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VARIOUS

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AUTOSEROTHERAPY.*

ELMO P. PORTERFIELD, M. D.

ST. LOUIS.

In presenting this subject, I desire to state that no especial attempt will be made to explain the biologic, metabolic or serologic changes which take place, but will rather purpose presenting for your consideration a few cases and their results, by the autoserotherapy method. It will be remembered that in 1910 Mayer and Linser reported their results from using the human serum of a pregnant woman, who was perfectly healthy, on another pregnant woman, who showed various evidences of toxemia of pregnancy, as in eclampsia, hyperemesis and various skin manifestations. In 1911 Linser reported 24 cases of urticaria treated with serum. In 1912 Henck reported his success in such cases as pruritus

senilis, urticaria and dermatitis herpetiformis. In 1913 von Lumbush reported his favorable results in pemphigus, he, however, using blood and serum. In 1914 Ullman's reports were much less favorable. The blood and serum of all these cases reported were blood and serum from humans other than the patient to which it was given. In 1913 Spiethoff was the first to use the patient's own serum, in combination with foreign serum. He reported very favorable results in prurigo, pruritus, chronic urticaria, and psoriasis. In 1914, Gottheil and Satenstien reported, in the Medical Record, their experiments in the treatment of skin diseases with human serum; these reports were more or less uniform and extremely satisfactory, especially in cases of psoriasis, when followed by a weak local application of chrysarobin ointment. In December, 1914, Fox, New York, reported uniform and favorable results in the treatment of psoriasis, some 28 cases were reported. His method consisted in using the patient's own serum plus the application of a 10 per cent chrysarobin ointment. He seldom gave over three injections and usually his cases cleared up in three or four weeks. Fox usually took 50 cc. of blood from which he obtained 15 to 20 cc. of serum, which was given to the patient at once, intravenously.

My own work was not only prompted by these reports but by the results I had obtained in several cases of pleurisy with effusion, in which a part of the serum exudate was withdrawn and immediately 1 to 2 cc. given subcutaneously, once daily, for three days. All these cases proved negative for T.B. by inoculation in guinea pigs. The results obtained were alike in all followers of this treatment, prompt absorption of the remaining serum exudate, and in none of my cases did it reform. Knowing that the fluid in pleurisy is exudative in character and that many skin diseases are merely exudates, it occurred to me that the patient's own serum ought to have a favorable result in reducing the exudative processes of the skin as it does in pleurisy with effusion. So I used it in five cases of seborrheic eczema that had resisted all of the many used forms of external and internal treatment. I usually withdrew 10 cc. of

* Read before the St. Louis Physicians Club, April, 1915.

blood from the arm into a sterile test tube, and immediately defibrinated it, then centrifuged it, and, without filtering, placed it in an ice box for 24 hours, after which it was filtered through gauze, through which a few blood corpuscles probably passed 1 cc. of this serum was then injected subcutaneously in the forearm. After 24 hours no change could be noticed; after 48 hours the eczematous areas were much paler, after 72 hours there was a decided paleness, and after five days the skin appeared entirely normal though the patient still complained of some itching; after ten days to two weeks the itching ceased. These experiments in seborrheic eczema have been uniform in result, no matter whether the condition existed in the ear, on the hands, face or body, extremities or scalp. I then used the same treatment in three cases of psoriasis, using the method advocated by Fox, as far as carrying out the use of chrysarobin; however I used less serum and not on the same day the blood was taken. In these three cases of psoriasis one on the scalp cleared up in three days, the other two in ten days. About a month ago I saw a case of syphilis which had been given three intravenous injections of salvarsan and which since the injections, developed a papular eruption, of a strawberry red color, over the entire body. This case was given 2 cc. of his own serum as given in other cases, and the eruption disappeared in five days, and has not returned. The only theory that I present for this phenomenon, is that most all diseases have a natural tendency to create within the body antibodies, through which immunity is acquired in varying degrees; in some apparently for life, others for a period varying from a few years to many years. It is when these antibodies exist in sufficient numbers or strength that this variation of the degree of immunity can be attributed. However, in those diseases in which the antibodies do not exist in sufficient strength or numbers to give proper resistance, it is in these diseases that we find the patients chronic, or possibly suffering from some form of anaphylaxis. I apply this especially to skin diseases. I believe that in the serum of these cases lies the particular element that is necessary to start within the system a change in which there will be an increase in the formation of antibodies of sufficient strength and numbers to bring about the necessary changes which will result in a cure of eczema, psoriasis and numerous other exudative skin lesions, the same as we experienced in cases of pleurisy with effusion. I have no hesitancy in saying

that in spinal injections of salvarsanized serum the most important element introduced is the serum and not the small amount of salvarsan that might have been in the serum. It might be well to subject some of these cases to spinal serum injection prior to taking salvarsan to determine which is the better.

