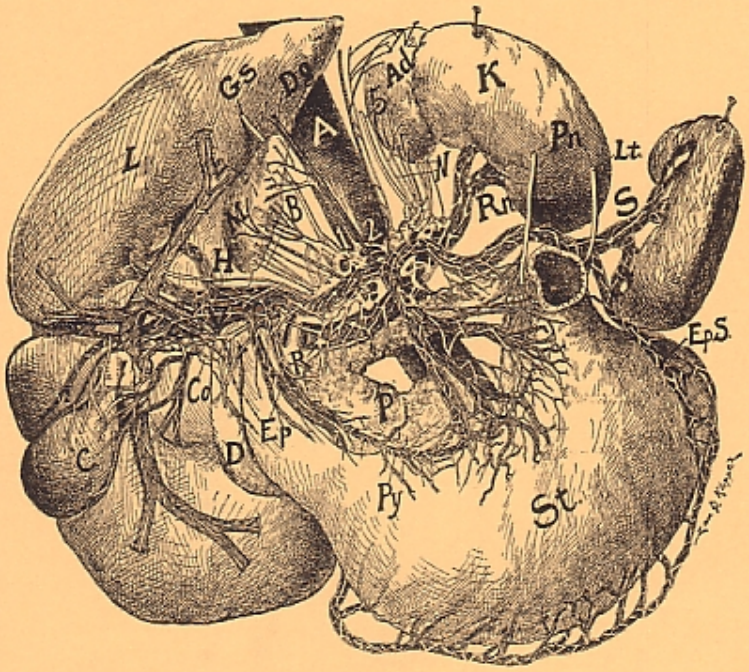
SELECTIONS FROM

THE ABDOMINAL AND PELVIC BRAIN

BY

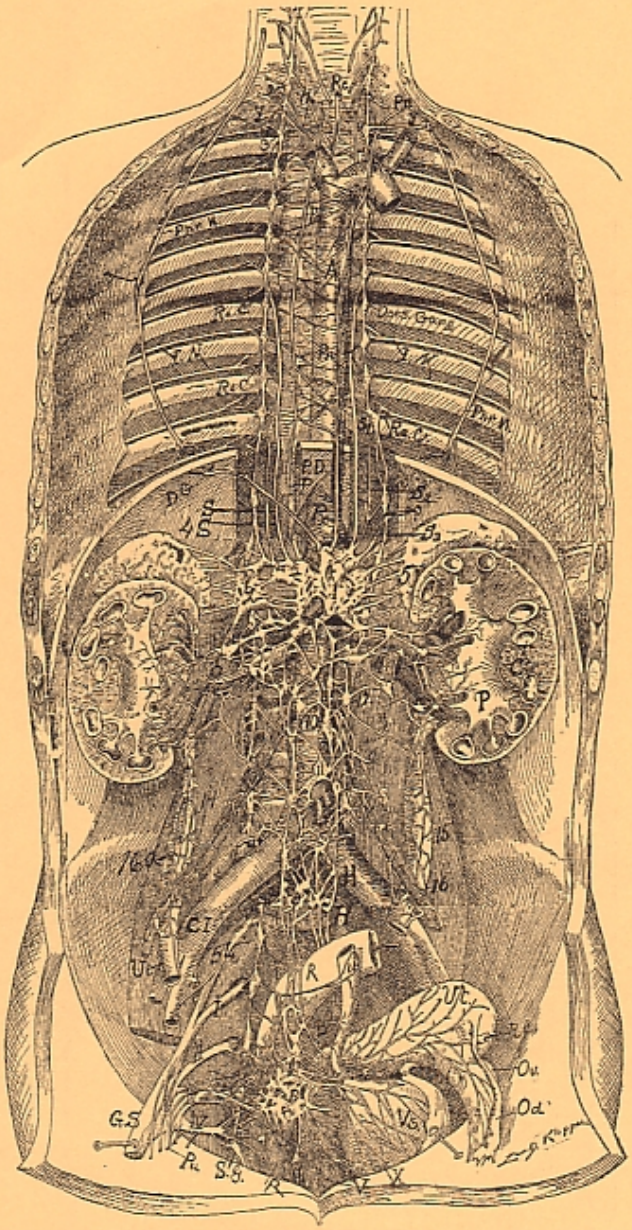
BYRON ROBINSON, M.D.



WITH COMMENTARY BY

DAVID MCMILLIN, M.A.

A Valuable Resource for the Serious Student of the Edgar Cayce Health Information



In mammals there exist two brains of almost equal importance to the individual and also to the race: One is the cranial brain, the instrument of mental progress and physical protection; the other is the abdominal brain, the instrument of nutrition and visceral rhythm. To the casual observer the cranial cerebrum seems to overshadow all other nervous centers.... But in the abdomen there exists a brain of wonderful powers. It presides over organic life. Its great functions are two - nutrition and visceral rhythm. In this abdominal brain are repeated all the physiological and pathological manifestations of nutrition and rhythm of viscera. It controls nourishment and secretion. It initiates, sustains and prohibits rhythm. It receives sensations and transmits motion. It is an automatic nervous center. It is a physiological and anatomical brain. (Byron Robinson, 1907, ***The Abdominal and Pelvic Brain***)

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(With Commentary by David McMillin, M.A.)

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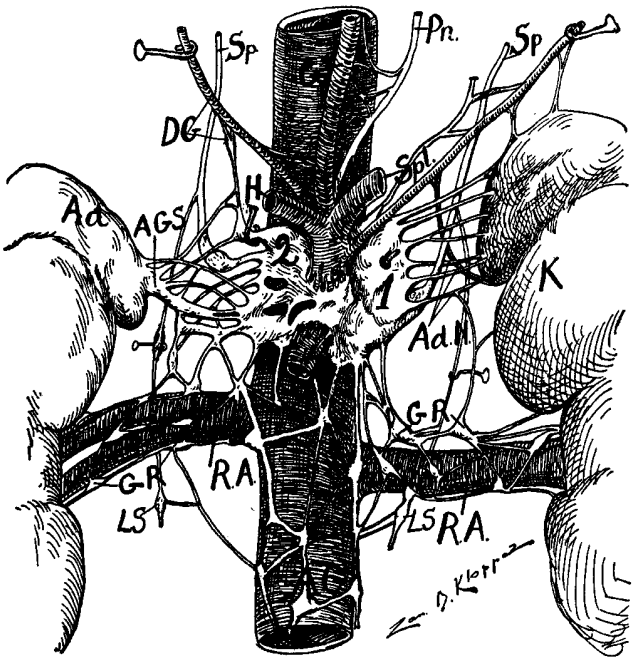


ABDOMINAL BRAIN - CEREBRUM ABDOMINALE.

Fig. 36. This illustration was drawn from a carefully dissected abdominal brain. I dissected the tissue under alcohol. The relations and proportions are those of life, being drawn by accurate measurements. 1 and 2, abdominal brain. Observe the nerves which the adrenals receive: Sp, splanchnic major; DG, ganglion diaphragmaticum; GR, renal ganglia; Ad, adrenals; LS, lesser splanchnics; RA, arteria renalis; H, hepatic; G, gastric; and Sp, splenic artery. The hook fixes the ganglion of the phrenic artery which I term ganglion arteriae phrenicae.

INTRODUCTION

Byron Robinson M. D. was a tremendously important and influential clinician, researcher and writer during the late 19th and early 20th centuries. His masterpiece, ***The Abdominal and Pelvic Brain*** (published in 1907) thoroughly documents his understanding of anatomy and physiology in health and illness.

Almost 700 pages long with over 200 detailed illustrations, **The Abdominal and Pelvic Brain** is a monumental work. Byron Robinson was a giant in the medical field.

My interest in Robinson's work has three major aspects: 1) its relation to traditional osteopathy, 2) its potential contribution to the understanding of the Edgar Cayce information, and 3) the rediscovery of the "gut brain" by modern medical research.

The early osteopaths were well aware of Robinson's research and writings. In some of the seminal osteopathic texts (e.g., Charles Hazzard's *Principles of Osteopathy*, 1899) Robinson is quoted as an authority of the first order in matters of anatomy and physiology of the nervous systems. Robinson's belief in self-healing and natural therapeutics was also consistent with the founding principles of the osteopathic profession. Understanding Robinson's views of the body and how it operates greatly complements the early osteopathic vision of health and healing.

While preserving some of the basic philosophy of traditional osteopathy, modern osteopathy has changed significantly in the realm of clinical application. Many of the traditional manipulative therapies have been replaced by more allopathic treatments such as drugs and surgery.

For several years I have been involved in research (academic and applied) which focuses on traditional osteopathic principles and techniques. I believe that this approach still has much to offer in contemporary health care. Robinson's work helps

to provide a context for understanding traditional osteopathy.

My second area of interest relative to ***The Abdominal and Pelvic Brain*** is the extensive body of health information provided by Edgar Cayce. Cayce has been called the "father of modern holistic medicine." Through thousands of psychic readings over a period of five decades, he diagnosed illness and recommended treatments for the full spectrum of illness. Although he died in 1945, Cayce's life and work continue to touch the lives of persons seeking healing.

However, one of the problems with applying Cayce's medical wisdom is the terminology of the information itself. At times, the Cayce material almost seems to be written in a foreign language. In a certain sense, this is true. The foreign language used by Edgar Cayce was the medical terminology in use during his lifetime. It is the same language used by Byron Robinson and the early osteopaths. Thus a comparative study of Robinson and traditional osteopathy provide a key to interpret Cayce's medical information. In particular, ***The Abdominal and Pelvic Brain*** is essentially a "Rosetta stone" in this regard.

For example, Edgar Cayce also spoke of the abdominal brain (calling it the "solar plexus brain"). Cayce placed great importance on the "sympathetic nervous system." Robinson described his work as **"practically a treatise on the abdominal sympathetic nerves."** Cayce's insistence that neurological disorders such as migraine headache and epilepsy are most often caused by problems in the abdomen (abdominal brain) only make sense if one understands the abdominal brain with its nervous system (sympathetic) and its means of communication (reflexes).

My third area of interest in Robinson's work is its relation to modern medical research. One of the exciting areas of current research is the rediscovery of the "gut brain." Named the "enteric nervous system" (ENS), this portion of the nervous system is now recognized as having a similar structure (anatomy) and function (physiology) as the brain in the head. MEDLINE, the electronic database for medical research, contains hundreds of articles on the ENS since 1990.

To me, one of the most exciting facets of the ENS research is not only that it is a "rediscovery" of the type of information promoted by Byron Robinson, but may be just the "tip of the iceberg" with regard to the abdominal brain. As substantial as the modern literature is, it is only a portion of Robinson's understanding of the

nervous system. The enteric (intestinal) aspects of the abdominal brain and its nervous system were given only one chapter (among 40) in Robinson's book. While it is important, there is much, much more to be rediscovered. Perhaps a consideration of ***The Abdominal and Pelvic Brain*** can contribute to this renaissance in medical research.

FORMAT OF THIS BOOK

In the chapters which follow, I have tried to draw out the various similarities between traditional osteopathy, the Cayce approach, and modern medical research. I have selected exemplary quotations from ***The Abdominal and Pelvic Brain***, arranged these selections in chapters which relate to specific topics (particularly as regards it relevance to the Edgar Cayce material), and provided brief commentaries for each chapter.

The selections (direct quotes from Robinson) in the following sections are in bold type to make it easier to identify them. I have used APA style for references which are found in Appendix A. I have included numerous illustrations from Robinson's book to give readers a sense of the graphic quality of the original work.

The original work (in its entirety) is being made available in an electronic format for those individuals who would like to study the complete work. A CD of the complete ***The Abdominal and Pelvic Brain*** in WordPerfect 6.1 format is available from:

David McMillin
2516 Townfield Lane
Virginia Beach, Virginia, 23454.

The text and illustrations can be viewed online or printed out. I have included the "Contents" page in Appendix C for persons interested in the entire work.

SELECTIONS FROM THE ABDOMINAL AND PELVIC BRAIN

ROBINSON'S ORIGINAL PREFACE

The selections which follow are taken from the *Preface* of Robinson's original work. Notice these important themes which will be covered extensively in the chapters which follow:

1) the anatomy and physiology of abdominal and pelvic brains;
2) definitions of what constitutes a brain;
3) the importance of "reflexes," particularly pathological "reflex neurosis" and "referred disturbance" produced by "reflex irritation;"
4) the production of mental and emotional conditions ("hysteria" and "neurasthenia") as a result of reflex irritation to abdominal and visceral systems;
5) the **"exquisite mutual dependency"** or coordination of the cerebro-spinal and sympathetic nervous systems;
6) the therapeutic use of "visceral drainage," a form of natural healing to treat the full spectrum of illnesses linked to pathology in the abdominal and pelvic brains.

SELECTIONS FROM BYRON ROBINSON'S ORIGINAL PREFACE

The present volume contains views concerning the anatomy, physiology and pathology of the abdominal and pelvic brain. The abdominal brain is the solar or epigastric plexus. The pelvic brain is the cervico-uterine ganglion located on each side of the uterus.

A brain is an apparatus capable of reception, reorganization and emission of nerve forces. It may be composed of one or more nerve or ganglion cells. The book is partly based on the so-called "reflexes," as they are observed in both health and disease. We understand by "reflexes" disturbances which are produced in parts more or less remote from points of local irritation. The reflex is the "referred disturbance" of modern writers. I have attempted to

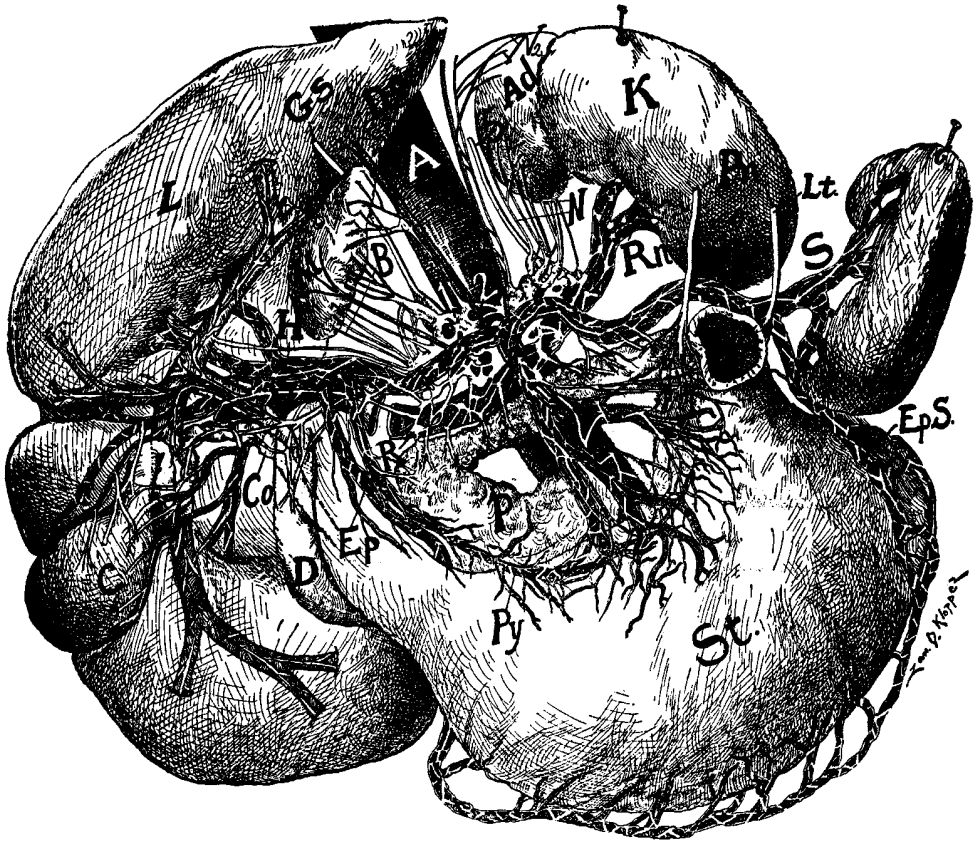
show the extensive utility and dominating influence of the abdominal sympathetic nerves upon the animal economy. The reflexes and rhythm concerning organs under various conditions are discussed. The automatic menstrual ganglia are presented as the peripheral ganglia of the uterus and oviducts. No attempt has been made to divorce the cerebro-spinal and sympathetic nervous systems from their exquisite mutual dependency. Yet. notwithstanding this latter, the abdominal sympathetic nerve, under observed conditions of defect of the cord and cerebrum, acts with a certain degree of independence....

The course of reflex irritation may be observed clinically as: (1), Peripheral (reflex, infective) irritation; (2), indigestion; (3), malnutrition; (4), anemia; (5), neurosis. The final stage is the irritation of the innumerable abdominal sympathetic ganglia by waste-laden blood, which produces the hysteria and neurasthenia.

This book is practically a treatise on the abdominal sympathetic nerves (nervus vasomotorius abdominalis), a resume of views which I have discussed in current medical literature for a decade and a half.

A short pioneer chapter on pathologic physiology of abdominal viscera is introduced to emphasize its signification and practical value to general physicians. This subject I have attempted to teach by word and pen for a decade. The essay on diagnosis and treatment of reflex neurosis from disturbed pelvic mechanism will suggest to the general practitioner rational views of handling such cases.

In this book I wish to recommend vigorously, especially to the younger members of the profession, what I term "visceral drainage." By its systematic, persistent employment the physician can accomplish vast benefit for the patient and successfully establish a permanently increasing clientele on rational treatment.



ABDOMINAL BRAIN AND COELIAC PLEXUS

Fig. 13. This figure presents the nerves of the proximal part of the tractus intestinalis that is, the nerve plexuses accompanying the branches of arteria coeliaca. 1 and 2 abdominal brain surrounding the coeliac axis drawn from dissected specimen. H. Hepatic plexus on hepatic artery. S. Splenic plexus on splenic artery. Gt. Gastric plexus on gastric artery. Rn. Renal artery (left). R. Right renal artery in the dissection was rich in ganglia. Dg. diaphragmatic artery with its ganglion. G. S. Great splanchnic nerve. Ad. Adrenal. K. Kidney. Pn. Pneumogastric (Lt. left). Ep. right and Eps. left epiploica artery. St. Stomach Py, Pyloric artery. C. cholecyst. Co. clole-dochus, N, adrenal nerves (right, 10, left 10). The arterial branches and loops of the coeliac tripod (as well as that of the renals) with their corresponding nerve plexuses demonstrate how solidly and compactly the viscera of the proximal abdomen are anastomosed, connected into single delicately poised system with the abdominal brain as a center. Hence local reflexes, as hepatic or renal calculus, disturb the accurate physiologic balance in stomach, kidney, spleen, liver and pancreas.

Chapter One

THE ABDOMINAL BRAIN

It should come as no surprise that we each have a brain in our abdomen. Our language is full of expressions associating thoughts and feelings with visceral processes. We speak of "gut feelings," or "gut reactions." We attribute "intestinal fortitude" to individuals of great courage by saying they have "a lot of guts."

Byron Robinson, M. D. researched and wrote extensively about the abdominal brain. His thorough search of medical texts (both ancient and contemporary) revealed a vast historical literature on the subject. His clinical practice (gynecology and internal medicine) was based on his understanding of the abdominal brain (and more generally, the sympathetic system). His prolific writings on the abdominal brain and its nervous system (sympathetic) were collected into his 1907 masterpiece, "***The Abdominal and Pelvic Brain***."

Edgar Cayce also spoke of the abdominal brain, describing it as the "solar plexus brain" (Cayce, 1921 & 1926) and the "secondary brain of the body" (Cayce, 1944). However, he regarded it as more than simply a mass of nerve tissue. He also described it as a key energy center in the body. It is a primary anatomical and physiological connection of the soul with the material body. From Cayce's perspective, the sympathetic nervous system and its abdominal brain are the brain of the soul - or as Cayce put it, "the brain manifestation of soul forces" (Cayce, 1923). This psycho-spiritual aspect of the abdominal brain and sympathetic nervous system will be explored in Chapter Seven.

Recognition of the abdominal brain has important clinical implications. Certain neurological illnesses of unknown causation (such as migraine headache and epilepsy) are currently thought to be caused by problems in the cerebral brain. The connection is apparent - "headaches" occur in the head and seizures are said to be electrical storms in the head-brain. What is not so obvious is that each of these

serious disorders have significant abdominal features. So much so, that the medical literature contains numerous examples of "abdominal migraine" and "abdominal epilepsy." In other words, the abdominal brain is probably involved in these conditions. (Appendix B)

The early osteopaths were aware of the abdominal brain and its relation to migraine and epilepsy. Traditional osteopathic treatment of these disorders focuses heavily on the abdomen and sympathetic nervous system.

With regard to migraine, Edgar Cayce noted that, "the sources of the conditions to which the body becomes allergic in the digestive system should be looked for - that deal with all migraine headaches." (Cayce, 1943) In other words, migraine is caused by an allergic reaction in the intestines. The irritation is transferred via reflex (Chapter Eight) to the trigeminal nerve (Chapter Eleven) causing the symptoms of migraine (such as facial pain) associated with the head.

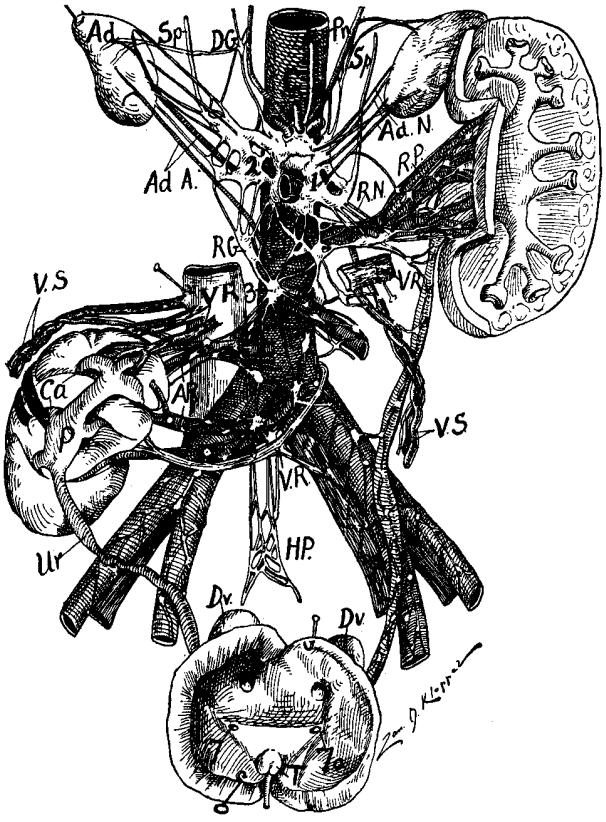
With regard to epilepsy, Cayce observed, "epilepsy comes either from stomach [abdominal brain] or genitive system [reproductive system, i.e., pelvic brain]" (Cayce, 1930). So with migraine and epilepsy, two medical conditions obviously associated with the head and cerebral brain, in many cases the cause might originate in the abdomen and its nervous system.

HISTORICAL PERSPECTIVES ON THE ABDOMINAL BRAIN

The abdominal brain or ganglion coeliacum has experienced multiple names during the past three centuries.

***Synonyms.* - Celiac ganglion (ganglion coeliacum); solar plexus (plexus solaris, Todd and Bowman, 1847); semilunar ganglion (ganglion semilunare); the great abdominal ganglion (ganglion abdominale maximum); abdominal brain (cerebrum abdominale, Wrisberg, 1780 [1739-1808]); the nervous center of Willis (centrum nervosum Willisii, 1622-1675); epigastric nervous center (centrum nervosum epigastricum); splanchnic ganglion (ganglion splanchnicum); vascular abdominal brain (cerebrum abdominale vasculare); epigastric plexus (plexus epigastricus); celiac plexus (plexus cceliacum).**

Some authors have viewed the abdominal brain or celiac ganglion as



ABDOMINAL BRAIN

Fig. 34. This illustration is drawn from a specimen I secured at an autopsy through the courtesy of Drs. Evans and O'Byrne. The right kidney was dislocated, resting on the right common iliac artery, with its pelvis (P) and hilum facing ventralward. The adrenal (Ad.) remained *in situ.* It was a congenital renal dislocation, and was accompanied with congenital malformations in the sympathetic nerve, or nervus vasomotorius. 1 and 2 is the abdominal brain. It sends five branches to the adrenal from the right half (2). Though the sympathetic system is malformed, yet the principal rules as regards the sympathetic ganglia still prevail, viz., ganglia exist at the origin of abdominal visceral vessels, *e.g.*, 3, at the origin of the inferior mesenteric artery; at the root of the renal vessels, HP is no doubt the ganglion originally at the root of the common iliacs (coalesced). In this specimen the right ureter was 5 inches in length, while the left was 11 ½. This specimen demonstrates that the abdominal brain is located at the origin of the renal, celiac, and superior mesenteric vessels - *i.e.*, it is a vascular brain (cerebrum vasomotorius).

composed of two parts, right and left, bilateral and paired. I shall consider it as practically one sympathetic ganglion or plexus anatomically and physiologically, and term it the abdominal brain - the celiac ganglion, a coalesced, vascular, visceral brain, unpaired, existing at the origin of the celiac, superior mesenteric, and renal arteries (major visceral arteries).

The *arrangement* of the abdominal brain consists of: (a) afferent or centripetal nerves (entering or contributing nerves from the cerebrum, spinal cord, or sympathetic); (b) efferent or centrifugal nerves (distributing or visceral). The afferent nerves enter chiefly on the proximal and lateral borders, while the efferent nerves radiate from all regions of the abdominal brain - hence solar plexus. There is no relation between the number and dimension of afferent and efferent nerves of the abdominal brain. (Robinson, 1907, p. 112)

ANATOMY AND PHYSIOLOGY OF THE ABDOMINAL BRAIN

***In mammals there exist two brains of almost equal importance* to the individual and also to the race: One is *the cranial brain*, the instrument of mental progress and physical protection; the other *is the abdominal brain*, the instrument of nutrition and visceral rhythm. To the casual observer the cranial cerebrum seems to overshadow all other nervous centers. The anterior brain of mammals, situated in the skull, is so manifest to the practitioner that it seems to do all the business of the nervous system. It is true that the knot of life is situated at the base of the cranial brain, and by one prick of a bodkin in the medulla, life may be quickly extinguished. Yet a derangement of the abdominal brain destroys life as effectually, though not so quickly. A study of the abdominal brain brings to light views which are both important and practical. In the cranial brain resides the consciousness of right and wrong. Here is the seat of all progress, mental or moral, and in it lies the instinct to protect life and the fear of death. But in the abdomen there exists a brain of wonderful powers. It presides over organic life. Its great functions are two - nutrition and visceral rhythm. In this abdominal brain are repeated all the physiological and**

pathological manifestations of nutrition and rhythm of viscera. It controls nourishment and secretion. It initiates, sustains and prohibits rhythm. It receives sensations and transmits motion. It is an automatic nervous center. It is a physiological and anatomical brain. In short, it is a nervous ganglion; only a ganglion possesses rhythmical power.

The abdominal brain is situated around the root of the celiac axis and superior mesenteric artery. It lies just behind the stomach, consists of a blended meshwork of nervous ganglia, and is made up of the union of the splanchnics, the two pneumogastrics and the right phrenic.

There is a difference between the right and left abdominal brain. The left is more closely packed together; it is retort-shaped, chiefly consists of a large, solid ganglion and is apparently an expansion of the lower end of the left splanchnic nerve and is larger than the right. The right half of the abdominal brain is more of a meshwork than the left; it is perforated with numerous apertures, in short, is flatter and wider than its fellow. I am convinced that its flatness is due to the pressure of the inferior vena cava.

The abdominal brain really consists of two ganglia. These two ganglia are sometimes called semilunar, but I never saw one of such shape. The two ganglia are united by cords at the foot of the celiac axis and are known as the solar or epigastric plexus. This abdominal brain lying along the aorta just behind the stomach is a silent power in assimilation and rhythmical movements, unless some organ is deranged. Observations of the disturbance of visceral functions in women who were the subjects of pelvic disease led me to follow the work.

Disease of the viscera is likely to disturb the two great functions of the abdominal brain: nutrition and rhythm. The abdominal brain distributes its branches to all the vascular system - artery, vein and lymphatic. The branches of nerves will sometimes surround the artery like a sheath or pass along its parallel strands. In short, the branches of the sympathetic nerves are carried to all parts of the economy on the walls of the blood-vessels. The caliber of the blood-vessels, especially the smaller ones, is controlled by these fine strands of nerves. They may produce by their action the scarlet flush (capillary dilatation)

of the cheek, or the marble paleness (capillary contraction) of fright. Several years ago, from experiments on the pregnant uterus of slaughtered cows, I became thoroughly convinced that the sympathetic nerve is the cause of rhythm, while the cerebro-spinal nerves prohibit rhythm. It is evident that the rhythmical waves in the fundus and body of the uterus are entirely due to the sympathetic, which almost alone supplies it. The sober stillness and non-rhythmical motion of the uterine neck is due to the excessive supply of spinal nerves. The order from the cranial brain for motion is active, direct and reflex, subsiding after action. But the order from the abdominal brain is rhythmical, and the rhythmical movements play on all vessels and hollow organs, on the circulatory apparatus and the viscera.

The abdominal brain presides likewise over the glandular system. Here it holds the balance of power between normal blood-tissues and substances to be excreted. The abdominal brain controls secretion. The orders which it sends out to each gland, however, must be reorganized in each separate viscus, *i.e.*, in the periphery of the nerves. The orders to the liver are manifest in the products of bile, glycogen and urea. The forces sent to the digestive tract from the abdominal brain are obvious from the secretion of the digestive fluids, from the mouth to the rectum. The sympathetic system holds the glandular system as a unit, *e. g.*, when the ovarian gland is injured or removed, inflammation may arise in the parotid gland. And mumps and parotitis may be accompanied by orchitis. The rhythm of glands, such as the liver and spleen, is possible from their elastic capsules. The orders from the abdominal brain to the digestive glands may become so violent that Auerbach's plexus throws the muscle of the intestine into rigid contraction, and Meissner's plexus may secrete so rapidly that an active diarrhea may arise in a few minutes. It has been observed that herds of cattle on a ship have been attacked with diarrhea five minutes after the boat was put in motion. The abdominal brain was suddenly disturbed. The sweat-glands may be irritated so violently that the entire body becomes suddenly bathed in perspiration. Much execution may be done by inhibiting the sweat-centers.

Excessive or deficient gland secretion, then, depends on the abdominal

brain and its principal machines. The gynecologist sees wonderful rhythmical movement in the generative apparatus, and he must refer this to the orders of the abdominal brain. The oviducts and ovaries pass through rhythmical circles due to nervous bulbs situated in their walls. I named and wrote of these as "automatic menstrual ganglia," several years ago. The ganglia of the oviduct and uterus which cause the monthly rhythm are entitled to due respect, as well as the peripheral digestive and cardiac ganglia. Again, there is a mechanism called the vasomotor center, which distributes itself in the medulla and along the spinal cord. If the abdominal brain is disturbed the vasomotor center becomes deranged and the skin will be waxy pale or scarlet red. Under this category come the cold, white hands and feet of women, and the flushes and flashes at the menopause. In some patients I have seen the neck and face show variations of color like that in a revolving electric light. The wave of redness will gradually pass over one side of the face and neck, and as it slowly disappears (two to four minutes), the paleness which follows is of a marble whiteness. Then the other side of the face shows that its capillaries go through a slow rhythm of dilatation and contraction. In ten minutes all the rhythm is over and the nervous, pale face again appears.

Uterine hemorrhage from a myoma is reflex and accomplished by the sympathetic system. The bleeding is due to loss of tone in the vessels of the endometrium. The irritation starts in the mucous membrane of the uterus and passes up to the abdominal brain, where the force is reorganized and sent to the vasomotor centers of the medulla and cord. Now, a continuous irritation soon disarranges a center and the vasomotors sooner or later lose the power to control the blood-vessels of the endometrium and become deficient in tone. It may be frequently observed that in a myomatons condition the tone of the vessels in the endometrium is restored and the bleeding ceases for a time, only to be renewed on exhausting irritation. Hence, we consider hemorrhage from a myomatous uterus as reflex. It consists in irritation followed, through reflex action, by vasomotor paralysis, which harbors congestion. We note, then, that the abdominal brain presides over significant organs in man. It controls the forces which hold man's body intact. It has a very subtle way of enforcing

chemistry to subserve its ends.

A general summary of the abdominal brain is that (a) it presides over nutrition; (b) it controls circulation; (c) it controls gland secretion; (d) it presides over the organs of generation; (e) it influences in a dominant, though not an absolute, control its peripheral visceral automatic ganglia.

Each of the above will again be discussed.

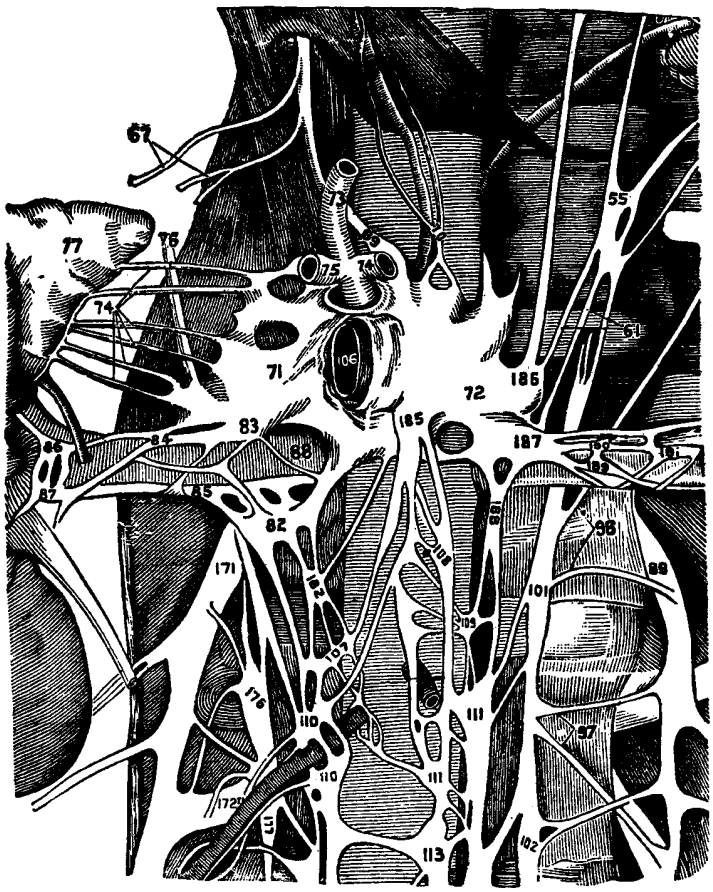
The ideal nervous system is: (1) a ganglion cell; (2) a conducting cord; (3) a periphery. The sympathetic nervous system possesses all three in an eminent degree. The abdominal brain represents the central ganglion cell. Its thousands of distributing and communicating fibers represent the conducting cord. The various ganglionic machines located in each viscus represent the periphery.

In regard to the independence of the sympathetic nerve we wish to say that it is not entirely independent in action, but it may be insisted that it has certain amount of independence which is very manifest in rhythmical motion. The dependence and independence of the (a) cerebro-spinal axis; (b) the abdominal brain and (c) the automatic visceral ganglia may be illustrated by (1) the federal government; (2) the state government and (3) the city or county government.

The cerebro-spinal axis typifies the federal government, and is endowed with the chief rule of the animal. It is the central power and all others must submit to it. It is, moreover, to a large extent, under the will as far as motion is concerned.

The abdominal brain is the state government. In fact, it exercises many functions almost entirely independent. The abdominal brain sends its physiologic orders to all the visceral ganglia. If healthy, all obey, but disturbing pathologic changes cause some to stop, or act irregularly.

The automatic visceral ganglia situated in each organ represent the county or city government. The city, or county, government, is free from neither state nor federal government, but still it has normal independence which it freely exercises. The same views may be illustrated by society and labor in general where division of labor exists, and where certain sections exercise



ABDOMINAL BRAIN.

Fig. 37. This illustration drawn from a cadaver, illustrates the location, relation, and radiating plexuses of the solar plexus, or abdominal brain (71 and 72), which is built around the major visceral arteries, the celiac (73, 74, 75), superior mesenteric (1 6), and renal (88) arteries; hence it dominates the visceral function as to vascularity (blood and lymph), peristalsis, absorption, and secretion. The clinical manifestations of the abdominal brain are coextensive with that of the abdominal viscera. This ganglion of the first magnitude presents radiating plexuses to all the abdominal viscera, presenting an exquisitely balanced and poised nervous mechanism, controlling vascularity (blood and lymph), peristalsis, absorption, and secretion. 76 and 185, splanchnic major; ll0, 111, ganglia ovarica. The body from which this dissection was drawn possessed wide, flat nerves, as is noted by the majestic ganglion - the abdominal brain or cerebrum vasomotorius ; 69 is the left vagus.

almost independent rights. Thus the sympathetic nervous system may be considered to be independent to a certain degree.

After a large number of dissections on man and animals I find that the ganglionic system of the female is larger and more marked than that of the male. Females seem to have more distinct ganglia and more marked conducting cords. I have not investigated the peripheral nerve supply sufficiently, so far, to render any opinion. I have found the abdominal brain and ganglia relatively larger in animals than in man. The abdominal brain is very large in the dog, in proportion to his cranial brain. Man's cranial brain has grown relatively faster than his abdominal brain, and I think man suffers more from malnutrition than do the animals, so that he pays dearly for his superior cranial brain power. Besides, it appears that man's abdominal brain (and superior cervical ganglion) is very liable to deteriorate with age. Disease is very apt to arise in the above ganglia after forty years of age. Perhaps no animal suffers so much from indigestion as man and so far as I know he has not only the smallest abdominal brain, but it is attacked the most severely with disease. The latest researches seem to show that the sympathetic nervous system originates by sprouting from the ganglia on the posterior roots of the spinal nerves. Some believe that the sympathetic nerve originated from the adrenal. Some points relative to the sympathetic nerve and the suprarenal capsules are quite obscure.

The distribution of the sympathetic nerve **is peculiar. It consists of three great parts:**

1. There exists a double lateral chain of ganglia lying on each side of the vertebral column and extending from the skull to the coccyx. The ganglia correspond generally in number to the vertebral except in the neck, where the seven are blended into three. The ganglia, no doubt, represent the original segmentation of the body. Now, the lateral chain of sympathetic ganglia is connected with the cranial nerves, and with the spinal nerves. It is strongly connected with the cranial nerves, and also very intimately connected to each side of the vertebral columns, out of the way of pressure. A notable feature in regard to the lateral chain of the sympathetic is that it is very intimately connected with the cranial nerves, and also very intimately connected with the

sacral nerves. In other words, it blends at the ends very closely with spinal and cranial nerves, but is less intimately associated in the middle with the spinal nerves. The best way to demonstrate the sympathetic system in the human is to place an embryo or fetus in alcohol and then open the thoracic and abdominal cavities, when the chain can be easily observed through the pleura and peritoneum. The sympathetic nervous system is relatively much larger in the fetus than in the adult. In a dog just killed one can see the sympathetic nerves through the pleura very easily and they can be observed also through the peritoneum.

2. The second part of the sympathetic consists of four great plexuses of nerves, situated anterior to the vertebrae, called prevertebral plexuses. One of the pharyngeal, situated around the larynx. Another is the cardiac and pulmonary plexus. A third is the solar or epigastric plexus, situated around the coeliac axis and superior mesenteric artery. The ganglia in the solar plexus are what I am calling the abdominal brain. A fourth plexus lies in the pelvis, and is distributed to the generative and urinary organs and rectum.

