bile, more or less imparts its color to the fæces; its color, however, is variable, from being generally of a yellowish brown, it is sometimes green, and occasionally it is almost colorless. When the fæces are too light, it is considered that there is a deficiency of bile; when too dark, that there is a redundancy of that secretion. This sign, however, is more or less fallacious.

6. Periodicity of the Fæcal Evacuation.

It may be observed, as a general rule, that the excrementitious residuum of one day's aliment taken into the stomach, and amassed in the rectum, is sufficient to provoke the expulsive movement. The frequency of the fæcal evacuations, however, is by no means certain, depending in a great measure upon the nature and the quality of the food; upon the habit of the individual; upon the age, the sex, the constitution, and the occupation. With regard to the habit, there is perhaps no functional act of the whole body more under its influence, than that of defecation. In children, the fæcal dejections take place more frequently than in adults, being usually in proportion to the number of meals. This frequency is doubtless in consequence of the digestion of children being much more rapid, the intestinal secretions more profuse, the fæces more fluid, and the sensibility of the alimentary canal much greater. It may also, to some extent, depend upon the fact that in childhood the rectum is wholly uninfluenced by the will. Another important fact to be considered, respecting the frequency of the fæcal evacuations in infants, is, that in them the large intestine is not developed beyond the common calibre of the small one—hence there is no room for fæcal accumulation. In infants the proportionate smallness of the cæcum, colon, and rectum does not allow of any alvine collection, as these portions of intestine do in the adult, consequently the stools are more frequent, and purgative medicine acts quicker; whilst in the adult the lower bowels being greatly enlarged, admit in some instances of enormous accumulations of fæces. The intestines, at these two periods of life, seem to partake of the characteristics of those of carnivorous and herbivorous animals. As the child, however, advances in age, the periods of alvine discharge become less frequent. In females, the intervals of defecation are less frequent, and the dejections less copious than in males.

Whilst the accumulation of fæcal matter is taking place in the rectum, the fluid portions of it, as has already been observed, are gradually being absorbed, together with any nutritive particles that may have been left in it. Should the dejections occur regularly once in twenty-four hours, no

unfavorable change in the excrementitious matter would result; but should they be protracted much beyond this period, the mass would gradually become compact, then indurated, friable, and knotty; so much so, that its evacuation would be rendered both difficult and painful. Such, however, is the influence of habit, that occasionally cases occur in which no alvine dejections take place for days, and even for weeks, without the occurrence of any unpleasant or serious consequences, which a little medicine would not correct. Many such cases are recorded by medical authors. In such the protracted presence of the fæcal matter, obtunds the organic sensibility of the rectum, so that it requires something more than the accumulation, to stimulate it to the expulsive effort.

7. Intestinal Gases.

A knowledge of the production, composition, and effects of intestinal gases is important, as must at once be obvious to all.

The several changes which the alimentary substances undergo in the stomach and in the small intestine, give rise to more or less gaseous products, and a similar result follows the remora of the excrementitious matters in the colon and in the rectum. The exact source, however, of the different gases attending the process of chylification and of fæcation, is not by any means positively ascertained. They are generally, however, supposed to arise: 1st, from the common atmospheric air taken in with the food, and confined chiefly to the stomach and the superior portion of the small intestine; 2d, from the chemical reactions of the chyme in the small intestine; 3d, from the mucous membrane by secretion, and not confined to any particular portion of the intestinal canal; 4th, from the decomposition of the contents, both solid and fluid, of the large intestine, and 5th, in some diseases of the intestinal canal, from the affected tissues themselves, by a vito-chemical evolution, as in gangrene of the stomach, or of the rectum, or as in malignant degeneration of these organs.

A strong inference in favor of the opinion, that during the digestive process the contents of the alimentary canal absorb or extricate different gases, is derived from the fact

that the quantity of these creating flatus and borborygmi, depends upon the nature and the character of the ingesta; for it is well known that flatulence to a much greater extent follows the use of some particular articles of food, than of others.

That the mucous membrane of the alimentary canal does both secrete and absorb gaseous products, there is no doubt whatever. Pathological facts intimately connected with the functions and properties of this membrane in other parts of the body establish this position beyond a doubt. There is the most positive evidence derived from observation and from experiment, that such substances are absorbed and given off by the mucous membrane of the respiratory apparatus.

The formation of these gases gives rise, from time to time, to a proportional absorption of caloric, in order to constitute their latent and specific heats.