714 Century Building.

HEALTH AS RELATED TO MENTAL EFFICIENCY.

L. HERBERT LANIER, M. D.

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In a study of health as related to efficiency to grasp the magnitude of its meaning we have to go back in history to the dawn of creation to learn that every sacrifice for progress, every struggle for freedom, every conflict, and every achievement, had for its guiding star the preservation of the health of the nation. Health is the greatest fact in history and when we cease to observe the unchangeable laws of hygiene and sanitary science, then we shall witness the inevitable doom of the republic.

The same conditions that caused the fall of Persia, Egypt and the Roman Empire are today retarding progress and a higher civilization in Africa, China, India, Mexico and other countries, and this, upon general analysis, is due to the defiance of the laws of God, hygiene and health; hence it is that we witness the whole world today interested in the first law of nature, "self-preservation." Nothing more interesting, more absorbing and more inspiring was ever written than the health maxims of Hippocrates, the great father of medicine, who first taught the importance of preventing, rather than curing disease.

I shall invite your attention to the fact that hygiene and sanitary science correctly applied have made possible the construction of the Panama Canal, the greatest engineering feat ever recorded in the annals of history; yet for 400 years previous to the time the United States acquired Panama it had been considered the most unhealthful spot in the world, the hottest, wettest and most unsanitary region on the face of the world. How different we find it today, quite as free from disease as is the southern part of the United States.

Each civilized nation figures that every healthy citizen increases its assets and each places a stipulated valuation on such, while it places a small estimate on the worth of

individuals with physical imperfections, though they be not sufficient to incapacitate them for all work. Degenerates, mental and moral perverts, the blind, the deaf, the dumb, the paralyzed and confirmed invalids are placed on the liability ledger and considered a charge on the state and government.

The most prevalent disease in America today, especially regarding its influence on mental efficiency, is neurasthenia, or nerve prostration. It is rarely recognized in its early stages, it is a condition in which the nerve and brain cells are in a state of pathological fatigue and unable to perform their functions with any degree of unison and harmony. It may result from various chronic diseases, mental worry or emotion; overwork, a neurotic temperament, alcoholism and the tobacco habit are contributing causes and, according to Jackson, "When the expenditure of nerve force is greater than the daily income, physical bankruptcy sooner or later results." Other potent causes, though less easily dealt with, are the worries attendant upon love affairs, religious beliefs and doubts, and domestic troubles.

Heredity plays an important part in the production of neurasthenia. We do not all start in life with the same amount of nerve capital. Parents who have led irrational lives, indulging in excesses of various kinds, or who have been subject to nervous complaints, or to mental trouble, may transmit to their children an organization which is defective, because of the absence of "nerve force." Such individuals start life handicapped, with a neuropathic predisposition, and furnish a considerable proportion of our neurasthenic population. As Van Geison puts it: "The potential energies of the higher constellations of their association centers have been squandered by their ancestors." Again, Osler reminds us that "so long as these individuals are content to transact a moderate business with their life capital, all may go well, but there is no reserve, and in the exigencies of modern life these small capitalists go under and come to us as bankrupts."

Because of the complexity of modern business life in America, neurasthenia is found, affecting more people in proportion to population in this country, than any other part of the world, truly confirming the trite old saying: "We are burning the candle at both ends."

A patient with neurasthenia feels his mental incompetency and is conscious of cerebral exhaustion and nervous unrest, and soon loses confidence in his ability to ac-

complish as much as he formerly did and finally does not try. There is no routine treatment for this condition, every case is a law unto itself, but there is a great deal in prevention and since the causes have been enumerated the prevention is at once suggested.