3. The third part of the sympathetic consists of the peculiar mechanism at the ends of the nerves situated in each viscus. It is termed the peripheral apparatus. In a diagnostic sense the peripheral apparatus is the most important to the physician, as he can often only make his diagnosis by the manifestation of the disturbances of the periphery of a nerve in a viscus: e. g., in dyspepsia, Auerbach's and Meissner's plexus may be wrong; in jaundice the automatic hepatic plexus may be wrong, and bile, glycogen and urea fail in proper quantity. It is well to remember that there are three more or less distinct splanchnics distributed in the viscera.

The splanchnics **are the inhibitory nerves of the viscera, e.g., of sensation, motion and vasomotor action. We note the following distribution:**

1. There are the cervical splanchnics, which arise in the cord from the first cervical to the fourth dorsal. These splanchnic nerves mainly reach the viscera (heart, stomach, etc.) by traveling up the cervical portion of the spinal accessory and then passing down the vagus (especially the right).

2. The second splanchnics arise in the cord from the second dorsal to the

second lumbar and pass through the rami communicantes to the three or four abdominal splanchnics, whence they pass to the abdominal brain. These govern the vascular area of the intestines, etc.

3. There is also a third set of these nerves, called the pelvic splanchnics. They pass from the cord by way of the second and third sacral nerves and do not enter the lateral chain, but pass to the hypogastric and thus supply the genitals.

From the origin of these three great splanchnics (cervical, abdominal and pelvic), it is clear why irritation or a blister on the lower part of the back of the neck is so effective in dispelling visceral disturbances. The blister inhibits the vasomotor centers and thus soon rights the vascular disturbances in the viscera.

The three splanchnics control the vasomotor region of the viscera. It may be considered that the sympathetic nerve is endowed with sensation and motion. But the sensation is dull in the sympathetic, and its motion is rhythmical. But the utility of the sympathetic in the animal economy is not fully settled. The reason is, that experiments on this nerve are not perfectly decisive, and also because it is so intimately blended with the cerebrospinal nerves. But some study has convinced me that it plays a large role in chronic or remote uterine disease, and that is what has called out this paper. The sympathetic nerve produces involuntary movements. It is called the ganglionic nerve, from the tendency to the formation of ganglia, or knots along its course. In using the term, "abdominal brain," I mean to convey the idea that it is endowed with the high powers and phenomena of a great nervous center; that it can organize, multiply and diminish forces. The views which I wish to bring forward concern the periphery of the abdominal brain, or the mechanism found in each viscus. I mean by viscera those organs contained in the chest and abdomen. (Robinson, 1907, pp. 159 - 165)

CONCLUSIONS AS REGARDS THE ABDOMINAL BRAIN.

The abdominal brain is a nervous center - i.e., it receives, reorganizes, and emits nerve forces.

THE ABDOMINAL BRAIN

The abdominal brain is the nervous executive for the common functions of the abdominal viscera, as rhythm, absorption, and secretion.

The abdominal brain was originally in function and location a vascular brain - cerebrum vasculare. Though complicated functions have been added, yet it is still a primary vasomotor center controlling the caliber of the blood-vessels and consequently the volume of blood to viscera, which determines visceral function.

The abdominal brain is a reflex center in health and disease.

It is the major assembling center of the abdominal sympathetic.

The abdominal brain is the seat of shock. A blow or trauma on it may cause shock, collapse, or death.

It is the automatic, vegetative, the subconscious brain of physical existence. It is the center of life itself.

In the abdominal brain are repeated all the physiologic and pathologic manifestations of visceral function - rhythm, absorption, secretion, menstruation, gestation, ovulation.

The abdominal brain can live without the cranial brain (and spinal cord), for children have been born alive with no cerebrospinal axis. Children have been born alive hours after the mother was dead.

The abdominal brain may be the agent of valuable therapeutics - e.g., in postpartum hemorrhage massage of the aortic plexus will stimulate the abdominal brain to control the blood-vessels of the uterus. Massage of the aortic plexus will stimulate the abdominal brain to send blood to the viscera, enhancing rhythm, secretion, and absorption, improving constipation and increasing visceral drainage.

The abdominal brain is the primary agent of rhythmic visceral motion. A wide office of the physician is to maintain regular visceral rhythm by means of rational therapeutics, as regular habits and exercise, wholesome coarse food, ample fluids, and proper rest. (Robinson, 1907, pp. 128 - 129)

PELVIC BRAIN OF ADULT

Fig. 44. B represents the pelvic brain. The plexus aorticus extends from the abdominal brain to the aortic bifurcation or interiliac disc (H). The plexus interiliacus (hypogastricus) extends from the interiliac disc (H) to the pelvic brain (B). It is evident that the pelvic brain is the result of the coalescence of the plexus interiliacus and sacral nerves II, III and IV. Note that part of the plexus interiliacus sends nerve cords directly to the uterus. 16a and 16 is the arterio-ureteral crossing. The ureters were dilated. Note the great vesical nerve extending from III to X. In this drawing suggestions from Frankenhauser were employed.

Chapter Two

THE PELVIC BRAIN

As a practicing gynecologist, Byron Robinson was extremely cognizant of the physiology (function) of the pelvic brain and its importance in maintaining health and healing illness. From his numerous dissections, he was also probably the world's foremost authority on the anatomy of this brain in the lower portion of the abdomen.

Robinson understood that the pelvic brain is a "**vasomotor center for the pelvic viscera - especially the tractus genitalis.**" In other words, it maintains a strong regulatory function over the blood flow to organs of the lower abdomen. (See Chapter Six for more on vasomotor function).

While the pelvic brain is subordinate to the abdominal brain, it has primary responsibility for the six functions of the female reproductive system: ovulation, secretion, absorption, peristalsis, menstruation and gestation. It is the major pelvic reflex center. (See Chapter Eight for more on reflexes.) It possesses nutritive powers over its peripheral nerves. It has a powerful influence over the visceral muscles of the pelvis. It controls secretion and absorption of pelvic glands.

Edgar Cayce never referred directly to the pelvic brain. Instead he referred to the "hypogastric nerve plexus"when describing the anatomy and physiology of the nervous system in the lower abdomen. Otherwise, his psychic readings correlates closely with Robinson's analysis of the role of this key sympathetic nerve plexus.

ANATOMY AND PHYSIOLOGY OF THE PELVIC BRAIN

The pelvic brain is the localized, subconscious, vegetative, sympathetic,

automatic nerve apparatus for the viscera, particularly of the tractus genitalis.

The pelvic brain is located closely adjacent to the point of crossing of the ureter by the pelvic floor segment of the utero-ovarian artery, hence in hysterectomy the cervical ganglion is extensively traumatized and damaged.

A curious feature in regard to the pelvic brain is that, however, originally it was a vascular brain, located intimately with the common iliac arteries, at present in man from erect attitude and distalward movements of the tractus genitalis, it is practically removed from great arteries and lies ensconced in a woven web of rich veins. The largest ganglia of the pelvic brain lie in the center, while extending to widely adjacent distances on the viscera are located smaller ganglia, separated by gradually increasing fenestrated areas.

The nerve plexuses and accompanying ganglia of the pelvic brain firmly bound in connective and elastic tissue richly surround the tractus genitalis like a net on a rubber ball and traverse its parenchyma like a spider's web.

In the rich ganglionated plexuses issuing from the pelvic brain to the tractus genitalis, i.e. the periuterine and parauterine plexuses, as well as the perivaginal and paravaginal plexuses, the nerves assume an arrangement similar to the arterial blood-vessels, i.e. they decrease in dimension in the median plane. The entire uterus is luxuriantly surrounded and its parenchyma richly traversed by abundantly gangliated nerve networks.

The vagina from proximal to distal ends is interwoven with a fine network of nerve fibers interspersed with ganglia to a remarkable degree. (Best observed with a magnifying lens in infant cadavers.)

The pelvic brain receives, reorganizes and emits nerve forces and hence is not a mere agent of the spinal cord. In it are repeated physiologic and pathologic manifestations of general visceral functions (rhythm, absorption and secretion) and special visceral function of the tractus genitalis (ovulation, menstruation and gestation).

The pelvic brain is subordinate in function to the abdominal brain because of less number of cells only, while it is superior in specialized function (as ovulation, menstruation and gestation). The subordination of the pelvic brain to the abdominal brain is evident from the fact that animals and men can

NERVES OF TRACTUS GENITALIS
PREGNANT ABOUT THREE MONTHS

Fig. 25. This illustration presents the nerves on its genital vascular circle at about three months gestation. The fundus of the uterus is drawn distalward, exposing its dorsal surface. A, abdominal brain. The pelvic brain is faintly represented. The plexus ovaricus is carefully presented.

live well with the pelvic brain extirpated (i.e. with absent genital function or genitals) while life will not continue, or at least under disturbance and for short duration, with the abdominal brain extirpated. (The extirpation of the abdominal brain is practically an anatomic inaccessibility during life.)

It must be admitted from anatomic facts that the abdominal brain partly rules the physiology of the tractus genitalis, one (or several) strong nerves from the plexus interiliacus (directly from the abdominal brain) passes directly to the uterus without first passing through the pelvic brain. However, the plexus uterinus, the major nerve supply of the uterus - passes directly from the pelvic brain to the uterus. It is a large, powerful ganglionated nerve plexus and no doubt accounts chiefly for the wonderful periodic rhythm, the stately peristalsis of the uterus. In short, the individual functions of the pelvic brain are:

(1) It demedullates nerves; nerves enter it (afferent) sheathed and depart (efferent) unsheathed.

(2) It is a source of new nerves; it has more efferent than afferent nerves.

(3) The pelvic brain is a giant vasomotor center for the pelvic viscera - especially the tractus genitalis.

(4) It shares in executing the six functions of the tractus genitalis - ovulation, secretion, absorption, peristalsis, menstruation and gestation.

(5) It is the major pelvic reflex center.

(6) It possesses nutritive powers over its peripheral nerves. It presides, though subordinately, over the rhythm, peristalsis, of involuntary, visceral muscles of the pelvis. It controls secretion and absorption of the glands in tubular viscera (pelvic). The parametrium and entire pelvic subperitoneal tissue is richly traversed by nerves radiating to and from the pelvic brain. An accurate and comprehensive knowledge of the anatomy of the nerve supply of the tractus genitalis (especially the pelvic brain) will enable the gynaecologist to interpret symptoms of disease and to form a correct diagnosis which is the basis of rational treatment. It will aid to extend so-called medical gynoecology which is constructive, and limit so-called surgical gynecology frequently destructive.

A general view of the pelvic brain is that it is an intermediary agent to receive and modify the spinal and sympathetic nerve forces for utilization in the

tractus genitalis. It is a plenary envoy, an ambassador plenipotentiary to reconcile the spinal and sympathetic forces for appropriate use in the genital tract and associated viscera.

PHYSIOLOGY OF THE PELVIC BRAIN

The function of the ganglion cervicale - pelvic brain - is practically (a) to rule the physiology of the tractus genitalis (uterus, oviduct, ovary, vagina); (b) part of the tractus urinarius (bladder, distal ureter); (c) part of the tractus intestinalis (rectum). The pelvic brain, subordinate to the abdominal brain, dominates the function of the tractus genitals, which is under the command of the sympathetic. The dynamics of the pelvic brain comprise the physiology of the tractus genitalis, which is: - (a) ovulation; (b) secretion; (c) absorption; (d) peristalsis; (e) menstruation; (f) gestation (post-natal). It is claimed that the pelvic brain demedullates, unsheaths, the spinal nerves and that all efferent or exit nerves of the ganglion cervicale are sympathetic. The pelvic brain dominates the pelvic viscera as the abdominal brain dominates the abdominal viscera. It assumes the dignity of a brain from its power of reception, reorganization and emission of nerve force. The dynamics of the pelvic brain includes the initiation, maintenance and conclusion of rhythm (peristalsis, labor) in the tractus genitalis as well as the domination of secretion and absorption. The pelvic brain presides over the monthly explosions, monthly rhythm of menstruation, controlling or modifying the automatic menstrual ganglia. The pelvic brain is a giant vasomotor center (cerebrum vasculare) for the tractus genitalis ruling the vast and varying phases of circulation (congestion and anoemia during sexual life, as pueritas, pubertas, menstruation, gestation, puerperium, climacterium and senescence). It presides over the lymphatic circulation and nourishment of the genital tract. The pelvic brain rules the manifest stately, periodic rhythm of the uterus during labor. It is the rhythmic center for the tractus genitalis. The pelvic brain dominates the bladder sufficiently to impose on it a rhythm (diastole and systole), however, powerful spinal nerves are amply present to modify the vesical rhythm. The

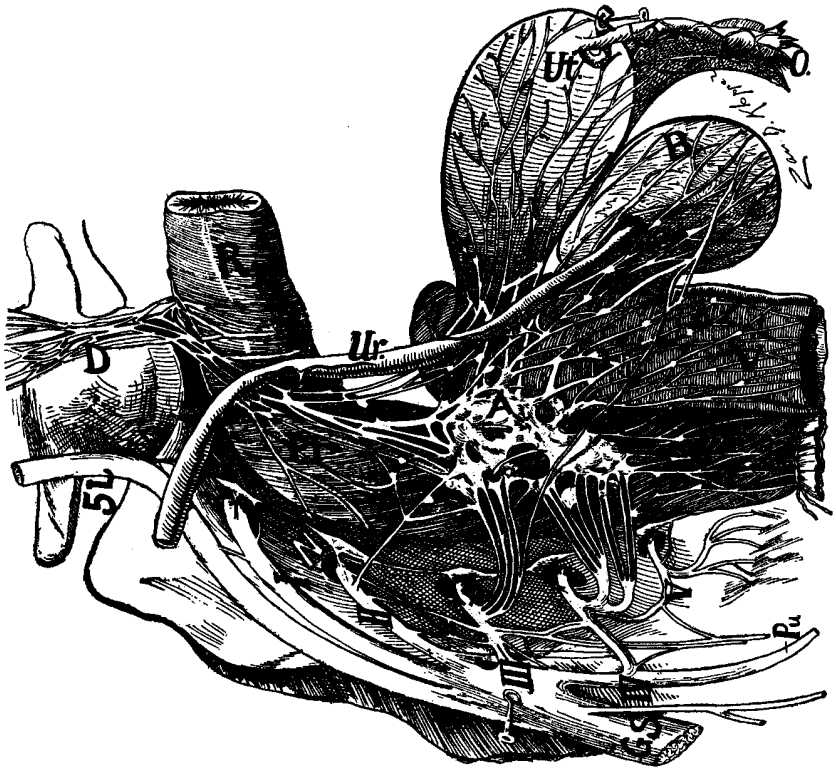
plexus rectalis emitted from the pelvic brain to the rectum to a limited degree influences the rhythm, secretion and absorption of the rectum. Cerebrum pelvicum - the ganglion cervicale - is an automatic nerve center, a brain, as it has the power of reception, reorganization and emission of nerve force.

The pelvic brain is the local central potentate of visceral rule in the lesser pelvis.

The initiation, maintenance and conclusion of parturition should be referred to the pelvic brain. The stately rhythm and measured peristalsis of the uterus in the evacuation of its contents has excited the wonder and stirred the profound amazement of all observers in all time. The rhythm of the uterus is its protest against all occupants. The gestating uterus is always in a state of rhythm - the most active when most distended. The uterus (corpus and fundus) is always ready for an abortion. Were it not for the guarding, resting cervix, the sentinel of the uterine portals, the continuous myometrial rhythm would expel all uterine contents without regard to time. In the resting uterus the cervical ganglion or pelvic brain is free from pressure, not subject to trauma. In the gestating uterus, since the cervix is not practically involved in the enlargement, distention, the cervical ganglion is free from pressure or trauma because the gestating corpus and fundus pass proximalward in the abdomen in the direction of the least resistance, for ample space, leaving the lesser pelvis free from compromising pressure or trauma as in the resting uterus. During the last month of gestation the fetus (especially the head or perhaps the pelvis) passes distalward into the lesser pelvis and gradually the cervix becomes distended, obliterated from pressure, allowing the fetal parts (head or pelvis) to press, traumatize, mechanically irritate the pelvic brain with gradually increasing intensity, which initiates labor (uterine rhythm). (Robinson, 1907, pp. 141 - 146)

PERISTALSIS - RHYTHM OF THE TRACTUS GENITALIS

Peristalsis, or rhythm, of the genitals, though one of the common functions of all abdominal viscera (under control of the abdominal brain), is particularly



PELVIC BRAIN

Fig. 40. An illustration of the pelvic brain, drawn from my own dissection. The plexus interiliacus (bypogastricus) is distinct, presenting two terminations - *viz.* : (a) one part (P) terminates in the uterus without first passing through the pelvic brain (B). The other portion of the plexus interiliacus terminates in the pelvic brain (B). The source of the nerves which compose the pelvic are (a) interiliac plexus; (b) the sacral plexus; (c) the sacral ganglia. It may be observed that there are small ganglia on the rectum, bladder and vagina and uterus. The pelvic brain rules the physiology of the tractus genitalis; it is a brain, it is a receiver, a reorganizer and an emitter of nerve force. The pelvic brain includes in its dynamics the initiation, maintenance and conclusion of labor. G. S., great sciatic. Pu., pudic nerve. S. G., sacral ganglia. R., rectum. V., vagina. X represents the nerve which arises from the III sacral and ends in the bladder. H., interiliac disc. U., ureter. C. I., common iliac artery. 16, vasa, ovarica crossing the ureter. Ov., ovary. 0. D., oviduct. Observe the solid ganglionic mass (A) as a pelvic brain. Note the peculiar origin from the sacral nerves and the tailed division The pelvic brain is but slightly fenestrated.

specialized in the tractus genitalis - uterus and oviducts - to a degree of popular demonstration. Rhythm of the uterus to the ordinary observer is its chief characteristic phenomenon. The rhythm, or peristalsis, of the uterus under the direct command of the sympathetic nerve, differs not, except in degree, from the rhythm of other viscera under direct command of the sympathetic, such as the enteron, colon, ureter, spleen, liver pancreas. Such organs as the lungs, heart, stomach, and bladder, though dominated by the sympathetic, yet are so powerfully supplied by the cranial nerves (vagi) and the spinal nerves (sacral) that their rhythm is modified. The periodic rhythm and stately peristalsis of the uterus has induced observers of all time to enquire and wonder as to its cause. That irritation of the plexus interiliacus and of the plexus uterinus is followed by the rhythmical movements of the uterus, is the main testimony of a vast majority of investigators. The myometrium, the complicated muscle of the uterus in general, is maintained and completely developed by menstruation and gestation, otherwise it would atrophy. In the uterus are located nerve ganglia, little brains, smaller ganglia - extended or transported from the pelvic brain to the uterus, which I termed fifteen years ago automatic menstrual ganglia. They are local rulers of muscle or myometrial rhythm. When the automatic menstrual ganglia are periodically bathed in extra blood (which is a stimulant or excitant) they explode rhythmically, the uterine muscle or myometrium assumes an active, vermicular movement; thus the myometrium or uterine muscle is preserved from atrophic death. Extra absorption of the uterine glandular apparatus is due to the extra trauma of the muscular bundles on the utricular glands. The myometrium thrashes, massages, and whips the glands to extra secretary labors. Myometrial activity and glandular activity are concomitant - cause and effect. The chain of events is: extra blood to the automatic menstrual ganglia induces extra myometrial rhythm. Extra uterine peristalsis induces extra massage, excitation, to the uterine glands, which results in extra secretion. Therefore, be it observed the dominating nerve of the uterus - the sympathetic functionates as a unit - no conflict, in rhythm which develops the myometrium. During gestation the automatic menstrual ganglia become bathed with continual extra blood. Profound congestion, progressive exalted

engorgement, produce extra nourishment and multiply elements until the gestating uterus is perhaps fifty times the dimension of the resting uterus., The gestating uterus is always in motion - rhythm. One curious feature I have noted in the arteries of gestating uteri of animals and man, and that is, that the uterine artery was enlarged, hypertrophied, exactly from its origin in the internal iliac. No part of the iliac was enlarged. Hence gestation belongs entirely to the tractus genitalis, to the utero-ovarian artery. The function is distinct, does not glide into any other visceral tract. The sympathetic nerve has through aeons of ages become, differentiated to perform separately and distinctly the important functions of the tractus genitalis. The sympathetic nerve, nervus vasomotorius, originally belonged to the arterial system. It is differentiated at present to control some veins and also the gradually added tractus lymphaticus. Great importance lies in the tractus vascularis and its ruler, nervus vasomotorius. The future problems, especially as regards shock, must be solved in the wide field of the sympathetic nerve and circulatory system.

Besides rhythm or peristalsis the nerves of the uterus preside over the functions of absorption, secretion, menstruation, gestation, and sensation of the uterus, a description of the physiology of which space forbids. The physiology of the oviduct is under the control of the sympathetic nerve and we may note the following points in its functional activity: The object of the oviduct is transportation - export and import service - of spermatozoa proximalward and of ova distalward, forcing the impregnated ovum distalward to the uterine cavity. The following are the main physiologic factors in oviductal transportation:

1. The periodic congestion of the genitals, stimulation of the automatic menstrual ganglia by extra blood.

2. The cilia of the oviductal mucosa whip continually toward the uterus distalward, not only forcing the ova distalward, but also creating a fluid current.

3. The congestion induces the endosalpinx to secrete a fluid which makes the oviduct a canal to float the ovum distalward:

4. Congestion induces continual oviductal peristalsis, which forces the

ova distalward.

5. The contraction of the muscular processes in the ligamentum latum enhances the peristalsis.

6. The shortening of the fimbria ovarica which induces the infundibulum to apply its mucous surface to the ovary, capturing the ovum.

7. The congestion induces the secretion of mucus and glues the infundibulum on the surface of the ovary.

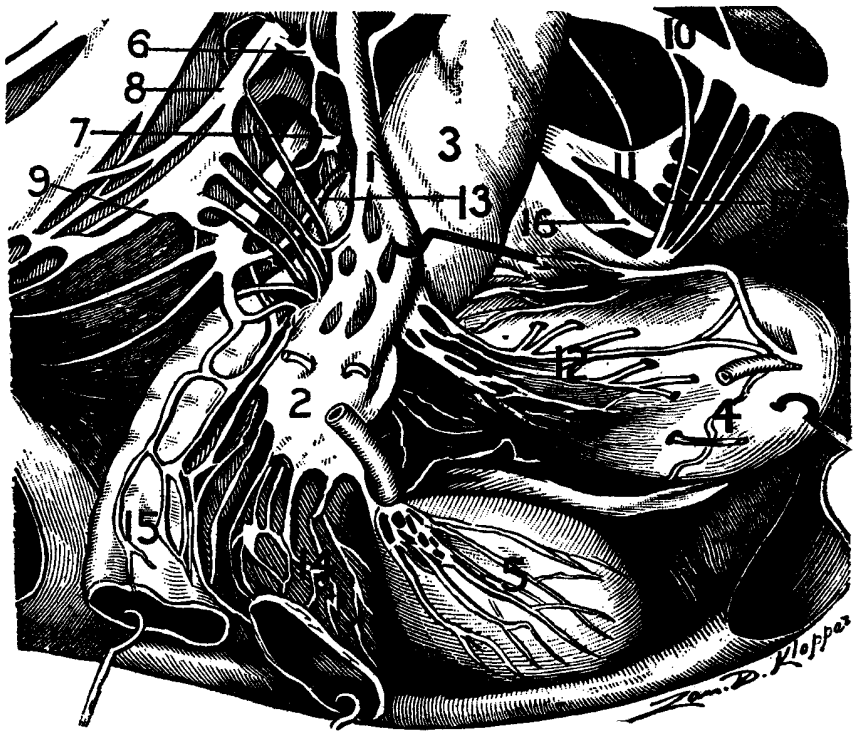
8. Intra-abdominal pressure aids the distal progress of the ova.

9. The enlarging of the ovum approaching the infundibulum aids.

10. Secretion of the endosalpinx produces a fluid medium adjacent to the proximal oviductal end and the cilia of the fimbriae induce a current toward the abdominal ostium.

11. The oviduct has an import (spermatozoa) and an export (ova) service. It is analogous to the vas deferens in the male. The spermatozoa pass through the oviduct proximalward, while the ova pass through it distalward.

12. The oviduct is a temporary (or pathologic permanent) depot for conception. The oviduct (ampulla) is a physiologic sporting ground for ova and spermatozoa. It has three general physiologic offices to fulfill, viz.: (a) to secure and transport the ovum (distalward) to the cavity of the uterus; (b) to conduct spermatozoa proximalward; (c) to serve as physiologic temporary (or pathologic permanent) depot of conception. All the physiologic statements in regard to the ovary will be, that the rich plexus ovaricus rules ovulation, but also, perhaps, some form of internal ovarian secretion is necessary for the best normal corporeal existence. The physiology of the tractus genitalis is vigorous, as it is supplied by a luxuriant system of sympathetic nerves. With the higher forms of differentiated animals the magnitude and influence of the genitalis increases. The higher the animal the more thought is applied to the genitals, the more periodic congestion and permanent increase of nerve and blood supply. The intense attention paid to sex in higher animals, such as monkey and man, is a remarkable phenomenon, and attention induces blood flow, congestion. At the bottom of the sex lie ambition, hope, and much of the pride of life. Man's life and thoughts are arranged around sex as a center. Hence the genital nerve and



PELVIC BRAIN

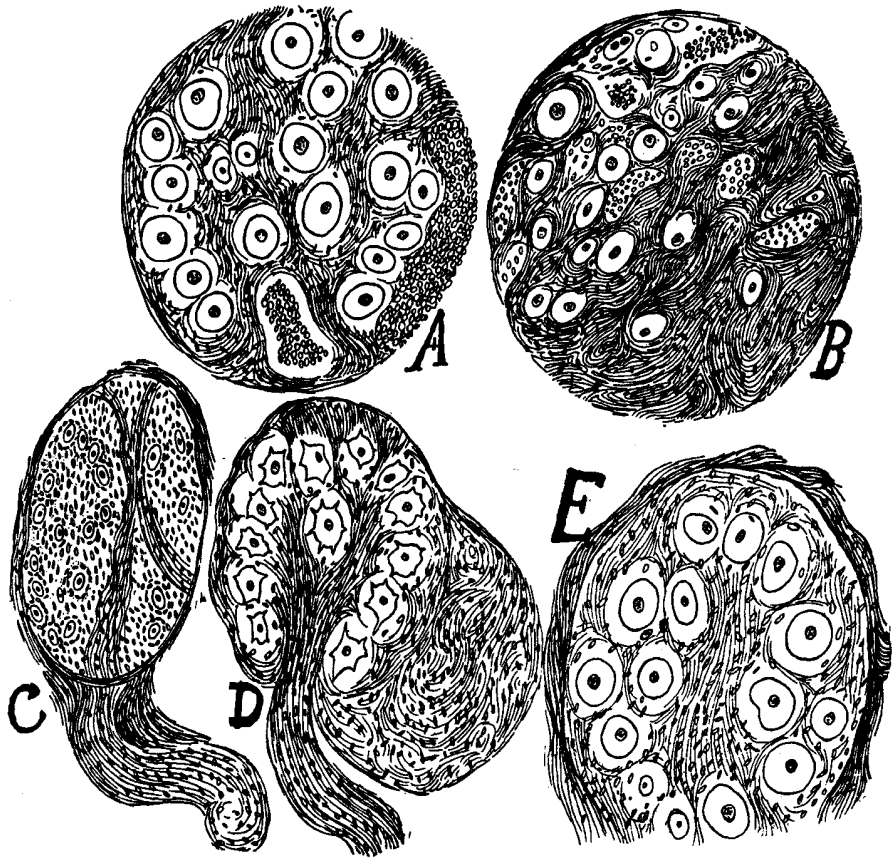
Fig. 42. Drawn from my own dissection. Woman about thirty years of age. In this subject the dissection was rather deficient than excessive, hence, the pelvic brain presents more of a solid ganglion than a fenestrated ganglion, or ganglionated plexus. 1 and 2, pelvic ganglion. 3, rectum. 4, uterus. 5, bladder. 6 and 7, sacral ganglia. 8, last lumbar nerve. 9, IV sacral nerve. In this subject the pelvic brain results from the union of the plexus interiliacus (I) and branches from II, III and IV sacral nerves.

The detailed dissection was not continued sufficiently to demonstrate that the plexus interiliacus emitted separate strands directly to the uterus without first entering the pelvic brain. In this subject the pelvic brain was one inch in length, one-half inch in width, and one-fifth inch in thickness. Such a majestic ganglion must be endowed with giant power.

blood supply and consequent genital physiology will remain an increasing maximum. (Robinson, 1907, pp. 100 - 102)

CLINICAL IMPLICATIONS

A knowledge of the pelvic brain with its multiple radiating nerve leashes and plexuses is not only valuable for the science alone of obstetrics and gynaecology, but it is important for successful practice. The independence of the pelvic brain is evident when children are born, expelled, from the uterus after the death of the mother. Joseph Hyrtl, the celebrated Viennese anatomist, reports that during a war in Spain some bandits hanged a pregnant woman. After she had hung on the gallows for four hours, and consequently was long dead, she gave birth to a living child. I have observed the giant uterus of slaughtered pregnant cows executing with wondrous precision its stately rhythm and measured peristalsis hours subsequent to death and evacuation of the uterine contents. If one extirpate an oviduct from a human patient and place it in warm normal salt solution oviductal rhythm may be maintained by physical stimulus for some three quarters of an hour. Labor should be painless, as normal visceral rhythm is painless. Scanzoni reports a woman paralyzed from the dorsal vertebra distalward as having had a painless labor - the spinal nerve of the tractus genitalis was paralyzed - hence, painless dilatation of the cervix occurred, with expulsion of uterine contents. The signification of the cervical ganglion in practice is evident when observed that trauma or shock on the pelvic brain will kill in a few hours. For example, I performed an autopsy on the body of a woman after her first child who had ventral hysteropexy performed on her four years previously and in whom, immediately subsequent to labor, the uterus invaginated, killing her in about two and a half hours. She died from shock, which went swiftly onward and swiftly downward. The pelvic brain dominates the rhythm of the corpus and fundus (uterus). That the uterus is supplied by sympathetic nerves and cervix by spinal is significant in practice. For example, the uterus (corpus and fundus) is always ready for an abortion, because it is



HISTOLOGY OF PELVIC BRAIN

Fig. 124. A, drawn from the pelvic brain of a girl seventeen years of age. The ganglion cells are completely developed. B, drawn from the pelvic brain of a three months' normal gestation. The ganglion cells are completely developed. Observe the enormous mass of connective tissue present. C, child 11/2 years old. A nerve process courses within the ganglion. Few and small ganglion cells incompletely developed. D, girl 11/2 years old. A nerve process branches and reunites itself with the intercellular substance. E, girl 6 years old. The ganglion cells are presenting development. (Redrawn after Doctor Sabura Hashimoto.)

always in rhythm. The cervix is never ready for an abortion, because it is not in rhythm, being dominated by sacral spinal nerve. The pelvic brain is intimately and profoundly connected to the abdominal brain by a direct nerve route of vast nerve plexuses and ganglia - viz., by the plexus interiliacus (hypogastricus) and plexus aorticus. Any disturbance in the pelvic brain is flashed with telegraphic rapidity to the abdominal brain, and most of the consequent pathologic physiology is manifest from the stomach by disordered rhythm (vomiting or nausea), absorption and secretion. (Robinson, 1907, pp. 147 - 148)

DEVELOPMENTAL CYCLES OF THE PELVIC BRAIN AND GENITAL SYSTEM

Age Relations. **- In contra-distinction to the abdominal brain, a life-long functionating organ, the pelvic brain possesses age relations concomitant with the age relations of the tractus genitalis. The age relations of the pelvic brain, similar to those of the tractus genitalis, depend upon the volume of blood irrigating it at the different phases of sexual life, as pueritas, pubertas, menstruation, gestation, puerperium, climacterium, senescence. The pelvic brain, present at birth, experiences multiplication of its ganglion cells, maximum completion and minimum atrophy during postnatal life. Its function rises and falls with that of the genitalis.**

I. ***Pueritas.*** **- In childhood the pelvic brain is present; however, the ganglion cells are few and small. The cell body is small, slightly granular. Cell nucleus is distinct. Cell nucleolus, small and indistinct. The ganglion cells grow, increase gradually with the years. At six years of age the cell nucleus is marked and the nucleolus is distinct.**

II. ***Pubertas.*** **- At puberty the ganglion cells are completely developed (simulating the arteria uterina).**

III. ***Menstruation.*** **- At the menstrual period the hypereemia, congestion, may aid in increasing the connective tissue cells.**

IV. ***Gestation.*** **- During pregnancy the profound and continuous**

hyperaemia, the permanent exalted engorgement, produces an increase, a multiplication of interganglionic cellular nerve and connective tissue, which force the ganglion cells asunder. This lends to the pelvic brain an evident increase in its gross dimension (not positively a multiplication of ganglion cells). The vast majority of investigators admit that the pelvic brain hypertrophies in its nerve and connective tissue department during gestation (not in ganglion cells). However, it is a very difficult problem to solve, as we are not familiar with the number of ganglion cells present at any one epoch of sexual life. Besides, inflammatory processes in the tractus genitalis modify or destroy the ganglion cells. Also individual variations confuse. Connective tissue develops in the pelvic brain during the active function of the genitals, in maximum sexual life (menstruation and gestation). S. Pessimski, in his able production (1903), asserts that the character of the plexus (pelvic brain) and the dimensions of the ganglia are identically the same in gravid and nongravid subjects.

V. *Puerperiun.* - In the devascularization of the puerperal stage cellular elements will perhaps degenerate, atrophy, disappear.

VI. *Climacterium.* - In the climacteric stage the blood supply begins to diminish, increasing the interganglionic cellular elements, which forces the ganglion cells asunder, and the parenchyma (ganglion cells) begins its final long night of atrophy and disappearance.

VII. *Senescence.* - In senescence the arteria uterina loses its spirality, becoming extended, its lumen becomes diminished, its walls become hypertrophied and the volume of blood supplying the pelvic brain (and genitals) gradually decreases with consequent atrophy. The interganglionic connective and nerve tissue increases, multiplies. while the parenchyma (ganglion cells) becomes atrophied, compressed to death by cicatrization and lack of blood. By progressive interganglionic nerve and connective tissue multiplication the ganglion cells are separated and compressed, gradually losing their nucleolus, and later their nucleus, and finally the granulation of the ganglion cell body disappears and the ganglion cells become reduced to a homogeneous mass - atrophic death. They have ceased to command the rhythmic uterus. The senescent decadent process of the pelvic brain is identical with that of the

tractus genitalis (*i.e.*, for the segment supplied by the arteria uterina).
(Robinson, 1907, pp. 150 - 151)

CONCLUSIONS AS REGARDS THE PELVIC BRAIN

(A) *Anatomy*. - The pelvic brain, a constant structure, is practically formed by the union of the visceral branches (pelvic splanchnics II, III and IV) of the sacral plexus with the interiliac (hypogastric) plexus. It is a composite or compound ganglion, paired and practically symmetrical in dimension, form, position and weight. The pelvic brain is located bilaterally at the cervico-vaginal junction, where the latter is in contact with the rectum. It is situated extraperitoneally in the parametrium at the base of the ligamentum latum, on a level with internal os uteri well concealed in connective tissue. Practically the position of the pelvic brain is at the point of crossing of the ureter with the uterine artery. It is the major assembling center for the pelvic sympathetic. It is surrounded and interwoven with dense subperitoneal pelvic connective tissue, presenting difficulties of exposition by dissection on account of its simulation to adjacent tissue. The pelvic brain has extensive and profound connection with the uterus, vagina, ureter, bladder and rectum. The composite, compound ganglia of the pelvic brain are composed of multipolar ganglionic nerve cells ensconced in periganglionic tissue. From erect attitude the pelvic brain has changed position, moving more distalward into the lesser pelvis and approaching more the median plane. The average dimensions of the adult pelvic brain, with resting uterus, are: Length (proximadistal), one inch; width, three-quarters of an inch; thickness, one-sixth of an inch. In the gestating uterus the average dimensions of the pelvic brain are: Length, one and one-half inches; width, one inch, and thickness, one-fifth of an inch. The form is triangular, quadrangular. The borders, or contour, are irregular and not well defined. The arrangement of the pelvic brain consists of (a) afferent or centripetal nerves (entering or contributing nerves) from the plexus interiliacus (sympathetic) and plexus sacralis (spinal); (b) efferent or centrifugal nerves (distributing or visceral nerves).

The afferent nerves enter the pelvic brain mainly on the proximal and external borders as single, slightly plexiform cords.

The efferent nerves radiate mainly from the median and distal borders as luxuriant leashes or richly ganglionated plexuses.

There is no relation in number or dimension between the afferent and efferent nerves. The pelvic brain is a fenestrated ganglionic mass. Its consistence is moderately dense from association of abundant periganglionic tissue. The ganglia of the pelvic brain vary in dimension, location, form, coalescence, separation.

To expose the pelvic brain by dissection the most perfectly, the cadavers of infants preserved in alcohol are absolutely necessary - superior to that of adults.

The pelvic brain resembles the abdominal brain in that it receives the visceral nerves (pelvic splanchnics) from the II, III, IV, sacral nerves, while the abdominal brain receives the visceral nerves (abdominal splanchnics) from the VII dorsal to the II lumbar (thoracico-lumbar). The pelvic brain is accessible to palpation per vaginam and per rectum. Practically, the genitals are supplied from two sources, viz.: (a) directly from the plexuses of the pelvic brain; (b) from one (to several) strands issuing directly from the plexus interiliacus (which does not first pass through the pelvic brain).

The plexuses of the pelvic brain (uterine, ureteral, vaginal, vesical and rectal) anastomose, connect, solidly and compactly, the tractus genitalis, part of the tractus urinarius (ureter, bladder), part of the tractus intestinalis (rectum), which induces them to act clinically as a joint organ - injury or disease in any one tract produces reflex effects in the other two, and vice versa.

(B) *Physiology.* - The function of the pelvic brain is practically to rule the physiology of (a) the TRACTUS GENITALIS; (b) part of the tractus urinarius (ureter, bladder); (c) part of the tractus intestilialis (rectum).

The physiology of the tractus genitalis is (a) ovulation; (b) secretion; (c) absorption; (d) peristalsis (prenatal and common with functions of the abdominal brain); (e) menstruation; (f) gestation (special functions of the pelvic brain), and (g) sensation.

The pelvic brain is a nervous center - i.e., it receives, reorganizes and emits nerve forces. The pelvic brain is a local nervous executive for the common functions of the pelvic viscera (peristalsis, absorption and secretion) and for the special function of the tractus genitalis (ovulation, menstruation and gestation.) The pelvic brain was originally in function and location a vascular brain - cerebrum pelvicum vasculare.

The dynamics of the pelvic brain include the initiation, maintenance and conclusion of parturient peristalsis (labor).

The ganglion cervicale assumes the dignity of a brain from its power of reception, reorganization and emission of nerve impulses.

Parturient peristalsis (labor) is initiated by the distalward movement of the child and the consequent mechanical irritation, pressure, excitement on the pelvic brain. The greater the distalward movement of the child in the pelvis the more mechanical irritation from the foetal head occurs on the pelvic brain, and consequently the greater number of nerve elements (ganglia) are excited.

The pelvic brain functionates as a unit, possessing no segmental ganglionic differentiation as in the cranial brain. It is a source of new nerves, a creating center, as it possesses more efferent than afferent nerves. The pelvic brain is subordinate to the abdominal brain in total number of ganglion cells - not in specific functions (as ovulation, menstruation, gestation). It demedullates nerves - i.e., medullated nerves enter (afferent) sheathed and depart (efferent) demedullated, unsheathed. The pelvic brain is a giant vasomotor center for the pelvic viscera, especially for the tractus genitalis. It shares in the execution of the six functions of the genital tract - viz., ovulation, secretion, absorption, peristalsis, menstruation, gestation. The pelvic brain is the major pelvic reflex center. It is the minor abdominal reflex center, the abdominal brain being the major reflex center. It possesses nutritive power over its peripheral nerves. The pelvic brain arrives at its adult maximum dimensions and functionating power after a complete gestation. The pelvic brain is an intermediary agent to receive and modify the spinal and sympathetic nerve forces for utilization in the tractus genitalis.

