lutely impossible to correct faulty postures unless you correct the faulty position of the feet as well. You can not adequately correct the foot condition unless you correct the body mechanics. I worked in the "Foot and Mouth Camp," as the boys in France called it, the Posture Camp, in which 80 per cent of the men were reclaimed. It was marvelous to see how these men were sent back to the lines after they had entirely broken down.

Dr. Talbot did not lay a great deal of stress upon physical education and the appliances used, because usually these patients are turned over to the orthopedic man. It would not be amiss to say a word to you who are not orthopedists. Dr. Talbot showed one picture with an antero-posterior pad which is very simple. It is simple to adjust a pad with two stays of steel which follows the contour of the sacrum. In front is a rectangular steel piece connected by a strap which fits between the spine of the ilium and the trochanter and a second strap which follows the course of the ilium. This pressure against the abdomen with a fixed point against the sacrum assists in maintaining the correct posture. The severe cases in which this type of apparatus is not sufficient are corrected by a pad with a back brace. It is the same as the anterior pad, but it has two uprights of strong steel connected at the lower border of the sacrum with a cross piece of strong steel. This will maintain proper posture in the most extreme cases.

*Dr. Robert A. Strong, Pass Christian, Miss.—*I wish to emphasize only one point: the earlier we start correction the better will be our results because, "As the twig is bent the tree inclines."

*Dr. Walter D. Brown, Beaumont, Tex.—*I would like for Dr. Talbot to tell us what percentage of cases of cyclic vomiting he considers can be cured by this method. I mean cases other than those which are found to be due to appendicitis.

*Dr. Talbot (closing).—*I think we are very fortunate in having Dr. O'Ferrall to speak from the orthopedic point of view. I purposely did not emphasize the use of mechanical supports because after Dr. Brown's and my first paper came out we were flooded by letters from various parts of the country wanting to know where they could get one of these supports. There are good supports and bad supports and it is only the orthopedist or such physicians who have studied the mechanics of the body who know how to build and apply a support, and for that reason I have not emphasized it. I hope you gentlemen will not undertake to apply abdominal supports indiscriminately, because you may do harm. A child came in recently wearing an antero-posterior pad which was pushing in the middle of the abdomen and pushing out the lower part, thus doing more harm than good; in fact, it was doing the same sort of thing that you and I have all seen at post-mortems of women who had worn their corsets laced too tight. I think that phase of the subject belongs distinctly to the orthopedist and I think that if you intend to fit supports you ought to become

orthopedists as well as pediatricians. I do not believe any one can do both jobs well.

Dr. Strong emphasized that the earlier we start the better and he is quite right. It is the point of view that all pediatricians should have, namely, that we ought to prevent these deformities which are a serious menace to the health of many individuals, especially if they are put under any stress.

In regard to Dr. Zahorsky's question on malnutrition, I do not know what to say, but whenever I see a case of bad body mechanics I have it corrected.

It is possible for me to interest parents so they will correct these deformities in more instances than it is for the orthopedist to do so because I will not get any money out of it and the orthopedist will, consequently the parents are willing to listen to me, and I prepare them for the orthopedist. I have seen very pretty results from some very obscure conditions.

In answer to Dr. Sanders' question, you put them in the position of extension immediately after meals and keep them there for thirty minutes.

I left Dr. Brown's question to the last. I do not want to appear to be an enthusiast, but I believe that most cases of recurrent vomiting which are not due to an infected appendix or to improper diet will straighten out when the body mechanics are corrected. I do not remember so far in my experience any failure in a case in which the diet has been properly taken care of, using all methods of diagnosis, in which the child has been properly rested and in which the child has had the mechanics of the body corrected. There have, of course, been failures where all factors could not be controlled.

MY OBSERVATIONS WITH HEPATIC EXTRACT (SOLUBLE) AS A REMEDIAL AGENT*

By A. L. LEVIN, M.D.,
New Orleans, La.

INTRODUCTORY REMARKS CONCERNING GLANDULAR THERAPY

We are often inclined to disregard the words of wisdom expressed by ancient sages. A certain wise king of prehistoric fame once said, "There is nothing new under the sun." Very few modern physicians witnessing daily the wonderful progress of medical science would give the above phrase any merit.