The perfect symmetry of form, broad shoulders, full round face, erect body, smooth features, sound and even teeth, shapely limbs—in all the marvelously fine physique of the ancient Greeks and Spartans furnishes a striking contrast to the physical aspect of a large proportion of the inhabitants of the world today; on every side we see round shoulders, weak lungs, hollow cheeks, sunken eyes, bald heads, decayed teeth, lean and distorted figures; all of which clearly demonstrates that the vital and inviolable laws of health have been disregarded and their "sins have surely found them out."

Malaria, an infectious disease conveyed by mosquitoes and found principally in southern Russia, Italy, India, Africa, South America, Mexico and in the southern part of the United States, has proven to be the chief obstacle to overcome in these places. Strenuous endeavors are being made to develop these countries to a health position parallel with that of Germany, England and the northern part of the United States.

Simultaneously with the foci of epidemics of malaria becoming more restricted in the countries mentioned, an unprecedented wave of developmental activity has swept over them, which has resulted in stable government and constructive legislation, the erection of schools, the education of the masses, profitable farming and, last but not least, hundreds of men of great intellectual attainment who rank among the world's best, in art, science, literature and commerce. What has caused the change? Simply screening the houses and the enforcement of hygienic and sanitary measures that limit the spread of a disease which saps the vitality and causes malaise and mental inertia. Malaria has been ten times more detrimental to the southern states, in arresting development, than was the civil war; but at last its rapidly disappearing because the laity now know how to combat it.

The superlative degree of mental and physical perfection which we should seek can only be obtained by returning to the "simple life", living as much as possible in the open air and by observing the unchangeable laws of hygiene and sanitary science, thereby developing a strong vigorous body, capable of enduring the demands

made upon it as a result of prolonged mental effort which each man must make to master his world problems.

The result of the eradication of malaria and other infectious diseases from those places where they have been most prevalent is obvious, better health means renewed vigor, it will engender the determination to succeed in life, it will lift the fog that clouds the vision and point the way to a higher plane of physical and mental possibilities.

The fountain head of the problem of conserving the health, that the greatest possible degree of mental efficiency may be attained, is to be found in the care and training of children, or we might go even farther and say, in eugenics, a solution of the problem is here offered, and, indeed, the whole world is studying eugenics and the proper care and training of children. This is resulting in a marvelous improvement in physical and mental accomplishments at given ages. May we not hope that each day will witness still greater interest in the subject of properly safeguarding the health of children and children yet to be born, that they may grow up strong and vigorous, to be valued and respected citizens, an honor to their parents and an asset to the state?

A child's future, its education, its livelihood, its appreciation and enjoyment of all the beauties of creation depends upon the preservation of its health, but in spite of this fact we see daily innocent little children sacrificed on the altar of ignorance and neglect. What school child, or adult if you please, can accomplish anything worth while when suffering from adenoids, enlarged tonsils, colds, catarrh or any other morbid condition which saps the vitality of its victim and clouds an otherwise healthy brain. Shall we allow children to grow up and become non-entities and social outcasts because they are physical wrecks? Many neglected diseases of the eye, ear, nose, throat and other organs predispose to mental and physical inertia, and may finally result in idiocy and degeneracy. The vital part played by the organs of special sense, in the conduct of human affairs is unquestionable.

The eyes are more frequently neglected than the other organs of special sense, many children are born blind or cross-eyed, and continue so because they are refused an operation that will straighten the eyes or restore their vision. Many children, victims of near sight, astigmatism or muscle anomalies can be benefited by glasses and can accomplish little without

them. Among the symptoms of the various forms of eye trouble so noticeably benefited by glasses, but usually first otherwise attributed because they are of a reflex character are headache, ocular pains during the use of the eyes, heart burn and nausea. Some patients suffer from indigestion, nervous attacks, insomnia, accommodative and muscular athenopia, with gastric or nervous symptoms, irritable tempers, etc., the eye cause of which would be determined only by an oculist.

To consider all phases of this subject would require a voluminous paper, but we are chiefly concerned with the methods whereby the individual and public health may be conserved and intellectual progress continued.

How many physicians know that the majority of feeble-minded and insane people are so because of either alcoholism or ancestral abnormalities, yet this is a fact, and this state of affairs would be eventually eliminated from the calendar of future events by universal eugenic marriages and abstinence from intoxicating drinks. What an asset to the state and government, to have its inhabitants living normal lives, instead of witnessing the physical and mental degradation so conspicuous today.