The pelvic brain experiences an age relation concomitant with that of the

tractus genitalis - i.e., with the utero-ovarian artery. The age relations of the pelvic brain depend on the volume of blood irrigating it at different phases of sexual life.

(a) In pueritas the ganglion cells are few and small.

(b) In pubertas the ganglion cells are completely developed.

(c) In menstruation the hyperoemia, congestion, increases the connective tissue.

(d) In gestation the profound and constant hyperaemia, exalted engorgement, produces a multiplication of ganglion cells and an increase of connective tissue.

(e) In puerperium the devascularization of the ganglionic cell elements may produce degeneration, atrophy.

(f) In climacterium the blood supply decreases, the ganglionic cells atrophy and the connective tissue increases.

(g) In senescence the ganglion cells atrophy and disappear, while the connective tissue multiplies, increases. The pelvic brain begins its long night of atrophic death. (Robinson, 1907, pp. 152 - 156)

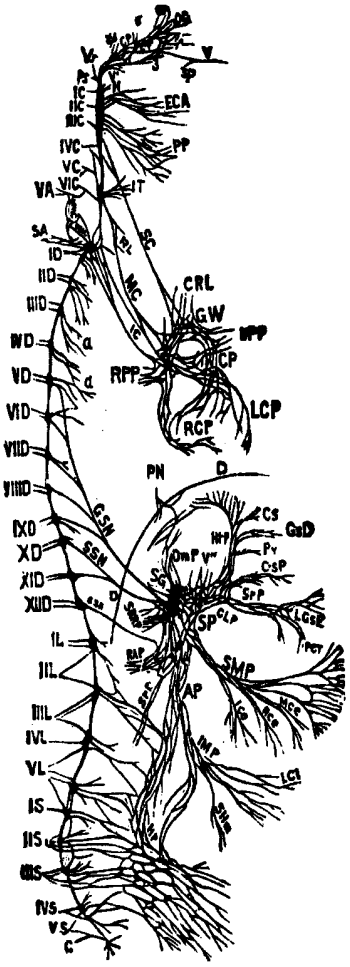


Fig. 3. A diagram of the nervus vasomotorius (sympathetic) from the proximal end (ganglion of Ribes) to the distal end (coccygeal ganglion of Luschka) presenting a lateral view of the truncus vasomotorius (lateral chain) and the three prevertebral ganglia (cardiac, coeliac and pelvic plexuses). Observe the exit of the three cardiac nerves, the three abdominal splanchnics and the 3 (or more) pelvic splanchnics (after Flower).

Chapter Three

"LITTLE BRAINS" OF THE SYMPATHETIC SYSTEM

Robinson's recognition of an hierarchy of brains does not stop with the "head brain" (cerebral/cranial brain) and the brains of the abdominal cavity (abdominal and pelvic brains). He goes on to describe numerous "little brains" scattered throughout the entire sympathetic nervous system. The little brains are nerve ganglia which have a certain degree of autonomy and independence in their function. As he notes in the section which follows, the "little brains" are **"reorganizing centers, receiving sensations and sending out motion."**

Robinson states that the "little brains" are particularly prominent in the intestinal tract (the enteric nervous system - see Chapter Five), the cardiac (circulatory) system, the pelvic/reproductive tract and along the spine (the so-called double chain of sympathetic ganglia).

The early osteopaths were aware of the various "little brains," especially along the spinal column:

> "The term "CERVICAL BRAIN" has been applied by Dr. Still [founder of osteopathy] to the region lying between the first cervical vertebra and the fourth dorsal vertebra. The term "ABDOMINAL BRAIN" has been applied by him to the region lying between the first dorsal and third lumbar vertebrae, "PELVIC BRAIN," to that region lying between the tenth dorsal and fifth lumbar vertebrae." (Hazzard, 1899, pp. 9 - 10)

To the early osteopaths, these "little brains" along the spine were directly associated with the larger brains in the body cavity. Hence, injury (or pathology of any nature) to spinal nerve ganglia affects other systems (e.g., the abdominal nerves and organs). Traditional osteopathic treatment of the spinal nerve ganglia was

directed at improving nerve functioning to the rest of the system thus bringing the nervous system, and the body in general, back into balance.

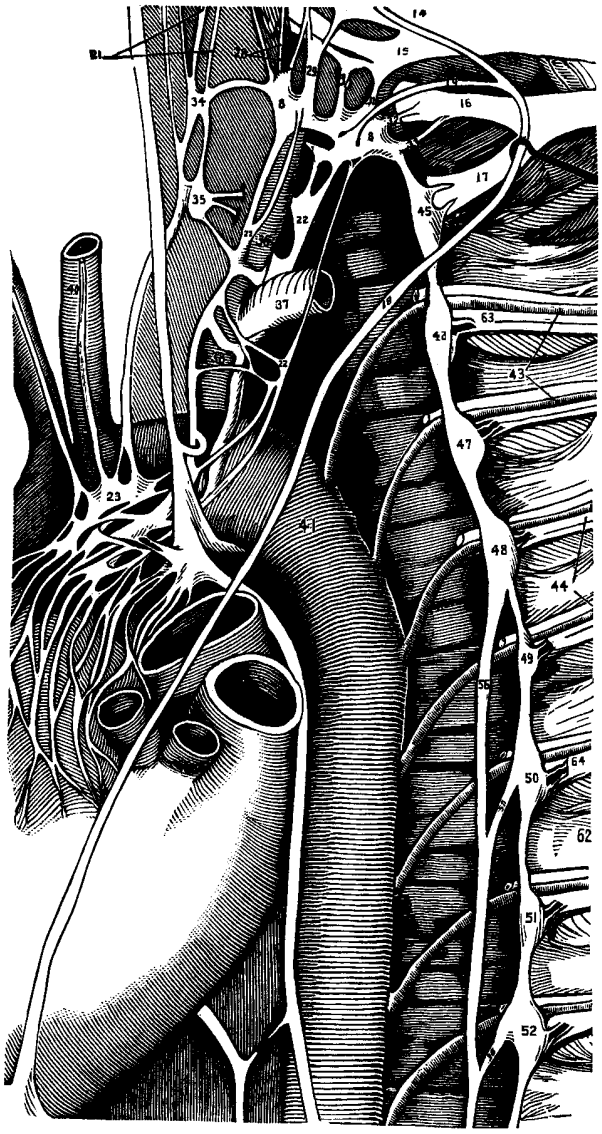
The early osteopaths often referred to the "little brains" of the sympathetic system as "centers." Most early osteopathic textbooks contain one or more chapters on the "concept of centers." Thus, the location of "centers" and how to influence them therapeutically was a major emphasis in traditional osteopathy.

Like the early osteopaths, Edgar Cayce also made reference to the "little brains" in the body, even calling the ninth dorsal (thoracic) sympathetic ganglia the "solar plexus brain." However, consistent with the osteopaths, he also most often used the term "centers" when referring to the "little brains."

ANATOMY AND PHYSIOLOGY OF THE SYMPATHETIC CENTERS

The sympathetic nerve consists of, viz.: (,z) ganglia (lateral chain); (b) conducting cords; (c) three ganglionic plexuses located in the chest (thoracic plexus), abdomen (abdominal brain), and pelvis (pelvic brain); and (d) automatic visceral ganglia. The conducting cords are not sheathed; they are non-medullated. The ganglia, composed of nerve cells, are little brains. They are reorganizing centers, receiving sensations and sending out motion. The abdominal and pelvic brains and the ganglionic plexuses are simply large brains or aggregations of nerve cells. (Robinson, 1907, p. 286)

In each of the viscera are found small nervous ganglia scattered through the organ, or the nervous bulbs are gathered in distinct localities of the viscus, as in the heart or digestive tract. Now it may be understood that these little ganglia found in the organs have the power to maintain movements to some extent. These peripheral ganglia may be looked upon as little brains which are capable of developing nerve force and communicating it to the organs without the aid of the cerebro-spinal axis. They can multiply or diminish nerve force, which is sent to a viscus where they exist. Diseases of any viscus or disturbance



NERVES OF THE HEART

Fig. 54. This figure represents the 3 cardiac sympathetic nerves on the left side to the heart (Nos. 34, 22, 22) ; 23 is Nrisberg's ganglion ; 18 is the phrenic joined to the inferior cervical ganglion at 8 by a branch, 19. This connection explains the braying sound or expiratory moan on sudden rectal dilatation.

of its rhythm must be due to them or to abnormal forces passing through them, arising from the abdominal brain. Again, the rhythm and function of a viscus are involuntary, i.e., beyond control of the will. They are automatic nerve centers placed in the viscus in order to isolate it from the control of man's mind. These little brains induce the viscera to perform their functions independent of the state of mind. They exclude the mind from speculating on the viscus so far as regards function. The will cannot induce the ganglia to do two years' work in one, or one year's work in two. The peripheral ganglia of every viscus assumes its own time of rhythm. The ganglia of each viscus rise to a maximum and sink to a minimum according to their own law of existence. They go through a rhythmical movement, a peculiar cycle. There are explosions of nervous energy from the ganglia during regular periods of time. For example, the heart ganglia thus explode a little oftener than once a second, while those of the oviducts and uterus explode once a month. They are automatic visceral ganglia.

We will consider *the peripheral apparatus* of the heart, lungs, uterus and oviducts, liver, spleen, kidneys, bladder and digestive tract. A study of the ganglia in each organ will enable one to diagnose disease in the said viscus.

The peripheral ganglia have been well studied and some of the more important ganglia of the heart substance have received definite names. The little brains in the heart are called automatic cardiac ganglia. They are named the automatic centers of Remak, Bidder, Ludwig and Schmidt. These are simply some of the more important automatic motor centers of the heart. In many experiments on dogs I have repeatedly satisfied myself that the automatic cardiac ganglia are mainly aggregated in the auricles and auricular-ventricular septum. Wherever the automatic motor centers are located in the heart anyone can satisfy himself that these ganglia excite and maintain the rhythm of the heart. The frog's heart can be kept in rhythmical motion by stimulation in warm salt water for hours after it has been removed from the body. A few experiments on animals will soon convince one that the peripheral ganglia of the sympathetic nerve located in the heart are a very significant apparatus as regards the cardiac functions. The disturbance of the heart's rhythm by uterine

disease is what we shall attempt to demonstrate in its appropriate place. The most striking peripheral apparatus of the sympathetic nerve is found in the heart. Its rhythm is so perfect, its cycle is so apparent and its explosion so manifest, that men sought its origin outside the cerebrum. The dominating influences of the automatic motor-centers on the heart are shown by the idea that in the living fetus, without brain or spinal cord, the heart keeps up its rhythmic beat. In such fetuses the heart ganglia are well developed. One-half of the spinal cord has been removed in pigeons without disturbing the cardiac beat. Besides, the inferior cervical ganglion has very intimate connections with the great ganglion of Wrisberg. (Robinson, 1907, p. 167)

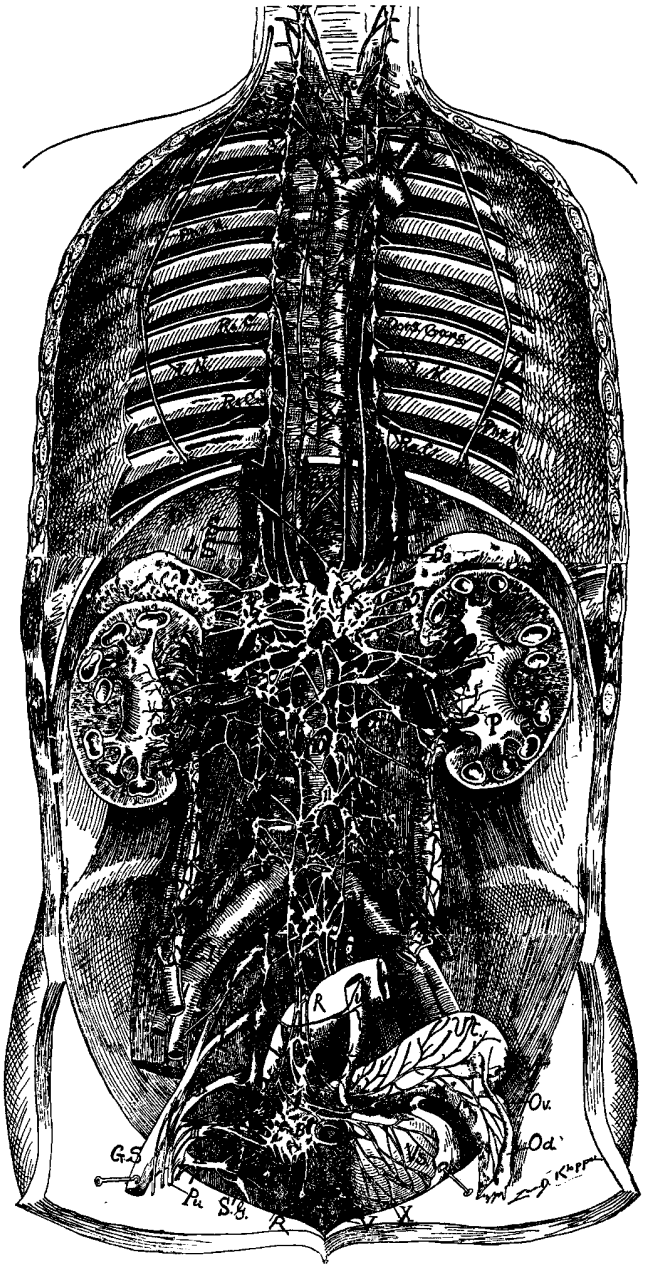


Fig. 1. AN ILLUSTRATION OF THE SYMPATHETIC NERVE

Chapter Four

THE GREAT SYMPATHETIC NERVOUS SYSTEM

Medical terminology is constantly changing. So it is to be expected that medical texts from early in this century sometimes seem like a foreign language. Portions of ***The Abdominal and Pelvic Brain*** can be challenging due to the outdated language and use of "extinct" words.

For example, descriptions of the nervous system from the late nineteenth and early twentieth centuries consistently divide the body's nerve apparatus into two important systems: the "cerebro-spinal nervous system" and the "sympathetic nervous system." From a clinical standpoint, the physicians of that era used these terms (including the early osteopaths). Edgar Cayce also consistently referred to the "cerebrospinal" and "sympathetic" in his medical readings.

Translating these key terms into modern medical language is essential to understanding the work of Byron Robinson, the early osteopaths, and Edgar Cayce. The problem is that while it is relatively simple to translate words, the concepts represented by the words are not so easily communicated. In short, much has been lost in our understanding of the body (particularly that portion called the "sympathetic nervous system"). I will try to explain without becoming too technical.

The simple translation of "cerebrospinal" into the modern vernacular is "central nervous system" (CNS). Generally speaking, this refers to the cerebral brain and spinal cord.

The simple translation of "sympathetic" is autonomic nervous system (ANS). The autonomic nervous system includes that portion of the nervous system in which the nerve ganglia lie outside the CNS, primarily along the spine and in the region of the abdomen and viscera.

So, in this simplified translation: "cerebro-spinal" = central nervous system and "sympathetic" = autonomic nervous system. This has been the approach adopted

by many writers who have attempted to translate the work of the early osteopaths and Edgar Cayce's medical information. I have even used this model myself, while noting its shortcomings (McMillin, 1991).

This is where the problem begins because in modern language the "sympathetic" is also considered as a subdivision of the ANS. The other major branch of the ANS is the "parasympathetic."

The problem is that by oversimplifying the translation, we lose the conceptual significance of the "great sympathetic system." The modern equivalent of the "sympathetic system" is merely a subdivision of a secondary system (ANS). Thus, the modern "sympathetic system" (and the ANS of which it is merely a part) is barely a handmaiden to the all-powerful and dominant CNS.

Adopting this view discounts the work of Byron Robinson, Edgar Cayce and the early osteopaths who placed tremendous emphasis on the "great sympathetic system." To fully appreciate their contributions, we must expand our concept of what is meant by the "sympathetic" system. The selections in this chapter are intended to provided a glimpse into this incredible system.

The noted osteopathic researcher, Irvin Korr Ph.D., documented the modern conceptual deficiency regarding the sympathetic system when he observed:

> "Among the most persistent myths is that the two divisions of the ANS, the sympathetic and parasympathetic, are equal and opposite moieties, one being inhibitory where the other is excitatory, one positive, the other negative, one yin, the other yang. The implication usually conveyed is that normal life is a nicely balanced tug-of-war between these two divisions, and that it is the physician's function to redress "autonomic imbalance," usually with appropriately -lytic or -mimetic medications.
>
> Although this view is widely held by physicians (and others), it will be shown that the two divisions are vastly different systems. Indeed, only one of them, the sympathetic, can truly be called a system. They differ in their basic design, central origins, peripheral distributions (overlapping though it is), and the sensory stimuli to which they respond." (Korr, 1979, p. 214)

In other words, the sympathetic system is a "great" system in its own right. Understanding and appreciating the various aspects of this system are essential.

THE GREAT SYMPATHETIC NERVOUS SYSTEM

Edgar Cayce recognized the "greatness" of this system. He frequently acknowledged the role of the sympathetic in the causes of disease. His therapeutic recommendations often focused heavily on the sympathetic system. His descriptions of the great sympathetic system were anatomically and physiologically consistent with the medical literature of his era. Furthermore, his use of language to communicate the vastness and variety of this system is interesting.

For example, realizing that a single word (i.e., sympathetic) was inadequate to convey all the multiple facets of its involvement, he often used other terms to qualify its meaning. When speaking of the psychological aspects of the sympathetic system he would frequently refer to the "imaginative or sympathetic system." (See Chapter Seven for more on this aspect of sympathetic functioning.) When referring to the life sustaining aspects of the sympathetic system, he would often use the expression, "the vegetative or sympathetic system." (See Chapter Five.) When indicating the circulatory (blood and lymph) influence of this great system, he would speak of the "superficial or sympathetic circulation." (See Chapter Six.) I have termed these three aspects of the great sympathetic system the "three faces of the sympathetic."

Another example of Edgar Cayce's appreciation of the great sympathetic system is the role which he attributes to it in relation to the "cerebro-spinal system." He observed that these two important systems must work in harmony (i.e., "coordination") with each other to maintain health. Coordination (and incoordination) between the cerebro-spinal and sympathetic systems was a major theme in Edgar Cayce's perspective of health and healing. Similarly, Byron Robinson dedicated a whole chapter to just this topic (Chapter 23 of his book is entitled, "RELATION BETWEEN VISCERAL (SYMPATHETIC) AND CEREBRO-SPINAL NERVES;" see Chapter Thirteen in this book for more on the relation of these two systems).

As a final assertion of the importance of the great sympathetic system, Robinson discusses at length and in detail the autonomous nature of this system. He dedicated an entire chapter to this topic (Chapter 15 is entitled, "INDEPENDENCE OF THE SYMPATHETIC NERVE.")

In a sense, Robinson's masterwork of medical writing is a wonderful

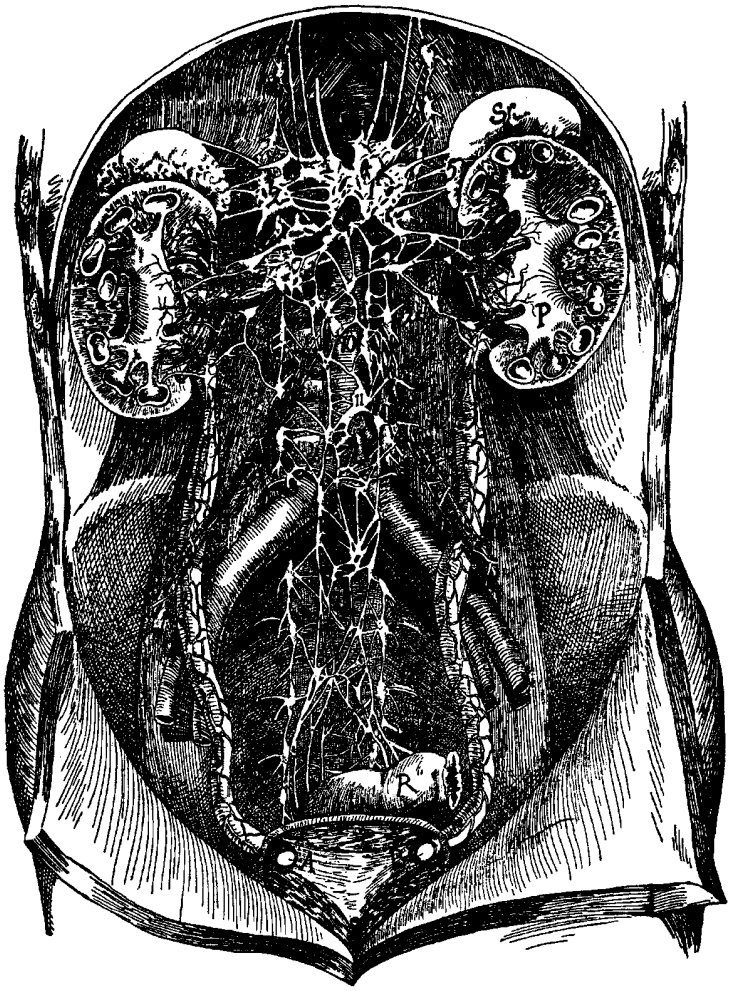
dissertation on the great sympathetic nervous system. As he noted in his preface to the work, "**This book is practically a treatise on the abdominal sympathetic nerves ...**" His contribution is a cornerstone in the effort to interpret and apply the accomplishments of the early osteopaths and the work of Edgar Cayce.

HISTORICAL PERSPECTIVES OF THE SYMPATHETIC NERVOUS SYSTEM

The original investigations of the sympathetic nervous system, in both humans and animals, upon which this work is founded, were begun in 1887, and have been carried on quite steadily since. The works of Fox, Chapin, Gaskell, Eulenberg and Guttmann, Patterson, Robert Lee, Lobstein, SnowBeck, Rauber and Frankenhauser have been carefully studied. A number of physiologies, as well as some fifty anatomies, were searched. One hundred human cadavers have been dissected with reference to the sympathetic system and also among the lower animals, those of the rodents and solipeds - cow, calf, pig, dog, fish, bird, frog, rabbit, rat and sheep. The dissections have comprised in addition a considerable number of embryos, human and animal. The results of this work demonstrate that the ganglia of the sympathetic nerve are much larger in the lower animals than in man. That is, as the scale of animal life ascends, the sympathetic system proportionately decreases, while the cerebro-spinal system proportionately enlarges. In short the higher the life the more dominant the cerebro-spinal system, and the lower the life the more dominant the sympathetic system. (Robinson, 1907, p. 159)

ANATOMY AND PHYSIOLOGY OF THE SYMPATHETIC SYSTEM

Here will be presented a few remarks on the anatomy, physiology, and pathology of the sympathetic nerve, showing the principal points in gynecology relative to the abdominal and pelvic brain. They are the result of my investigations of the sympathetic nerve, which I have dissected during the last



AN ILLUSTRATION OF THE ABDOMINAL SYMPATHETIC NERVE OF THE MALE

Fig. 2. It is accompanied by ureteral dilatation.

Drawn from a specimen under alcohol which I secured at an autopsy through the courtesy of Dr. W. A. Evans and Dr. C. O' Byrne. 1 and 2, abdominal brain; 10 and 12 represent the spermatic ganglia emitting their plexuses along the spermatic artery; H represents the coalesced hypogastric ganglia. 11, inferior mesenteric ganglia. Note the network of nerves ensheathing the ureters and also the anastomosis of the plexus spermaticus with the plexus ureteris, hence, the testicular pain is explained in ureteral calculus. Observe the numerous and marked dimensions of the ganglia renalia.

ten years. The claim is that the ganglia of the sympathetic nerve are little brains; i. e., they receive sensation, emit motion, and control secretion. They are trophic centers, and possess vaso-motor power. They are centers for reflex action, and are endowed with a peculiar quality called rhythm.

The great reorganizing centers in the sympathetic nerves are the abdominal and pelvic brain and the three cervical ganglia. Reorganizing power of a less degree exists in the lateral chain of ganglia situated at the circumference of the elliptical-shaped sympathetic, and in the collateral ganglia in the chest, abdomen and pelvis, and also in the ganglia situated in every viscus which I have designated automatic visceral ganglia.

The sympathetic nerve consists of two lateral chains of ganglia, extending from the base of the skull to the coccyx. Situated anterior to these chains are collateral plexuses known as the cardiac, abdominal and pelvic. Besides these there exist in all the viscera small ganglia, automatic visceral ganglia - for example, the automatic hepatic, cardiac, menstrual ganglia.

The distribution of the sympathetic nerve is (a) to vessels, (b) to glands, and (c) to viscera. It is connected with the cerebro-spinal nerves by the rami communicantes. Its independence of the cerebro-spinal axis is not yet fully settled; but children have been born at term with no cerebro-spinal axis. The part of the sympathetic that appears to be most independent of the cerebro-spinal axis is the cardiac, abdominal and pelvic plexuses (brains). I have kept the intestines of dogs in active peristaltic waves for nearly two hours after death, in a warm room, by tapping them with the scalpel.

The automatic parts of the sympathetic to which I wish to direct attention are, the cervical sympathetic ganglia (superior, middle, and inferior), the abdominal brain (the solar plexus), and the pelvic brain (or cervico-uterine plexus). Due consideration must be given to the three splanchnic groups: (1) the cervical splanchnics, conducted to the stomach, heart, and lungs through the spinal accessory and the vagus; (2) the abdominal splanchnics, originating from the fourth dorsal, running to the second lumbar, and thence to the abdominal brain; (3) the pelvic splanchnics, conducted to the hypogastric plexus by means of the second, third and fourth sacral nerves, to supply the rectum and the

genito-urinary organs.

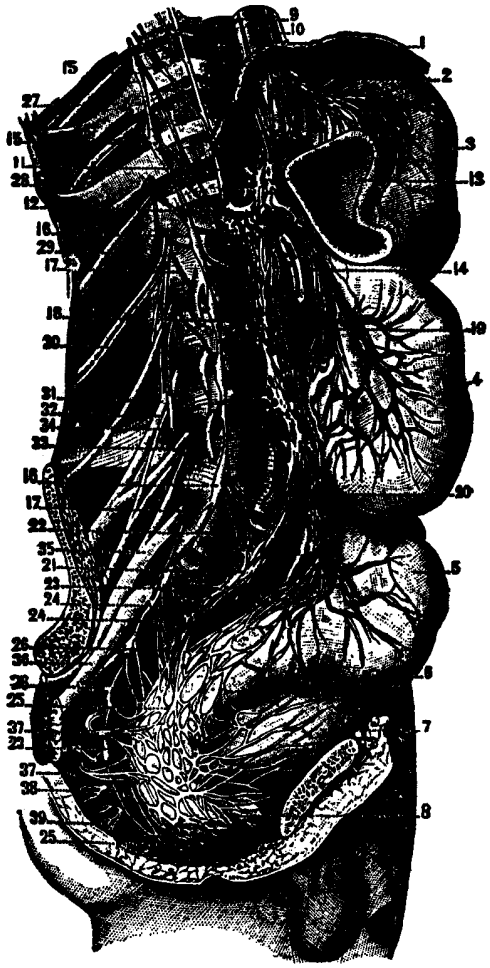
I have observed for some time that the connection of genital and urinary systems with all the great nerve centers is intimate and profound. For example, the organ which has the most intimate connection with the cerebrospinal axis and the abdominal and pelvic brain is the uterus. The eye, too, is closely connected with both nervous systems, and also with the uterus. This intimate nervous connection of the uterus with the nervous system increases with the ascending scale of animal life.

The physiological function of the sympathetic nerve is rhythm. The sympathetic nerve alone possesses this function. The power to produce rhythm belongs only to a ganglion. The viscera functionate rhythmically. The destruction of this periodical function causes disease. The organs which have the most pronounced rhythm are those intimately connected with the abdominal brain. Chief among these is the uterus and oviducts. So far as I can observe, the uterus is connected with the abdominal brain by twenty or thirty strong nerve strands. (Robinson, 1907, pp. 289 - 290)

THE SIGNIFICANCE OF THE SYMPATHETIC SYSTEM

The significance of the abdominal brain and sympathetic system must not be forgotten, as children are born without a brain, and some reports note the absence of the medulla also. In such children the heart and viscera have been kept going by the sympathetic system. Dr. W. F. Ball, of Mantua Station, Ohio, reported such a case to me. The sympathetic nerve is characterized by accumulations of cells at certain points, these being known as ganglia. In the abdomen and chest the ganglia have a regularity of location corresponding to definite segments of the body. There is a long chain of such ganglia situated on each side of the vertebral column, known as the lateral chain of sympathetic ganglia, and extending from the first cervical to the last sacral vertebra. Two fine, small cords connect the spinal cord with each of the ganglia of the lateral chain, making a close and intimate relation of the spinal cord and lateral chain. The spinal cord is doubly connected with the lateral chain. The medullated

branch passes from the anterior root to the ganglia. The non-medullated root passes to the blood-vessels of the cord. The lateral chain is well protected by adjacent bony structures from any injury or pressure by viscera. Ventral to the lateral chain there are located three nerve plexuses: one in the chest, the cardiac; one in the abdomen, the abdominal brain; and one in the pelvis, the utero-cervical, or as I prefer to call it, the pelvic brain. The thoracic and abdominal plexuses are single, located in the ventral line of the body and possessed of a large amount of nervous ganglia and cells, especially the abdominal brain. The pelvic plexus is double, situated on each side of the cervico-uterine junction, and is quite a massive collection of ganglia and nerve cells. All three central plexuses, the thoracic, abdominal and pelvic, are bound by intimate and very close relations with the lateral chain of sympathetic ganglia. Every viscus is profusely supplied with the sympathetic strands, and the vast number of cords and ganglia, like the equalizers on a horse power, hold in intimate relation all the viscera in a delicate balance. Specialists are beginning to recognize the wonderful sympathetic balance of all the viscera, for when one gets out of order it untunes the chorus of the whole. In fact, if a viscus in an adult is disturbed, it is generally the genitals, and if soon unbalances the remainder. It is easy to note the large cords, the ganglia and the invertebral plexuses of the sympathetic system, to note their distribution and the relations of the ganglia to the viscera in spare subjects hardened by alcohol. It is not difficult to see, even in rough, incomplete experiments, that there is a certain independence of the ganglia distributed to the viscera. Though the latter are seen to be in close relationship with the great structure of the sympathetic, yet they show definite, independent action. An hour after death one can induce the viscera in a dog to act by slight irritation or stimulation. Perhaps little remains to be discovered concerning the arrangement of the, automatic ganglia in the viscera, or the structural arrangement of the cerebro-spinal and sympathetic systems. But much remains to be discovered in regard to the functional relations of the cerebrospinal and sympathetic systems. Each system may contain structures of the other, or not. As a birdseye view of the sympathetic



LUMBAR AND SACRAL PORTIONS OF THE SYMPATHETIC

Fig. 5. 1, incised edge of diaphragm; 2, lower end of esophagus; 3, left half of stomach; 4, small intestine; 5, sigmoid flexure of the colon; 6, rectum; 7, bladder; 8, prostate; 9, lower end of left vagus; 10, lower end of right vagus; 11, solar plexus; 12, lower end of great splanchnic nerve; 13, lower end of lesser splanchnic nerve; 14, 14, two last thoracic ganglia; 15, the four lumbar vertebrae ; 16, 16, 17, 17, branches from the lumbar ganglia; 18, superior mesenteric plexus; 19; 21, 22, 23, aortic lumbar plexus; 20, inferior mesenteric plexus; 24, 24, sacral portion of the sympathetic; 25, 25, 26, 26, 27, 27, hypogastric plexus ; 28, 29, 30, tenth, eleventh and twelfth dorsal nerves; 31, 32, 33, 34, 35, 36, 37, 38, 39, lumbar and sacral nerves. (Sappey, 1810.)

nervous system we may produce the following:

1. A series of distinct ganglia connected by nerve cords, extending from the base of the skull to the coccyx.

2. Automatic visceral ganglia.

3. A series of three centrally located prevertebral plexuses. situated in the thorax, abdomen and pelvis.

4. A series of communicating and distributing nerve fibers.

The above propositions may be reduced to three elements, viz., nerve fibers and nerve cells, or ganglia and periphery.

The caudal end of the sympathetic ends in a nerve mass known as the ganglion impar, and the head (frontal) end ceases in the ganglion of Prof. Francois Ribes of Montpelier, France (1800-1864). I must confess that my searches for Ribes' ganglion have not been fully successful.

We find the sympathetic nervous system very widely distributed and it must not be considered improbable to find sympathetic centers in the cerebrospinal axis. The seat of a ganglion may be anywhere and yet not partake of the adjacent surroundings, i. e., sympathetic ganglia may be situated in the cerebrospinal axis, yet not be an integral part of it, particularly as regards function. Thus we may consider the vaso-motor center, the cardiac, and other centers, located in the medulla and cord, not to be a part of them. This view must hold as a fact, for blood-vessels which necessarily supply all parts of the body, brain or spinal cord, must be supplied with sympathetic nerves to regulate their caliber, but neither the nerves nor the blood-vessels are of the cord or medulla. The sweat, heat (flashes) and vaso-motor (flushes) centers are located in the medulla and segments of the cord. Pathologic states, as at the menopause, make all these centers painfully manifest. Doubtless the genital center lies in the lumbar portion of the cord, though automatic visceral ganglia exist in the genital organs, such as I have formerly designated "automatic menstrual ganglia." Such ganglia require a month to accomplish a rhythmical cycle; they explode monthly. In the spinal cord there exists a linear row of cells known as the columns of the late English investigator, Dr. Clark. Some think that Clark's columns exercise the function of vaso-motor action, i. e., control the caliber of

blood-vessels. But as Dr. Fox states, this column of Clark's does not exist throughout the whole length of the cord. Should further investigations demonstrate that Clark's columns have a vaso-motor function it would go a long way in proving considerable independence of the sympathetic nervous system.

This independence, however, does not entirely depend on the supposed vaso-motor column of Clark. Definite, though limited independence can be observed in portions of the sympathetic nerve by any one who will carefully perform experiments on the lower animals. We of course do not overlook the idea that the sympathetic system and cerebrospinal system are so intimately co-related that one so blends with the other that all action seems lost in the cerebrospinal mass.

When the spinal cord and brain have lost control of the intestines they assume a wild and disordered action, as may be seen in a person dying of brain disease. In cases in which at the autopsy we could discover no brain disease I have found from one to four invaginations after death. In such cases, doubtless, after the cessation of the function of the cerebrospinal masses, the sympathetic fell into a wild, confused and disordered action. The muscular wall of the intestine assumed an irregular action producing invagination. This latter is due to irregular action of the muscles in the intestinal wall.

In a certain sense we may look at the nervous system as composed of two parts, viz.: a cerebrospinal part and a sympathetic part, connected by a number of single, fine, short, non-medullated strands. These strands really connect the ganglia of the sympathetic with the brain and cord. With such a constructed apparatus before us it might be stated that the sympathetic system simply consists of branches of the cerebrospinal system. It may be represented as a branched roadway which distributes forces from the spinal cord to the viscera. It may be considered as overflow paths to carry nervous energy to the periphery. The ganglia of the sympathetic system are entirely outside of man's will-power. He cannot control them to hasten visceral action or retard it. It is plainly of utility to man to place beyond his willpower the action of viscera, as he would doubtless abuse it from selfish and other purposes.

But we must claim that the sympathetic nervous system is more than a

mere branched roadway for the mere distribution of nervous energy from the cerebrospinal axis. If nervous energy was merely to flow to the viscera from the cerebrospinal axis, why all this complicated, brain-like apparatus in the various sympathetic ganglia? No, the ganglia of the sympathetic are centers of nervous energy, accumulations of brain cells, of reflex centers, organized receivers of sensation and transmitters of motion. Is the cerebrospinal system closely related to the sympathetic system by mere relations of structure, because the sympathetic ganglia and cells are imbedded in the great centers, or is it because the cerebrospinal system has intrinsic and final control of the sympathetic?

In the dorsal region we find the typical spinal nerve of the morphologist with its three chief divisions, viz.; (a) dorsal; (b) ventral and (c) visceral branch. The visceral and vaso-motor branch is contained in the ramus communicans, which passes from the spinal cord to the lateral chain of the sympathetic or lateral ganglia, the demedullating centers. From this lateral chain of ganglia nerves pass onward to a second chain of ganglia, known as the prevertebral or collateral ganglia, i. e., the cardiac, abdominal brain, inferior mesenteric and pelvic brain. Milne Edwards called the nerves which pass from the lateral sympathetic chain to the collateral (prevertebral) chain, rami efferentes. Again, from the prevertebral (collateral) ganglia or plexus, nerve fibers pass into smaller terminal ganglia in the abdominal organs, or to what we designate the automatic visceral ganglia. We also have, besides the three distinct sets of sympathetic ganglia, connected with the ramus communicans, the posterior ganglia at the roots of the nerves as they issue from the spinal canal. The ramus communicans is then connected with four distinct ganglia:

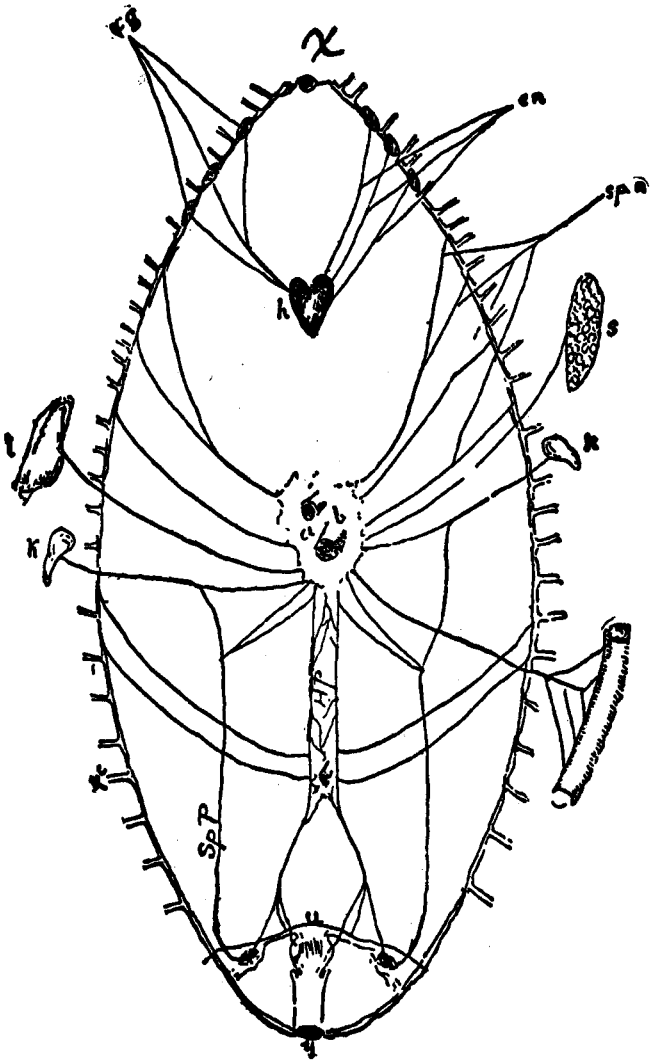
1. The root ganglia (proximal ganglia), i. e., the ganglia situated on the posterior spinal nerves immediately after issuing from the cord.