Studying the medicine of the Talmudic period in anticipation of preparing a

*Read before Southern Gastro-Enterological Association, meeting conjointly with the Southern Medical Association, Fifteenth Annual Meeting, Hot Springs, Ark., Nov. 14-17, 1921.

monograph on the subject, I came across a very interesting discussion on the permissibility to administer liver substance on the Day of Atonement as a curative agent in hydrophobia. In another section I read the following: "Liver substance is not meat and the consumers of it are not human beings." This sentence has no real meaning unless we interpret it in the following light: liver substance should not be looked upon as a mere food product, such as meat, meaning to interpret that it has higher properties, probably medicinal, and those who consume it merely as a food do not display good judgment. The value of liver substance occupied the minds of our sages thousands of years ago. Today we are very much alive to the vital interest which is attached to organotherapy or the administration of preparations of animal organs. Liver substance is one of those preparations used in modern medicine as a new fad. So, after all, there is some value to the phrase, "There is nothing new under the sun."

Organotherapy was known in the remote days of the Talmudic, Hippocratic and Galenic periods. Brown-Sequard has been crowned as the sponsor of scientific organotherapy. It has been used, discarded and is coming again to the front. Enthusiasts claim that the study of organotherapy, as it is occasionally called, "Hormone therapy," is daily gaining in scope and prestige. Four reasons are advanced in favor of its use, namely: (1) experimental results throwing light on empiricism; (2) standardization of glandular extracts; (3) organotherapeutic success driving drug failures from the market; and (4) the new aspects of the relationship of endocrine glands in the human economy. J. S. Taylor begins his remarkable essay on the endocrines with the following words:

"There is no occasion today to urge upon medical men the importance of the endocrines to the human economy. It is an accepted fact, and it is incumbent upon us to grasp and master the new developments as they occur."

In the human body, so far, scientists have described 16 sources from which hormones are obtained. The liver is one of the 16 sources. The purpose of this paper is to deal only with the results ob-

tained from the use of liver hormone in the form of an hepatic extract (soluble).

ACCEPTED FACTS REGARDING LIVER EXTRACTS

It is conceded that the liver hormone is still in the mysterious domain, the *terra incognita* of medicine, because very little is known about its action and the results obtained so far are not very satisfactory. Still, judging from the relationship of the liver to general metabolism, we can reasonably assume that the substance of the glands consists of certain elements that exert an important influence on the human economy.

RELATIONSHIP OF LIVER TO GENERAL METABOLISM

It is needless to dwell upon this point when we bear in mind the well known physiological facts regarding the largest gland in the body, the liver, namely: (1) glycogenic function; (2) urea and uric acid formation; (3) bile formation. In other words, carbohydrate and nitrogenous materials are under the direct chemical and metabolic supervision of the liver. One author has stated (Merck's Annual Report, 1908, Vol. xxii, p. 58) as follows:

"We may regard it as a fact which has been proven physiologically that the liver has to perform various functions in the animal and human organism. It also certainly possesses the function of producing various secretions which are of importance in the circulation and in the transformation of the products of metabolism. We can not as yet say with certainty what is the nature of these secretions, whether they are toxins, ferments, hemostatic bodies, etc."

Mairet and Vires have attempted to isolate the active constituent of the liver and have prepared various albuminous bodies from it, possessing the quality of coagulating blood. They were also able to demonstrate the presence of toxins which are to be reckoned among the soluble ferments. Gilbert and Carnot presume the presence in the liver of a hemostatic substance which prevents the blood from flowing too rapidly out of the vessels. They also believe that this or some other substance has something to do with preventing or diminishing glycemia and glycosuria by furnishing the means of storing reserve sugar. Herrmann and Gyr described a diuretic action to liver

substance. Spillman and Demange claim in addition to a diuretic action also an elimination of urea and phosphoric acid and the suppression of albumin. A number of investigators, among them Hirtz, Perrin, Crepuy, Galliard, Roncogillo and Desplats, speak of a considerable increase in the erythrocytes, resulting from the use of hepar. I wish to add my own mite that by the use of hepatic extract (soluble) prepared by Parke, Davis & Co., and given hypodermatically, I have noted an increased flow of bile, purer in appearance and character, and also a diminution of intestinal toxemia. I shall speak of it later.

METHOD OF PREPARING SOLUBLE HEPATIC EXTRACT

The manufacturers furnish the following description of their preparation:

"Hepatic extract represents the soluble extractive properties of fresh (bovine) liver. According to the process of making the extraction, this product is presumed to contain the liver hormone. The true liver tissue is carefully dissected, removing as much of the fatty portions and attachment structures as possible. It is then thoroughly washed and cut into small pieces and ground, reducing it to a soft, pulpy consistency. It is then heated on a steam bath at low temperature, after which it is treated to a technical extracting process. The residue is then evaporated to dryness by a combination of blower and vacuum at low temperature.