8. *Chemical Characters of the Gases.*

A correct knowledge of the chemical characters of the different gaseous substances found in the stomach and bowels is of no little importance, especially in the treatment of some of the diseases of the intestinal tube. According to the experiments and the analyses of MM. Magendie and Chevreul, the following tables give the particular kind of intestinal gases, their proportions, and their relative quantities as found in the several portions of the alimentary canal. (*Précis Elementaire de Physiologie. English Version, by Milligan, pp. 268-270. Edinburgh, 1823.*)

TABLE I.

Gases in the Stomach.

| | |
|--------------------|--------|
| Oxygen..... | 11.00 |
| Carbonic Acid..... | 14.00 |
| Hydrogen..... | 3.55 |
| Azote..... | 71.45 |
| | <hr/> |
| | 100.00 |

TABLE II.

Gases in the Small Intestine.

| | |
|--------------------|--------|
| Oxygen..... | 00.00 |
| Carbonic Acid..... | 29.76 |
| Pure Hydrogen..... | 38.36 |
| Azote..... | 31.88 |
| | <hr/> |
| | 100.00 |

TABLE III.

Gases in the Large Intestine.

| | |
|--|--------|
| Oxygen.. | 00.00 |
| Carbonic Acid..... | 43.50 |
| Hydrogen and Carburetted Hydrogen..... | 5.47 |
| Azote | 51.03 |
| | <hr/> |
| | 100.00 |

TABLE IV.

Gases in the Cæcum.

| | |
|---------------------------|--------|
| Oxygen..... | 00.0 |
| Carbonic Acid..... | 12.5 |
| Hydrogen..... | 7.5 |
| Carburetted Hydrogen..... | 12.5 |
| Azote..... | 67.5 |
| | <hr/> |
| | 100.00 |

TABLE V.

Gases in the Rectum.

| | |
|---------------------------|--------|
| Oxygen..... | 00.00 |
| Carbonic Acid..... | 42.86 |
| Carburetted Hydrogen..... | 11.18 |
| Azote | 45.96 |
| | <hr/> |
| | 100.00 |

It will be seen from the above tables that oxygen is not found below the stomach. This important element, the presence and absorption of which being so essentially necessary in all animal decomposition and assimilation, is all absorbed in that organ before reaching the intestines, doubt-

less in forming carbonic acid and in assisting to form the albumen of the crude chyle. It may therefore be regarded as an established fact, that oxygen is never found free in the intestines, because the continual demands for it in the stomach are so great that it is doubtless all consumed there, as before remarked, in the formation of carbonic acid and the albuminous principles of the body.

It will also be observed from the above tables that in the rectum, the proportion of carbonic acid is considerably increased; the azote is also augmented in the great intestine, while the pure hydrogen in it has almost disappeared, having given place to a considerable quantity of carburetted hydrogen. A trace of sulphuretted hydrogen may likewise be detected in the colon and the rectum.

9. *Origin and Uses of the Intestinal Gases.*

It is reasonable to suppose that a large proportion of the azote and carbonic acid is derived from the mucous membrane by secretion, and that even oxygen and azote may form a part of the common air which is taken into the stomach with the food and the saliva, and which is disengaged by the natural heat of this organ, or of the intestinal canal; but, as already observed, the exact origin of these different gases is not positively known, neither are their uses or purposes well understood. Unfortunately there remains too much unexplained with regard to them, though obviously of the highest importance, as they play a most important part in the different portions of the alimentary canal, both when these are in a healthy, as well as when in an unhealthy condition. In a healthy state of the parts, these gases, when in a normal or moderate quantity, serve to give an agreeable and a necessary distention to the parietes of the bowels, by which their calibres are kept more or less open, and thus facilitate the action of the *valvulæ conniventes*, promote the peristaltic movement, and urge on gently the intestinal contents. They also serve to give an easier and a more elastic movement to one intestinal convolution upon another, than if the bowels had closely encircled and compressed their contents, however soft and fluid these might be.

When these gases are in excess, although of ordinary composition, they impede the assimilating and peristaltic functions, by unduly distending certain sections of the intestinal convolutions, by which the adjoining ones are injuriously compressed; indeed the distention sometimes proceeds so far as to produce irritation and inflammation of the intestines, and even paralysis of the muscular fibres, giving rise to obstruction, to regurgitation, and to ileus. Rupture of the intestines from over distention by gas sometimes occurs, but such instances are rare, for it would seem that when the intestinal pressure reaches a maximum, that either a further generation of the gas is arrested for the time being, or else absorption of it by the mucous membrane takes place. Tympanites or meteorism from morbid gases, in the advanced stages of inflammation and of fevers, is generally regarded as a fatal symptom, and is always an evidence of great debility.