2. The lateral chain of sympathetic (proximal sympathetic ganglia).

3. The prevertebral ganglia (distal sympathetic ganglia).

4. The automatic visceral ganglia, or terminal ganglia (distal sympathetic ganglia).

Leaving out the first of the ganglia, we note that the ramus communicans connects the spinal cords with three great systems of sympathetic ganglia, viz.:



SCHEMATIC DRAWING OF THE SYMPATHETIC NERVE

Fig. 57. X, ganglion of Ribes; y, coccygeal ganglion; h, heart; k, kidney; s, spleen; a b, abdominal brain; s p, spermatic (ovarian plexus) ; I, intestine; h p, hypogastric plexus; c g, the three cervical nerves.

The sides of the ellipse represent the lateral chain of the sympathetic. All the nerve strands report to the abdominal brain.

(a) the lateral chain (b) the prevertebral chain and (c) the automatic visceral ganglia, making a complicated and vast system distributed over a wide area. In regard to the relation of this vast sympathetic system to the cerebrospinal axis in general, three views have been held:

1. The first and perhaps the oldest view is that the sympathetic nervous system possesses a very great independence of action. The supporters of this view make the sympathetic system the exclusive center of motion and sensation of the thoracic and abdominal viscera. The chief establishers of this view are Volkmann (1842) and Bidder (1844). Their able defense of the independence of the sympathetic nervous system is still entertained and published in the best anatomies. Bichat (1800) advocates the independence of the sympathetic ganglia, as one of the first and ablest supporters. In fact Bichat was one of the first to definitely conceive this notion. Before me lies a rare old book which I secured from an old English collection. It is written by James Davey, 1858, on "The Ganglionic Nervous System." Davey gives Bichat credit for knowledge of the sympathetic ganglion. Davey began to advocate the primary and essential independent function of the sympathetic in 1835, as is recorded in the "Lancet." Fletcher wrote (1837) on the independent action of the sympathetic.

2. The second view held was chiefly established by Valentine (1839). This view makes the sympathetic system an offshoot or dependent of the cerebrospinal system. It would contain no fibers except those in the brain and spinal cord.

3. A third view considers the sympathetic to be composed of fibers from the brain and cord, and also of other fibers which arise in the various ganglia. According to this view every sympathetic nerve trunk contains both cerebrospinal and sympathetic fibers. This view should consider all nerves sympathetic which arise in the ganglia and preside over the functions of the organs.

The question might be asked, what are the functions of the sympathetic ganglia? It should be remembered that many different opinions mean unsettled views.

1. We may state that the ganglia demedullate nerves.

2. More nerves pass out of a sympathetic ganglia than enter it; hence the ganglion is likely the originator of nervous fibers.

3. The ganglia possess nutritive powers over the nerves passing from them to the periphery.

4. They are centers of reflex action, i. e., receivers of sensation and transmitters of motion.

We are therefore to consider as the subject of our theme:

1. The rami communicantes.

2. The lateral chain of sympathetic ganglia.

3. The prevertebral plexuses and

4. The automatic visceral ganglia.

There are some differences between the sympathetic system and cerebrospinal axis which may be noted and discussed later.

1. We may claim that the sympathetic nerves are the visceral branches of the spinal nerves and hence have a distinct function, if not structure.

2. The individual fibers of the sympathetic nerves are of smaller caliber than those of the cerebrospinal or somatic nerves.

3. The sympathetic branches preponderate in non-medullated nerves.

4. The fibers of the sympathetic nerves are interrupted by nerve cells or ganglia through which they pass.

5. Nerve cells are liable to accumulate into ganglia along a non-medullated nerve.

6. The sympathetic nerves tend to form closely meshed networks or plexuses, as Auerbach's and Billroth-Meissner's plexuses.

7. The somatic (cerebrospinal) nerves supply the body wall. The sympathetic nerves supply the viscera. In the visceral nerves must be included vascular nerves.

We might call the various systems of ganglia of the sympathetic by numbers. For example, the lateral chain of sympathetic ganglia may be called primary ganglia. In the primary ganglia the chief nerves of the rami communicantes pass.

Again, we might call the prevertebral plexuses, the secondary ganglia.

Many nerves from the rami communicantes enter the secondary ganglia without entering the primary ganglia.

Finally the automatic visceral ganglia might be called tertiary ganglia. In short we could conveniently speak of the primary, secondary and tertiary system of sympathetic ganglia. (Robinson, pp. 195 - 202)

THE INDEPENDENCE OF THE SYMPATHETIC SYSTEM

It may aid in comprehending the structure and function of the sympathetic nerve, and in concluding the discussion in regard to its independence, to arrange in short, concise propositions a number of observations which will show that the sympathetic nerve has a large degree of independence.

1. The independence of the sympathetic system is impressively shown in the distinct rhythmical action of the heart for some time after being removed from the body. This can be best demonstrated in the frog and turtle.

2. The peristaltic and vermicular motions of the intestines after death significantly point to the independence of the sympathetic nervous system. The intestines of a dog will continue in peristalsis for two hours after death if the room temperature be 100 degrees Fahrenheit.

3. The fetus has been born at or about term without a trace of brain or cord. This shows that nutrition, growth, secretion, absorption and circulation were conducted alone by the sympathetic - one of the strongest demonstrations of its independence.

4. Experiment has shown that nutrition (which means life's function) may be carried on after complete destruction of the cerebrospinal centers.

5. Nourishment without the cerebrospinal center would indicate that the arteries (blood-vessels) are under the control of the sympathetic system. Goltz goes so far as to say that the tone of the arteries is maintained by local centers situated in their own immediate vicinity.

6. The manifestations of blushing, local congestions and eruptions would tend to show that the blood acts reflexly on the vessels, affecting the

SYMPATHETIC NERVE IN LUMBAR REGION

Fig. 61. 114, ganglia at origin of inferior mesenteric artery; 115, interiliac nerve disc; 112, lateral sympathetic chain; 156, rectum; 181, common iliacs.

vaso-dilators or the vaso-constrictors. The white line (followed rapidly by a red one) on stroking the skin with the finger, as in scarlet fever, indicates that the vessels possess local nerve centers of control. The trauma produced on the vascular centers by stroking the skin first irritates the vaso-constrictors, and paleness results from constriction of the vessels. The secondary result of the trauma on the vaso-constrictor is that they are paralyzed, and then the vaso-dilators dominate with a resulting red line.

Bernard, in 1851, was the first to show conclusively that the sympathetics controlled the caliber of the blood-vessels. Any one who has long practiced medicine, observing the heart and the aorta, will be able to note that the heart itself, and the aorta, have seasons of dilatation and contraction. For example, in many spare, neurotic women it is common to note that the aorta has periodic times of powerful rhythms or beatings. With the hand on the abdomen the inexperienced announces a growing aneurism of the abdominal aorta. The aorta beats with such tremendous force that the patient will call the physician's attention to the phenomenon. A few hours subsequently its rhythm will be quieted and in a normal state. This phenomenon of the excessive abdominal aortic rhythm, or beat, is perhaps due to the excitation of the local nerve centers which control its caliber; for I could scarcely detect the excessive arterial beat in another portion of the body, as the wrist. At such times the heart acts slightly differently from normal. It is a little more noisy and appears as if it were dilated more than usual. Another phenomenon in regard to nerve centers which control vascular tone (contraction and dilatation) may be observed in the heart. By careful watching of the heart of an individual, one may note that the heart changes at times in, both its method of beat and its size. Occasionally the heart will dilate, beat with more noise, continue so for some hours, and then subside to its natural state. This phenomenon, as well as that of aortic dilatation and contraction, is doubtless due to the controlling sympathetic nerve centers localized in the substance or immediate vicinity of the heart and aorta. The heart, like a blood-vessel under the controlling vascular nerve centers of the sympathetic, dilates and contracts and varies its rhythm still more within wide ranges. I have never seen this periodic dilatation noted in any book. Practically

nothing is to be found in books concerning this peculiar periodic dilatation and vigorous beating of the abdominal aorta.

7. The abdominal brain (the solar plexus, the semilunar ganglion) may be viewed as a gigantic vaso-motor center for the abdominal viscera. The dilatation and contraction of the heart and aorta, with the periodic varying of the vigor of their rhythm (without recognizable disease), may be referred to this king of vaso-motor centers - the abdominal brain. In the progress of life's vascular phenomena the abdominal brain, as a vaso-motor center, exercises very dominant and quite independent prerogatives.

8. The dependence and independence of the cerebrospinal and sympathetic system of nerves may be compared to the state and federal government, or the municipal and state government. The former run in harmony, when friction does not arise. Yet the state lives quite a distinct individual life, quite independent from the federal government. The life of each is dependent, however, on the other. The internal life of each (as of the sympathetic nerve) maintains itself.

9. The sympathetic system alone would maintain life (sensation, peristalsis, absorption, secretion), especially in each viscus, but the cerebrospinal system coordinates the various viscera as a whole into a definite purpose or plan. The cerebrospinal system is an executive to suggest or organize the efforts of each system, ruled by the sympathetic, to combine for a common object - the continuation of an organized subject. The efforts of the circulatory system would be useless were they not combined with all the efforts of the digestive system, as well as those of the genito-urinary system. The cerebrospinal system simply coordinates the various independent systems (circulatory, digestive and genito-urinary) into a unit of life.

10. The phenomena of vaso-neurosis of the extremities would indicate a great degree of independence of the sympathetic nerve.

11. The ordered richness of the sympathetic nerves in ganglion cells, similar to the cerebrospinal ganglia, would tend to demonstrate its dependence.

12. The accumulation or aggregation of ganglion cells in the sympathetic should be sufficient argument for considering them as small brains, nerve

centers of life's action.

13. The independence of the sympathetic nerve may be observed in the fact that as it departs more widely from the cerebrospinal it increases in elements. Increased distribution shows increased aggregation of ganglion cells, e. g., the Meissner-Billroth and Auerbach's plexuses in the small intestines.

14. There is a partial necessity that the sympathetic be relatively independent, at least be out of the control of the cerebral center. The viscera being necessitated to be in constant activity, constant rhythm, should be beyond the control of the will, so that man cannot speculate on his viscera. The intellect cannot disturb the function of the viscera. The actions of the sympathetic ganglion are beyond the power of the will.

15. A stubborn opponent of the independence of the sympathetic nerve (Hermann) freely acknowledged that automatic and reflex coordinate movements and secretions can be the indication of the sympathetic ganglion cells quite independent of the cerebrospinal symptoms.

16. A significant partial independence of the sympathetic may be observed in peritonitis. The reflex irritation induced by the peritonitis causes extreme vaso-motor contraction in the skin. The skin becomes waxy pale, the blood is forced out of the skin by contraction of the vessels and the patient dies gradually from circumference to center. The heart at first attempts to work more vigorously to send the blood to the skin vessels, but the harder the heart works in sending the waste-laden irritating blood to the vessels, the more they contract, and gradually death approaches the heart. The independence of the grip of the sympathetic nerve is seen in the gradual death of the patient, beginning in the skin capillaries and ending at the heart. It is a good illustration of the fact that irritation of the sympathetic nerves may be sufficient to force all blood out of a part even to its death.

17. Vulpian severed the sciatic and brachial plexuses and waited until the pulp of the animal's corresponding paws became pale. Now, by irritating the pulp of the paws a local congestion could be produced. Hence reflex irritation of vaso-motor nerves can be limited to the particular organ or tissue supplied, showing a considerable degree of independence.

18. It has been suggested by Fox that myxedema is associated with the independence of the sympathetic.

19. Compression or macroscopial injuries of the cervical portion of the sympathetic produces such a marked physiologic phenomenon that it demonstrates in itself a considerable degree of independence of the sympathetic. The manifestation of compression or injury of the cervical sympathetic is that of the irritation or paralysis. Trauma of the cervical sympathetic shows marked independent functional disturbances. Exophthalmic goiter is considered, even by the skeptical Eulenberg and Guttmann, as a paralysis of the cervical sympathetic. If the latter can produce such vast changes, and such a dreadful disease, how great must be the influence of the abdominal brain in its independence. In exophthalmic goiter the independence of the sympathetic seems dominant, for of the great triumvirate in that disease - cardiac palpitation, protrusion of the eyeball and enlargement of the thyroid gland - the cardiac palpitation seldom fails. Few experimenters or observers fail to connect the cardiac disturbance with the cervical sympathetic, showing how dominating it is in this case.

20. The gastrointestinal secretions appear to be carried on automatically by the Meissner-Billroth (aided by the Auerbach) plexuses of nerves, which are sympathetic ganglia - automatic visceral ganglia. The automatic visceral, hepatic, renal, gastrointestinal and menstrual ganglia, all show a marked degree of independence. They produce rhythm in the viscera - activity and repose.

Undisturbed, they rule secretion harmoniously, but disturbed anatomic visceral ganglia induce (a) excessive secretion, (b) deficient secretion and (c) disproportionate secretion. The last is the most detrimental, for it creates fermentation and unbalances nutrition.

21. The independence of the automatic visceral ganglia of the sympathetic may be noted in the idea that if one viscus becomes diseased it may disturb all the others by reflex action.

22. If one viscus becomes diseased the next to become diseased is the one connected with the diseased viscus by the greatest number of nerve strands. If the uterus becomes diseased the next viscus in order is generally the stomach.

However, this is probably due to the fact that the disturbed stomach functions are easily observed.

23. The abdominal brain is a center of organization for impressions received from distal viscera. It is a gigantic vaso-motor center for the abdominal vascular system. The abdominal brain demonstrates its independence by its definite method of reorganizing reflex actions. When an abdominal viscus is mildly ill, the abdominal brain reorganizes the reflex impressions and transmits them mildly to adjacent viscera. But if a viscus is severely and especially chronically ill, the abdominal brain reorganizes the reflexes and transmits them violently to the adjacent viscera, according to the degree of illness. Also the reflexes reorganized in the abdominal brain are transmitted outward to the viscera with greatest force on the lines of least resistance, which means that the nerve forces travel on the plexuses the best where there are the greatest number of nerve strands.

24. The independence of the sympathetic nerve may be observed in the phenomenon of sleep. It never ceases action nor sleeps, while the cerebrospinal is in abeyance for about one-third of our life.

25. E. L. Fox reports two cases of compression myelitis in the cervical portion of the cord unattended by any oculopupillary or vaso-motor paralysis. This would tend to show the independence of the sympathetic, especially the cervical sympathetic.

26. Experimenters report that irritation of some portion of the cervical sympathetic will produce secretions from the parotid and submaxillary glands.

27. Fox asserts that irritation of the peripheral end of the cervical sympathetic will cause protrusion of the eyeball; sedation will cause sinking of the eyeball, and a slight flattening of the cornea. We know that in the lids are sets of smooth, muscular fibers innervated by the sympathetic, and. by contraction of these the lids are opened and so the eyeball is uncovered.

28. In general it may be said that the sympathetic presides over involuntary movements, nutrition and secretion, holds an important influence over temperature and vaso-motor action, and is endowed with a dull sensibility.

29. Experiments show that after destruction of the medulla oblongata

and brain of the frog irritation will cause congestion of the limbs.

30. The occurrence of pigmentation in the skin of the frog, after destruction of the cerebrospinal axis, shows the independence of the sympathetic.

31. Each histologic unit has its own nervous system, which is sufficient for it within certain limits.

It may be said that the object of the lateral chain of the sympathetic is to make known the great ganglionic system to the cerebrospinal system.

32. The ganglia of the uterus (sympathetic) are independent centers for reflex action. That it can act independently may be shown by the repulsion of a child after the death of the mother. It has a powerful reflex action on the heart. It is a great independent sympathetic ganglion. Associated anatomically with the abdominal brain are the following plexuses: (a) the diaphragmatic; (b) the suprarenal; (c) the renal; (d) the spermatic; (e) the superior mesenteric, which intimately connect it with all the abdominal viscera.

33. The expulsion of feces per rectum after death of the patient shows that the sympathetic ganglia of the bowels are independent centers for reflex action.

34. Pigmentation of the skin in the frog, after destruction of the cerebrospinal, demonstrates the independence of the sympathetic.

35. The abdominal brain is a great reflex center. Vaso-motor centers are organizing centers, and preside over the coordination of the visceral rhythm. The abdominal brain is a ganglion of far reaching significance. It has many connections with viscera and possesses vast influence over the circulation. It presides closely over the secretion of the abdominal organs.

36. That the sympathetic is the only nervous system belonging to some of the lower animals is open to doubt; for if that were the case, no argument would be required to demonstrate the independence of the sympathetic. The distinction of the cerebrospinal and sympathetic as to sleep or repose, since it cannot be proven, must be dropped. In any argument we must admit the very intimate and mutual dependence of the sympathetic and cerebrospinal nerves on each other.

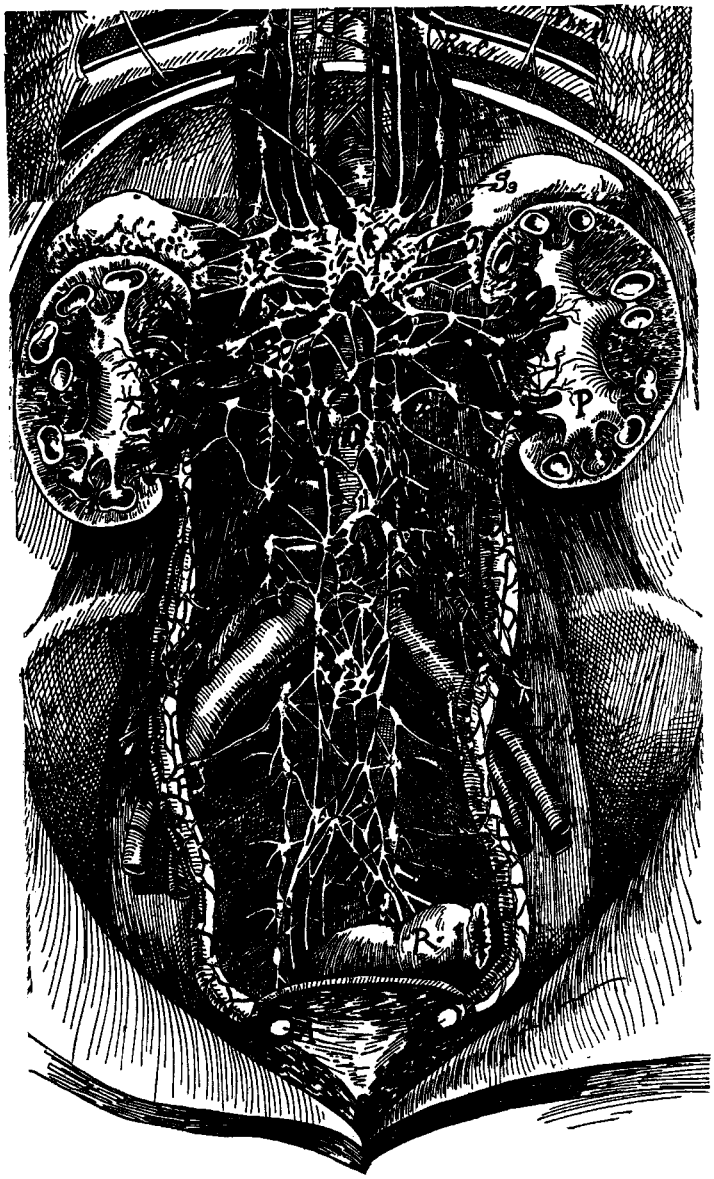
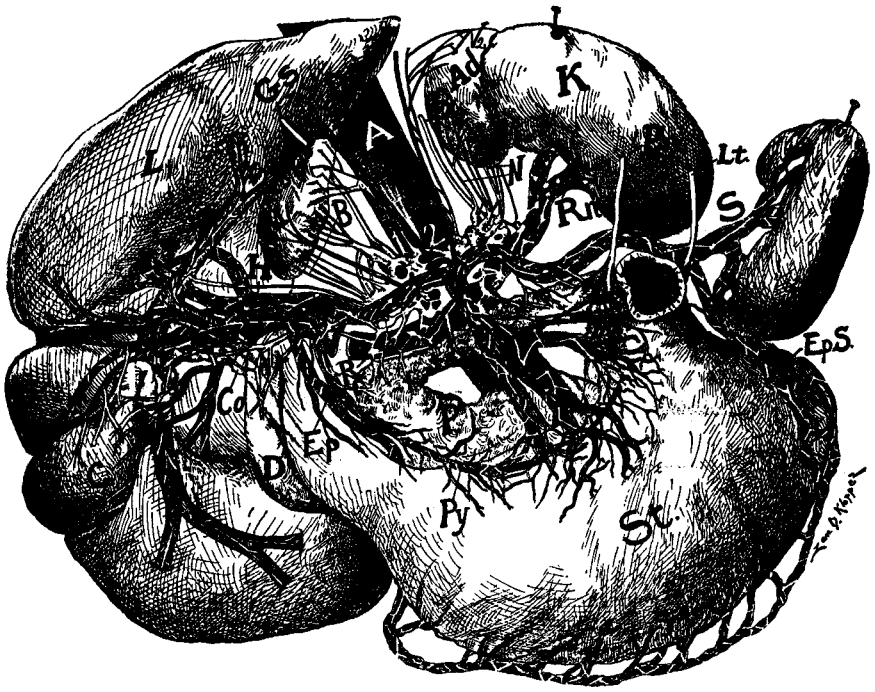


Fig. 130. AN ILLUSTRATION OF THE ABDOMINAL SYMPATHETIC NERVE OF THE MALE, ESPECIALLY PRESENTING THE NERVES OF THE TRACTUS URINARIUS.

37. The essential feature of the pathology of the sympathetic, and also one which tends to show its independence, is that the irritation in one organ may be reflected through a sympathetic ganglion and thus disturb the balance of the viscera. The best, most common and convincing example is irritation of the cervico-uterine ganglia, which is directly reflected to the abdominal brain, where the irritation is reorganized and sent to all the nerve plexuses.

38. The degree of independence of the sympathetic nerve must be worked out on the lines of experiment and observation of the effect of disease on its different parts. To what degree is the abdominal brain a center for the reorganization of forces; how does it modify and transmit receptions? How supreme is it over the visceral ganglia or does it coordinate their action to a definite plan? Does it enhance or prohibit their action? Is the abdominal brain a reflex arc for nerve forces, passing from one organ to another? In other words, will one diseased organ unbalance all other organs by transmitting its irritation by way of the reorganizing abdominal brain? (Robinson, 1907, pp. 187 - 192)



ABDOMINAL BRAIN AND COELIAC PLEXUS

Fig. 13. This figure presents the nerves of the proximal part of the tractus intestinalis that is, the nerve plexuses accompanying the branches of arteria coeliaca. 1 and 2 abdominal brain surrounding the coeliac axis drawn from dissected specimen. H. Hepatic plexus on hepatic artery. S. Splenic plexus on splenic artery. Gt. Gastric plexus on gastric artery. Rn. Renal artery (left). R. Right renal artery in the dissection was rich in ganglia. Dg. diaphragmatic artery with its ganglion. G. S. Great splanchnic nerve. Ad. Adrenal. K. Kidney. Pn. Pneumogastric (Lt. left). Ep. right and Eps. left epiploica artery. St. Stomach Py, Pyloric artery. C. cholecyst. Co. clole-dochus, N, adrenal nerves (right, 10, left 10). The arterial branches and loops of the coeliac tripod (as well as that of the renals) with their corresponding nerve plexuses demonstrate how solidly and compactly the viscera of the proximal abdomen are anastomosed, connected into single delicately poised system with the abdominal brain as a center. Hence local reflexes, as hepatic or renal calculus, disturb the accurate physiologic balance in stomach, kidney, spleen, liver and pancreas.

Chapter Five

THE ENTERIC NERVOUS SYSTEM

Byron Robinson was not alone in his fascination with the nervous system of the abdomen. At about the same time that Robinson was discovering the abdominal brain, British physiologist Johannis Langley of Cambridge University recognized that:

> "... the ganglia of the gut do more than simply relay and distribute information from the cephalic [cerebral] brain. He was unable to reconcile conceptually the great disparity between the 2 X 10 (8) neurons in the gut and the few hundred vagus fibers from the big brain, other than to suggest that the nervous system of the gut was capable of integrative functions independent of the central nervous system. (Wood, 1994, p. 424)

Langley labeled the brain in the gut the *enteric nervous system (ENS).* Although for several decades Robinson and Langley's work has been ignored, modern medical research has finally rediscovered the abdominal brain with its enteric nervous system. In fact, research on the nerve connections in the abdomen is one of the "hot" areas of medical research.

> "To a considerable extent, the new interest in exploring the ENS has come from the realization that both the ENS and the remainder of the autonomic nervous system are richly endowed with neurotransmitters and neuro-modulators. Many substances are found in both the bowel and the brain, a coincidence that strikes most observers as intrinsically interesting, if not immediately explicable." (Gershon, Kirchgessner & Wade, 1994, p. 386)

> "The similarity between the structure of the ENS and that of the brain, combined with the ability of the ENS to mediate relatively simple behaviors, suggests that general principles can be derived from studies of the ENS that will eventually be applicable to the CNS. Given the unique position of the ENS as the only peripheral system capable of autonomous function, it seems more likely that such principles will emerge from investigations of the ENS than from studies of other aggregates of peripheral ganglia. The parallel between the bowel and the brain also suggests that newly discovered principles of central neural function may find applicability in studies of the ENS, in a sort of reverse form of reductionism whereby the brain serves as a model for the gut." (Gershon, Kirchgessner & Wade, 1994, p. 414)

In addition to the biochemical and structural similarities between the cerebral brain and the abdominal brain, contemporary researchers are drawing computer analogies and using information processing models to describe the relationship between the brains of the body.

> "The cephalic [cerebral] brain communicates with the smaller brain in the gut in a manner analogous to that of interactive communication between networked computers. Primary sensory afferents and extensions of intramural neurons in the gut carry information to the central nervous system. Information is transmitted from the brain to the enteric nervous system over sympathetic and parasympathetic pathways. This, however, represents only one kind of input of an integrative network that also contains microcircuitry for processing information from a variety of sensory receptors along the digestive tract, as well as synaptic circuits that generate programmed patterns of neural outflow to the effector systems. Input to enteric ganglion cells is not exclusively from the central nervous system as once thought, and the old habit of referring to the neurons of the enteric nervous system as postganglionic neurons has become outmoded and abandoned.
>
> The current concept of the enteric nervous system is that of a minibrain placed in close proximity to the effector systems it controls. Rather than crowding the hundred million neurons required for control of the gut into the cranial cavity as part of the cephalic brain, and transmitting signals over long-unreliable pathways, natural selection placed the integrative microcircuits at the site of the effectors. The circuits at the effector sites have

> evolved as an organized network of different kinds of neurons interconnected by chemical synapses. (Wood, 1994, p. 424)

Strictly speaking, the recent medical interest in the "brain in the gut" relates to only a part of Byron Robinson's larger vision. The ENS of modern medicine was referred to by Robinson as the *"Tractus Intestinalis."* This was only one aspect (albeit an extremely important one) of the great sympathetic system." In the last selection in this chapter, note the reference to "little brains" in the intestinal tract, a reference to the nerve centers referred to as the "gut brain" in the modern ENS literature.

While appreciating the modern discovery of the "brain in the gut," one can only hope that researchers will re-discover the other portions of the great sympathetic system including the abdominal and pelvic brains.

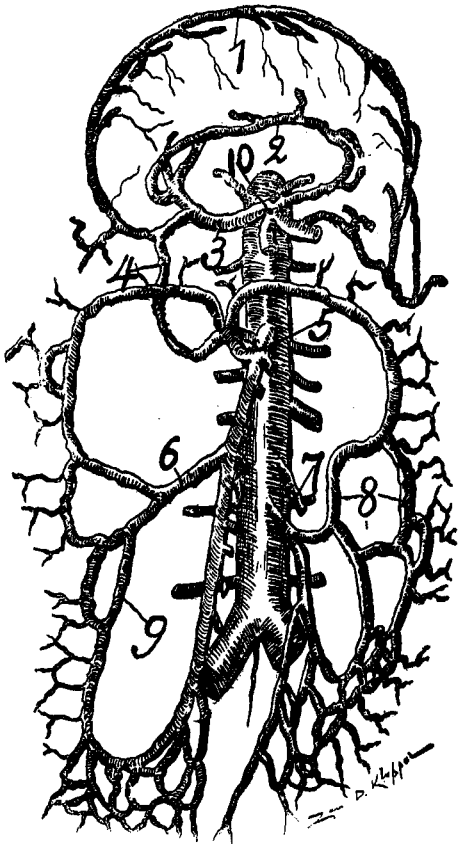
From the perspective of the Edgar Cayce health information, the functions of the ENS fall within that aspect of sympathetic nervous system functioning called the "vegetative or sympathetic nervous system." The ENS, to a large extent, regulates the essential processes of assimilation (via the small intestine) and elimination (via the colon).

ANATOMY AND PHYSIOLOGY OF THE ENTERIC NERVOUS SYSTEM
(Nerves of the Tractus Intestinalis)

The physiology of the nerve plexus supplying the tractus intestinalis is important both theoretic and practical. The sympathetic nerves dominate, rule, the intestinal tract, hence it possesses a rhythm, peristalsis - only sympathetic ganglia possess the power of rhythm. In the physiology of organs the course of nerves must be considered. First, the vagus (as cranial nerve) supplies the proximal end of the tractus intestinalis as well as its appendage; especially the liver with numerous fibres. The vagus aids to check rhythm, especially of the stomach. Second, the spinal nerves at the distal end of the tractus intestinalis particularly the middle and inferior haemorrhoidal nerves supplying the rectum and interfering with its rhythm or peristalsis. The spinal nerve attending the

rectum places it partially under the will in controlling to some extent the evacuation of faeces or gas. Third, there is the great splanchnic nerves, chief delegates in the function, rhythm or peristalsis of the tractus intestinalis (median) especially in the enteron or business segment. The splanchnic nerves though preponderatingly sympathetic possess a rich source in the spinal cord. Therefore though the tractus intestinalis is preponderatingly supplied with sympathetic nerves (hence rhythmic) it is supplied at its proximal end by cranial nerves (vagi) and at its distal end by spinal nerves (haemorrhoidal). The general function of the tractus intestinalis under the sympathetic nerve is: (a) peristalsis (rhythm); (b) absorption; (c) secretion. Its object is digestion. The business of a physician is chiefly to aid in maintaining normal functions, I. e., peristalsis, absorption and secretion in the intestinal tract. In the general application of the physiology of the nerves of the tractus intestinalis for practical - purposes there should be considered: (a) those of the proximal end, stomach and appendages; (b) the nerves supplying the medial region (enteron) and (c) the nerves supplying the distal end (colon). The great sympathetic nerve plexuses accompany the arteries. (Robinson, 1907, pp. 71 - 72)

It will be observed that the sympathetic system of the entire tractus intestinalis, consisting of six great plexuses (nerve cords and ganglia), viz.: (a) gastric; (b) hepatic; (c) splenic; (d) superior mesenteric; (e) inferior mesenteric; (f) haemorrhoidal, is not only profoundly connected with the coeliac plexus or abdominal brain, but ... are all solidly and compactly anastomosed, bound together and also anastomosed (connected) with all other plexuses of the abdominal visceral tracts, in order that the chief potentate - the abdominal brain - may rule as a single unit of power. No conflict of power arises, as all ganglia, of the tractus intestinalis are subordinate to the abdominal brain - however, local rulers, as the ganglion mesentericum inferior, are allowed to rule, to dominate, with a daily rhythm, the faecal reservoir (left colon, sigmoid and rectum). The nerve plexuses of the various abdominal visceral tracts are anastomosed, connected, solidly and compactly, in order to maintain a balanced



THE SOLID AND COMPACTLY ANASTOMOSING ARTERIES OF THE TRACTUS INTESTINALIS

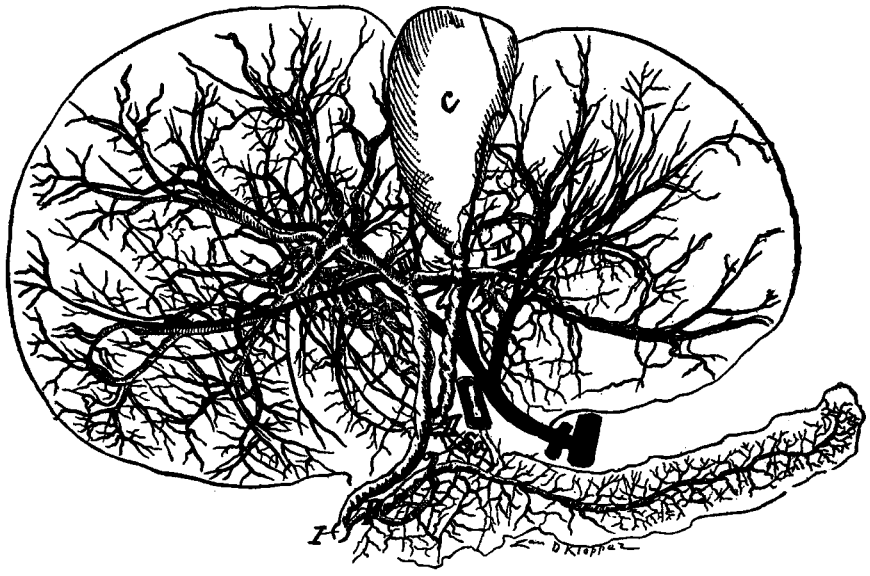
Fig. 14. This illustration demonstrates that the arteries of the tractus intestinalis are solidly and compactly anastomosed by vascular circles, arcs and arcades. To recall the plexus vasomotorius abdominalis one need to remember the arteriae abdominalis only. The circles, arcs and arcades of the abdominal arteries are richly ensheathed with a nodular plexus of nerves. 10 arteria coeliaca emitting the arterial tripod (tripus Halleri), hepatic, splenic and gastric, presenting circles, arcs and arcades. 5 arteria mesenterica superior with its circles, arcs and arcades. 7, arteria mesenterica inferior with its circles, arcs and arcades. 2-10, gastro-hepatic vascular circle (of author) anastomosed to the circles, arcs and arcades of the superior mesenteric arteries with their circles, arcs and arcades by means of the arteria pancreati co-duodenalis superior (a branch of the hepatic) and arteria duodenalis inferior (a branch of the superior mesenteric artery).

system and for local and general physiologic reports to the abdominal brain. (Robinson, 1907, p. 75)

Gastrointestinal secretion is a significant and important matter in animal life. Gastrointestinal secretions are under the control of the sympathetic ganglia located in the walls of the digestive tract. We designate those ganglia in general as the Billroth-Meissner plexuses (plexus myentericus internus) situated immediately beneath the gastrointestinal mucosa. They rule secretion. We cannot properly separate the submucous nerve plexus from the Auerbach's plexus (plexus myentericus externus) which rules muscular motion and is situated between the circular and longitudinal muscles of the gastrointestinal tract. One nerve plexus is a complement of the other. As secretion without motion is of little avail, and motion without secretion is equally futile, peristaltic motion is necessary to sweep onward the food to be attacked by fresh glandular secretion and to eliminate and drain the system from the debris of food. The remnants of the gastrointestinal feast must be removed by peristaltic movements. (Robinson, 1907, pp. 329)

The peripheral apparatus of the sympathetic nerve is very prominent in the digestive tract. The digestive tract consists of a muscular and a glandular apparatus. The muscular apparatus of the digestive tract consists of a longitudinal and a circular layer, and between these two muscular layers lies a system of nervous ganglia known as Auerbach's plexus. Auerbach's plexus is the peripheral apparatus that induces muscular movements in the gastro-intestinal passage. These little brains lying between the muscular layers are the cause of intestinal peristalsis or vermicular movements of the bowels. Undue stimulation of Auerbach's plexus causes colic, and insufficient stimulation is followed by constipation - a muscular paresis. An insufficient activity in Auerbach's plexus induces a kind of ileus paralyticus.

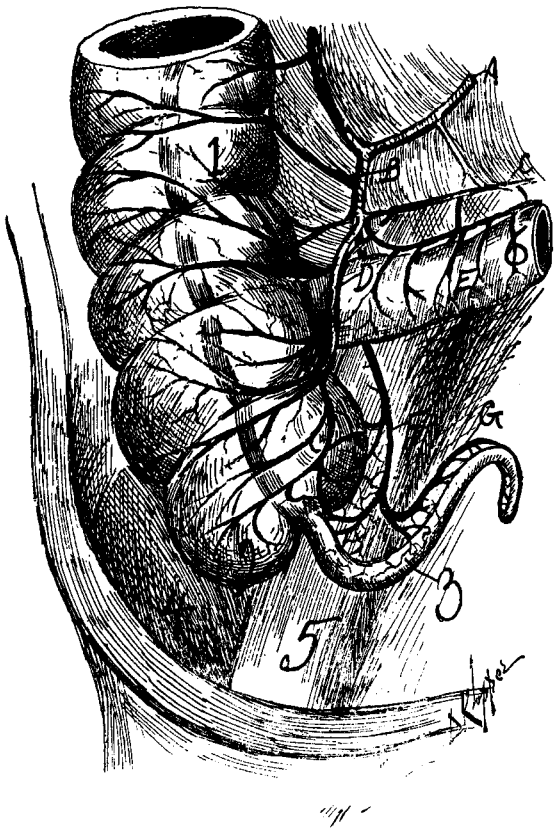
Just under the mucous membrane of the digestive tract there lies a still more delicate system of nerve ganglia called Meissner's plexus. Dr. D. D. Bishop, late histologist to Rush Medical College, has prepared for me very



NERVES OF THE HEPATIC ARTERY AND BILIARY DUCT

Fig. 15. Presents the copy of an X-ray of the hepatic artery, binary and pancreatic ducts which are each richly ensheathed by a nodular, plexiform web of nerves. The quantity of nerves may be estimated by the number of arteries and ducts in the liver and pancreas. I, Vater's papilla at duodenal end of ductus choledochus communis. II, junction of ductus hepaticus (III) and ductus cysticus (IV). C, cholcyst, P, ductus pancreaticus, Sa, ductus pancreaticus accessorius. The black conduit coursing parallel to the binary ducts is the hepatic artery.

beautiful specimens of Auerbach's and Meissner's plexus from dogs, by the gold-staining method. These plexuses preside over the production of the secretions of the gastrointestinal passage. The office of these little brains is really to control glandular secretion. They induce the secretion of digestive fluids. They assume the office of regulating the proper amount of fluids to digest the various foods, which office requires a nice balance. Hence, Auerbach's and Meissner's plexuses are the distinct and marked peripheral apparatuses of the digestive tract. Now these little brains, situated in the

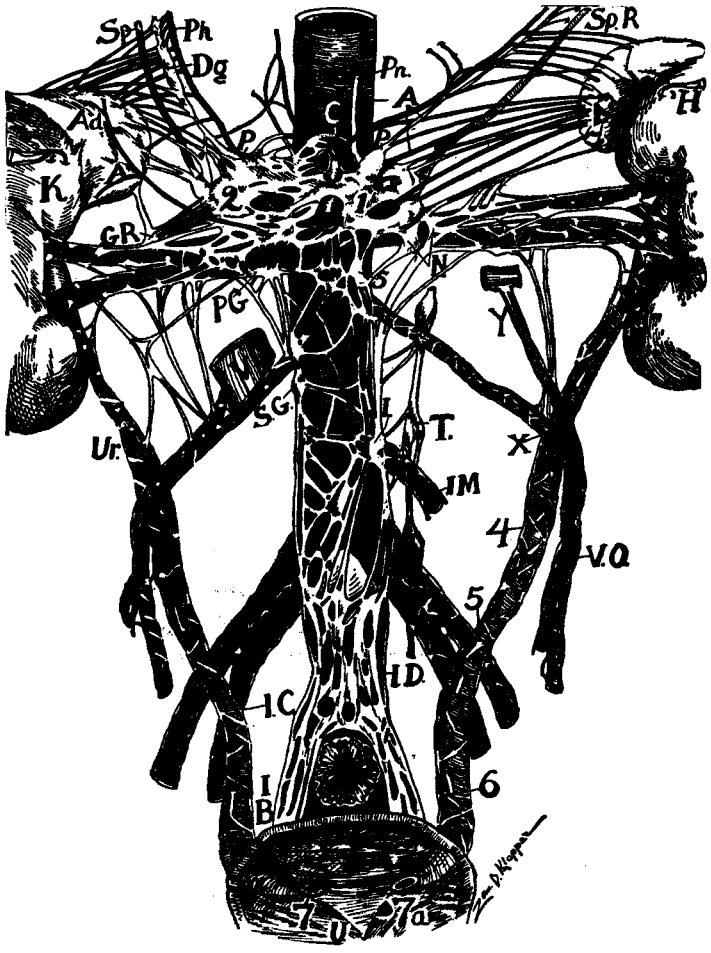


ARTERIES OF CAECUM AND APPENDIX

Fig. 16. The nerves in the important appendiculo-coecal region may be estimated by observing an illustration of the arteries of this segment of the tractus intestinalis. The nervus vasomotorius richly ensheaths the artery in a plexiform network.

intestinal wall, have an action quite independent of the cerebro-spinal axis. I have often chloroformed a dog and then watched the intestines perform their peristalsis after being tapped with a scalpel. If the dog is kept in a warm room, the intestine will go through its peristaltic motion for an hour and a half after death. The peristalsis will be strong and very marked. Half an hour after

death, it will be so strong that the circular muscles of the intestine will contract so as to look like pale white cords, or bands, around the intestine. Auerbach's and Meissner's plexuses are what induce rhythm in the bowel. The presence of food, of course, gives the occasion for rhythm. Hence, we must look to the peripheral nervous apparatus of the digestive tract when colic, indigestion, diarrhea and constipation arise, for these little brains induce motion and secretion in the bowel. Of course they are under the physiological and anatomical orders of the abdominal brain - a higher central organism. The pathology of Meissner's plexus is shown in (a) deficient secretion, (b) excessive secretion and (c) disproportionate secretion; that of Auerbach's, in paralysis or contraction (colic). (Robinson, 1907, pp. 168 - 169)



NERVES ACCOMPANY THE ARTERIES

Fig. 31. This illustration presents the sympathetic nerves following the arteries. I dissected this specimen (man 40) with care, and from the model. 1 and 2, abdominal brain. Splanchnicus major. Ad, adrenal; Dg, ganglion (right), (left), 7. G. R. arteria renalis (right an renalia (left) Ur ureteral nerves. S. G. and 5 mesentericum inferior; X, ganglionic coalescen ureteral crossing. 5 (Lowei) ganglionic coalescence of nerves at the crossing of the ureter and vasa iliaca communis. ID, Plexus interiliacus (hypogastricus). ID is the nerve disc of the sacral promontory. The arteries are accompanied by a plexiform nodular neural sheath encasing the vessel.