"*Physical Properties.*—The result of this process is a light yellowish powder with very little odor, not hygroscopic. It is readily soluble in water or physiologic salt solution, with or without the addition of a trace of acid. When dissolved in water it forms a perfectly clear solution and is preserved with chlorotone.

"*Administration.*—It is prepared in 1 c. c. ampoules, the contents of which may be considered an average dose. Each cubic centimeter represents approximately 7 per cent fresh moist gland and is equivalent to 9 grains."

THERAPEUTIC INDICATIONS

Clear indications for hepatic extract have not as yet been defined. Medical references indicate the possibility of a wide field for its use as a remedial agent. The earlier investigations have been carried on with dried and pulverized liver tissue. Merck's annual report of 1908, p. 58, mentions a compressed tablet of 8 grains. O. L. Mulot (*Long Island Medical Journal*, December, 1910, Vol. iv, No. 12, p. 496) used it in the form of a suppository. It was administered night and

morning. Gilbert and Carnot proved experimentally that the elimination of sugar given by mouth, per rectum or subcutaneously was considerably diminished by the simultaneous administration of liver. Further experiments in diabetes proved that not only experimental, but also toxic and nervous glycosuria are favorably influenced by the use of liver substance. The above authors found that in diabetes, due to insufficiency of the liver, the use of liver substance diminishes the sugar or leads to the complete cessation of its excretion, while the elimination of urine is increased. Diabetic cases, on the other hand, in which there is excessive activity of the liver coupled with enlargement of this organ and a high urea, are little benefited and may even be made worse by its use. Again, diabetes not of hepatic origin does not react to hepatotherapy. Hepatotherapy, then, is a useful method only in a certain category of diabetic patients and is also useful as a diagnostic means of recognizing the origin of this disease.

The contentions of Jousset and Lassance on this subject are also of a very favorable tone. Jousset used subcutaneously a fluid extract of liver without altering the diet and observed a considerable diminution of sugar in the urine. Lassance obtained very good results by its internal and rectal use. The indications and contraindications are the same as pointed out by Gilbert and Carnot.

Cirrhosis of the liver has also been under critical observations by Gilbert, Carnot, Vidal, Herrmann and Gyr. Considerable improvement has been noticed in the atrophic type. Even when it was associated with ascites, there seemed to be a decided diuretic action. French observers have even ventured to use such terms as "unexpectedly good results" in atrophic cirrhosis and congestive conditions of the liver. In advanced lesions of this organ or in bilious hypertrophic cirrhosis, the results were not favorable. Internally, from 100 to 300 gm. (oz. 3 to 10) of fresh liver were given. In many cases, 100 gm. (oz. 3) was sufficient, or 20 gm. (oz. 2/3) of hepar siccum. Per rectum, as much as 300 gm. (oz. 3) of fresh liver in the form of an emulsion may be given in

an enema. The hemostatic action of liver described by Gilbert is being advocated in hemorrhage, hemorrhoids and hematuria of cirrhosis, in epistaxis, hemoptysis in phthisis and in metrorrhagia. The surprising rapidity of improvement in icterus is fully described by Combe and Charrin. Cassaet used liver substance in cholelithiasis with remarkably good results in three severe cases. He also advocates its use in cutaneous eruptions produced by diphtheria serum.

Hemeralopia, which is said to have been known to Hippocrates, has been treated with cooked or roasted liver. More recently, Trantas reports improvement in this disease within ten to eighteen days, also a disappearance of xerosis of the cornea and conjunctiva when given 7 oz. daily, either stewed or roasted liver. The curative effect is due to a regeneration of visual pigment. Roncoglilo's opinion with regard to hemeralopia is that hepar counterbalances the harmful results of liver insufficiency. H. Fabry used raw sheep's liver, oz. 7/8 daily, for three days in the above disease with excellent results. Sicherer advocated cooked liver, which has the same effect. Twenty gm. of dried liver can be used, which is equal to 100 of fresh liver. E. von Leyden and P. Bergell have described a proteolytic ferment of liver having a destructive influence upon cancerous swellings. They experimented with the freshly expressed juices from the liver. The uricolitic power of the liver due to the enzyme (uricolitic ferment) is very well described by Stookey (*Jour. Med. Research*, December, 1906, Vol. xv, No. 3, p. 321). Mulot's experience with desiccated liver extract in diabetes and chronic intestinal auto-intoxication is worthy of notice. In his opinion, in giving liver extract by rectum large doses are necessary, because the portal system through the mesenteric veins bring such a small part of the medication to the place where it will do most good. In England hepatic extract is used in cirrhosis and also in gout. Mulot used it more especially in cases of chronic gastrointestinal auto-intoxication where there was a deficiency of bile secretion. He obtained success in 5 cases which showed irregular loose bowels with indican or

sugar in the urine. Hepatic insufficiency was marked and the cases failed to respond to any other medication except temporarily until liver extract was used. Relapses were prompt when medication was ceased.