The observance of a rigid hygiene and a strict sanitary code, by all the people, is the next most efficacious method of preventing disease, which in its myriad forms has proven the greatest enemy to civilization that the world has ever known.

231 State National Bank Building.

RETROSPECTIVE.

D. L. FIELD, M. D.
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The practice of medicine, because of the inability of any one man to master all the knowledge of the present science, has developed a large number of "specialists." The old-time family physician—if there is such a thing in existence yet?—is almost extinguished. We send surgical cases to the surgeon; sore eyes to the oculist; uterine diseases to the gynecologist, and so on.

That there are specifics for any disease, is an idle dream; a figment of the imagination; and no man who is grounded in the fundamentals of the science, can promulgate such a doctrine, except from a sinister motive. The young students who sit at the feet of the modern "Gamaliels" of our colleges, can but see, and learn the fallacies of many dogmas that are rampant in the medical world today.

Medicine is not yet what it will be some day, and is not yet free from many absurdities which once characterized it. There are still vagaries, and entirely too much empiricism, even among those who should know better! The ignorance and superstition of the past are hard to remove. Among the most absurd vagaries, are the claims of "specific medication!" It is a relic of the most primitive days of medicine—revamped, and now paraded as an infallible dogma; and such specious arguments have now a considerable following. There can be no specific medication! Disease is not to be always treated *per se*; but each individual case must be determined from the standpoint of the patient himself. Yet it is not strange that the idea of "specifics" is one that takes hold of the popular mind; "that there is a specific remedy for every ailment, and that every symptom has its corresponding drug which is good for it? Perhaps, though, the more superficial the education of the practitioner, the stronger the faith in specific medication. While this is true, it is passing strange, that in the full blaze of the twentieth century, such a fallacy should exist. There was a time, when it may have been excusable, but there is absolutely no excuse for such a claim now. We are crowded with more fads, fancies, fallacies, and cruel humbug, now, than ever were. It is "lo here and lo there." Any attempted exposure of such pretensions is futile.

With all the humbugs with which the practice of medicine has been as is yet, there has still been a steady progress and development in an honest endeavor to practice medicine scientifically and intelligently. It has not lagged behind in the march of progress. It has advanced in experimental research, manipulation and philosophic reasoning. Fifty years ago the science of medicine began to undergo a sort of revolution, which was the effect of experimental demonstration, by which new truths were brought forth, and erroneous theories relegated to oblivion. The time has come when no one is conceded the right to speak or write "ex cathedra," and no theories find favor, unless based upon solid and established facts.

It is stated that 5,000 criminals are detected annually in England by means of finger-prints. The system, which has been in use in India for some years, was introduced in England in 1900. In the far East a thumb mark is the royal sign manual.



SELECTED ARTICLE

CLINICAL LECTURE ON JAUNDICE.*

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LONDON

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Jaundice is the classical example of a striking symptom of varying significance. At the outset it will be well to consider the natural history of the bile pigment, so as to appreciate more fully the effects of a departure from the normal course of events.

In all probability the red corpuscles are ordinarily broken down in the liver. Hematoporphyrin which is isomeric with bilirubin, is set free from the hemoglobin molecule. The bile pigments, bilirubin and the more oxidized biliverdin, on leaving the liver, are stored up for a varying time in the gall bladder and are then discharged by the common bile duct into the intestine. In the intestine the bile pigments are reduced by bacterial action to stercobilin, the normal coloring matter of the feces. A certain amount of this is reabsorbed by the intestinal vessels and is excreted by the kidney as urobilin. Urobilin is not the chief pigment of the urine, which is urochrome, and most of the urobilin normally is further reduced to a chromogen. If urobilin is excreted as such it means either that (1) the destruction of red corpuscles is excessive, or (2) an excessive time is given for reabsorption, as in intestinal obstruction, or (3) there excessive reduction owing to an abnormal amount of intestinal putrefaction. If no bile pigment enters the intestine there can be no urobilin in the urine, and there is no satisfactory ground for stating, as is sometimes done, that urobilin in the urine is evidence of the existence of gallstones in the biliary passages.