Chapter Six

THE VASOMOTOR SYSTEM

Of all the aspects of the great sympathetic system, Byron Robinson placed primary emphasis on the vasomotor influence. From an anatomical standpoint, he observed that the **"vasomotor (sympathetic) nerves form a plexiform network, a neural meshwork, on the walls of the blood vessel."** By controlling (contacting) the smooth muscle tissue which lines the arteries ("vasoconstriction"), the sympathetic system is instrumental in regulating the flow of blood to any part of the body. **"The significance of vasoconstricting nerves becomes very evident when it is recognized that they are so powerful that they can drive or squeeze all the blood out of a part."**

In practical terms, this is evident when a person is frightened and they "turn white as a ghost." The vasomotor function of the sympathetic system has "clamped down" as it were, on the blood vessels on the surface of the body to force more blood to the vital organs and muscle groups. This is a protective function which is part of the "fight or flight syndrome" associated with the sympathetic system. Forcing the blood away from the surface of the body decreases the probability of blood loss should there be a fight. Also, the vital organs and massive muscle groups require more blood to either fight or run.

Another practical example of the vasomotor influence is digestion. After eating a heavy meal, more blood is directed to the intestines and viscera to assist with digestion and assimilation of nutrients. This is why you feel drowsy and desire a nap after a heavy meal. The blood is moved away from the brain (hence difficulty in staying alert) and main muscle groups. This is also why you were told as a child to never go swimming right after eating a heavy meal. Much blood has been routed to the intestinal tract. When it is re-routed to the arms and legs for swimming, you may experience abdominal cramps because the food is lying in the stomach and intestines

partially digested. The blood can not be at two places at once. The vaso-motor function of the sympathetic system guides the blood to where it needs to be.

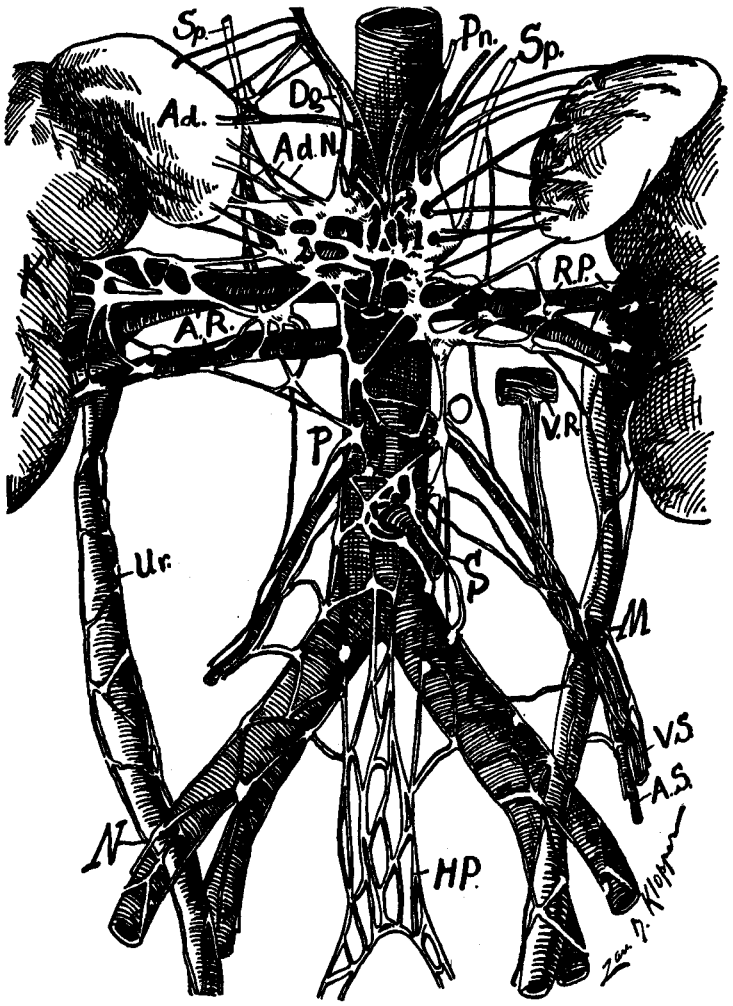
Biofeedback therapy relies heavily on the vasomotor influence of the sympathetic system. By using imagery and visualization, the vasomotor system can redirect blood to the extremities. This has proven helpful in medical conditions such as migraine headache and hypertension. Biofeedback technology is also useful for stress management. Incidently, the imaginative aspect of the sympathetic system is also involved in biofeedback (see Chapter Seven).

Regulation of the blood via the vasomotor system was important to the early osteopathic physicians. The foundation of traditional osteopathy was the "rule of the artery." In other words, keeping the blood flowing to all the tissues of the body was regarded as essential for health. A healthy flow of blood provides nutrients and removes metabolic wastes. Restricted blood flow starves and poisons tissue.

With regard to technique, the early osteopaths realized that the blood flow can be regulated to any part of the system by manipulating the "vasomotor centers" controlling that part of the body. A steady pressure on a vasomotor system inhibits that center which relaxes the smooth muscle around the affected blood vessel resulting in increased blood flow. An "on and off" pressure stimulates the vasomotor center constricting the blood vessel and restricting blood flow. Thus, the blood flow to any part of the body could be regulated by osteopathic manipulation techniques which stimulate or inhibit vaso-motor centers.

The "third cervical release" is a splendid example of traditional osteopathic vasomotor technique. By holding a steady pressure at the third cervical vertebrae (back of the neck) for a couple of minutes, much of the sympathetic vasomotor system is inhibited resulting in general relaxation and systemic cleansing from the increased circulation. Edgar Cayce was particularly impressed with this technique stating that it would set up drainages (eliminations) throughout the whole system.

As noted in Chapter Four, Edgar Cayce sometimes referred to the sympathetic vasomotor system as the "superficial system." This is in particular reference to the vasomotor regulation of blood to the surface of the body (recall the example of the fight or flight syndrome above). He was also aware of the osteopathic techniques of vasomotor regulation for increasing blood flow to specific areas of the body. He was



NERVES OF THE BLOOD VESSELS

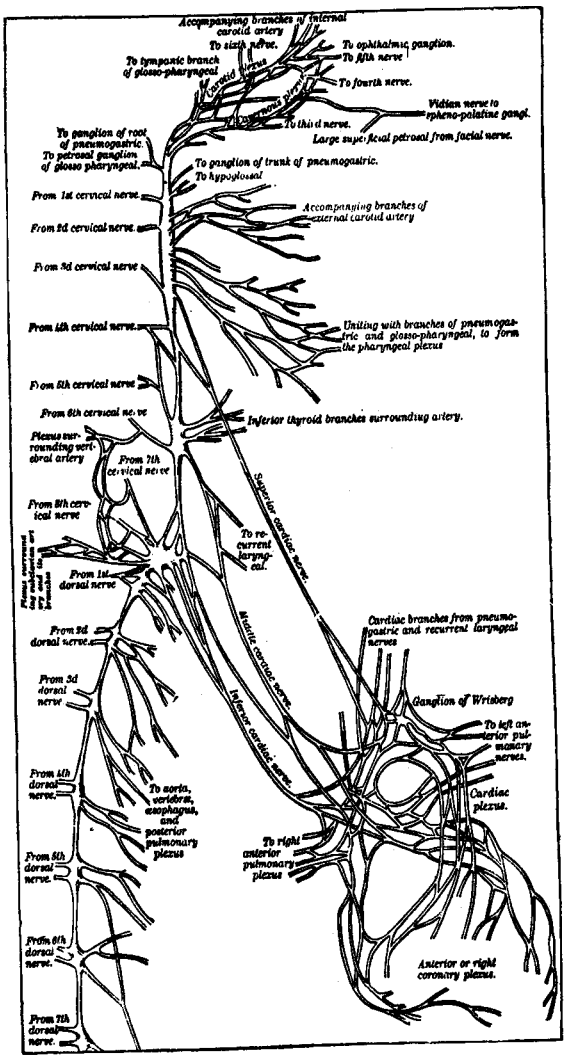
Fig. 32 represents typical Vascular Plexuses, which I dissected from a specimen taken from a subject of about fifty years of age. 1 and 2 abdominal brain lying at the foot of the great abdominal visceral arteries. P. 0. S. ganglia located at the other visceral arteries. The nervus vasomotorius (sympathetic) accompanies the arteries in the form of a plexiform, fenestrated, neural sheath.

impressed with these osteopathic regulatory techniques to "set up drainages" by increasing blood flow and cleansing tissue. In fact, on numerous occasions he stated that one of the primary benefits of osteopathic treatments was an increase in drainages (internal cleansing and increased eliminations).

The final point that I want to make about the vasomotor system is that it may be involved in illness. Byron Robinson was well aware of this aspect of vasomotor functioning. He observed that reflex irritation from various parts of the system can affect the vasomotor centers resulting in abnormal and unhealthy blood flow to specific organ systems. Notably, due to his strong gynecological focus, he frequently cited reflex irritation from the pelvic brain and reproductive system affecting the intestinal tract or cardiac system. Again, the "rule of the artery" applies. Restricted blood flow is the beginning of disease. Cure results from removal of cause. Byron Robinson was a master at tracing symptoms back to their cause and removing the restriction.

NERVES OF THE BLOOD VESSELS (NERVI TRACTUS VASCULARIS). - (A) ANATOMY. (B) PHYSIOLOGY.

The proper nomenclature to apply to the sympathetic nerves is the nervus vasomotorius. Practically it is a nerve belonging to the arteries. In the anatomy of the nerves of the blood vessels two factors should be considered, viz.: (a) that nerves tend to course with blood vessels as the intercostals, nerves in the extremities, nerve coursing with the aorta and its branches. However, cerebro-spinal nerves course mainly parallel with the vessels and divide mainly as acute angles, while vasomotor (sympathetic) nerves form a plexiform network, a neural meshwork, on the walls of the blood vessel, and are not confined to acute-angled dichotomy but divide and anastomose by angles of all dimensions; (b) the cerebro-spinal nerves in general do not form ganglia in their course along blood vessels. The vasomotor nerve (sympathetic) forms ganglia, plexiform nodular meshwork on the walls of the arterial vessels especially at the bifurcation or point of exit of the arterial divisions. The nervus vasomotorius



CARDIAC NERVES

Fig. 45 represents the vaso-motor nerves supplying the heart. The heart is the typical organ of popular demonstration of rhythm or peristalsis in the body. It is enormously supplied with nervus vaso-motorius besides by the ganglia of Bidder, Schmidt, Remak, Ludwig, Wrisburg, all but one located in the cardiae parietes.

courses along with the blood vessel as a nodularplexus, a leash woven like a web on the vessel wall. The coarser or finer web-like anastomotic meshwork of nerves surrounding a vessel is characteristic of the nervus vasomotorius (sympathetic). With the development and differentiation of the animal life the nervus vasomotorius becomes distributed in its relation to blood vessels, dislocated, removed, transported along projecting lateral vessels from its direct contact with the original trunk vessel. Excellent examples of removal - dislocation of the vasomotor nerve from contact with its original vessel - may be observed in the plexus aorticus, and especially in the instance of the plexus interiliacus where it is dislocated toward the median line from arteria iliacus communis. The second significant characteristic of the nervus vasomotorius is its numerous nerve ganglia found attached to the vessel wall and the location of marked ganglia at the bifurcation of trunk arteries as at the aortic bifurcations. Ganglia of dimension also exist at the origin or exit of visceral arteries from the great arterial trunk as ganglion coeliacum (abdominal brain) ganglion spermaticum, ganglion renalis, ganglion arteriae phrenicae, ganglion mesentericum superior et inferior, ganglion cervicale (pelvic brain). These significant ganglia located on the aorta at the origin or exit of visceral vessels, I shall term the aortic viscerel ganglia-ganglia aorticae viscerales. (Robinson, 1907, p. 103)

The vaso-motor nerves. **They are divided into vaso-constrictors and vaso-dilators, and to Claude Bernard belongs the credit of first conclusively showing (in 1851) that they exerted an influence over the caliber of the vessels. Authors agree, in general, that here are vaso-motor centers located in the spinal cord which control the caliber of vessels. Some place the vaso-motor centers in the vascular columns of Clark. Still another set of authors of great respectability claim that vaso-motor centers are located along the peripheral nerve branches. Doubtless there are in the walls of vessels nerve cells which are in connection with the vaso-motor nerves. These vascular ganglia, or nerve cells send fibers to the muscularis of the vessel, dilating or contracting it according to the nature of the despatched stimulus.**

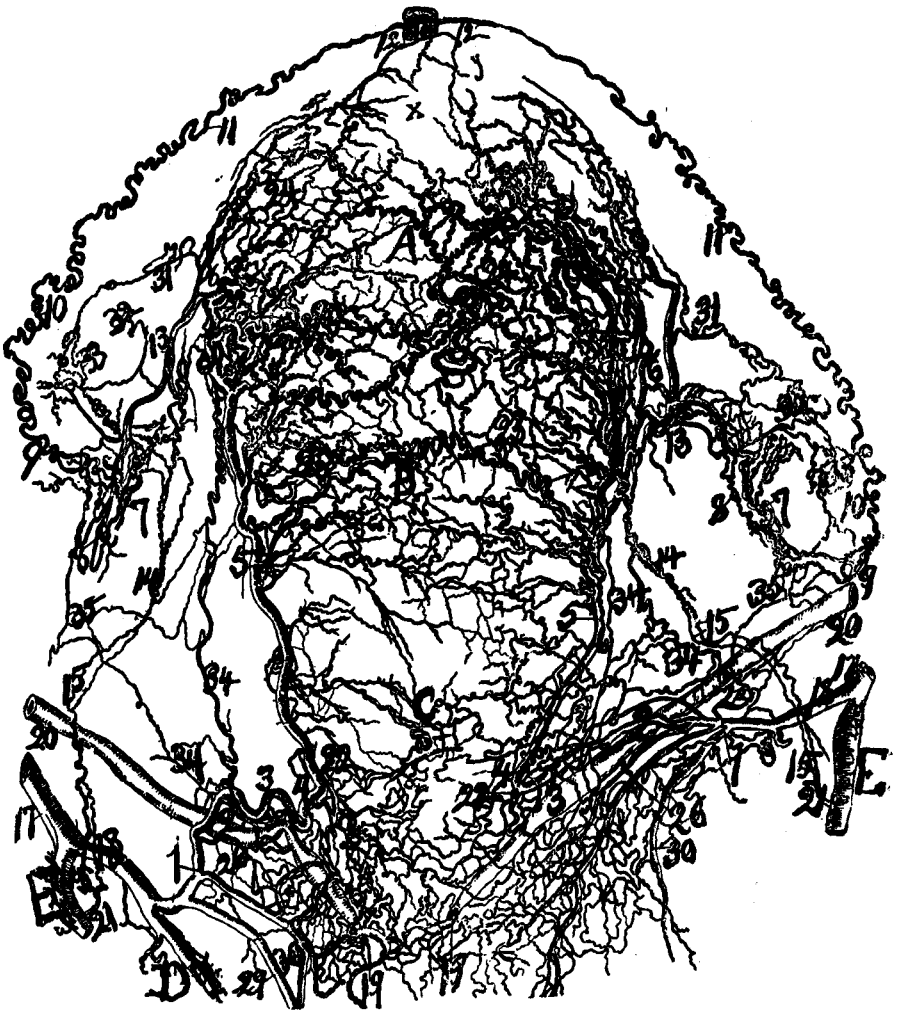


Fig. 110. The arteria uterina ovarica 3 hours subsequent to parturition at term. Every branch of the artery is ensheathed by a fenestrated plexus of nerves.

It is not yet definitely settled whether the vaso-motor nerves are constrictors or dilators, or whether there are distinct constrictors and dilators. Some assert that there is a constrictor nerve only and that dilation of the vessel is paresis of the constrictor. Later authority seems to point to a vaso-dilator and vaso-constrictor, and the fact that there are vaso-motor centers located on the vessel or adjacent to it. It is evident to observers and clinicians that local variation of circulation occurs in the genital or digestive tracts from reflex irritation. By slight irritation one can produce a white line (vaso-constriction) and by more severe irritation one can produce a red line (vaso-dilation). Cold first constricts the vessels, but it is rapidly followed by vaso-dilation, a redness. Now, this local variation of circulation occurs doubtless with more distinctness in the visceral organs which are so highly supplied with vaso-motor nerves, and so closely situated to the gigantic vaso-motor center, the abdominal brain. The significance of vasoconstricting nerves becomes very evident when it is recognized that they are so powerful that they can drive or squeeze all the blood out of a part.

In death from peritonitis the vaso-constrictors drive first all the blood out of the skin or periphery. The blood is forced into the large arteries and veins by the effect of the vaso-constrictors on the peripheral and smaller vessels. The vaso-dilators may be so effectively exercised that the blood escapes through the wall of the blood-vessels as in hemorrhagic peritonitis.

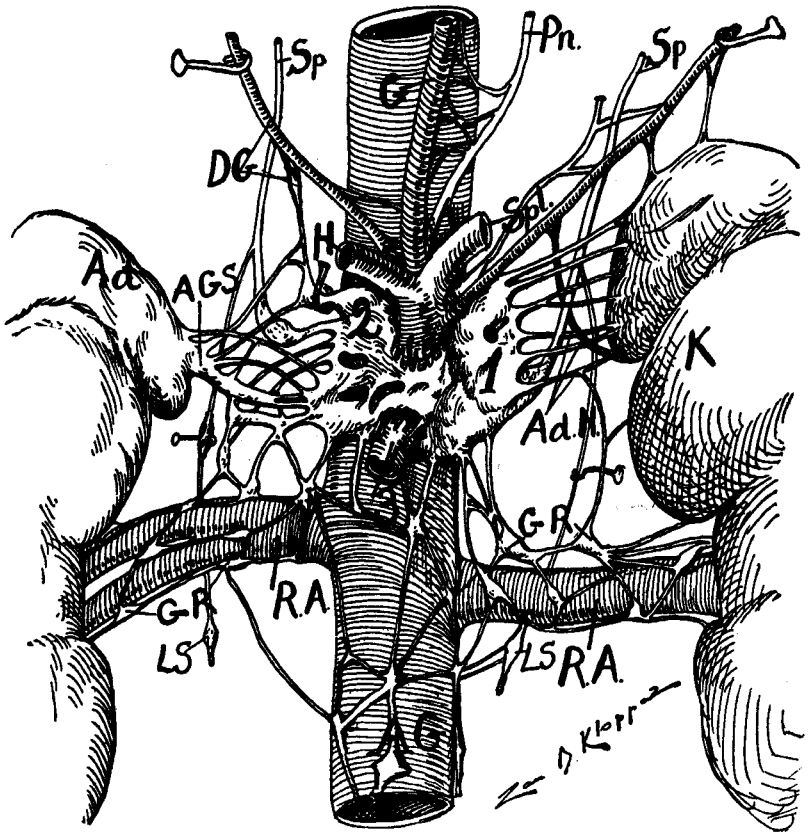
The vaso-motor nerves are of the sympathetic and exercise control over the caliber of vessels. The controlling of the lumen of vessels constitutes a vast field of physiology, in the domain of the sympathetic. It constitutes vascular tone. Section of the sympathetic dilates the vessels beyond the normal. One of the chief offices of the sympathetic nerve is to preserve tone of vessels. The nerves that insure tone in vessels issue from the sympathetic. They are always active and never in repose, - a characteristic of the sympathetic nerve. They pass to the muscular coat of the vessels and act as their permanent guardian, in preserving permanent vascular tone. Variation in this tone constitutes incipient disease. Doubtless the vascular tone is the result of a reflex matter, and the factor in the reflection is the blood-wave, i. e., the trauma or irritation of the

blood-wave on the endothelial membrane of the vessel induces the vaso-constrictors to act permanently in preserving vascular tone. Congestion is only the abolition of vascular tone. Goltz's percussion experiment demonstrates the reflex nature of the action of vaso-motor nerves, as by tapping on the exposed viscera he could produce dilatation of their vessels. Hence in this case the centers for reflex action must lie in the walls of the vessels themselves.

For a reflex act in the vaso-motor field, there must exist several factors, as (a) muscular walls or contractile tissue; (b) centripetal fibers; (c) a center of reflection; (d) centrifugal fibers.

All these factors exist on and adjacent to vessels.

For the reflex centers of vaso-motor movements we may look to the cardiac ganglia, the abdominal brain or, especially, to the ganglia around the vessels or in their walls. Finally, we may claim that the vaso-motor nerves control the caliber of vessels, that they belong to the sympathetic and that those of the abdominal viscera are chiefly under the control of the gigantic vaso-motor center - the abdominal brain. (Robinson, 1907 pp. 204 - 207)



ABDOMINAL BRAIN

Fig. 72. This illustration I dissected under alcohol. It represents fairly accurately the cerebrum abdominale in the general subject.

Chapter Seven

THE IMAGINATIVE SYSTEM

Edgar Cayce called the sympathetic system the nervous system of the unconscious mind (which is the mind of the soul). He contrasted it with the cerebrospinal nervous which is more closely associated with the conscious mind and a primary focus on the material world. Cayce's expression for this aspect of sympathetic functioning was the "imaginative system." He maintained that unconscious psychological processes affected the "vegetative" and "vasomotor" aspects of sympathetic functioning by imagination, resulting in psychosomatic illness and psychosomatic healing. In other words, the sympathetic system is a key component of the "mind-body" connection in health and healing.

Although Byron Robinson did not allude to the soul in his discussion of the abdominal brain and sympathetic system, he did recognize the inherent psychological aspects of its functioning. He used the expressions "psychic" or "psychial" when identifying psychological processes, particularly in diseased conditions.

Actually, Robinson's use of language had a strong historical basis. Strictly speaking, psychology refers to "psyche" (or "soul") and "ology" (or "knowledge of"). Thus psychology is "soul knowledge."

From a historical perspective, psychology dealt with that unseen, vital aspect of the human being which was regarded as a spirit entity or soul. Furthermore, the soul inhabits a physical body. In recent centuries, the soul aspect of psychology has been discarded or replaced by a more biological emphasis on the brain and its biochemistry as the basis of consciousness. So Byron Robinson, while decidedly modern in his outlook, was also strongly rooted in historical, traditional terminology and concepts regarding the psyche. Most importantly for the present consideration is the fact that he recognized the inherent connection of psychological functioning with the abdominal brain and sympathetic system.

The clinical implications are well known. Mental processes can influence (and perhaps even cause) disease. Mental (psychological) therapeutics can be applied in the treatment of illness. In modern terms, this is psychosomatic illness and psychosomatic healing. As mentioned in Chapter Four, biofeedback and such technologies, are the modern interventions used to influence the "imaginative" aspects of the sympathetic system.

During Robinson's era, "suggestive therapeutics" was commonly employed as a psychological therapy. Suggestive therapeutics is a form of hypnosis which is used as an adjunct to medical treatment.

Edgar Cayce also recommended "suggestive therapeutics" for individuals whose "imaginative system" was out of control. Most commonly, such cases involved children or the mentally ill. More frequently, for adults without severe mental and emotional problems, he simply suggested meditation, affirmations and visualization as techniques to influence the "imaginative forces." Cayce repeatedly insisted that "mind is the builder." The sympathetic system is a primary avenue for the imaginative processes of the mind. The Cayce readings maintained that the thoughts and images that we hold in our minds (and particularly in our unconscious minds) become builded into the fabric (nerve tissue, muscles, etc.) of our bodies. The sympathetic system is the building contractor of the imaginative system.

From a modern medical perspective, Andrew Weil, M. D. has also made the connection between the sympathetic nervous system and psychosomatic phenomena:

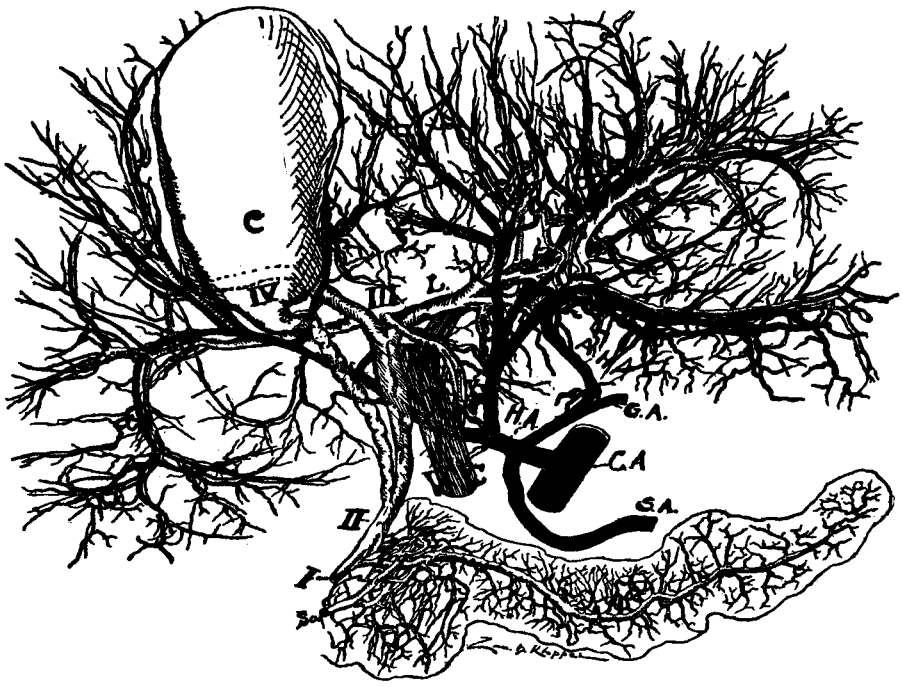
> "Increased sympathetic tone is the root of a number of chronic disorders of circulation [vasomotor] and digestion [vegetative], including high blood pressure, irregularities of heart rhythm, spastic conditions of the stomach and colon. Doctors interested in psychosomatic medicine have long suspected that unexpressed (and even unconscious) feeling of anger and anxiety might cause the sympathetic nervous system to react as if a real emergency threatened from outside and so maintain the body in a chronic state of internal tension." (Weil, 1983, p. 237)

PSYCHOLOGICAL ("IMAGINATIVE") ASPECTS OF THE SYMPATHETIC SYSTEM

The mind is a good source of pathologic physiology, as by concentrated thinking one can congest excessively an organ, e.g., genitals, brain. There is frequently more in the physicians suggestions than in his medicine. (Robinson, 1907, p. 438)

The mind is frequently the organ that needs the stimulant of which quacks, patent medicines, knaves and pretenders take advantage. Pathological physiology recognizes the influence of mind over matter. The sensible physician realizes that suggestions are a powerful aid to peristalsis, absorption, secretion and sensation, to the restoration of visceral function, and though the honorable physician may not make the bold, false assertions of the quack, he can suggest honest, legitimate aid and comfort to the patient. The honest physician is secret and reticent. The quack is blatantly false. Secrecy and reticence is better than falsehood. The physician can and should be an honest man. The physician comprehending pathologic physiology becomes master of suggestions for the patient's benefit. The medical profession cannot afford to leave the influence of mind over matter, the field of SUGGESTIVE THERAPEUTICS [emphasis added], to the quack and knave. The world of knowledge is our parish. To alleviate suffering and prolong life from rational demonstrations of science is our duty. To treat the sick by any legitimate means is our privilege. (Robinson, 1907, pp. 439 - 440)

Suggestion. **- I wish here to emphasize the subject of suggestion in the control or cure of constipation. The control of mind over matter has no uncertain sound in the aid to cure constipation. The psychic effect of a well-directed suggestion is of ten effective in stimulating peristalsis for regular stated times for evacuation. For example, tell a patient, definitely, to go to stool after breakfast, as the hot coffee stimulates the bowel to action. He will not only concentrate his mind on the function, but will cultivate his mind for a definite**



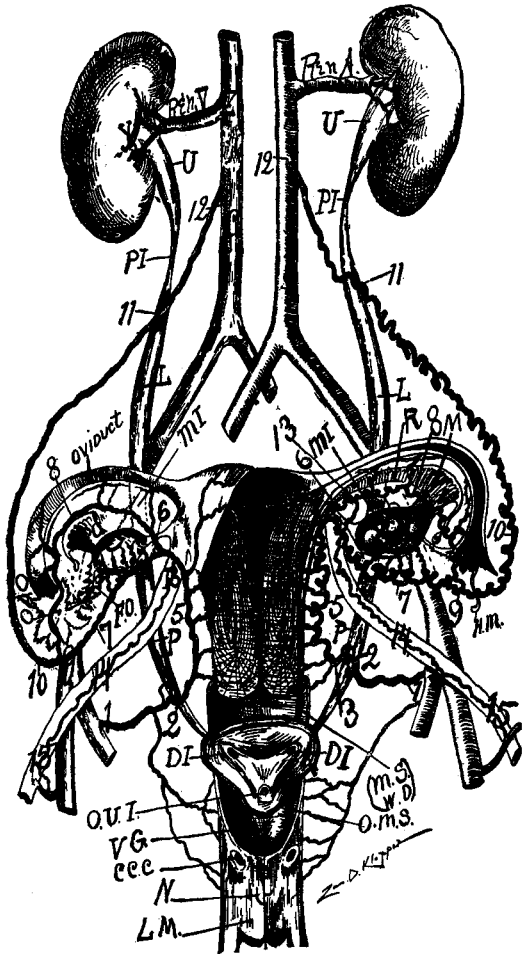
DUCTUS BILIS ET DUCTUS PANCREATIS ET AORTERIA HEPATICA

Fig. 53. This illustration represents the binary and pancreatic ducts with the hepatic artery, which are each ensheathed with a fenestrated network of sympathetic nerves.

A H, hepatic artery; I, vateis diverticulum; II, junction of ductus cysticus and ductus hepaticus; III, ductus hepaticus; IV, cholecyst with its duct.

period for evacuation, which I consider of vast value. Occasionally, particularly in neurotics, this will effect a cure. With the suggestion for a daily evacuation at a stated period should be combined simple convenient remedies, as gymnastic exercise, special diet, in order that the patient may observe cause and effect. (Robinson, 1907, pp. 374)

The sympathetic nerve, however, is a silent, ceaseless, painless agent, unconsciously increasing its function - rhythm, secretion and absorption - as food and fluid are offered. (Robinson, 1907, p. 82)



INTIMATE RELATION OF THE TRACTUS GENITALIS AND TRACTUS URINARIUS

Fig. 128. This illustration demonstrates how solidly and compactly the tractus urinarius and tractus genitalis are anastomosed, connected. At the proximal arterio-ureteral crossing (11, 11) the ureter and ovarian artery are solidly and firmly anastomosed by the nervus vasomotorius (sympathetic). Again at the distal arterio-ureteral crossing (2, 2) a similar but more extensive anastomosis occurs - hence the balanced relationship between the tractus urinaritis and tractus genitalis. Every practitioner realizes the intimate relation of the bladder and the uterus, e. g., in gestation, through the nervus vasomotorius. This intimately solid anastomosis between the two visceral tracts by means of abundant nerve strands aids to explain the vast and interdependent pathologic physiology observed in practice.

Chapter Eight

REFLEXES

The most common association most people have of a nerve reflex is the so-call "neck jerk reaction." When the knee is struck, the lower portion of the leg reacts by kicking out. It is an involuntary, unconscious movement - a reflex. Without getting into the intricacies of the sensory and motor aspects of reflex action, I will simply say that reflexes are an important means of communication within and between the various nervous systems of the body.

Byron Robinson recognized the importance of nerve reflexes with regard to the sympathetic nervous system. This was especially true of reflexes from one brain to another - for example, from the pelvic brain to the abdominal brain. In his book, he cites numerous instances where pathology in one portion of the system produces a reflex irritation to other organs.

Modern researchers of the enteric nervous system ENS also acknowledge the autonomy of sympathetic nerve reflexes related to the gastro-intestinal tract:

> "The sympathetic enteroenteric inhibitory reflexes decrease [intestinal] motility. They are initiated in one part of the gastrointestinal tract and pass to other regions and back to the same region via prevertebral ganglia. The existence of such reflexes whose pathways travel to the central nervous system and then back to the intestine via sympathetic ganglia was shown early this century. It was thus surprising when, in the 1940s, Kuntz and his colleagues showed convincingly that reflexes could be conducted from one part of the gastrointestinal to another via sympathetic prevertebral ganglia, even when these ganglia were completely isolated from central nervous system connections. It is now clear that there are two reflexes, a reflex via the spinal cord and a peripheral reflex. (Furness & Bornstein, 1991, p. 10)

Thus a problem (almost anywhere in the body but especially in abdomen) can be passed along to other portions of the system. The sympathetic nervous system is particularly prone to reflex activity. And of course, this is not necessarily bad. Nerve reflexes are simply a powerful form of communication within the body.

Traditional osteopathy utilized reflexes in making diagnosis and performing treatment. Early osteopaths understood where the reflex centers were and how to manipulate them to produce desired results.

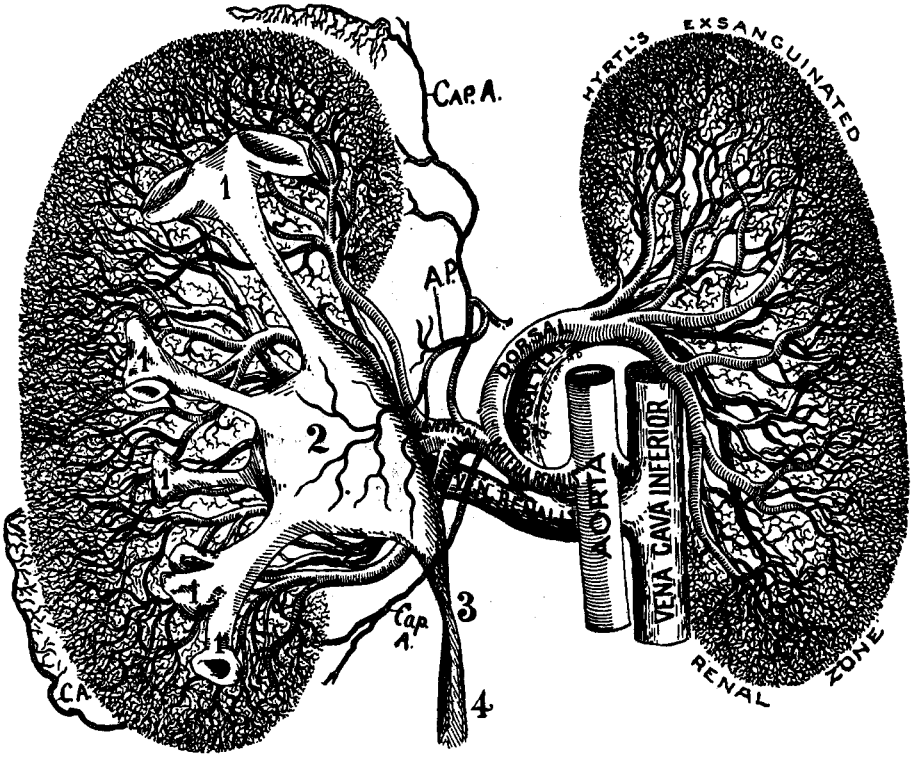
Edgar Cayce recognized the role of reflexes in the pathogenesis of disease. At times, his convoluted explanations of intricate reflex patterns were so complex as to almost defy comprehension. And yet, upon careful study and comparison with medical sources of that era (such as traditional osteopathy and Byron Robinson), his descriptions of chain reaction reflex patterns make sense.

In modern therapeutics, reflexes are still used to diagnose and treat illness. For example, reflexology is a special form of bodywork which is based entirely on nerve reflexes.