Its Uses in Conjunction with Duodenal Biliary Drainage and Chronic Gastrointestinal auto-intoxication.—In the last several years medical literature has been enriched by the work of a few enthusiasts in the field of biliary affections and a new chapter dealing with a new mode of treatment has been added to medicine. The new-born infant has been named duodenal biliary or non-surgical drainage. As customary in medicine, this new fad is passing through a period of vacillating opinions as to its merits. Being interested in this subject myself and believing that our failures with this method in non-surgical cases and the surgeon's disappointments are often due to hepatic insufficiency from a chronic infection or otherwise, I looked for something to stimulate hepatic function which would probably aid both the internist and the surgeon. Hepatic extract (soluble) appealed to me and I carried on experimental observations on a number of cases, the source of the disturbances in which can easily be traced to hepato-biliary derangements. This preliminary report covers 36 cases as follows: chronic cholecystitis, 25; diabetes, 4; intestinal auto-intoxication, 4; glossalgia, 2; and carcinoma of the liver, 1. Time does not permit to tabulate in detail the interesting points in each case, but I shall endeavor to present briefly my observations with the use of hepatic extract. That it stimulates liver function was particularly observed in the following case:

Mrs. M., age 54, practical nurse, in June, 1921, began to experience a general weakness and loss in weight, poor appetite, irregular bowels, nausea but no vomiting, no pain, no temperature and a bad taste in the mouth. Tonic medication did not strengthen her. In the latter part of September she developed jaundice and slate-colored stools. When I saw her the jaundice was very marked all over the body, liver was enlarged and nodular; three attempts to obtain bile-stained duodenal contents failed. A diagnosis of malignancy of the biliary tract was made which was proven by an exploratory. Several days before the operation I gave her two injections of liver extract. The color of the stool

changed to a distinct yellowish and her skin cleared up somewhat. When the drug was discontinued the slate-colored stools reappeared, demonstrating thereby that the remaining functioning liver cells were stimulated to activity.

The cholecystitis cases were divided into groups. Fifteen received an injection one hour before the non-surgical drainage was started; 5 received injections alone without drainage, and 5 drainage without injections. The 15 who received drainage plus injections showed signs of improvement more quickly than the others. Their symptoms cleared up more rapidly, the color of the bile was more nearly normal in a shorter period, and the coated tongue with its nasty taste disappeared. A unique feature was noted in a case of a heavily coated tongue and fetor oris of a very stubborn character, undoubtedly of liver origin.

The case was that of a young man who was operated upon for a ruptured gangrenous appendix, who, months afterward, developed symptoms of chronic cholecystitis. What worried him mostly was the fetor oris and the heavily coated tongue which had to be scraped four or five times daily. He felt miserable on account of it. Everything possible was done, including twenty-four non-surgical drainages plus transduodenal lavage, without any relief. One injection of hepatic extract cleared the tongue as if by magic. Its condition returned, however, soon and was not affected any more even by daily injections of the drug. Cholecystectomy was advised. The entire biliary tract evidently was involved in a chronic infectious process.

Another similar case with marked glossalgia has been greatly relieved by the injection alone and regulation of diet without drainage. Three cases of diabetes, sugar in the urine ranging from 2 to 10 per cent and blood sugar ranging from 134 gm. per 100 c. c. of blood to 151 gm. with high blood pressures, large livers, coated tongues, headaches, great discomfort after meals, constipation, no polyuria, polyphasia or polydipsia, have improved in a remarkably short time. One of these cases had a morbid desire for sodium bicarbonate for a period of ten years for relief of heartburn. The blood sugar in all the above cases came down to an average of 115, no sugar in the urine, no gastrointestinal symptoms and reduction in the blood pressure was noted. The treatment began with a twenty-four-hour fast, a gradual increase in the daily diet and a daily injection of the

drug for a period of two weeks. After that injections were given twice weekly for a period of two months. The fourth case, however, of a very nervous type, with excessive mental strain and worry, has not been relieved materially. Of the chronic cholecystitis cases, the following is worthy of mention.