Obstructive Jaundice.—In all forms of jaundice, except one, jaundice is due to obstruction somewhere in the biliary passages. Sometimes the obstruction is gross and obvious, affecting the main ducts; sometimes it is not obvious, and can only be demonstrated microscopically as catarrh of the smaller ducts. In the former group the obstruction may be within the lumen of the common duct (mucus from catarrh, gallstones, parasites), or in the walls of the duct (stricture, congenital atresia, new growth), or pressure on the duct from without (new growth in the head of the pancreas or in the lymphatic glands in the portal fissure).

It is important to observe that stones in the cystic duct do not cause jaundice, but the gall bladder becomes distended with clear mucoid fluid. Gallstones in the common duct, on the other hand, cause jaundice, but do not dilate the gall bladder. So that if there is jaundice with an enlarged gall bladder, gallstones ought not to be diagnosed, unless there is evidence of one stone impacted in the cystic and another in the common duct, a condition which must be very rare. Courvoisier long ago laid down the rule that if the common duct is obstructed by a gallstone the gall bladder does not enlarge, but if obstructed by something else, it does. We are now in a position to understand the reason for this. In the first place, gallstones do not usually produce so complete an obstruction that no bile can leak past the obstruction. A clay-colored stool may contain stercobilin, though excess of fat in the stool may completely obscure that fact. Nevertheless, extraction of the stool with acid alcohol, or amyl alcohol, may show the presence of stercobilin, which may be recognized by the spectroscope or by the brilliant green fluorescence which it gives with zinc chloride and ammonia. In the second place, gallstones are associated with a pre-existing cholecystitis, and this may lead to so much thickening of the gall bladder with surrounding adhesions around that it cannot enlarge.

On the other hand, a new growth in the head of the pancreas usually obstructs the common duct so completely that no stercobilin can be extracted from the stools, while the gall bladder, not having been the seat of previous disease, can enlarge. The occurrence of painless, persistent and completely obstructive jaundice in an elderly person should raise the suspicion of new growth of the pancreas, particularly if the gall bladder enlarges. It is worth while noting also that in this condition the liver is seldom greatly enlarged by metastatic deposits as so commonly occurs in new growth of the rectum, stomach or elsewhere in the abdomen, although there may be a slight general plumpness of the liver from distension of the intrahepatic ducts with bile which cannot escape into the intestines.

The cases of jaundice without obvious obstruction gave rise to much controversy in the past. It was known that the hematinoid of old blood clots was chemically identical with bilirubin, and that any drug that broke down red corpuscles caused jaundice. The conclusion was naturally drawn that jaundice was hematogenous.

But then it was found that if the liver were excluded from the circulation before the hemolytic drug was injected, hemoglobinuria resulted, instead of jaundice. Further observations showed that all the hemolytic drugs also excited a catarrh of the smaller bile ducts, a descending cholangitis obstructing them and leading to resorption of bile into the general circulation. Jaundice of toxic origin, such as occurs in phosphorus poisoning, yellow fever and acute yellow atrophy of the liver, is similarly explained.

Acholic Jaundice.—But soon after the theory that jaundice was always obstructive in origin seemed firmly established, a group of cases was recognized to which the discarded term "hematogenous" would fairly apply. To this group the name of "congenital family cholemia," or "acholic jaundice" has been given. As the condition is a rare one, I need only say here that the patient may be born jaundiced or become so soon, after birth. Jaundice persists with little or no variation for many years. Bile pigment is present in the serum and in the stools, while it is absent from the urine. The spleen is always enlarged, and there is considerable anemia. Yet the patient has good or fair health and shows normal resistance to intercurrent diseases. The condition tends to appear in more than one member of the family, and in successive generations. The most striking pathological feature is the undue fragility of the red corpuscles, which are hemolysed by a dilute salt solution, which has no effect on ordinary corpuscles. We may conclude that there is a chronic hemolysis of unduly fragile corpuscles occurring so slowly that it does not excite catarrhal cholangitis but leading to pigmentation of the serum and tissues just like the yellow staining in old blood clots. It is not known how this pigment escapes from the body without affecting the urine.

The Results of Obstructive Jaundice.—We may next consider the effect on the body of the alterations in the course of the bile which follows an obstruction to the small intrahepatic ducts or the common bile duct.