Excessive gaseous products are a troublesome and a painful accompaniment of the derangements of the functions and secretions of the stomach and intestines. They are especially the torment of dyspeptics, of hypochondriacs, or individuals of an atrabilarious or of a cold and phlegmatic temperament, who frequently complain of cold and heat alternately in their bowels, and who always feel great relief and comfort by the expulsion of these gases, however readily and rapidly they are again reproduced. In some persons the excessive production of them seems to be encouraged by the wonderful facility they have of expelling them, whenever they are felt in the least inconvenient. Some persons are much troubled with these gases in health, but who under inflammatory attacks of the bowels are not sensible of their existence; from this it would appear that in such cases, their generation is suspended for the time being.

In indigestion, there is almost always more or less carbonated or sulphuretted hydrogen gas escaping by the anus, producing the offensive odor peculiar in such cases. This odor differs entirely from that of the flatus which is ejected from the stomach or small intestine, which contains pure hydrogen or carbonic acid gas. The latter, however, is sometimes voided by the anus, but much less frequently than hydrogen

combined with carbon, sulphur, or even phosphorus. In diseases of the colon, the rectum, or of both, the gases become more fœtid, sulphureous, or ammoniacal, and the hydrogenous elements appear greatly to be increased. Doubtless ammonia is sometimes extricated, and accompanies the evacuation of the fæces in putrid diarrhœas, as in dysentery combined with low fever. Happily the *ileo-cæcal valve* prevents the regurgitation of these offensive gases, as well as of the excrements.

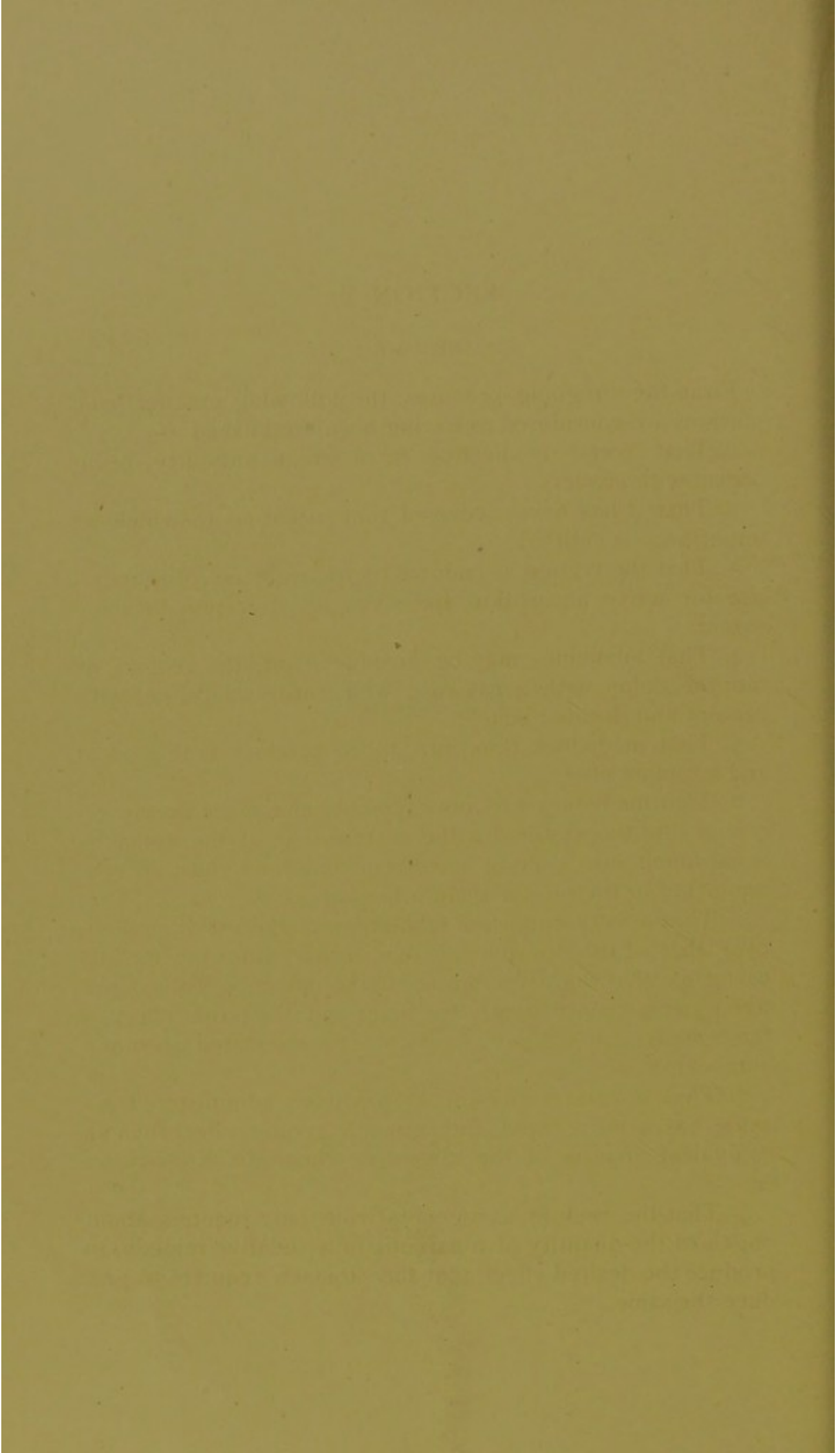
When there is any inflammation or lesion of the mucous membrane of the inferior portion of the rectum; or painful hæmorrhoidal swellings, the expulsion of gas by the anus is sometimes attended with the most exquisite suffering, especially in *fissuri ani*. What is remarkable, in this most painful disease, is the vast quantity of gas sometimes generated.