A World War veteran who was in perfect health up to the time he was gassed in France began to suffer from that time on from upper abdominal irregular cramps. He also complained of fetor oris, bloatedness after meals, constipation, loss of appetite and headaches. As customary in such cases, the appendix was made the scape goat, but the sins were not forgiven by this offering. The cramps and allied symptoms continued. After a careful examination and study of the duodenal contents, a diagnosis of chronic cholecystitis was made and non-surgical drainage was instituted. Some relief was obtained by this mode of treatment, but not to mine or the patient's entire satisfaction. Liver extract injections were started and the results obtained are remarkable. He enjoys again good health and has absolutely no pain.

With regard to intestinal autointoxication it can reasonably be judged if it is of hepatic origin that beneficial results could be expected. I shall reserve any conclusions on this point, as my observations in that field are as yet too limited.

CONCLUSIONS

My impressions with regard to hepatic extract (soluble) are as follows:

(1) It is a useful agent to stimulate liver function unless the damage is beyond repair.

(2) It must be used for a long period until definite good results have been obtained.

(3) It is of value in conjunction with non-surgical drainage, but has no power to influence pancreatic pathology.

(4) It can be used as a diagnostic agent to determine the hepatic origin of the trouble.

(5) Liver enlargements due to biliary stasis can be diminished in size in a reasonably short period if used in conjunction with non-surgical drainage. This includes acute catarrhal jaundice.

(6) The injection does not give rise to any unpleasant reactions, local or systemic.

(7) I am not certain that 9 grains is a sufficient dose.

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DISCUSSION

Dr. George C. Mizell, Atlanta, Ga.—I have had no personal experience with liver extract. In looking over the literature I was surprised to see how extensive the use of liver substances had been on the continent of Europe, but it appears that in this country we have probably been negligent, for their use has not been reported to any extent. As Dr. Levin has stated, the French physicians have used liver preparations in all forms of biliary insufficiency in diabetes, and even in severe organic conditions of the liver and they report good results. The use of them, up until the present time, has been more or less unscientific and empirical.

The use of glandular extracts is based upon Hallion's law, which is that the extract of a gland has a stimulating effect upon the gland from which it is derived for a longer or shorter period of time. If there is any value in this method of treatment—and I believe there is—liver extract as a therapeutic agent may fill a long-felt want. The bane of the medical man and the surgeon, so far as my observations have extended, has been hepatic conditions and conditions of the gall-bladder and the gall tract. We operate upon these patients and in a year or two they return with more symptoms. If we

have the gall-bladder excised we do not know whether we get any better results than if it remained in. So these patients may suffer a great deal.

In conjunction with duodenal drainage, which attacks one side of these conditions, and the use of liver extract on the other side, we may get better results. That, of course, is based upon the idea that there is something in this method of treatment. Certainly it will have a large field in hepatic insufficiencies and in those chronic intestinal invalids that we see so much of. In addition to metabolic functions, the liver is the great sewage disposal plant of the body. Its numerous functions certainly need helping out in this day of sedentary habits and rapid living.

It is not settled yet that the effect of liver extract is due to the hormones. Only four or five of these substances have been recognized.

We hope that Dr. Levin's work in this direction will develop something of value.

Dr. J. L. Jelks, Memphis, Tenn.—I was reminded while the Doctor was reading his paper of the fact that there is nothing new under the sun. He has repeated what the Talmud or the old Jewish law had to say about the preparation and administration of the maws and the different glands of animals and birds.

Dr. Elliott C. Prentiss, El Paso, Tex.—There is one feature that has received hardly any attention clinically. It has been experimented upon and accepted by scientific workers as it applies to animals, but not to human beings. That is the function whereby oxydase is produced. We know that in normal blood oxydase is present and helps to maintain normal activities all over the body. If that be diminished you get diminished metabolism and a retention of toxins in the periphery of the body or in the organs wherever they may be. This, of course, is not to the exclusion of other metabolic factors. In toxemias of liver origin we get diminished formation of bile with retention and stasis and probably alteration of oxydase formation. It is natural to suppose that many other pathological conditions would give subnormal formation of oxydase, and consequently that might be a factor in the toxemia in these cases, perhaps one of the important factors.

As far as I know, that has not been studied in human beings. It has been studied in animals, but I do not think any clinical observations have been made of pathological conditions in people.