Within two hours of the occurrence of an obstruction, the bile reaches the blood stream by way of the lymphatics and the thoracic duct. This is much sooner than it appears in the conjunctiva or skin. Bile salts *in vitro* are marked by hemolytic due to their solvent action on the fatty substances of the red corpuscles. And the serum of a jaundiced patient will readily hemolyse foreign corpuscles so that it may

be impossible to carry out Wasserman's test because hemolysis occurs in all the tubes. Yet jaundice is not typically accompanied by secondary anemia, for the patient's own red corpuscles acquire a heightened resistance to bile salts, which increases with the intensity of the jaundice. Herein it differs from acholuric family jaundice. Anemia, may, of course, result from the cause of the jaundice as in malignant disease of the liver, but it is not produced by the jaundice. One definite result of bile passing into the blood is slowing of the pulse. High tension usually accompanies a slow pulse, but, in the bradycardia of jaundice, the pressure is low and the pulse dicrotic. High tension stimulates the cardio-inhibitory centre in the medulla, and thus slows the heart through the vagus, but bile salts have a directly depressing effect upon the heart. Hence, the slow pulse with low blood-pressure. The action can easily be demonstrated by applying a 1 per cent solution of bile salts to the isolated heart of a frog.

Bile pigment appears in the urine soon after its appearance in the blood serum, and before it can be detected in the conjunctiva. Naturally, as jaundice clears up, the pigment disappears from the urine last. The best test is Gmelin's, the play of colors obtained on addition of fuming nitric acid, green being the most important tint to look for. Rosenbach's modification of dipping filter paper into the urine, and then placing the acid on the paper is the easiest way of doing the test. The green color given on pouring tincture of iodine on to the surface of the urine is not so sensitive a test. Bile salts may be found in the urine even before bile pigment. The only test of any value is Matthew Hay's. Flowers of sulphur poured on to the urine sink if bile salts are present, owing to reduction of surface tension. No other test is sensitive enough to recognize the small quantity of bile salt which may be found in urine. But the majority of cases of jaundice do not show any bile salts in the urine. It might be thought that, from their presence or absence, we could draw some conclusion as to the cause of the jaundice, but unfortunately this is not the case. The bile salts which normally enter the bowel are reabsorbed and used over again several times. Copeman's observations on biliary fistulae show that soon after the fistula has been established the salts in the bile fall to one-tenth of the normal amount, since reabsorption cannot occur now. This suggests that bile salts are secreted and reabsorbed approximately ten times under normal conditions.

Bile is partly an excretion, partly a secretion. The bile pigments, the mucin and the cholesterol, are excretory in character, while the bile salts have a secretory value. This combination of an excretion which has to be continuous with a secretion which is only required during digestion is effected by the gall bladder. The clay-colored stool of jaundice, as already explained, may contain some bile pigment, but the return of normal pigment to the stool is evidence of the cessation of obstruction to the bile duct. Bile precipitates undigested protein and, in some way, accelerates the digestion of starch. But its main digestive value is in connection with the fats. Bile salts permit of closer contact between the watery digestive juices and oily fluids by lowering surface tension, while lecithin and cholesterol help to dissolve fatty acids and soaps, including the otherwise insoluble calcium and magnesium salts. Even in acid media the action continues because the bile acids, which are now set free, can dissolve fatty acids. Bile salts also play an important part in promoting the absorption of fat by lowering surface tension. We can therefore determine in a case of fatty stools whether the pancreatic juice or the bile is at fault. In normal feces, the saponified and unsaponified fats are approximately equal in amount. Pancreatic juice effects the splitting of fats which must precede saponification, so that, if the excess of fat is due to a pancreatic defect, neutral or unsaponified fat will be in excess of the split fat. On the other hand, bile salts provide for the absorption of the fat already digested by the pancreatic juice, so that, when the excess of fat in the stools is due to loss of bile, the split fats will be in excess because they cannot be adequately absorbed.

It is due to this difficulty in absorption of fat that jaundice is so commonly associated with wasting even when the jaundice is not due to a wasting disease like carcinoma. Theoretically, it should be possible to correct this by liberal diet of proteins and carbohydrates which can be digested and absorbed in the absence of bile. Practically, however, the reflex digestive disturbances which so frequently accompany jaundice make this difficult and consequently the patient is compelled to consume his tissue fat.

Bile is a natural laxative, as the bile salts stimulate peristalsis. Jaundice is, therefore, apt to be accompanied by constipation. It is claimed that bile is antiseptic in its action, and it is certain that, in its absence from the bowel, there is excessive putrefaction as evinced by the rise in the