SYMPATHETIC NERVOUS SYSTEM REFLEXES

Pathogenesis through the sympathetic [nervous system], in health and disease, is by reflex action. (Robinson, 1907, p. 292)

A reflex is a disturbance in a distant part from some local peripheral irritation. The pelvic viscera are liable to trauma and infection during the childbearing period from exposed mucosa and serosa, and this traumatic or infection atrium becomes a fruitful source for reflex distribution, through disturbed pelvic mechanism, due to cicatricial contraction and subsequent dislocation. The irritation is transmitted to the abdominal brain, where it is reorganized and emitted to the organs of the abdomen and chest, disturbing their rhythm, secretion, absorption, sensation and nutrition. The visceral rhythm becomes irregular, secretion and absorption become excessive, deficient, or disproportionate and the blood becomes waste laden. The patient is forced slowly or rapidly through definite, though irregular, stages of disease (traumatic



NERVES OF THE TRACTUS URINARIUS - CORROSION ANATOMY

Fig. 132. This specimen presents quite faithfully the circulation, the kidney, calyces and pelvis. The two renal vascular blades I present opened like a book. The corrosion was on the left kidney and the larger vascular blade is the ventral one. The vasomotor nerves accompanying the urinary tract may be estimated by the fact that a rich plexiform network of nerves ensheath the arteries, the calyces, pelvis and ureter proper. When the renal vascular blades are shut like a book their thin edges come in contact, but do not anastomose. The edges of the vascular blades are what I term the *exsanguinated renal zone of Hyrtl*, who discovered it in 1868, and we, at present, employ it for incising the kidney to gain entrance to the interior of the calyces and pelvis with minimum hemorrhage. This specimen presents excellently the capsular artery - Cap. A. Think of the vast amount of pathologic physiology which could be created by disturbing the rich sympathetic nerve supply to the kidney.

or infection atrium), irritation, indigestion, malassimilation, malnutrition, anemia, neurosis and psychosis. The nerve mechanism between ovary, genitals and kidney is very intimate. The ovarian plexus originates from the renal and hypogastric, which connection directly associates the kidney with the internal genitals, and accounts for the disturbed functional relation of kidney and internal genitals during menstruation and pregnancy (pain, albumen, and vomiting). The intimate association of nerve relation between kidney and internal genitals is manifest in diseases of either organ. In menstruation there is a pain in the renal regions. Congestion of one organ produces congestion or anemia in the other (reflex action). Renal calculus or nephritis causes pain and retraction of the testicle, and of course similar disturbances arise in the ovary, though not so easily demonstrated. Ovarian disease may cause pain in the rectum (supplied by the hypogastric). The ovarian and hypogastric plexus have direct communication with the abdominal brain, and hence the severe shock from injury to the ovary, uterus, or rectum, and especially the tendency to vomit. The internal genitals (ovary, oviduct, and uterus) are in just as intimate and profound connection with the great abdominal brain as the enteron, and in trauma or infection of the genitals or enteron, will have like severe manifestations of general disturbances. (Robinson, 1907, pp. 280 - 281)

The sympathetic ganglia are especially liable to reflex irritation, and nowhere is it more manifest than in the stomach. The gastric secretion is modified by reflex stimuli from the brain, uterus, kidney. testicle, ovary, heart and spinal cord, etc., etc. Emotions play a role in gastric secretion The successful treatment of stomachic disease is significant in methods of stimulating the stomach, as irritating its mucous wall, which not only starts secretion, but motion as well. In ordinary stomach diseases there are four factors, viz.: (a) excessive secretion, (b) deficient secretion, (c) disproportionate secretion, and (d) muscular motion. Washing the stomach, irritating its wall with instruments or coarse food, will accomplish much in inducing health. Doubtless this is the action of nux vomica and hot water. The clinging germs should be washed from the dormant stomach wall and the muscular movements must be stirred to

excite natural secretions. It has astonished me at the frequent beneficial results of irrigation of the stomach. It stirs to more normal rhythm the sympathetic ganglia, both of secretion and motion. Besides, it washes from the stomach wall abnormal matter. The stomach must have rest and repose or it cannot long stand irregular irritation without resentment of the little circulation insults. Hence the distal irritation from a diseased uterus, oviducts and ovaries sooner or later unbalances stomach function by its regular passage of the traumatic insults to the abdominal brain where reorganization occurs, perhaps with multiplication of effects. The excitation of the diseased genitals has no season of rest, no day or night repose, but at any or all times it rushes and flashes, now tumultuous or turbulent, now pell mell and explosive. There is nothing like a chronic atrophic myometritic uterus to derange and unbalance the gastric secretion and motion.

The stomach is very highly supplied with blood-vessels and nerves, because it is a vast and complicated laboratory, requiring much energy to hold its delicate but active processes in the balanced order. From experimental data we may view the stomachic glands as under the control of the sympathetic nerves, i. e., the ganglia in them. (Robinson, 1907, pp. 331 - 333)

It should be remembered that the sympathetic ganglia in the walls of the heart (Ludwig's, Bidder's, Schmidt's and Remak's) are numerous and large. Also that the network of cords with their ganglia, situated close to its surface, constitute an extensive nerve system. It consists of the great or deep cardiac plexus, otherwise known as the plexus magnus profundus of Scarpa, besides the superficial cardiac plexus, with the cardiac ganglia of Wrisberg, which is occasionally large from the coalescence of several ganglia, and may be represented by a meshwork. In tumors of the pelvis we are dealing with the effect on the vast cardiac sympathetic nervous system. The first manifest objective heart symptom is irregularity.

The irritation from the uterine myoma reaches the heart in two ways:

1. The irritation passes up the hypogastric plexus to the abdominal brain, where it is reorganized and emitted to all the viscera over their respective

sympathetic plexuses. In the case of the heart it passes up the abdominal splanchnics to the three cervical ganglia of the sympathetic, where it is reorganized and sent directly to the heart.

2. Some of the irritation is transmitted by way of the vagi to the medulla, where it is reorganized and sent directly to the heart by the cardiac nerves which supply the heart from the vagus. This is more especially the case in the right vagus, as that is the cranial nerve which largely rules and supplies the heart and abdominal brain. Now, this irritation from the myoma goes on day and night. It gives the heart no rest. It flows to the heart in the midst of a diastole, or a systole. The first great characteristic of the heart (rhythm) is lost. Having lost its rhythm, the heart proceeds irregularly. Irregular action means a changed nourishment; continued irritation with disturbed rhythm induces the heart to overfeed itself, the result being hypertrophy.

It may be noted that this hypertrophy is not brought about in precisely the same way as is hypertrophy from valvulitis or aortic insufficiency; but vaso-motor dilation must play a role in over-nourishing the cardiac muscles. It resembles more nearly the cardiac hypertrophy existing in goiter. That from the reflex irritation in myoma is also a moderate hypertrophy, so far as the writer has observed, and it is a very slow process. In the first stage the heart becomes irregular, in the second hypertrophied, in the third it takes on fatty degeneration. This is no doubt a preservative process, so that a large, vigorously beating heart will not rupture an artery in a degenerated state (atheromatous or fatty). It appears certain that many old cases of large uterine myoma are lost after skillful operations simply from fatty degeneration of the heart. It is common to observe palpitation in patients having uterine myoma, and palpitation is the characteristic symptom of a weak heart.

The automatic cardiac ganglia are disturbed by reflex irritation and take on an excessive nourishment. The irritation, sent to the heart over the hypogastric plexus, is in one sense an increased demand for action. The irritation, passing to the heart day and night, winter and summer, according to a physiological law, provokes hypertrophy, if the nutritive powers are good. If they are not good, the complement of hypertrophy - dilation - results.

A fatty degenerated or weak heart induces low blood-pressure, which is the bottom factor in waste-laden blood and deficient elimination. It allows local congestions and consequent impaired nourishment. The local force of such circumstances teaches to remove uterine and other abdominal tumors as early as possible, so that the patient will not be left with partially or completely damaged viscera.

Reflexes arising from the irritation of the sympathetic in the peritoneal membrane are profound in results. Irregularity, hypertrophy, and degeneration of the heart are the effects of a reflex act, accomplished mainly through the sympathetic system and due to irritation at the periphery of the hypogastric plexus. It is transmitted to the abdominal brain, to the three cervical ganglia, and some to the spinal cord, whence the reorganization of the forces occurs.

The organized nervous impressions then pass to the heart over the six cardiac (vagi) nerves. This abnormal force deranges the fine balance of the heart's rhythm. The automatic cardiac ganglia become discolored, and in time vaso-motor action and consequently nourishment are disturbed.

It may be remembered that the untoward influence on the heart, disturbing its rhythm and consequently its nourishment, is also aided and abetted by disturbing the caliber of distal blood-vessels which are controlled by the sympathetic system. (Robinson, 1907, pp. 210 - 211)

SYMPATHETIC (VISCERAL) REFLEXES

The five abdominal visceral tracts (tractus genitalis, urinarius, intestinalis, lymphaticus, vascularis) exist in an exquisitively balanced or poised state, hence, the so-called reflexes, from one visceral tract to another, accomplished through the nervus vasomotorius, exert extensive influence in producing pathologic physiology - yes many conditions of pathologic physiology arise in different visceral tracts. The essential conditions of a reflex are: (a) an intact sensory periphery (receiver); (b) an intact ganglion cell - pelvic or abdominal brain - (reorganizer); (c) an intact conducting apparatus (transmitter). A pure reflex

consists of a sensation transmitted to a reorganizing center which emits it over a motor apparatus.

A reflex is independent of will. The abdominal viscera are not only intimately connected, associated by means of the tractus vascularis, tractus lymphaticus, tractus nervosus but especially by the peritoneum. Any excessive irritation in any one of the exquisitively poised visceral tracts immediately unbalances the others - at first producing pathologic physiology and perhaps later pathologic anatomy. Hence the sensory apparatus in each visceral tract is significant. The reflex from one visceral tract to the other disorders: (a) the blood circulation; (b) lymph circulation; (c) absorption; (d) secretion; (e) peristalsis; (f) sensation. E. G., when the gestation contents distends the uterus, uneven expansion stimulates, irritates the sensory apparatus of the uterus. The sensation is transmitted over the plexus interiliacus and plexus ovaricus to the abdominal brain where reorganization occurs whence the stimulus is emitted over the plexus gastricus to the gastrium with end results of excessive gastric peristalsis and vomiting. Other abdominal visceral tracts are likewise effected by this uterine reflex, but do not manifest such prominent symptoms as vomiting. Vomiting is pathologic physiology. Ordinary function as gestation will induce pathologic physiology in the tractus intestinalis by: (a) reflexes; (b) robbing it of considerable blood - the extra amount required for the tractus genitalis to gestate the child; (c) instituting indigestion and constipation, from limited blood supply. A calculus in the tractus urinarius (ureter) will produce numerous reflexes with consequent pathologic physiology in the several abdominal visceral tracts - viz.: disordered peristalsis, absorption, secretion, sensation - not pathologic anatomy. (Robinson, 1907, pp. 457)

VISCERAL NEUROSES.

Under this head we will include a series of phenomena of the viscera, partly pathologic and partly reflex, partaking of a disturbance of sensation, motion or secretion. By visceral neurosis we mean an undue irritability or

perverted function of one or more of the viscera. The pathologic condition may be demonstrable or not. Frequently it is pathologic physiology.

In the phenomena of visceral neuroses must be included the clinical fact that if one organ is disturbed it will tend to unbalance the remainder, i. e., irritation is reflected by a nerve arc from one viscus to another. A diseased uterus is frequently followed by a disturbed stomach. A checking of normal function not only makes neurosis but indigestion, non-assimilation and anemia. Such a case occurred in the person of a young woman on whom I performed laparotomy. A few months after the operation she began to suffer tenesmus, spasmodic dragging pain in the sacrum at defecation, and colica membranacea arose. She became slowly ill, neurotic and unable to work. Dr. Lucy Waite and I operated on her and all that we found was an organized peritoneal band several inches long stretching from the amputated oviductal stump to the middle of the sigmoid. The peritoneal band checked the normal peristaltic action of the sigmoid, producing pain, non-assimilation, anemia and indigestion. She became well after the operation, gaining some twenty pounds. In over a dozen cases during the past three years Dr. Lucy Waite and I have reoperated for old post-operative peritoneal adhesions. We generally found that some loop of bowel was attached to the amputated end of the oviduct and checked more or less the bowel peristalsis. Hence, partial checking or hindering of bowel peristalsis produces a peculiar kind of neurosis. All one may notice at first in such cases is irritability. Pain may not be spoken of as the chief annoyance. These subjects with peritoneal bands, which more or less interfere with visceral rhythm and peristalsis suffer in distant organs from reflex irritation radiating to them. It should be remembered that reflex action goes on in health and disease. Nerves like railway cars carry any kind of freight.

The essentials of a nervous system consist of (a) a central nerve cell, (b) a conducting cord, and (c) a peripheral apparatus. However vast the nervous system, the elements are the same. For example, the skin is the peripheral apparatus, the spinal nerves are conducting cords and the spinal cord the central nerve cells. The same form of illustration may be made in regard to the abdominal and pelvic brain as in the central nerve cell. The superior and

inferior mesenteric plexuses of nerves are the conducting cords (for the intestines) and the peripheral apparatus is in the mucosa. In visceral neuroses pain is not always the chief symptom. Subconscious irritation plays the chief role; irritation which does not come within the field of recognized pain.

Among visceral neuroses we should include enteroptosia. The *maladie de Glenard* is doubtless a neurotic disease belonging to the domain of the nervous vasomotorius. Recently Dr. Schwerdt has written some interesting and well studied articles on enteroptosia. Visceral neurosis means that the nervous system in the abdomen and the organs are not living in harmony. The gamut of the sympathetic nerve has lost its tone. (Robinson, 1907, pp. 267 - 268)

The testimony in favor of the production of reflex neurosis from dislocated genitals is ample for the gynecologist. To the physician foreign to gynecology from lack of knowledge and experience, clinical and anatomical facts, comparisons, methods of successful treatment, the domination of the sexual system and instinct and controlling power of genital reflexes over other viscera, in fact, all legitimate arguments of cause and effect, should be presented. Distorted mechanism of the pelvic structures causes genital dislocation. Dislocation of structures compromises circulation by the strangulation of vessels and thus induces malnutrition. Dislocation of structures traumatizes nerve-trunks and nerve periphery, causing pain and reflexes which radiate over nerve-tracks to other viscera and there disturb motion, secretion, absorption and sensation. Tension placed on a woman through dislocated genitals, by compromising circulation and by trauma of nerve periphery, devitalizes her system and exposes her a prey to intercurrent disease and to the great functional neuroses (neurasthenia and hysteria). The gynecologist by removal of the gynecologic dislocation, i. e., the focus of reflexes, can demonstrate that the reflex neuroses will disappear. In view of the prevailing difference of opinion between neurologists and gynecologists as to the consecutive reflex neurosis of genital dislocation a careful weighing of the data is demanded. Careful, comparative examination of gynecologic cases gives a definite series of reflex neuroses. It is admittedly difficult in each individual

case to establish genuine genital reflex neurosis. The diagnosis must be made by exclusion. Improvement of the dislocation and lessening of the reflex neurosis under rational treatment is ocular proof. Certain rare cases arise in which no palpable, pathologic anatomic changes are perceptible and still apparently the gynecologic reflex neurosis exists. There are no exceptions to the rule. (Robinson, 1907, pp. 341)

REFLEX OR REFERRED PAIN.

In general, sudden acute abdominal pain is referred by the patient to the umbilical region, to the solar plexus, directly over the abdominal brain. This, in my opinion, is a nervous center, possessing the power of reorganization, of receiving and transmitting forces, controlling visceral circulation and inducing reflex or referred pain. The irritation of peripheral visceral nerves is transmitted to the abdominal pain, when reorganization may localize the pain over the abdominal brain, at the seat of disease, or at a remote abdominal point, due to a supersensitive nervous system. Anal fissure, or ulcer, is one of the most typical examples to produce reflexes in the abdominal viscera, especially in the tractus intestinalis. Short trauma of viscera, as hernia, acute flexion of tubular viscera, induces abdominal pain and especially by reflexes. (Robinson, 1907, pp. 402 - 403)

OBSCURE SYMPTOMS OF ABDOMINAL PAIN.

Reflex pain from distant areas may simulate severe abdominal pain, multiplying the difficulties in differential diagnosis. (Robinson, 1907, pp. 402 - 403)

Fig. 184. Gastro-duodenal dilatation - gastroptosia. This illustration is drawn from the subject. This subject was 67 years old, dying of carcinoma of the ductus bilis et ductus pancreaticus. It is a so-called transverse stomach, and as the stomach dilates it extends more distalward until in this case it extended to the pelvis. Du and D presents the enormously dilated duodenum, obstructed by the superior mesenteric artery A and vein V. Observe the difference in dimension between the duodenum immediately to the right of the mesenteric vessels and that immediately to the left of them. The jejunum, J., is normal in dimension, while the duodenum is as large as a man's arm. A segment of the stomach and duodenum is resected at D to show the dimension of the distal duodenum. 1, a resected segment of the ventral surface of the duodenum in order to expose Vater's papilla. 0, elongated oesophagus. In this subject the pylorus was dilated in proportion to the duodenum and gastrium. This figure is from the same subject as Fig. 185. I secured this specimen at an autopsy by the professional courtesy of Dr. Charles O'Byrne.

Chapter Nine

PATHOLOGY

One of the great strengths of Byron Robinson's work is its direct relevance to the causes and treatment of illness. If Robinson is accurate in portraying the sympathetic system (with its abdominal and pelvic brains) as an incredibly important component in the body's functioning, it makes sense that this system would be involved in the full spectrum of visceral disease. In the selections quoted in this section, Robinson makes a strong case for the primary role of the sympathetic system in numerous diseases.

Robinson's clinical experience in diagnosing and treating a wide range of visceral illness was the basis for his understanding of how the abdominal and pelvic brains were involved in illness. The sympathetic system is particularly susceptible to reflex irritation (see Chapter Eight). In other words, a problem in one part of the system causes irritation to another part of the system by nerve reflex.

Within the abdomen is located a vast nervous system (sympathetic) with its brains (abdominal and pelvic). In addition to this significant nerve tract, the abdomen contains six other important tracts which constitute systems within themselves: 1) respiratory tract, 2) vascular tract, 3) lymphatic tract, 4) intestinal tract, 5) urinary tract, and 6) genital tract.

Each tract or system is susceptible to a wide range of pathology due to heredity, poor eating or lifestyle habits, environmental toxicity, poor mental hygiene, injury, etc. When one system become diseased, the illness is transferred to other abdominal systems by way of the nerve reflexes within the sympathetic nervous system - the common system which integrates and coordinates all abdominal activity.

The chain reaction of illness produced by reflex irritation is not limited to "physical" disease. Robinson is frank in discussing the mental and emotional associations of abdominal pathology. Mental symptoms ranging from depression,

anxiety and hysteria to psychosis were linked to problems with the abdominal and pelvic brains. From his extensive gynecological experience, he was well aware of the frequency with which problems in the genital tract produced irritation in the pelvic brain which reflexed to the abdominal brain where it disrupted the intestinal and vascular systems.

Robinson was particularly interested in a syndrome called splanchnoptosia. Splanchnoptosia refers to a group of symptoms associated with a stretching and elongation of abdominal muscles. The various abdominal organs become displaced, producing mechanical strains which decrease the effectiveness of each organ. The sympathetic nervous system becomes "devitalized." **"The trauma to the sympathetic nervous system produces excessive, deficient or disproportionate secretions and peristalsis in the viscera, hence nourishment is again defective."** All of the abdominal tracts (respiratory, nervous, intestinal, urinary, vascular, lymphatic, and genital) suffer under the strain leading to numerous and diverse symptoms, which in themselves are difficult to diagnose and treat. Robinson's approach to this syndrome is "visceral drainage," a natural approach to healing (as contrasted to the drugs and surgery commonly used to treat splanchnoptosia). "Visceral drainage" simply means using natural means of increasing eliminations and cleansing the abdominal tracts.

The early osteopaths relied heavily on sources of information such as Bryon Robinson for their foundation in anatomy and physiology, particularly regarding patterns of illness involving reflex irritation and referred pain.

The complex chain reaction type patterns of illness described by Robinson is also typical of Edgar Cayce's psychic readings. Being interested in mental health, I was especially impressed with Robinson's recognition of the importance of pelvic and abdominal reflexes in the cause of mental and emotional problems. Edgar Cayce often cited these same reflex patterns in this descriptions of the causes of mental illness (McMillin, 1991a, 1991b, 1992, 1994, 1995a, 1995b).

PATHOLOGY

ILLNESSES ASSOCIATED WITH THE SYMPATHETIC SYSTEM

(1) We have tried to establish the view that the abdominal brain is the great nerve center of the abdominal viscera and perhaps of the thoracic viscera; (2) that it is the cause of visceral rhythm; (3) that each viscus has its own automatic peripheral ganglia or plexuses in the organ; (4) that the duration of the rhythm of each viscus is determined by the mechanism of the automatic ganglia situated in the organ.

The rock and base view maintained in this book is, that the abdominal brain is a reorganizing nerve center - a brain, a cerebrum. The abdominal brain is capable of reception, reorganization and emission of nerve forces involving the life of viscera (which consists of rhythm, absorption and secretion). The emission of nerve forces will travel as a maximum to organs possessing the greatest number of nerve strands, e.g., the genitals, kidney, heart and stomach, and as a minimum to organs possessing the least number of nerve strands.

Having planted our orchard we will examine its fruits. We now come to the application of these views to the subject of disease. Disease of any of the viscera will very often be preceded by some derangement of their rhythm, absorption or secretion. The common functions of viscera are peristalsis (rhythm), absorption and secretion - all dominated by the sympathetic nerve, i.e., the abdominal brain. To the common functions of viscera (peristalsis, absorption and secretion) must be added, in the genital tract, ovulation, gestation and menstruation.

The two great factors in visceral diseases, so far as regards the sympathetic nerve, are (1) impaired nutrition, and (2) reflex action, referred pain or disturbance. An important central point around which much of the abdominal sympathetic turns is the female generative organs. They are the one cog in the wheel which makes the watch keep defective time.

The pathology of the sympathetic nerve is not so distinctly settled as that of the cerebro-spinal. (1) The most significant pathology of the sympathetic is reflex irritation, referred disturbance. (2) Pigmentation and sclerosis. The

origin of the pigmentation is primarily in the spleen and liver. Pregnancies, menstruation (periodic congestion), fever (malarial), etc., etc., are accompanied by pigmentation. This may be due to a diseased state of the blood. It is more frequently due to reflex irritation from the distant organs. Some consider violent emotion as a cause of pigmentation, but it is likely that it refers to some unrecognized lesion. (3) The third kind of pathology of the sympathetic would be lesions secondary to those of the cerebro-spinal system. (4) The fourth would be recognized and nonrecognized lesions of the sympathetic. I have not space here to discuss these interesting and wide pathological fields, but simply mention them.

Disturbances in the Digestive Tract from Uterine Changes. **- In this case we have immediate and remote troubles as regards time. The chronic uterine disease will produce remote malnutrition and remote reflex changes. In these cases I mean diseases of the entire, or part of the generative apparatus - pudenda, vagina, especially the uterus, oviducts and ovaries. Take, for example, a case where the digestive tract is deranged on account of pregnancy. In the first place the vomiting arises from trauma, stretching on the uterine nerves by an expanding foreign body (contents) and, the dragging of the neck of the uterus on the neck of the bladder. This dragging or pressure on the neck of the bladder disturbs the spinal and sympathetic nerves massed there. The irritation is carried up the hypogastric plexus to the abdominal brain. When the irritation arrives at the abdominal brain the forces are reorganized and sent out on the various nerve plexuses which radiate from this nerve center. If the force is emitted along the gastric plexus, which is liable to happen on account of its large size, the stomach receiving sympathetic nerves from the three branches of the celiac axis, the stomach will suffer and vomiting is likely to occur. Now, in the troubles of the stomach resulting from reflex disturbances from the uterus by way of the hypogastric plexus, it may be considered that the stomach is affected in two distinct parts; (a) its muscular wall (Auerbach's plexus), (b) its glandular or secretary apparatus (Meissner's plexus). When the irritation from the generative organs travels up the hypogastric and ovarian plexuses to the abdominal brain it is then reorganized and emitted along the gastric plexus to**

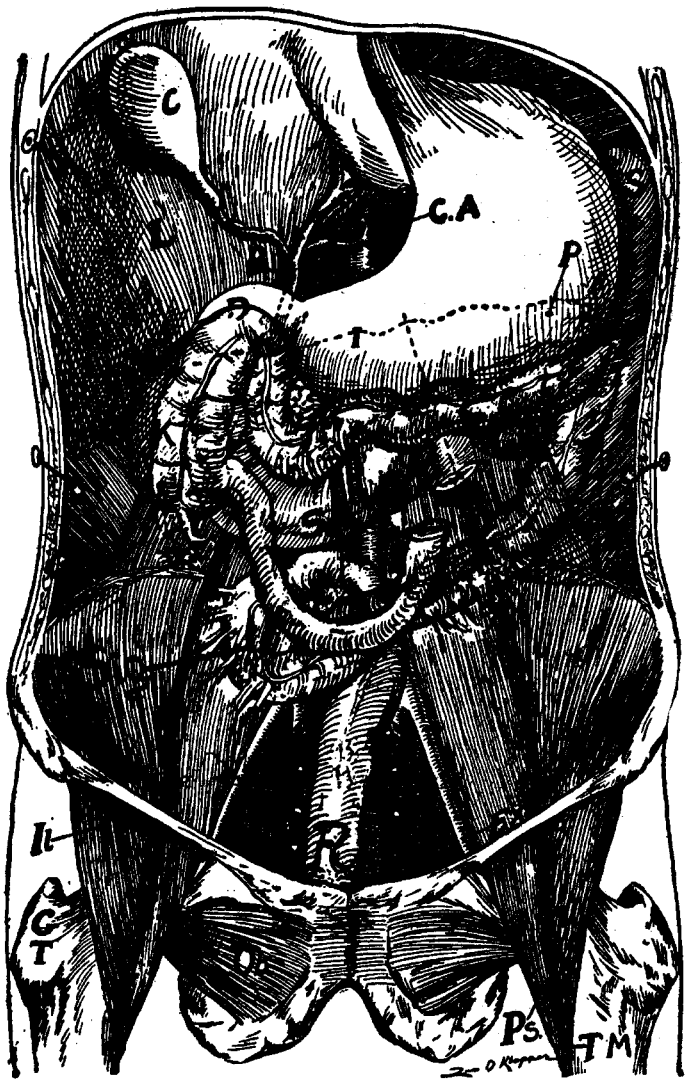


Fig. 186. This illustration presents the horizontal stomach, which in gastroptosia dilates from pylorus to cardiac extremity and passes distalward as in Fig. 184 - a gastro-duodenal dilatation. Sig. represents the sigmoid flexure in a 180 deg. condition of physiologic volvulus.

the automatic gastric ganglia, known as Auerbach's plexus. It affects Auerbach's plexus first because it first meets it in the muscles. The result of irritation of Auerbach's plexus is irregular action of the muscles of the stomach - nausea or vomiting. When the irritation goes farther along the gastric plexus it meets Meissner's plexus, which lies just beneath the mucous membrane, and controls gastric secretion. If Meissner's plexus is considerably irritated it may cause excessive or deficient secretion of the fluids, or the fluids may be secreted in disproportionate quantities. The result will be indigestion and fermentation, causing the development of gases.

The reflex irritation from the uterus may be of such a nature that Auerbach's plexus may be insufficiently stimulated, causing paresis of stomach wall, or that Meissner's plexus is so little stimulated that it will not secrete sufficient gastric fluids. But the track of the nervous irritation is definite from the generative organs, through the hypogastric plexus, to the abdominal brain, where it is reorganized and emitted to the various viscera. This is the interpretation of the old story that uterine disease creates stomach trouble, and vice versa. By reference to a cut showing the pelvic brain, or cervico-uterine ganglion, one can see at once the extensive nerve supply which attends the uterus. It may be observed in cases of violent vomiting that digestion and nourishment are quite good. The reason must be that Auerbacb's plexus is the main one affected (muscular), while Meissner's (glandular), the one which really digests the food, is not much affected. In the case of chronic uterine disease the whole subject is plain and practical. Such patients have malnutrition for several years. In short, it is noticeable that a woman will apply for treatment of uterine disease some four years after the cervix has been lacerated. The illness was increasing all the time, the last part being more apparent. In stomach troubles from chronic disease of the generative organs, it appears that Meissner's plexus is affected the most, as such patients seldom vomit; but they do not digest their food, which is performed by the gastric fluid secreted by the influence of Meissner's plexus on the cardiac and pyloric glands.

But I wish rather to note the effect of chronic disease of the generative organs on the enteron intestines, which is the location of real digestion. The

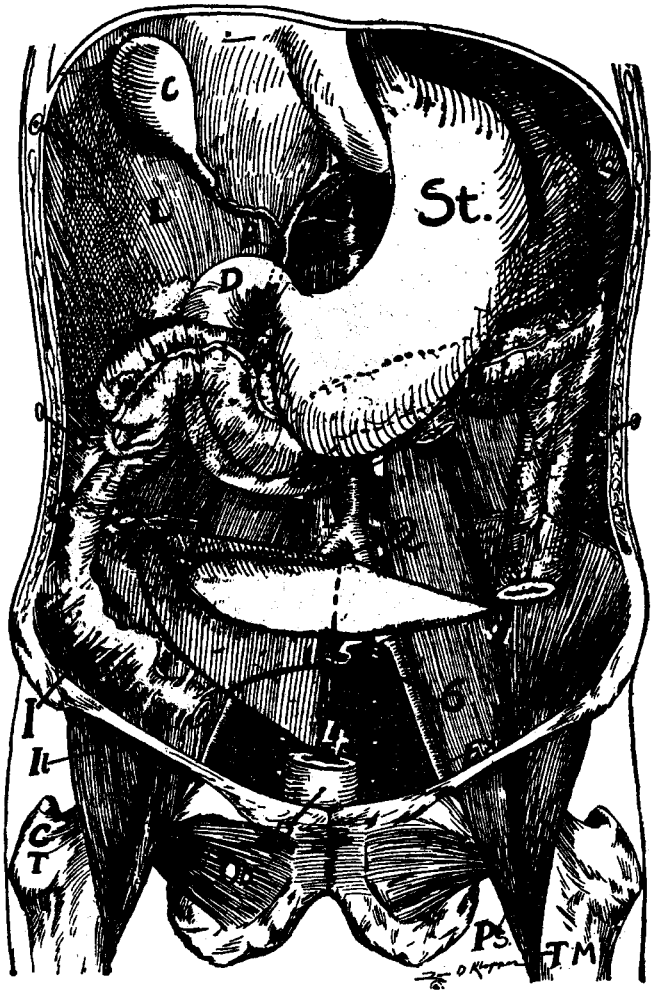


Fig. 187. This represents a vertical stomach. During gastro-duodenal gastroptosia the chief gastric dilatation occurs at the distal end of the stomach. The superior mesenteric, S, compressing the transverse duodenum, causes the gastro-duodenal dilatation. This figure presents a non-descended cecum, and an ileum, 1, adherent to the iliopsoas muscle. 1, 2, 4 representing the dorsal insertion line of the meso-sigmoid.

business part of the digestive tract is the enteron, the small intestines - the jejunum and ileum. The enteron is supplied by the superior mesenteric artery, and along this artery goes the great superior mesenteric plexus of nerves. What we will observe is the mechanism at the end of this superior mesenteric nerve, viz., Auerbach's plexus. This produces bowel peristalsis, rhythm.

Take, for instance, a case of chronic endometritis, salpingitis or ovaritis of several years' duration. Disease of the female organs is a slow, continuous, progressive process. It is a kind of evolutionary process and generally should be read endometritis, plus myometritis, plus endosalpingitis, plus ovaritis, plus as much peritonitis as the infection produces at the ends of the oviducts. Because of this slow, evolutionary progress of female disease the effect through this sympathetic nerve is of slow progress and gradual. The irritation from the generative organs will travel to the abdominal brain by way of the ovarian and hypogastric plexuses. It is a common observation that gases may develop in a few minutes so that fermentation is not the explanation of their origin. Some attempt to explain the origin of this intestinal gas by noting that it collects because the bowel muscle has lost its power to contract; but the gas develops too suddenly for this theory to fit. If the irritation from the uterine disease causes Meissner's plexus to secrete deficient fluids, indigestion and constipation arise. So reflex irritation from the generative organs, by way of the abdominal brain to the small intestine or enteron can act in two ways: (1) It may so stimulate Auerbach's plexus in the intestinal wall as to produce colic, and (2) so stimulate Meissner's plexus as to induce excessive secretion, deficient secretion or disproportionate secretion. The result here will be development of gases and diarrhea.

The abnormal stimulation of Auerbach's and Meissner's plexuses may result in deficient bowel peristalsis and secretion which ends in constipation. The final result of these is indigestion or malnutrition. Hence, chronic uterine disease creates its disasters on the system really by malnutrition. It disturbs the normal visceral rhythm. Malnutrition is manifest in pregnancy, in perceptible disease of the generative organs, and at the menopause. The explanation lies in the abnormal irritation of the nerves in the generative organs, which is reflected

through the abdominal brain to the digestive tract. I have never heard or read of the method herein used to explain the action of the abdominal brain on the digestive tract, but I think it is a practical explanation. These views explain why animals or man lose control of the bowels under fright. The violent forces emitted from the abdominal brain induce excessive activity of Auerbach's plexus (colic) and Meissner's plexus (secretion) and a sudden diarrhea results in the animal. In other words, under high emotional influences the animal's rectal sphincters are unable to resist the violent bowel peristalsis. Peristalsis is stronger than the orificial sphincters. Involuntary defecation is common among children and animals from fright. In older animals the cranial brain assumes more influence over the abdominal brain, i. e., it sobers down its violent and irregular rhythm. Chronic disease of the generative organs creates malnutrition in the digestive tract by disturbing its normal functional rhythm and by reflecting irregular rhythms into the digestive tract during its times of rest and repose. It does not matter what the disease of the generative organs is, so that irritation arises and is reflected to the abdominal brain. Inflammation, tumors or the local manifestations of the menopause, will act similarly, according to the degree of irritation. The subject may be considered in the following short summary:

The reflex irritation of the abdominal brain will cause Meissner's plexus to secrete (a) too much secretion (diarrhea), (b) too little secretion (constipation) or (c) disproportionate secretion (fermentation). The same thing will occur in any secondary organ, i. e., too much, too little or disproportionate secretion. Now, I will point out a matter which long puzzled me, viz., a woman who has a lacerated cervix will go through various pathological stages for some five years and end as a confirmed neurotic. I have observed it for years, and the order of occurrences is as follows:

1. The first stage is irritation. The irritation does not arise so much from the lacerated cervix as from the endometrium (infection atrium). The irritation keeps up for years, endometritis, myometritis, endosalpingitis.

2. The second stage is indigestion. The long-continued irritation arising from the

genitals and passing up to the abdominal brain, and being there recognized and sent out on the plexuses of Meissner and Auerbach of the digestive tract, soon causes too much secretion, too little secretion or disproportionate secretion, which results in indigestion.

3. The third stage is malnutrition. Long-continued indigestion simply results in malnutrition. The reflex irritation goes on continually.

4. The fourth stage is anemia, resulting from the indigestion and malnutrition.

5. The fifth and last stage is neurosis, which is due to the nervous system having been bathed in waste-laden blood for years, neurosis, psychosis.

Hence, a patient with laceration of the cervix passes through five stages: (1) irritation (infection); (2) indigestion; (3) malnutrition; (4) anemia; (5) neurosis, psychosis. (Robinson, 1907, pp. 173 - 179)

It is easy to see how nerve storms shock the heart from peritoneal manipulation. I have noted depression of the heart. The peripheral arteries contract and the heart cannot drive the blood home. It is easily seen that in the abdominal brain and cervical sympathetic, the great regions of reflex action play a great role in neuroses and all emotional phenomena. When we feel fear or fright, the effect is noticeable in the solar plexus, which lies behind the stomach. Sorrow and sadness are, frequently, first felt in the abdominal brain. The good-hearted David said that he "yearned for the young man in his bowels." His is only a common experience that the abdominal brain plays a role in emotional and neurotic phenomena because of its capacity for reflex action. (Robinson, 1907, p. 186)

Debility characterizes the ganglionic [sympathetic nervous system] disease while irritability is the feature of cerebrospinal axis pathology. Women with ganglionic diseases are weak, illnourished creatures, often unable to do a little housework. Can we not consider that such patients have hyperesthesia or

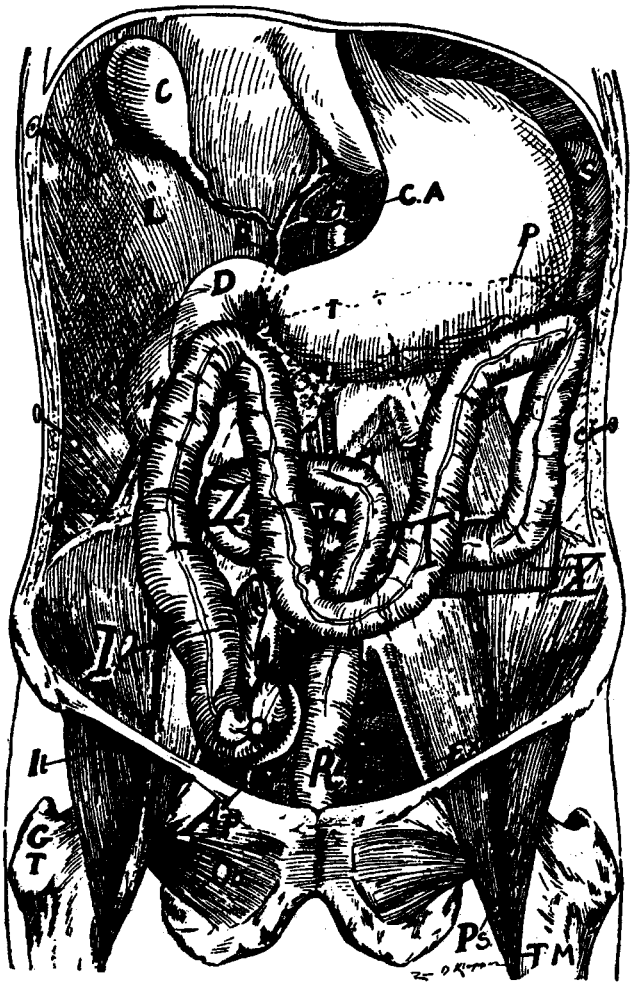


Fig 190. Coloptosia. The transverse colon extends into the lesser pelvis. Coloptosia increases the flexion of the flexura hepatica coli and the flexura linealis coli, increasing the difficulty and friction of fecal circulation. Z The cupola of the sigmoid, presenting a physiological sigmoid volvulus. CO Coecum located in the lesser pelvis, with the appendix Ap. 11. Ileum, coursing proximalward and parallel with the right colon, assuming conditions favorable to an ileocecal volvulus. X illustrates that during volvulus of the sigmoid it appropriates peritoneum, and formulates it into an additional elongated mesosigmoid.

anesthesia of the visceral ganglia? The ganglia are little brains, for they all have the elements of the cranial cerebrum, - nerve cells and processes. In short every nerve cell is a unit in itself. It is an isolated anatomic unit, a neuron, a brain and a reorganizing center. The essential of the cell is the nucleus because it has the power of nutrition, hence reproduction. Hence each ganglion is a little brain, a reorganizing center.

Now, a brain or ganglion cell receives sensation, emits motion and controls nutrition. It reproduces itself, it controls secretion and lives in balanced relations with its environment. Can we not think that such patients have over-sensitive or irritable abdominal brains? Their visceral nerve apparatus is abnormal, it is out of order. But this center holds in abeyance nerve energy and nerve force. It holds all the assimilating and circulatory laboratory in living tension. Such patients have not a perfect machine with which to work. (Robinson, 1907, p. 261)

1. Hyperesthesia of the abdominal brain (Neuralgia Celiaca) consists of a sudden violent pain in the region of the stomach. The pain is accompanied by a sense of fainting and impending anxious dread. It manifests itself, objectively, chiefly in the character of the circulation and in the facial appearance. The skin is pale, the extremities cold, the muscles assume vigorous contractions, especially over the abdomen, and the heart beats under tension and may intermit. The abdominal muscles are put on a stretch. Some patients are occasionally relieved by pressure on the stomach. From the intimate and close anatomical connection of the abdominal brain with all the abdominal viscera, and also the thoracic viscera, various other symptoms of a similar character to neuralgia celiaca may and do arise, as disturbance in the action of the heart and of the gastrointestinal tract. The attacks are irregular, periodical, uncertain in time and intensity. The attack may last a few minutes to half an hour. The attack may disappear slowly or under a crisis of perspiration, emission of gas, vomiting or copious urination, leaving the patient apparently very exhausted. The peculiar characteristics of the attacks in the abdominal brain determine neuralgia celiaca from inflammatory processes of the stomach.