Dr. Daniel N. Silverman, New Orleans, La.—We are doing some work on the action of the pancreas, not only in pancreatic disease, but in dysfunction as we find it in diseases of the liver and gall-bladder. We have a series of cases at the present time in the physiological laboratory at Tulane in which we have mostly definite gall-bladder and liver infection. In these cases we have found that with enzyme activity in the duodenal content there is a deficiency of enzymes of the pancreas. We find in these various cases of biliary infection that one enzyme may be deficient or lacking entirely, whereas the other two may be normal. We have checked up our results with normal cases to be sure that our methods were in accordance with McClure's,

which is replacing the method of Einhorn and others in the minds of scientific workers. In all of our cases the duodenal examinations have been checked up by the fluoroscope. That is absolutely essential. It may be impractical in every examination, but in the first examination at least we should have a fluoroscopic examination of the tube to be sure that it is in the duodenum. After we have finished this work, if we believe it is of value, we shall be glad to take up the work of Dr. Levin in the reaction of hepatic extract, or the influence of hepatic extract on pancreatic secretion in diseases of the biliary tract.

Dr. Levin (closing).—I wish to remind Dr. Silverman what I have stated in my paper that hepatic extract has no influence on pancreatic secretion. Whether by improving the liver function it will indirectly influence pancreatic secretion or not I do not know; it is probably worth while trying. There is very little American literature on the subject. I am convinced that the reason why we have failures in some cases of non-surgical drainage is that the infection is deeper in the biliary tract and does not reach the duodenum. Consequently we cannot extract it with the tube. We know that one of the roads for infection to reach the gall-bladder is the hematogenous through the portal circulation. It stands to reason that it will often go through the liver before it reaches the gall-bladder. If the gall-bladder is infected secondarily we only drain that organ and improve very little the drainage of the liver. It stands to reason, then, that if the liver forms toxic products we should not expect results from drainage of the bile through the duodenum unless we stimulate in some way the liver to greater activity. Hence the experimental trial with soluble liver extract.

This can also be applied to post-operative cases with a return of pre-operative symptoms. They form quite a perceptible percentage. The surgical drainage or removal of the gall-bladder affects only a portion of an infected system. Can we improve the drainage through the hematogenous route?

THE POSSIBLE RELATION OF SECRETIN TO CANCER*

By ELLIOTT C. PRENTISS, M.S., M.D.,
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I wish to bring up for your consideration certain facts regarding secretin and cancer which seem to indicate that there is an obscure relation between them. Any factor that is antagonistic to the incidence and development of cancer is worthy of the most careful investigation.

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Time will not be spent in detailing procedures well known to you that have yielded valuable results in preventing and curing both animal and human cancer. It is not necessary here to deal with any of the causes of, or defensive factors against, cancer, nor do I wish to be understood as minimizing them.

I shall first give statistics of frequency of gastric and duodenal ulcer and of cancer of the digestive tract below the mouth.

Smithies¹ states that of 1,725 cases of peptic ulcer seen, 1,181 were duodenal and 544 gastric, or in the proportion of 1 gastric to 2.45 duodenal. In the 1,181 cases of duodenal ulceration, cancer was found only 9 times.

Moynihan² states that 95 per cent of all duodenal ulcers are in the first portion, but by compiling the figures of Collins, Perry and Shaw, and Oppenheimer given by him we have the following: total, 492; first portion, 434; second portion, 30; third and fourth, 8; scattered, 8.

The following statistics are some of them a little indefinite and conflicting, but a careful study of them will give an accurate idea of the relative frequency of carcinoma in the various parts of the intestinal tract. Some duplication of figures is unavoidable.

Herman and Glahn³ state that of all autopsy figures collected by them, carcinoma of the duodenum was found in 0.035 per cent; 4,177 cases of cancer of the intestines were collected by Jefferson, of which 130, or 3.1 per cent were in the small intestine; those in the ampullary region were the most common. By combining the figures of Perry and Shaw, Fenwick, Geiser, Forgue, Chauvin and Rolleston 24 per cent were supra-ampullary, 64 per cent were ampullary, and 12 per cent infra-ampullary.

The following are the combined figures of Maydl and Nothnagel:⁴ Total autopsies, 41,838; carcinoma, 3,585; intestinal, 343; of which there were in the duodenum, 7; jejunum, 0; ileum, 10; large intestine, including rectum, 326.

The following is taken from an article by Judd:⁵ Cancer of the small intestine comprises 3 per cent of cancers of the intestinal tract. From a review of the