In some instances these gases are rapidly generated immediately preceding death. In such cases, at the moment when contractility is forsaking the organs, the intestines become greatly distended with gas, which hastens the approach of death by impeding the descent of the diaphragm.



SECTION V.

RÉSUMÉ.



SECTION V.

RÉSUMÉ.

From the foregoing premises, the following practical conclusions are considered as having been established :—

1. That rectal medication is of great antiquity, being coeval with clysters.

2. That it has never received that attention to which its importance is entitled.

3. That the rectum is endowed with every essential requisite for active absorption, and even for digestion to some extent.

4. That medicines may be introduced into the rectum, or into the colon, with great ease, with entire safety, and with prompt and decided benefit.

5. That medicines thus introduced produce both a local and a remote effect.

6. That medicines are more speedily and more purely received into the system by the rectum than by the stomach ; being much less liable to become decomposed, inert, or contaminated in the former than in the latter.

7. That a very important advantage of the rectal method, over that of the stomachic, is that in the former the medicinal agent is but slightly subjected to the influence of the digestive process ; consequently the fuller and the purer effect of the remedy, can the more certainly be calculated upon and obtained.

8. That a certain amount of medicine administered *per anum* has a more rapid, and a much greater effect than an equivalent amount of the same has when administered *per os*.

9. That the rectum, as a general rule, only requires about one-third the quantity of a narcotic or a sedative remedy, to produce the desired effect, that the stomach requires to produce the same.

10. That medicines administered *per anum* have the decided advantage of those administered *per os*, by being transmitted simultaneously into both the portal and systematic circulation, and of producing their immediate action upon the organs which they specifically affect.

11. That, through the rectal medium, the most decided therapeutic impressions may be made upon the various important viscera contained in the pelvis; the rectum being so closely associated in proximity and sympathy with the uterus, with the vagina, the bladder, the prostate gland, the vesiculæ seminales, and the urethra.

12. That medicines, nutriment, and stimuli can be administered *per anum*, when, under certain and not unfrequent circumstances, it would be impossible to administer anything *per os*.

13. That, although rectal medication cannot be employed as a complete substitute for stomachic medication, yet it nevertheless can and should greatly restrict its use.

14. That in drawing a parallel between rectal medication on the one hand, and hypodermic, iatraliptic, enepidermic, endermic, intravenous, and lingual on the other, all of which have their advantages and disadvantages, the decided preference, without discarding either, should be given to rectal medication.

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uniformly in effecting cures without so severe a procedure. He employs the knife only in very intractable cases, and then only to the extent of dividing the mucous membrane through the long axis of the fissure.

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ON TRAUMATIC HEMORRHAGE OF THE RECTUM.

New York Medical Record, Sept. 1, 1872, p. 361.

(By the Same Author.)

ARE HEMORRHOIDS SALUTARY?

New York Medical Record, Sept. 8, 1877, p. 563.

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
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