PATHOLOGY

The most typical neuralgia celiaca coming under my notice was (1890) that of a man about 40, a real estate dealer, in whom it had persisted for perhaps ten years. I could discover no gall-bladder, heart or ureteral trouble, and no stomach lesion. He was attacked, irregularly, however, depending on over-exertion, several times a year. When attacked he felt that impending death was at hand. He screamed between paroxysms and would fall on the floor, rolling in agony for a half or three-quarters of an hour. He anticipated the terrific attacks by preparing for them with great care of his health. He would be very quiet f or one or two days subsequent to the attacks; otherwise he was quite healthy. I soon lost sight of him.

The second most typical case of neuralgia celiaca in my practice was that of a woman (1883) about 28. She had very severe and frequent attacks which lasted some fifteen minutes; seemed to have terrible dread and anxiety, a wiry, small pulse, rigid abdominal muscles and varying pupils during the attack. She appeared greatly relieved by pressure directly on the stomach during the attack. She recovered with much exhaustion and relaxation; otherwise she appeared well. She died of rectal carcinoma some twelve years later. Neuralgia celiaca may exist in very various degrees of intensity and duration. In some very severe attacks it would seem from appearances and the patient's report that the suffering was more profound than an ordinary death. The chief valuable treatment consists in securing active secretion of the skin and kidneys with free bowel evacuation. General tone is secured by tonics and wholesome food; even temperature and quiet life tells the rest of the story. The treatment during the attacks is purely expectant-sedative and stimulant. Vigorous baths and wholesome suggestions are valuable. There is often more in the advice given with the medicine than in the medicine itself. (Robinson, 1907, pp. 302 - 304)

NERVE REFLEXES AND MENTAL ILLNESS

Nervous irritation may be occasioned by exposure of the genital nerve periphery from vaginal catarrh, papillary swellings at the vaginal introitus, or the meatus urinarius externus, or from fissures or erosions about the urethra,

pudendum, or anus. Such lesions are often exacerbation by urination, defecation, coitus, or scratching, and may be accompanied by severe neurosis if allowed to persist for a long time. Progressive nervous affections rapidly radiate from the local lesion to the general visceral system. The irritation may remain isolated in the nervous system of the genitals for a longer or shorter period, but if long-continued or severe the neurosis eventually spreads to the general nervous system and is followed by indigestion, constipation, sleeplessness, and a state of more or less high nerve tension; in other words, a peculiar nervous irritability. Entirely isolated neuroses from the genitals are quite rare because the nervous apparatus of the genitals is so intimately and profoundly connected with both the cerebrospinal and the great sympathetic systems that disturbance in the rich nerves of the genitals spreads over the whole nervous system.

Besides, the disturbed pelvic mechanism often sooner or later invades the psychical apparatus and directs the mind to the diseased genitals with additional disadvantage to the individual. The general practitioner is very liable to treat the psychical or mental symptoms, forgetting that the disturbed pelvic mechanism is the rock and base of the neurosis. Not infrequently the psychical symptoms play the chief role in the disease. How often does the gynecologist observe the general practitioner treating the psychical or superficial symptoms - cardialgia, sacrolumbar neuralgia, or sexual disease with little idea of its etiology - though palpable in the pelvis? In short, the psychosis, which has a mental base, and the neurosis, which has a physical base, should be carefully differentiated. However, the psychosis is generally secondary to the neurosis, which latter generally has a palpable pelvic origin. It is what I shall term a vicious sexual circle, viz. : (a) disturbed pelvic mechanism, (b) neurosis, and (c) psychosis. This is accentuated in other ways by Hegar, Freund, Krantz and others to whose excellent labors I am a debtor. More in detail, this vicious sexual circle consists of (a) disturbed pelvic mechanism (trauma and infection); (b) indigestion (from disturbed visceral motion, secretion, absorption, and sensation); (c) malnutrition; (d) anemia; (e) neurosis, and (f) psychosis. (Robinson, 1907, p. 348)

PATHOLOGY

Stomach and colon diseases may lead to reflexes, hypochondria, neurosis, and even psychosis. (Robinson, 1907, p. 350)

In some subjects the sensation of the tractus nervosus of the abdomen is awry. Subjects complain of animals crawling within the abdomen. This matter may be explained by supersensitiveness or hyperesthesia of the mucosa of the tractus intestinalis from gas or contents. More than one operation has been performed for such condition. (Robinson, 1907, p. 498)

SPLANCHNOPTOSIA

The embryologic view demonstrates that the seven visceral tracts (respiratorius, intestinalis, circularis, lymphaticus, nervosus, urinarius and genitalis) are practically alike affected - splanchnoptosia is a unit though a general disease. However, the symptoms of splanchnoptosia of some visceral tracts are not so manifest as that of others e. g., the tractus nervosus is practically manifest as that of the urinarious and intestinalis. Embryology suggests that viscera of late development and distant fixation from the radix mesenterica (coeliac and superior mesenteric arteries) are prominent in splanchnoptosia as the liver, stomach, colon, genitals, kidney. They are distantly removed from the solid anchorage of the radix mesenterica and their solid fixation is hence more limited by peritoneal bands to the abdominal wall. (Robinson, 1907, p. 552)

PATHOLOGY OF THE LYMPHATIC SYSTEM

The functions of the tractus lymphaticus are: I, sensation; II, peristalsis; III, absorption; IV, secretion. Disease in the lymphatic tract consists in deviation, abnormal repetition, of one or all the above four functions. The four functions manifesting pathologic physiology in the disease of the tractus lymphaticus will be recognized by being *excessive, deficient, disproportionate.* (Robinson, 1907, p. 523)

It is evident that to the tractus lymphaticus the four common visceral functions (sensation, peristalsis, absorption, secretion) belong. When these four functions of the tractus lymphaticus pursue a normal course there is no pathologic physiology - no disease exists - and no correction of function or therapeusis is demanded. As water basins are the great centers of civilization, so the lymph channel is the great center of nourishment. In both instances it is the facility of a transporting fluid medium which accomplishes the object. The signification of the tractus lymphaticus is evident when it is realized that it is the highway of cell nourishment and cell drainage. Along the borders of the great lymph stream every cell is a harbor for import and export service. The object of the tractus lymphaticus is universal cell nourishment and universal cell drainage. Pathologic physiology of the tractus lymphaticus is the zone between normal physiology and pathologic anatomy and should be amenable to therapeutics. (Robinson, 1907, pp. 528 - 529)

The abdominal brain is the seat of shock. A blow over the epigastrium, violent trauma to the abdominal brain, may cause immediate shock, collapse, or death. I performed an autopsy on a subject where invagination of the uterus had killed the patient in two and a half hours. Death was due to shock in the abdominal brain, transmitted to it over the hypogastric plexus from the traumatized (invaginated) uterus.

PATHOLOGY OF THE PELVIC BRAIN

(C) *Pathology.* - The pelvic brain is subject to disease similar to other abdominal viscera. As the tractus genitalis is frequently subject to infection and, consequently, inflammatory processes during its maximum activity, the pelvic brain, no doubt, becomes diseased and manifests symptoms. Peritonitis, cellulitis and infectious processes will affect the pelvic brain and induce a series of neurotic symptoms. Atrophic genitals following inflammatory processes are frequently accompanied by neuroses. The most typical disease is that known from W. A. Freund as:

Parametritis Chronica Atrophicans. **- The anatomic substratum of reflex neuroses, hysteria, may be found in disease of the pelvic brain; cicatricial contraction traumatizes the pelvic brain. The pelvic brain may be the agent of valuable therapeutics - e.g., in postpartum hemorrhage massage of the pelvic brain may be accomplished per rectum, per vaginam, manipulation of the uterus or light stroking of the plexus interillacus inducing the elastic and muscular bundles of the myometrium to contract like living ligatures, controlling vessel lumen.** (Robinson, 1907, pp. 152 - 156)

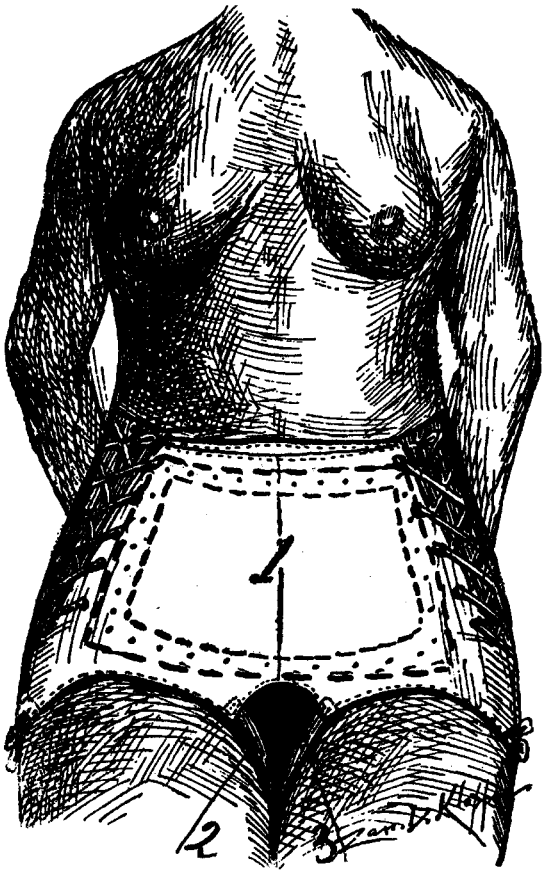


Fig. 205. Byron Robinson's pneumatic rubber air pad is fitted to the abdomen inside the abdominal supporter. 2, 3 are rubber tubes passing between the limbs to fix the abdominal supporter. It requires several days, a week for patients to become adjusted to the pad. Patience on the part of the patient and encouragement on part of the physician will soon adjust the use of the pad.

Chapter Ten

THERAPEUTICS

Robinson's therapeutic model is very consistent with his strong emphasis on the abdominal and pelvic brains (and more generally on the sympathetic nervous system). If the causes of many illnesses are to be found in the sympathetic nervous system, treatment of that system is the key to healing. Robinson was also a great supporter of "natural healing." He believed that natural processes created the body and can be called upon to heal it.

Thus, the therapeutics utilized by Robinson were relatively natural and gentle to the body while focusing on the sympathetic nervous system and associated organs (primarily abdominal). He valued physiotherapies such as massage, manipulation, hydrotherapy, exercise, and mild electrotherapy.

In his comprehensive, "holistic" perspective he also recognized the importance of the mind. He used "suggestive therapeutics," a form of hypnosis, to engage the mind in the healing process. He also advocated for healthy "habitat" and "avocation." By habitat, he meant a healing environment and healthy lifestyle. For the seriously ill, a sanitarium may be needed to provide the optimal healing environment. The modern term for this aspect of healing is "therapeutic milieu."

"Avocation" refers to the occupational dimension of lifestyle. Where we work and how we use our bodies in our vocation affects our health. Robinson was particularly interested in how work and lifestyle affect the visceral (abdominal) organs and their functioning.

All of the above therapeutics could be designated as forms of "natural healing." Robinson recognized the healing power of nature and especially the natural processes in the body. The role of the physician is to assist the body to heal itself by regaining natural functioning.

One of Robinson's basic strategies for assisting the body via "natural healing"

was through "visceral drainage." Drainage refers to the ability of the body to cleanse itself by increasing eliminations. The full spectrum of therapeutic techniques mentioned above were called upon in his systematic approach to visceral drainage.

However, Robinson was not rigid in his approach to healing. Being a medical doctor, he was well aware of the therapeutic potential of medicines and surgery, usually as a last resort.

The therapeutic philosophy described above is almost identical to that developed by Edgar Cayce beginning at about the time of Robinson published his book. Cayce also advocated natural healing by using a full spectrum of physiotherapies such as massage, hydrotherapy, manipulation, diet, exercise, electrotherapy, etc. Cayce also recognized the importance of the mental aspects of healing and specifically prescribed "suggestive therapeutics," giving detailed instructions on how to apply this form of naturalistic hypnosis.

One difference in the two approaches is Cayce's strong emphasis on the spiritual aspects of health and healing. Robinson's work is not without spiritual emphasis, but it is certainly not as overtly religious as the Edgar Cayce readings.

Both Cayce and Robinson saw the necessity of medication and surgery for certain cases, a similarity which distinguished them from the early osteopaths who avoided these relatively extreme therapeutic measures. Otherwise, the therapeutics of the early osteopaths were similar to Robinson's. They did place greater emphasis on the manipulative form of treatment to address nervous system and circulatory problems. However, recommendations for diet, hydrotherapy, exercise and so forth are common in the early osteopathic manuals. The Still-Hildreth Osteopathic Sanitarium (which once operated in Macon, Missouri) was a wonderful example of the traditional osteopathic model at its best. It was an institution recommended highly by Edgar Cayce and the sort of healing program that Byron Robinson would have appreciated.

Robinson's recognition of nerve centers ("little brains," see Chapter Four) throughout the body had important therapeutic implications for the early osteopaths. These centers were accessible to physical manipulation which allowed the osteopaths to regulate the physiology (especially the circulation) of specific areas of the body. Edgar Cayce was also well aware of the significance of osteopathic regulation of the

nerve centers to coordinate the nervous system and increase "drainages" (eliminations) in the system. Robinson's technique for treating postpartum hemorrhage is an excellent example of regulation of physiology by manipulation of nerve centers (see **"UTILITY OF THE PLEXUS INTERILTACUS IN PRACTICE"**).

MASSAGE

In abdominal massage we apply practical physiology to the various abdominal visceral tracts. For example in constipation one or all the great visceral functions (peristalsis, absorption, sensation and secretion) are defective. By stimulating the aortic plexus through massage intestinal peristalsis, secretion and absorption are enhanced as the irritation passes over the gastric plexus to the stomach over the superior mesenteric plexus to the enteron and over the inferior mesenteric plexus to the colon. Constipation may be cured by massage of the abdomen. Massaging the abdominal brain induces more active renal peristalsis, absorption and secretion. The physiology of the sympathetic presents a vast field for future therapeutics, especially in the direction of visceral massage. The massage of the abdominal sympathetic (plexus aorticus) will assume three directions of physiologic utility, viz.: (a) The great ganglia of the plexus aorticus will be stimulated, that is, the ganglion at the root of each visceral artery will be stimulated, which will excite the pulsating vessel (and the heart), supplying more blood to its corresponding viscus and consequently individual and collective visceral peristalsis, absorption and secretion is enhanced - this is administering a vascular tonic. It also aids visceral drainage which consists in elimination of waste laden blood and lymph products. In short, massage of the plexus aorticus abdominalis enhances visceral function (rhythm) and visceral drainage (elimination); (b) massage of the plexus aorticus enables the operator to manipulate each, individual, viscus which not only excites the capsule or muscularis of the organ to enhance peristalsis, but the parenchyma of each viscus receives a direct stimulus for increased absorption and secretion. This is again administering a natural tonic for the massage of a

viscus enhances its function and drainage. Visceral stimulation and visceral drainage must be complements and compensatories of each other; © in performing massage of the plexus aorticus abdominalis, the voluntary abdominal muscles are invigorated in function and usefulness. The active contraction and relaxation of the abdominal muscles on the viscera is a necessity for their normal function (rhythm, absorption, secretion) and support, e. g., splanchnoptotics possess relaxed abdominal walls and consequent distalward movements of viscera and elongated mesenteries - resulting in disturbed, compromised, visceral peristalsis, absorption and secretion as constipation, indigestion and neurasthenia. Every organ has its rhythm. In the rhythm or peristalsis of an organ undoubtedly lies the physiologic secret of correlated secretion and absorption. Hence one of the essential duties of a physician is to aid in maintaining a normal visceral rhythm. In conditions of acute inflammation or irritation of viscera, the abnormally active rhythm is best treated by anatomic (quietude of voluntary muscles) and physiologic rest (prohibition or control of fluid and foods). In conditions of defective rhythm of organs as in constipation, splanchmoptosia, the best means to stimulate normal rhythm is systematic abdominal massage and vigorous visceral drainage. A rational method to stimulate visceral rhythm is to administer coarse foods (cereals and vegetables) that leaves a large fecal residue which irritates the intestines into vigorous peristalsis or rhythm. (Robinson, 1907, pp. 50 - 51)

UTILITY OF THE PLEXUS INTERILTACUS IN PRACTICE

It is accessible to manipulation from proximal to distal end through the abdomen, per rectum or per vaginam. Massaging or stimulating the plexus interiliacus induces the muscular and elastic bundles of the organ which it supplies to contract by controlling the blood volume. The most typical example for the employment of therapeutics on the plexus interiliacus is during postpartum haemorrhage. It is the irritation, massage of the plexus interiliacus, that induces muscular and elastic bundles of the myometrium to contract and consequently control the hemorrhages. It is not the obstruction produced in the

aorta by the pressure, the technique of which is almost impossible, for the two ovarian arteries would still continue to force large volumes of blood to the uterus. Light abdominal stroking, digital manipulation of the uterus in postpartum hoemorrhage irritates, massages the plexus interiliacus and its branches, which induce the elastic and muscular bundles of the uterus to contract like living ligatures on the blood vessels, checking haemorrhage. The so-called uterine inertia of long, tedious labor may be due to paresis of the plexus interiliacus from trauma by the child's head. Sudden cessation of parturient peristalsis - arrest of labor - is doubtless due to trauma by the child's head on the plexus interiliacus, a sudden paresis. Vaginal or rectal injections (hot or medicated) stimulate the plexus interiliacus, hastening labor. Electricity will accomplish similar effects. The flat, band-like form of the plexus interiliacus protects it from trauma during parturition. Massage of the plexus interiliacus will end all alleviating constipation by stimulating active peristalsis and secretion of the left colon, sigmoid and rectum. The plexus interiliacus may be stimulated by means of hot fluid or food taken, in the stomach. The irritation passes from the stomach over the plexus gastricus to the abdominal brain, whence it is reorganized and emitted over the plexus interiliacus, inducing more vigorous uterine contractions. By appropriate systematic massage of the plexus interiliacus stimulation of the pelvic viscera may be effected, resulting in a vigorous circulation. (Robinson, 1907, pp. 60 - 61)

NATURAL HEALING

Nature always resents violent insults, with evil consequences. Nature itself is a bundle of habits, and if we are to be successful, we must imitate her methods. Hence, we must employ for constipation, diet, fluid, exercise, physical procedure, and, lastly, adjuvant cathartics - we must study the sympathetic nervous system. (Robinson, 1907, p. 372)

SELECTIONS FROM THE ABDOMINAL AND PELVIC BRAIN

SUGGESTIVE THERAPEUTICS

The mind is frequently the organ that needs the stimulant of which quacks, patent medicines, knaves and pretenders take advantage. Pathological physiology recognizes the influence of mind over matter. The sensible physician realizes that suggestions are a powerful aid to peristalsis, absorption, secretion and sensation, to the restoration of visceral function, and though the honorable physician may not make the bold, false assertions of the quack, he can suggest honest, legitimate aid and comfort to the patient. The honest physician is secret and reticent. The quack is blatantly false. Secrecy and reticence is better than falsehood. The physician can and should be an honest man. The physician comprehending pathologic physiology becomes master of suggestions for the patient's benefit. The medical profession cannot afford to leave the influence of mind over matter, the field of suggestive therapeutics, to the quack and knave. The world of knowledge is our parish. To alleviate suffering and prolong life from rational demonstrations of science is our duty. To treat the sick by any legitimate means is our privilege. (Robinson, 1907, pp. 439 - 440)

Suggestion. **- I wish here to emphasize the subject of suggestion in the control or cure of constipation. The control of mind over matter has no uncertain sound in the aid to cure constipation. The psychic effect of a well-directed suggestion is of ten effective in stimulating peristalsis for regular stated times for evacuation. For example, tell a patient, definitely, to go to stool after breakfast, as the hot coffee stimulates the bowel to action. He will not only concentrate his mind on the function, but will cultivate his mind for a definite period for evacuation, which I consider of vast value. Occasionally, particularly in neurotics, this will effect a cure. With the suggestion for a daily evacuation at a stated period should be combined simple convenient remedies, as gymnastic exercise, special diet, in order that the patient may observe cause and effect.** (Robinson, 1907, pp. 374)

VISCERAL DRAINAGE.

In my experience nothing has been so successful as visceral drainage - draining the skin by salt baths, the kidneys by drinking ample fluids, and the bowels by salines, with set hour for evacuation. Drainage of the bowels, skin, and kidneys is the rock and base of the therapeutics which will benefit the vicious sexual circle. It is rational hydrotherapy. (Robinson, 1907, p. 349)

Visceral drainage signifies that visceral tracti are placed at maximum elimination by dietetics, fluids, appropriate hygiene and habitat, exercise. The waste products of food and tissue are vigorously sewered before new ones are imposed. The most important principle in internal medication is ample visceral drainage. The residual products of food and tissue should have a maximum drainage in health. I suggest that ample visceral drainage may be executed by means of: (A) fluids; (B) food. (Robinson, 1907, p. 458)

HABITAT IN VISCERAL DRAINAGE.

Habitat includes all methods of living from the sedentary to the athletic, from the paralytic to the traveler. In general the habitat will refer chiefly to the tractus muscularis and tractus respiratorius. Muscular activity, vigorous exercise, enhances two grand functions, viz., tractus vascularis and tractus glandularis.

The muscles are powerful regulators of circulation (blood and lymph) hence their stimulation (exercise) increases the tone of vessels, magnifies blood currents to viscera which consequently multiplies common visceral function (sensation, peristalsis, absorption and secretion), ending in free visceral drainage. Muscular activity increases blood volume, universally improving nutrition. Maximum blood volume is the primary base of visceral peristalsis. The most typical popular example of the muscles controlling the blood circulation is that of the uterus. The myometrium like elastic living ligatures controls the uterine blood supply (and consequently its functions), (sensation,

peristalsis, absorption, secretion, menstruation and gestation), hence drainage with flaccid muscles drain glandular secretion, as in the uterus, may be excessive (leucorrhea).

Exercise is an essential for health. Muscles exercise a dominating control over circulation (blood and lymph). The abdominal muscles influence the caliber of the splanchnic vessels. They exercise an essential influence over peristalsis, secretion, absorption, of the tractus intestinalis, urinarius, vascularis and genitalis. The muscles massage the viscera, enhancing their function and the rate of circulation with consequent free drainage. In the uterus, the most typical example (especially marked during parturition), is prominently demonstrated how the myometrium controls the blood currents like elastic living ligatures. The myometrial bundles by continual contraction decreases the dimension and blood volume of the uterus at a moment's notice subsequent to parturition. The muscular system is equally and continually influential, at all other time as it is parturition, over circulation and visceral function. Regular vigorous habits enhance visceral drainage.

The value of fresh air was never realized so effectively and practically as at present. Fresh cold air cures pulmonary and other tuberculoses. The success of the sanitorium is the continued use of fresh (cold) air. The subject should sleep with fresh continuous cold air passing through an open window space of 3 x 3 feet. Every physician should advocate the continuous open window, day and night for living and sleeping room. It appears to be demonstrated that cold fresh air is more beneficial than warm fresh air. It is common talk among people that one winter in the mountains is worth two summers for the consumptive. Much of man's disease is house disease. It is lack of oxygen and exercise. The curative and beneficial effect of cold fresh air continually, day and night, for the family must be preached in season and out of season by the physician. The windows should be open all night. Fresh cold air is one of the best therapeutic agents in pathologic physiology of viscera. It stimulates viscera to active function and consequent visceral drainage. Observe the wonderful results of systematic deep breathing, chest expansion. It utilizes ample oxygen which is rapidly transported to the tissue by the tractus vascularis. If one

observes the naked body in rapid deep breathing it will be observed that man's respiratory apparatus extends from his nostrils to his pelvic floor, I. e., it extends to the territory of the spinal (intercostal and lumbar) nerves. Hence, by stimulating to a maximum the functions of the tractus respiratorius (sensation, peristalsis, absorption, secretion) - e. g., by systematic deep respiration - vast benefits result to the organism. The habitat that furnishes opportunity for abundant fresh air, like an open tent on the plains and ample muscular exercise, is the one that affords the essential chances for recovery of pathologic physiology viscera. It enhances visceral drainage. Fresh air is required to transport a continuous, ample supply of oxygen to the muscular apparatus to maintain its normal tone, its contractions and relaxations.

AVOCATION IN VISCERAL DRAINAGE.

The suitability of avocation to health is a daily observation. The prisoners confined in a cell, the clerk confined in a store, stand in contrast to the subjects living in the field, and the traveler continually exposed to sun and wind. The sedentary occupation confining the laborer affords insufficient muscular exercise or fresh air to maintain ample visceral drainage. Visceral drainage is required for health as nourishment. Fresh air aids visceral drainage by transporting well oxygenized blood to the viscera which stimulates the four common visceral functions. The avocation should suit the laborer's physique that the four common visceral functions may be normally maintained.

CONCLUSIONS REGARDING VISCERAL DRAINAGE.

Normal visceral drainage is the key to health. It is maintained by appropriate fluid, food, habitat, avocation. Visceral drainage depends on the normal activity of the four common visceral functions (sensation, peristalsis, absorption, secretion). The chief factor in appropriate visceral drainage is ample fluid administered at regular intervals. It requires five pints of fluid daily to compensate for the visceral elimination. The function of water in the

organism is: - 1, elimination; 2, solvent; 3, transporter; 4, regulator of the temperature. The cells of the body (parenchymatous and connective tissue) functionate in a fluid medium. Life can persist in a fluid medium only. Visceral drainage is a vast factor in correcting the pathologic physiology of viscera and especially the tractus lymphaticus. Therapeutics must be rational, for nature alone can cure. Therapeutics must imitate and aid nature in restoring function by natural agents. Practically the influence of a physician is limited to pathologic physiology, i. e., the zone between normal physiology and pathologic anatomy. The physician's chief duty is to correct function. Visceral drainage produces maximum cell nourishment and maximum cell drainage, hence creates maximum energy and vitalizes the organism. Practically ample fluids at regular intervals is recommended in pathologic physiology of the viscera, e. g., in obesity, in diabetes, in rheumatism, in fevers, cholelithiasis, nephrolithioses, constipation. Water is a vital stimulant to the life of a cell. (Robinson, 1907, pp. 543 - 545)

TREATMENT OF SPLANCHNOPTOSIA

The essentials of medical treatment in splanchnoptosia [deformed abdominal cavity] **are: (1), hygiene; (2), visceral drainage; (3), diet; (4), habitat; (5), avocation, electricity, spray, douche. Advice is frequently of more value to a splanchnoptotic than medicine.** (Robinson, 1907, p. 634)

NATURAL HEALING OF THE LYMPHATIC SYSTEM

The *chief duty of the physician is to restore function*. The deviating functions to restore in pathologic physiology of the tractus lymphaticus are sensation, peristalsis, absorption, secretion. Pathologic physiology of the tractus lymphaticus is best corrected and normal function maintained by natural methods or rational therapeutics. The rational agent of therapeutics for the treatment of pathologic physiology of the tractus lymphaticus are: I, Fluids; II,

THERAPEUTICS

Food; III, Habitat; IV, Avocation; V, Drugs; VI, Surgery; VII, Miscellaneous.

Since pathologic physiology of the tractus lymphaticus is the zone between physiology and pathologic anatomy it should be amenable to treatment. In the treatment of pathologic physiology of any abdominal visceral tract it must be remembered that the half dozen viscera tracts normally functionate in perfect harmony - no friction - and if any one tract be disordered the exquisite physiologic balance of all is disturbed. The pathologic physiology of the tractus lymphaticus is treated mainly indirectly, i. e., through the influence of other visceral tracts, e. g., (1) the tractus vascularis must be restored to normal as to *composition* (blood, plasma, oxygen) and *pressure* (cardiovascular function must be normal; venous flow depends on arterial blood pressure); e. g., (2) the tractus muscularis must functionate normally (lymph largely depends on muscular activity, on respiration, condition of veins). The pathologic physiology of any viscus is frequently restored by stimulating the four common functions of other viscera (sensation, peristalsis, absorption, secretion). (Robinson, 1907, p. 532)

DRUGS

Finally, in the treatment of constipation, we come to use of drugs - at once the most disastrous and inefficient of all methods. Cathartics are to be avoided as much as possible in constipation. Constipation is generally the result of catarrh. Cathartics influence catarrh injuriously by further complicating the circulation, and inducing congestions and depletions. (Robinson, 1907, p. 372)

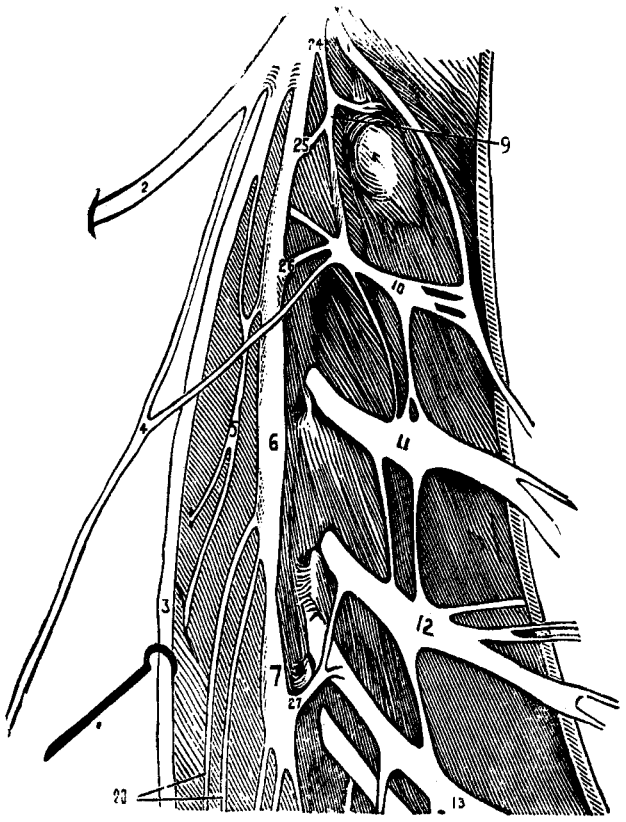


Fig. 63. 6, superior; 7, middle cervical sympathetic ganglia; 9, 10, 11, 12, 13, cervical nerves (spinal); 24, 25, 26, 27, cervical rami communicantes; 3, vagus; 20, superior cardiac from superior cervical; 2, hypoglossel.

Chapter Eleven

CRANIAL NERVES

In the modern anatomical and physiological terms, the autonomic nervous system is comprised of sympathetic and parasympathetic nerves. The parasympathetic component consists of certain cranial nerves (third, seventh, ninth and especially the tenth or vagus nerve) and the sacral parasympathetic spinal nerves.

What is not generally recognized in modern descriptions of the nervous system is that the trigeminal (fifth cranial nerve) also has strong associations with sympathetic system and thus is somewhat "parasympathetic" with regard to anatomy and physiology.

Byron Robinson recognized the abdominal and pelvic sympathetic associations of the trigeminal nerve. He particularly emphasized the olfactory connections between the trigeminal and reproductive system.

The trigeminal/sympathetic nervous system connection is especially important with regard to Edgar Cayce's explanation migraine headache. Robinson's descriptions of the anatomical and physiological connections of the trigeminal nerve with the sympathetic system (including the abdominal and pelvic brains and especially the intestinal tract) is supportive of Edgar Cayce's perspective on migraine. In a sense, one might say that migraine headache is actually a "brainache" which originates in the abdominal brain and is referred to the cranial nerves and cerebral brain. Hence, the significant abdominal/visceral symptoms of migraine (such as nausea, vomiting, constipation, diarrhea and stomach pain) are actually closely linked to the cause of the disease rather than simply being disturbing side-effects.

Furthermore, there is considerable medical research support for an intestinal etiology of migraine. Therapies (such as dietary restrictions and colonics) have proven helpful for persons suffering from migraine.

SELECTIONS FROM THE ABDOMINAL AND PELVIC BRAIN

Epilepsy is another illness which is thought to originate in the cerebral brain, has significant abdominal symptoms, and may be caused by reflex irritation in the abdominal brain. Edgar Cayce gave numerous readings for persons suffering from epilepsy. In most cases, he said the problem originated in the abdomen (abdominal brain) or reproductive system (pelvic brain). He specifically mentioned the lacteal ducts (Chapter Twelve), a portion of the lymphatic system located in close proximity to the abdominal brain. He said that adhesions in the lacteal ducts produced reflex irritation which disrupted the coordination between the cerebro-spinal and sympathetic nervous systems (Chapter Thirteen). The incoordination was transmitted to the cerebral brain resulting in seizures.

The tenth cranial nerve (vagus) may play a key role in the transmittal of the abdominal reflex to the cerebral brain. Modern medical research has acknowledged "abdominal epilepsy." Some researchers have suggested that the vagus may be the link between the abdomen and the cerebral brain in abdominal epilepsy:

> ... it is not clear that the initial disturbance in abdominal epilepsy arises in the brain. There are direct sensory pathways from the bowel via the vagus nerve to the solitary nucleus of the medulla which is heavily connected to the amygdala. These can be activated during intestinal contractions. (Peppercorn & Herzog, 1989, p. 1296)

Sympathetic and cranial nerve involvement in epilepsy is a fascinating possibility that may find its place in modern medical research. Whatever the research outcome in neurological diseases such as epilepsy and migraine, it is clear that the cranial nerves (especially the vagus and trigeminal) have significant relations with the sympathetic system and its brains in the abdomen.

CRANIAL NERVE RELATIONS WITH THE SYMPATHETIC SYSTEM

The physiology of the nerve plexus supplying the tractus intestinalis is important both theoretic and practical. The sympathetic nerves dominate, rule, the intestinal tract, hence it possesses a rhythm, peristalsis - only sympathetic

ganglia possess the power of rhythm. In the physiology of organs the course of nerves must be considered. First, the vagus (as cranial nerve) supplies the proximal end of the tractus intestinalis as well as its appendage; especially the liver with numerous fibres. The vagus aids to check rhythm, especially of the stomach. Second, the spinal nerves at the distal end of the tractus intestinalis particularly the middle and inferior haemorrhoidal nerves supplying the rectum and interfering with its rhythm or peristalsis. The spinal nerve attending the rectum places it partially under the will in controlling to some extent the evacuation of faeces or gas. Third, there is the great splanchnic nerves, chief delegates in the function, rhythm or peristalsis of the tractus intestinalis (median) especially in the enteron or business segment. The splanchnic nerves though preponderatingly sympathetic possess a rich source in the spinal cord. Therefore though the tractus intestinalis is preponderatingly supplied with sympathetic nerves (hence rhythmic) it is supplied at its proximal end by cranial nerves (vagi) and at its distal end by spinal nerves (haemorrhoidal). The general function of the tractus intestinalis under the sympathetic nerve is: (a) peristalsis (rhythm); (b) absorption; (c) secretion. Its object is digestion. The business of a physician is chiefly to aid in maintaining normal functions, I. e., peristalsis, absorption and secretion in the intestinal tract. In the general application of the physiology of the nerves of the tractus intestinalis for practical - purposes there should be considered: (a) those of the proximal end, stomach and appendages; (b) the nerves supplying the medial region (enteron) and (c) the nerves supplying the distal end (colon). The great sympathetic nerve plexuses accompany the arteries. (Robinson, 1907, p. 36)

It is plain that the genitals have quite an independent nerve supply and also stand in intimate relation to definite regions; in other words, diseased genitals have a predilection for certain nerves and nerve lesions. This fact is patent in the functional crises, at puberty, during pregnancy, at menstruation, and at the menopause. In pregnancy the irritation from the genitals invades the stomach in a physiologic rather than the pathologic degree. The grade of the genital irritation of pregnancy and menstruation seldom reaches a pathologic condition.

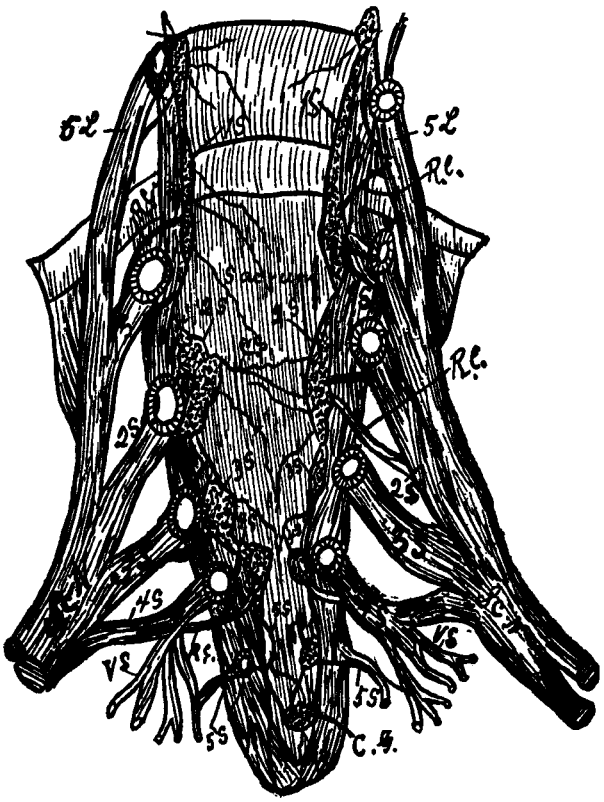
During puberty, menstruation, pregnancy, and the menopause certain organs suffer, as the stomach, breasts, larynx and thyroid glands. The cranial nerves deserving mention for a special share during the above periods are the trigeminus and vagus, which may manifest not only excessive physiologic activity but an actual pathologic condition (physiology). (Robinson, 1907, p. 342)

The chief manifestation of the vasomotor nerve is that it is endowed with a peculiar rhythmical phenomenon. The ganglia of the nervus vasomotorius alone possess rhythm. (Some advocate that muscle possesses inherent power of rhythm, however, so far it is found in muscle supplied by the sympathetic nerve, e. g., muscles of the various visceral tracts.) The vasomotor nerve is particularly connected to the cerebrum through the vagi (proximal end) and to the spinal cord by the sacral nerves (distal end). (Robinson, 1907, p. 36)

SYMPATHETIC NERVE RELATIONS OF THE TRIGEMINAL NERVE

Valentin discovered that irritation of the fifth [cranial] nnerve [trigeminalnerve] produces invariably movements of the small intestines. We must remember that the fifth nerve is par excellence the ganglionic cranial nerve, having eight ganglia situated on its branches. It is really a sympathetic cranial nerve. (Robinson, 1907, p. 327)

Let us examine for a moment the ganglia of the trigeminus (trifacial or fifth cranial nerve - the ganglionic nerve of the brain). A significant statement may precede the short description, by saying that one of the chief offices of a ganglion is to demedullate nerves. 1, We may note the Gasserian ganglion of the fifth cranial nerve, situated in a depression in the apex of the petrous portion of the temporal bone. The ganglion is as large as the end of the little finger. The ganglionic nature of this swelling was perceived by Raimund Balthasar Hirsch, a Vienna anatomist, in 1765, who christened it the "Ganglion Gasserii" in honor of his teacher, Gasserius, who in 1779 was "Privat Docent" in anatomy under Prof. Joseph Jans, in Vienna. Since Du Bois-Remond announced from personal



SACRAL SYMPATHETIC AND SACRO-SPINAL NERVES

Fig. 62. This illustration is drawn from a woman about 40 years of age. It represents the sacral sympathetic and sacro-spinal nerves 1s, 2s, 3s, 4s and 5s, sacral ganglia. Sc. N. sciatic nerve. The sacral sympathetic ganglia are connected, anastomosed by transverse strands.

experience that he thought facial neuralgia was due to spasmodic contraction of the blood vessels controlled by the sympathetic, surgeons have attempted to cure facial neuralgia by destruction of Gasser's ganglion. This is at least a recognition of the sympathetic nature of the Gasserian ganglion, and its consequent influence over the caliber of the blood vessels.

The Gasserian ganglion has close and intimate connection with the sympathetic nerves. The blood vessels alone which are necessary to supply the Gasserian ganglion would produce a close and intimate relation between the sympathetic and trifacial. The trigeminus shows a very intimate and extensive connection with the tonsils, the sebaceous glands of the face and genitals. This is seen at puberty of both boys and girls (facial acne), and in the menopause. The changes in voice of boys at puberty, and the changes of voice of women at the monthly, may be easily worked out anatomically, by dissecting out the connection between the superior cervical ganglion and the pneumogastric and glosso-pharyngeal. Also the spheno-palatine sends branches to the tonsils in the descending palatine nerves. One may find from three to five branches of nerves passing from the superior cervical ganglion to the glosso-pharyngeal and pneumogastric nerves. During menstruation the vocal cords are congested and hence the hoarse, husky voice; and a similar but permanent physiological process of congestion and growth occurs in the boy at puberty. Hence the close and intimate relations of the vocal cords (voice) and nasal mucosa (smell) and reflex action with the genitals, have a distinct, concrete, anatomical explanation. Besides, the larynx is supplied by the sympathetic branches which accompany the superior and inferior recurrent laryngeal nerves.

The ophthalmic, lenticular or ciliary ganglion is a pinhead sized ganglion situated in the orbit. It is closely connected by roots with the nasal branch of the fifth nerve, i.e., has relations with the nasal mucosa, by a sympathetic branch from the cavernous plexus. It is also connected with the third cranial. This second ganglion has intimate connections with the nasal mucosa. Joseph Guiscard Duverny (1648-1730), a French anatomist, discovered this ganglion.

The spheno-palatine, or Meckel's ganglion, situated in the sphenopalatine fossa and on the superior maxillary branch of the trifacial, is a large mass of nerve cells. It is intimately connected with the nasal mucosa by the descending palatine nerves. The spheno-palatine ganglion was discovered and described by Johann Friedrich Meckel (1717-1774), a celebrated German

X-RAY OF DUCTUS PANCREATICUS AND PART OF DUCTUS BILIS

Fig. 75. This illustration suggests the quantity of nerves - ensheathed by a nodular, fenestrated, anastomosing plexus - supplying these channels.

anatomist. Like all the other ganglia of the fifth cranial nerve, it possesses motor, sensory and sympathetic roots. It sends a considerable nerve supply to the tonsils. Hence we again observe that this ganglion shares in distributing nerves to the nasal mucosa and the region of the tonsils. But the premise of our argument is that the fifth nerve, being studded by eight sympathetic ganglia, is intimately and closely connected, anatomically and functionally, with the genitals. Therefore what affects the fifth nerve will affect the genitals, and vice versa.

The optic or Arnold's ganglion is located just below the foramen ovale, on the inferior maxillary branch of the trifacial. Its sympathetic branches are derived from the sympathetic plexuses which surround the adjacent middle meningeal artery. It is connected with the facial and glosso-pharyngeal nerves and sends branches to the tensor palati. In our library may be seen Friedrich Arnold's " Anatomie des Menschen, " 3 vols. On page 909, Vol. 11, Arnold says, "Der Ohrknoten wurde von mir im Winter 1825-26 endeckt." In English, "The optic ganglion was discovered by me in the winter of 1825-26. " Professor Arnold noted 75 years ago that many tried in vain to show that others than himself discovered the ganglion. This ganglion shows connection with the larynx by way of the glosso-pharyngeal and tensor palate; and, through the Vidian nerve and Meckel's ganglion, with the nasal mucosa.

The submaxillary ganglion is situated on the lingual branch of the inferior branch of the trifacial nerve. Its sympathetic branch is derived from the plexus which surrounds the adjacent facial artery. This ganglion was discovered by Meckel in 1748. It has been named after him - Ganglion Meckelii Minus. The ganglion communicates with the facial or the seventh nerve.

The sublingual or Blandin's ganglion is situated on the branch of nerves going to the sublingual gland. This collection of nerves may be only a plexus or a ganglion. It should have a similar connection with the submaxillary ganglion. Phillippe Frederic Blandin (1798-1849), a French surgeon. first described this ganglion in 1849.

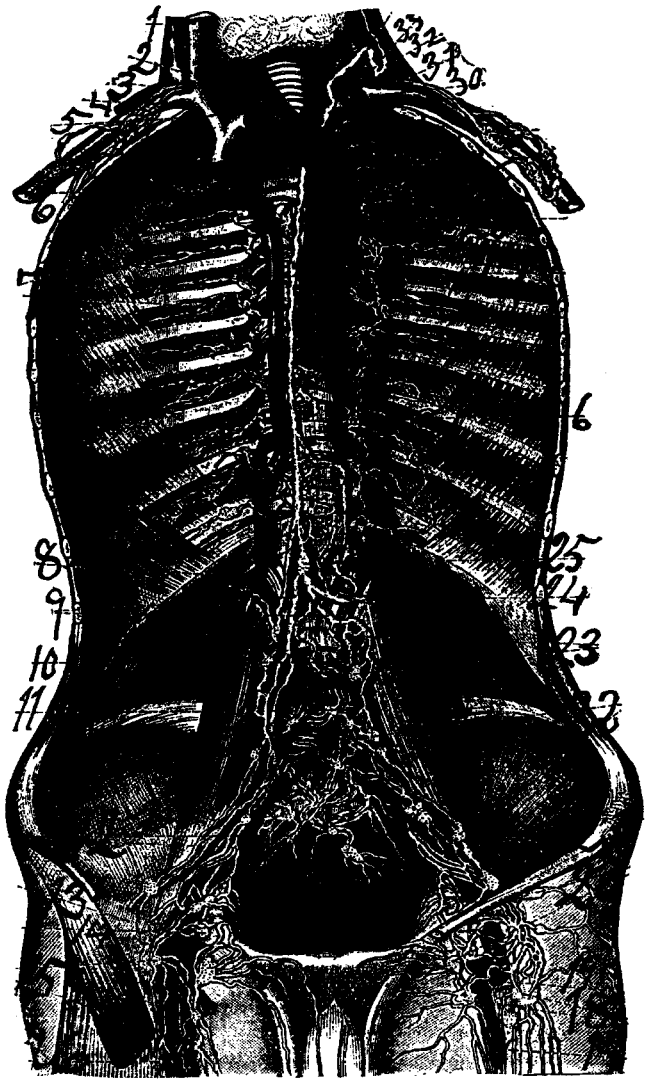
The ganglion of Bockdalek is located at the junction of the middle superior dental nerve with the anterior superior dental nerve. It is not constant,

and besides, the swelling may not always be a ganglion, I. e., may not contain nerve-cells. It lies above the upper canine tooth. Its discovery is due to Victor Alexander Bockdalek, Professor of Anatomy in Prague until 1869 (papers published in 1866), and Victor Bockdalek, his son, also an anatomist in Prague. However, it appears to be the father who discovered this ganglion, previous to 1851.

The ganglion of Valentine is situated at the junction of the middle superior dental nerve and posterior superior dental nerve. It is located above the second bicuspid tooth. The ganglion was discovered by Gabriel Gustave Valentine (1810-1888), a German anatomist. All the ganglia of the fifth cranial or trifacial have systematic connections.

We should have known that the trigeminus is supremely the ganglionic cranial nerve; that it is closely and intimately connected, especially with the genitals by way of the sympathetic tracts; also that the trigeminus is closely and intimately connected, especially with the nasal mucosa, and to a considerable extent with the larynx and vocal cords. There are found to be numerous and intimate connections between the fifth cranial nerve (the trigeminus) and the seventh cranial nerve (the facial). Observation shows the intimate relation is accomplished by means of the sympathetic nerves, especially the ganglia on the trifacial. This physiologic relation of the genitals to the trifacial and facial nerves may be plainly observed in the sexual relations and cohabitations of animals....

Many diseased generative organs co-exist with diseased nasal mucosa. The eight ganglia on the fifth cranial nerve - (l) Ganglion Gasser; (2) Ophthalmic; (3) Spheno-palatine; (4) Optic; (5) Submaxillary; (6) Sublingual; (7) Bockdalek; (8) Valentine - not only show the sympathetic nature of the fifth cranial nerve, but also intimate relation with the nasal mucosa, larynx, abdominal brain, and especially with the genitals. (Robinson, 1907, pp. 654 - 658)



DUCTUS THORACICUS, SINISTER ET DEXTER

Fig. 160. This illustrates well the terminating lymph trunks as an anastomosing network on the dorsal wall. Note: (a) the isthmus of the thoracic duct (at its middle portion, 27); (b) the *receptaculum lymphatics* (25) at its distal end; (c) *the thoracic dilatation* or ampulia at its proximal end.

Chapter Twelve

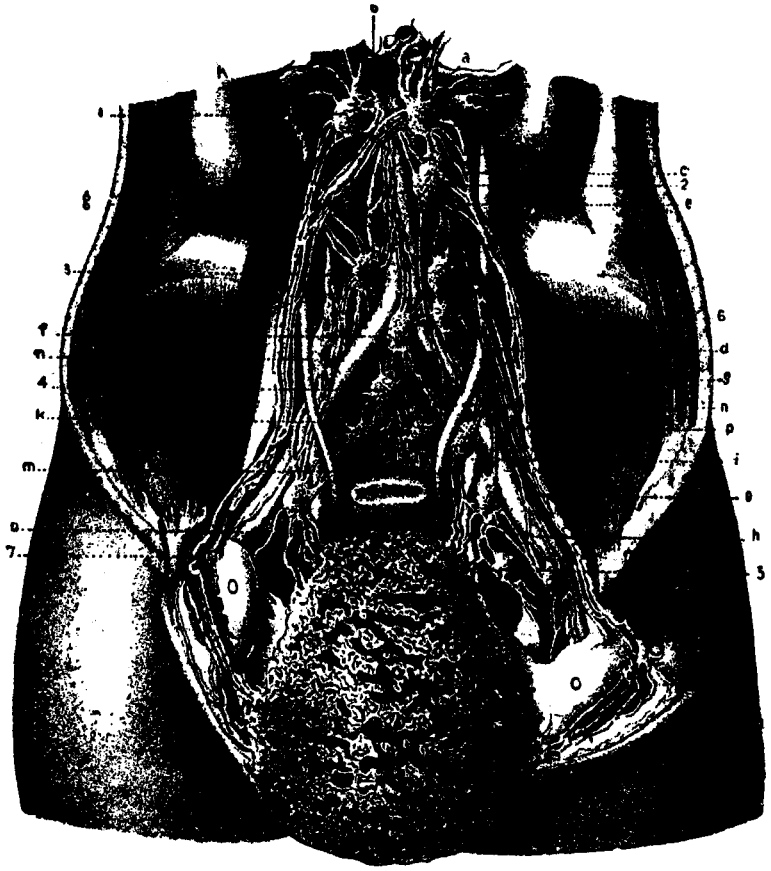
THE LYMPHATIC SYSTEM

Byron Robinson devoted Chapter 38 of his book to a lengthy discussion of the lymphatic system. For Robinson, the lymphatic system serves two major functions: 1) lymph plasma nourishes cells and 2) removes wastes. He notes the intimate relation the lymph vessels have to the veins. He also describes the sympathetic nervous system relations to the lymphatics.

I was most fascinated by his discussion of the "lacteals." Lacteals are the lymphatic vessels that assist in the assimilation of fats and proteins from the small intestine. Lacteals are most common on the lower right side of the abdomen in association with Peyer's patches, rather large nodes of lymph tissue which play a role in the immune system.

Of the numerous drawings of the lymphatics in Robinson's book, I was particularly impressed with Figure #160 (shown on previous page). Note that the central lymphatic channel shown in Figure #160 is asymmetrical. It lies along the right side of the spine. At (or slightly above) the navel (#25 on Figure #160) is shown the ***receptaculum lymphatica***. This would appear to coincide with the lacteal duct plexus so often mentioned in the Edgar Cayce material. The lacteal ducts and especially the lacteal duct plexus were the source of most epilepsy as diagnosed by Edgar Cayce. Adhesions (sticking together, adherence) in the lacteals was said to disrupt nervous system coordination resulting in seizures. Hot castor oil packs and abdominal massage were frequently recommended by Cayce in such cases to break up the adhesions.

The lacteal duct plexus was also said to be a key vibratory assimilation center which was utilized in certain forms of electrotherapy (i.e., the wet cell battery) recommended by Edgar Cayce.



LYMPH CHANNELS AND GLANDS DRAINING THE TRACTUS GENITALIS (SAVAGE)

Fig. 147. The tractus genitalis is abundantly supplied by lymphatics and consequently possesses a rich lymphatic drainage. The tractus genitalis is peculiarly liable to be attacked by bacterial infection and carcinoma - both manifest in the annexed tractus lymphaticus. Infectious or carcinomatous material, on account of the luxuriant anastomoses of the genital lymph channels may appear to avoid certain of the adjacent genital glands and to attack glands more distant from the genitals. In other words the infectious or carcinomatous material may not attack the genital lymphatic glands in the direct order of the course of their arrangements. This illustration demonstrates the futility of attempting to extirpate all the lymphatic glands attending a carcinomatous infected genital tract - microscopically one is incapable of deciding whether a lymph gland be hypertrophied from bacterial infection or carcinomatous infection.

THE LYMPHATIC SYSTEM

HISTORY OF THE LYMPHATICS

Vasa lymphatic or lymph vessels arising from all parts of the body were discovered almost simultaneously by George joylife (1637-1658), an English physician, in 1652; Olaf Rudbeck (1630-1702), a Swede of Upsala in 1651; Thomas Bartholin (1616-1680), a Danish anatomist of Copenhagen from 1650 to 1667. Bartholin proposed the name vasa lymphatics. (Robinson, 1907, p. 514)

Chyle Vessels (Lacteals).

Vasa chylifera or the lacteals were first observed in the mesentery of man by Herophilus (310 B. C.). a Greek physician living in Egypt, while he was dissecting living criminals.

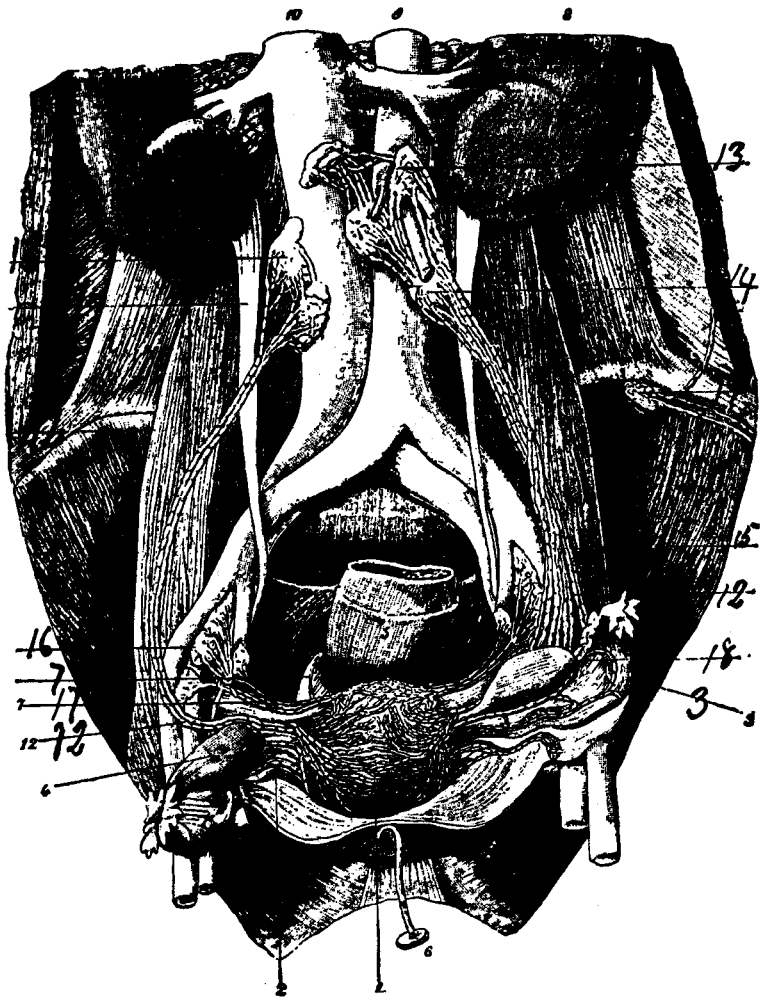
Erasistratus (340-280 B. C.), a Greek physician, observed the chyle vessels or lacteals while dissecting kids but named them arteries. However, Gasparo Aselli (1581-1626) professor of anatomy and surgery at Pavia, Italy, a prince among anatomists, discovered the lacteals while performing vivisection in a dog July 23, 1622, Aselli's work (lacteals) was published posthumous by his friends. (Robinson, 1907, p. 515)

ANATOMY AND PHYSIOLOGY OF THE LYMPHATICS

The lymph plasma performs an export and an import service. It conducts nourishment (fluid) to the cell and floats waste material (fluid) from the cell. It performs its labor through a fluid medium, saturating the cell (nourishment) and irrigating the cell (drainage). (Robinson, 1907, p. 520)

The tractus lymphaticus begins and ends in the veins. It is a venous appendage. It was a late developmental addition, differentiation of the blood vascular system - an additional circulatory apparatus.

The tractus lymphaticus resembles the tractus venosus, (a) in possessing afferent or converging vessels which course from periphery to center; (b) in being divided into two sets - superficial and deep; (c) in contour, the possession



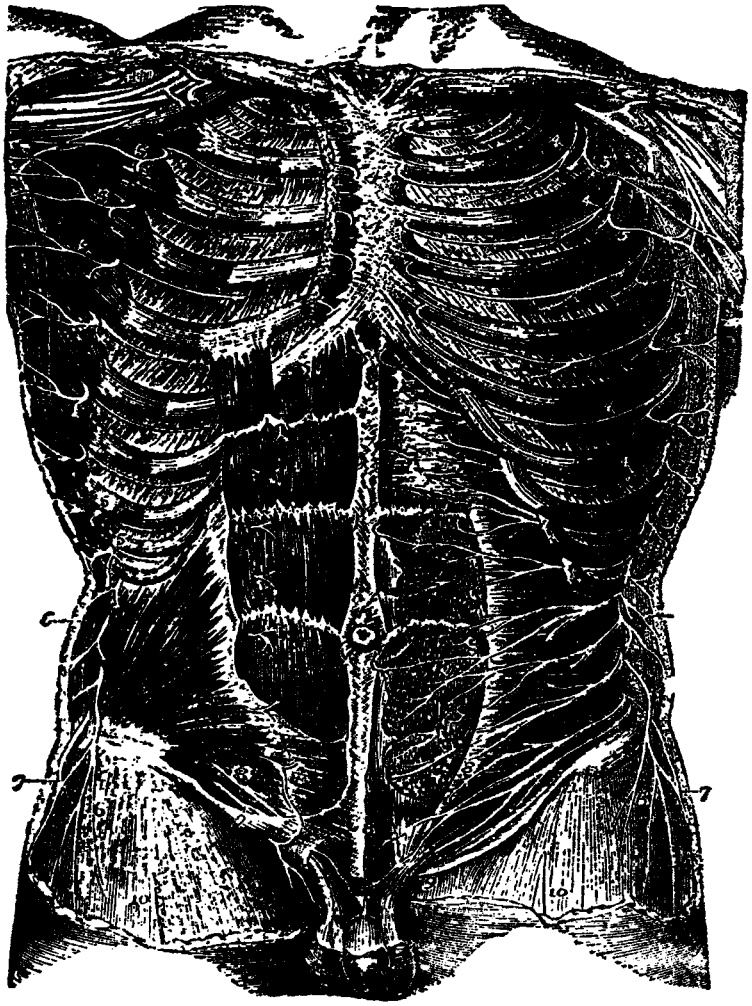
LYMPHATICS OF THE INTERNAL GENITALS

Fig. 146. This illustration of the lymphatics after Dr. Wm. Nagel and Porier demonstrates that the lymphatics accompany the vessels - in this figure they follow the utero-ovarian vascular circle (circle of Byron Robinson). The lymphatics of the genitals are of practical importance on account of the frequent location of carcinoma in the genitals and their distribution of the carcinoma through the lymphatics.

of valves - constrictions and dilatations.

The tractus lymphaticus differs from the tractus venosus, (d) in traversing glands; (e) in its reverse arrangement - I. e., the lymphatic vessel does not increase in dimension from periphery to center like the vein; (f) the progressive movements of the lymph depend exclusively on the parietes of the lymphatic vessel-that of the venous blood chiefly on the cardiac action; (g) the lymphatics communicate with intercellular spaces and serous sacs.

The tractus lymphaticus consists of: (A), (VASA LYMPHATICA*), Peripheral Anastomosing Plexuses of Lymph Vessels*, which originate in the meshes of the connective tissue. These lymph channels, converging and uniting, pass to the lymph glands, or nodes. In the pathologic physiology of the lymph vessels redness (hyperaemia) along the line of vessels and oedema are conspicuous features.... The chief location of lymphatic vessels is the connective tissue especially associated with blood vessels. The valves of lymphatic vessels are absent at their origin and in the capillaries. The valves are paired and numerous but irregularly located in - the collecting vessels, however, rare in the final collecting trunks - thoracic ducts. The arrangement of the vasa lymphatics consist of: (a) *superficial* or epifascial set and (b) *deep* or subfascial set - communicating with each other. The general organs or regions of the body are drained by converging, collecting lymphatic vessels - intermediate collecting trunks. The lymph capillaries consist of valveless endothelial tubes. The common collecting trunks consist of three coats, viz., (a) the internal endothelial layer; (b) the middle muscular layer; (c) the external connective tissue layer. (Robinson, 1907, p. 514)



VENTRAL DIVISIONS OF DORSAL NERVES

Fig. 65. A view of the anterior division of the dorsal nerves. The cut shows the nerves distributed to the muscles and skin of the abdomen. It may be easily noted how an irritation on the skin passes to the spinal cord, and thence to the abdominal muscles, putting them on tension to protect underlying viscera. Hirschfield and Leville.)

Chapter Thirteen

RELATION OF THE CEREBRO-SPINAL AND SYMPATHETIC SYSTEMS

One of the important themes which runs through Byron Robinson's work is that the sympathetic nervous system is a pervasive, powerful and life-sustaining force within the body. It has its own brain(s), processes information and carries out its functions with a significant degree of independence and autonomy. This is contrasted with the modern view of the sympathetic system as an important, yet secondary component of the peripheral nervous system.

A second major theme is that the great sympathetic system and the cerebro-spinal (central nervous system or CNS) work together in harmony (coordinate) to create and maintain health. When these systems fail to communicate and cooperate, illness results. Therapeutic interventions are largely aimed at restoring coordination between these great systems.

In Chapter Seven, the psychological aspects of this coordination were mentioned with regard to the conscious mind (voluntary) functions of the cerebro-spinal system and the unconscious (involuntary) processes of the sympathetic. Coordination of these two systems is essential for physical and mental health.

The relationship of the cerebro-spinal and sympathetic systems was so important to Byron Robinson that he dedicated a chapter to this topic [Chapter 23, "**RELATION BETWEEN VISCERAL (SYMPATHETIC) AND CEREBRO-SPINAL NERVES**"]. He described anatomical and physiological differences between the systems while emphasizing that they must work together harmoniously.

The early osteopathic literature is almost identical to Robinson's work, both in concept and terminology. In fact, Robinson's work is cited in some early osteopathic texts as an authority with regard to the anatomy and physiology of the nervous systems. The recognition of the sympathetic system as a great system which

maintains a close relationship to the cerebro-spinal is inherent in early osteopathic writings.

Edgar Cayce's views of the nervous system almost directly parallels Robinson's and the early osteopaths. Cayce also emphasized the importance of the sympathetic system and the importance of coordination with the cerebro-spinal. Cayce's views on the psychological dynamics of these systems (i.e., conscious-voluntary and unconscious-involuntary) was also consistent with Robinson.

One aspect of the sympathetic/cerebro-spinal relationship which Cayce often alluded to was circulation. Cayce described the sympathetic circulation (also called the "superficial" or "vasomotor") as that portion of the blood and lymph flow which goes to the surface or extremities of the body. He used the term "deep circulation" in reference to the cerebro-spinal circulation which he said was more concentrated on the "deep" internal organs such as the heart, lungs, liver and kidneys (the so-called "hepatic circulation"). I could not find information on these circulatory relationships in Robinson's work, a bit of a surprise given the close similarities between these two extensive bodies of information. The traditional osteopathic literature makes frequent references to the superficial and deep circulations without clearly identifying the nervous system associations. This is an area requiring further research.

RELATION OF THE CEREBROSPINAL AND SYMPATHETIC NERVOUS SYSTEMS

The cerebrospinal nerves practically follow blood vessels; however, they divide by acute angles and do not form plexiform sheaths around blood vessels.

The vasomotor [sympathetic] **nerves are generally distributed in the plexiform network ensheathing vessels and entering with them into the parenchyma of viscera.** (Robinson, 1907, p. 38)

The cerebro-spinal axis typifies the federal government, and is endowed with the chief rule of the animal. It is the central power and all others must submit to it. It is, moreover, to a large extent, under the will as far as motion is concerned.

Fig.66. (From Byron Robinson's life-size chart of the Sympathetic.) Represents the abdominal brain and adjacent ganglia. (55) A ganglion of the dorsal lateral chain. (61) Splanchnic. (96 and 97) Rami communicates. (67) Branches of right vagus to stomach. (69) Trunk of right vagus entering abdominal brain. (70) Phrenic nerve on phrenic artery. (71) Right abdominal brain. (72) Left abdominal brain. (73) Gastric Hepatic artery. (76) Adrenal. (79) Suprarenal (6). (82) Inferior renal ganglion. (83) Superior renal ganglion. (84, 85, 86 and 87) Ganglia on renal artery. (88) Renal artery. (89, 90 and 91) Lumbar nerves. (96, 97 and 98) Rami communicates. (101, 102 and 103) Lumbar lateral chain of ganglia. (106) Superior mesenteric artery surrounded by the abdominal brain. (107, 108 and 109) Genital ganglia. (110 and 111) Genital ganglia (ovarian) as well as (112, 113 and 114) Genito-rectal ganglia. (167) Nerves around the ovarian artery. (171) First lumbar nerve. (172) Second. (173) Third. (176) First. (177) Second and (178) Third lumbar ganglia. (182) Genital ganglion. (183) Inferior mesenteric artery. (185) Aortic branch of abdominal brain. (186) Ending of left great splanchnic in abdominal brain. (187) Superior, and (188) inferior (left) renal ganglia. (189, 190 and 191) (left) Renal ganglia.

The abdominal brain is the state government. In fact, it exercises many functions almost entirely independent. The abdominal brain sends its physiologic orders to all the visceral ganglia. If healthy, all obey, but disturbing pathologic changes cause some to stop, or act irregularly.

The automatic visceral ganglia situated in each organ represent the county or city government. The city, or county, government, is free from neither state nor federal government, but still it has normal independence which it freely exercises. The same views may be illustrated by society and labor in general where division of labor exists, and where certain sections exercise almost independent rights. Thus the sympathetic nervous system may be considered to be independent to a certain degree. (Robinson, 1907, p. 163)

The sympathetic is not merely an agent of the brain and cord. It generates action itself. It is, in general, a nerve center characterized by the power to receive sensation and send out motion., It has all the elements of any nervous system, viz.: a ganglion cell, a conducting cord, and a periphery. It is not attempted here to argue that either the cerebrospinal axis or the sympathetic nerve is absolutely independent of the other. The fact is that each nerve system has its own special duties. Both systems must be associated [coordinated] in order to carry on life's functions and purposes. It may be said that man and woman are independent of each other; but their association is required for the perfection of reproduction. In another place I have arranged quite a number of propositions to show that the sympathetic nerve enjoys a large degree of independence. In the discussion of its physiology certain topics must be discussed, in order to better comprehend the limits and factors of the field.

1. The abdominal pelvic brain, I. e., reorganizing centers.

2. A very important factor will be the vaso-motor nerves (I. e., vaso-constrictors and vaso-dilators).

3. The automatic visceral ganglia.

4. Glandular secretions (bile, urine, gastrointestinal juices, milk, ova and semen).

Fig. 67. (Byron Robinson.) From author's life-size chart of the Sympathetic. Represents the cervico-uterine ganglion. (-) The pelvic brain. (127) Second. (128) Third, and (129) Fourth, sacral nerves (left). (131) Second. (132) Third. (133) Fourth, sacral nerves (right). Note the connection of the second, third, and fourth sacral nerves to the pelvic brain. (137 and 138) Second and third sacral ganglia. (139) Branches from the second sacral. (140) Branches from the third and fourth sacral nerves to the pelvic brain (141 and 142). The pelvic brain or cervico-uterine ganglion is marked (141, 142, 143, 144) and (145) branches of it. Third sacral to the levator ani muscle (146). (147) Vesical ganglion. (148) Ureter. (149) Bladder. (150) Vagina. (151) Uterus. (152) Nerves of bladder. (153) Pudic nerve. (158) Right, and (159) left, sacral plexus. (160) Branches of hypogastric plexus which do not enter pelvic brain before distribution. (161) Fallopian tube. (162) Ovary. (163) Round ligarnent. (164) Acetabulum. (165) Spine of ischium.

5. Temperature.
6. Trophic nerves.
7. Pigmentation.
8. Reflex fibers.
9. Sleep.

The above nine divisions mark out a field for consideration. It may be broadly stated that all healthy movements initiated and sustained by the sympathetic nerves are involuntary movements.

First, we must consider the abdominal brain, the semilunar ganglia or solar plexus, in the physiology of the sympathetic. This large ganglion receives sensation and sends out motion. It is situated at the root of the great visceral artery I. e., at the foot of the celiac axis. It lies behind the stomach and entwines itself about the aorta and root of the celiac axis and superior mesenteric artery. In short, it is located at the roots of the celiac, renal and superior mesenteric arteries. It supplies all the abdominal viscera. It is a gigantic vaso-motor center for the viscera, as is shown by its location at the roots of the celiac, renal and superior mesenteric arteries - the great abdominal visceral blood way. It is connected with almost every organ in the body, with a supremacy over visceral circulation, with a control over visceral secretion and nutrition, with a reflex influence over the heart that often leads to fainting and may even lead to fatality. It rules visceral rhythm. No wonder that we may consider the abdominal brain the center of life itself, as the cranial brain is the center of mental and psychical forces!

The abdominal brain, or solar plexus, is composed of the aggregation of coalescence of a large number of ganglia. On the two sides of the abdominal brain are situated the semilunar ganglia - compact masses of nerve cells, nerve cords and connective tissue. During many dissections I have noted that the right semilunar ganglion is the smaller, doubtless because it lies behind the inferior vena cava, and hence has suffered from pressure atrophy. Each of the semilunar ganglia receives the great splanchnic nerve of the corresponding side. The other splanchnics may enter it, but it is more to enter the abdominal brain. It may be here stated that although the semilunar ganglia are located on the

sides, they are practically so intimately associated with the solar plexus that we insist in combining all the names into one, viz.: that of Abdominal Brain.

All plexuses or strands of nerves are secondary. The significance of the abdominal brain in the visceral physiology, i. e., in life, may be compared to that of the sun over the planets. The influence of the sun rules the planets, though they are influenced by other suns and planets (e. g., the cerebrospinal). The abdominal brain has ganglion cells (brain centers), nerve strands (nerve conductors) and a peripheral nerve apparatus, just as the cranial brain possesses a central, conducting and peripheral apparatus. The abdominal brain can live without the cranial (shown by living fetuses with no trace of cerebrospinal axis), while the cranial brain and the cord cannot live without the abdominal brain.

The great sympathetic ganglia, of which the abdominal brain is the ruling potentate, is the center of life itself. So long as the forces of life, assimilation, circulation, respiration and secretion proceed undisturbed, as in health, the abdominal brain remains a silent, steady, but ceaseless worker; but being unbalanced by peripheral or central irritation, it quickly manifests or resents the insult. From the abdominal brain large plexuses with numerous nerve strands pass to every abdominal viscus, connecting the viscera into a delicately balanced, nicely ordered, exquisitely, arranged apparatus for the object of maintaining life. The nerve plexuses or strands are arranged along the highways of nourishment - blood and lymph vessels, and vary in size according to the importance of the viscus supplied. (Robinson, 1907 pp. 204 - 207)

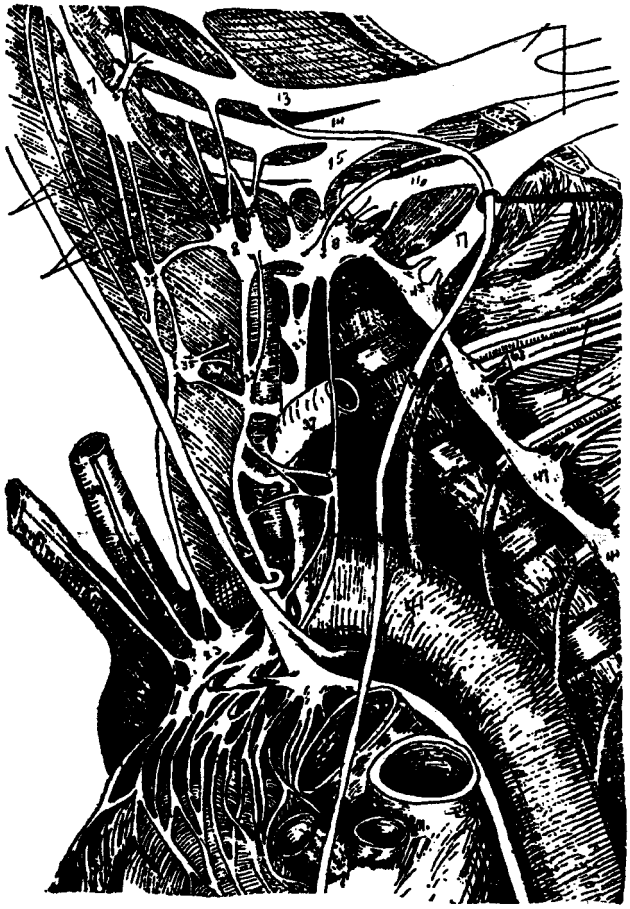


Fig. 69. (From Bryon Robinson's life-size chart of the Sympathetic.) Represents the upper or neck and chest portion. (7) Middle cervical ganglion. (8, 8) Inferior cervical ganglion. (13, 14, 15, 16) Cervical nerves. (17) First dorsal nerves. (18) Phrenic. (19) Branch from inferior cervical to phrenic. (20, 21) Cardiac nerves from middle and superior cervical ganglia. (22, 22, and 22) Cardiac nerves from inferior cervical ganglion. (23) Wrisberg's ganglion (of the heart). (24 to 33) Cervical rami communicantes. (34 and 35) Ganglia on superior, middle and inferior cardiac nerves of the cervical ganglia. (36) Verteral artery. (37) Left subclavian artery. (38) Innominate artery. (39) Right subclavian artery. (40) Carotid artery (41) Aorta. (43) Intercostal arteries. (45, 46 and 47) Dorsal lateral chain of ganglia. (63) Communicantes.

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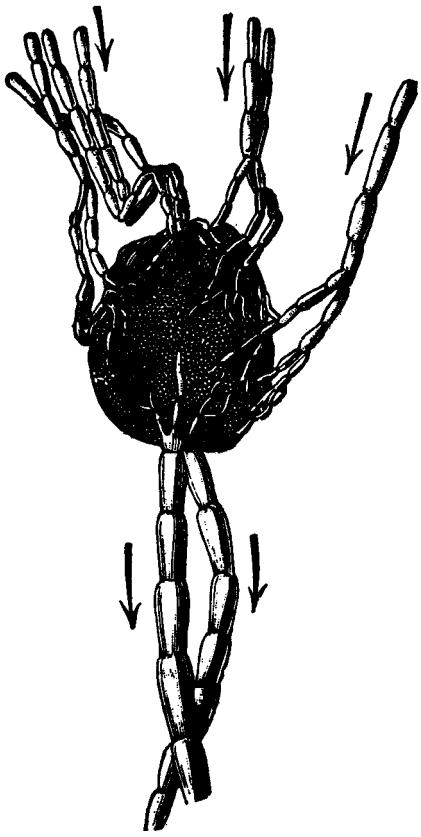

A LYMPHATIC GLAND WITH ITS AFFERENT AND EFFERENT VESSELS

Fig. 143. The valved afferent vessels are more numerous than the valved efferent (Testut).

Appendix B

ABDOMINAL EPILEPSY AND ABDOMNIAL MIGRAINE

The following references are representative of the abdominal epilepsy and abdominal migraine literature. They are included in this appendix as an aid to readers interested in further pursuing the topic.

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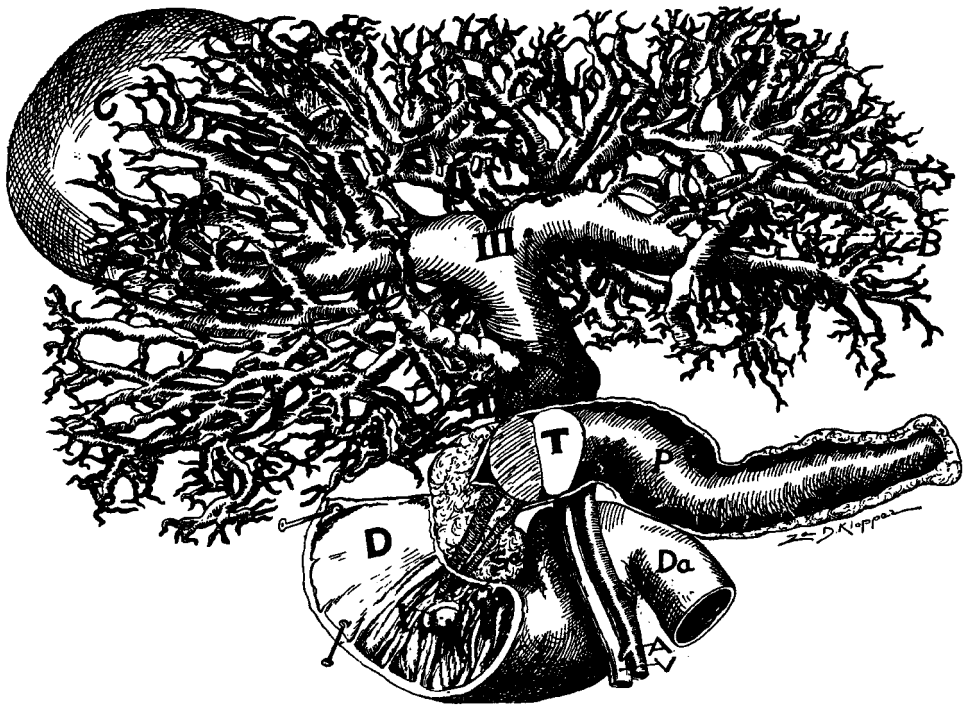

DILATED DUCTUS HEPATICUS

Fig. 78. The dilated hepatic ducts impress with the idea of the quantity of nerves attending the ducts in the form of a nodular, fenestrated, anastomosing plexus ensheathing the channels.

Appendix C

CONTENTS OF *THE ABDOMINAL AND PELVIC BRAIN*

(THE COMPLETE WORK AS PUBLISHED IN 1907)

SELECTIONS FROM THE ABDOMINAL AND PELVIC BRAIN

The original work (in its entirety) is being made available in an electronic format for those individuals who would like to study the complete work. A CD of the complete ***The Abdominal and Pelvic Brain*** in WordPerfect 6.1 format is available from:

David McMillin
2516 Townfield Lane
Virginia Beach, Virginia, 23454.