

tility of the gastro-intestinal tract, induced by thyroid action, are not influenced by way of the vagus or sympathetic nervous system.

But the problem is not simple for, as Timme and others have also pointed out, the thyroid rarely functions alone and the disturbance of this gland induces a change in the functions of the other glands, such as the parathyroids and pituitary, in other words, a multi-glandular endocrine involvement occurs.

In a further study of this larger problem, which is being conducted, Doctors Morrison and Feldman will attempt more fully to clear up the significance of this multi-glandular relationship to the associated digestive dysfunction.

Thank you!

DR. THEODORE ALTHAUSEN (San Francisco): I was very much interested in the observations of Drs. Morrison and Feldman on the increased emptying rate of the stomach and increased motility of the intestine under the influence of the thyroid hormone. In working with hyperthyroid rats, we made similar observations and were able to determine quantitatively the acceleration of the gastric discharge. Normal and hyperthyroid rats were given by stomach tube a 20 per cent solution of glucose or xylose. One hour later the rats were sacrificed and the amount of residual sugar determined separately in the

stomach and in the intestine. In normal rats, 72 per cent of the unabsorbed glucose was found in the stomach and 28 per cent in the intestine. In hyperthyroid rats, only 51 per cent of the remaining glucose was in the stomach, whereas 49 per cent of it was in the intestine. This effect of the thyroid hormone was even more pronounced when we fed to rats xylose, which has a slightly irritating action. Normal rats had 50 per cent of the residue in the stomach and 50 per cent in the intestine, while in hyperthyroid rats only 11 per cent of the residue was found in the stomach and 89 per cent in the intestine. These findings are rendered more significant by the fact that the rate of intestinal absorption for these two sugars is approximately doubled in hyperthyroid rats.

It is of interest that the slowing of gastric emptying in hyperthyroid rats with benzedrine did not significantly reduce the rate of intestinal absorption of glucose.

An increase of intestinal motility in our hyperthyroid rats was manifested by a tendency to develop diarrhea after the feeding of such slightly irritating substances as xylose or oleic acid. This tendency was entirely absent in normal animals.

DR. SAMUEL MORRISON (Baltimore): I thank those who have discussed the paper, and I have nothing further to add, thank you.

Editorials

NEW RESEARCHES ON THE MECHANISM UNDERLYING HEADACHE

ONE of the remarkable peculiarities of medical practice is that almost nothing is known about the mechanics of the commonest symptoms, and usually but little research is ever done on the subject. Who ever heard of anyone's getting large sums of money from a foundation to study mucous colitis, or ordinary headaches, or backaches, or nervousness, It isn't done. Enormous sums are spent commonly for research on rare diseases, simply because they excite most interest. For instance, recently all the public health forces of a great state were marshalled to fight an epidemic of *fourteen cases* of a rare type of encephalitis. Large sums of money were obtained from the state and the federal government; a large number of WPA workers were assigned to make surveys of mosquitoes and birds, and every effort was to be made to wipe out the disease. As we sat in a meeting and heard this great campaign being explained to the physicians gathered for the state medical convention, we could not help wondering how many hundreds of thousands of invalids there were in that state, crippled and suffering and kept on relief rolls or in charity hospitals because of such common troubles as constitutional inadequacy, psychopathy, constant fatigue and weakness, backache, headache, hypertension, and arthritis. We wondered if anyone could ever get much money with which to study these tremendously important and common scourges of civilized man.

Because of thoughts along this line, we were particularly pleased to see recently a report of a paper by George Schumacher and Harold Wolff on experimental studies on headaches and the pathways over which pain travels. It is to be found on page 488 of the July number of the Journal of Clinical Investigation.

Using volunteers, these investigators regularly pro-

duced a bilateral type of headache by injecting 0.1 mg. of histamine phosphate intravenously. They could see, then, what difference was made by the previous section or destruction of one or more nerves of the face or scalp or neck. Some of the volunteers studied had submitted to surgical operations on one of these nerves, and others had suffered some injury to the brain stem or to dorsal roots which resulted in partial or incomplete analgesia of one side of the back of the head.

It has been shown that histamine produces headache by causing dilation of cranial arteries, hence the origin of the nerve stimuli was known. It was found that four patients who, as a result of *incomplete* section of the trigeminal sensory nerve root, had unilateral loss of sensation over the lower part of the face, still had headache on both sides of the face and head. Five patients who, as the result of *complete* section of the trigeminal sensory nerve root, had in addition to hemi-analgesia of the lower half of the face, unilateral loss of sensation over the frontal, temporal, and parietal areas, did not get a histamine headache in these regions, although they did get it elsewhere over the head.

That ligation of the middle meningeal and temporal arteries, done at the time of a trigeminal root section, was not the cause of the absence of the histamine type of headache was shown by the appearance of a histamine headache after ligation of the vessels and only partial transection of the nerve root.

Two patients who had a unilateral loss of sensation in the occipital region did not have headaches induced in this region by histamine. They did, however, have headaches elsewhere in the head.

Other observations indicated that there were additional, though less important, afferent pathways. In short, painful messages coming from distended cranial arteries of the front of the head and traveling along

the sensory root of the fifth cranial nerve, were mainly responsible for frontal, temporal, and parietal headaches. The upper cervical sensory roots carrying sensation from the cranial arteries in the back of the head were chiefly responsible for occipital headaches.

Walter C. Alvarez, Rochester, Minn.

THE UNRELIABILITY OF GASTRIC ANALYSIS AS AN INDEX TO PROGNOSIS IN CASES OF PEPTIC ULCER

THE average physician, and even some gastroenterologists, appear to cling to the idea that the amount of free acid found in the stomach, after even one test meal, can serve as an index to the mildness or intractability of an ulcer and to the way in which it will respond to medical or surgical treatment. Actually, Vanzant et al showed a few years ago by following up a fairly large series of cases, that there is no statistical justification for this point of view. They found no close correlation between the height of the acidity and the intractability of the lesion, and it was obvious that by measuring gastric acidity one could not pick the patient who would do badly after operation. Furthermore, high acidities were found to be of no value in the diagnosis of ulcer because high acidities are commonly found in tense persons with indigestion in whom an ulcer cannot be demonstrated.

Bloomfield and French (*Jour. Clin. Inves.*, 17:667, 1938) have recently come to similar conclusions after a study of what they call basal gastric secretion. To estimate this they keep the patient at rest in a warm bed and give him no food for at least twelve hours. The gastric contents are then withdrawn at ten-minute intervals for an hour or two or until the secretory rate becomes fairly constant, and it can be assumed that a basal level has been reached. Repeated tests of this type made on normal persons showed that the secretory rate is fairly constant for the individual.

Interestingly, in one-third of the nine cases of gastric ulcer studied no free acid was secreted. Some of the patients with duodenal ulcer poured out a juice with an acidity as high as 140. Even with the small number of cases analyzed, Bloomfield and French felt they could state definitely that there was no correlation between the rate of healing of an ulcer and the degree of acidity of the stomach. They concluded that "acidity is certainly not the major determining factor."

Walter C. Alvarez, Rochester, Minn.

IS IT WISE TO GIVE A PURGATIVE TO A PERSON COMING DOWN WITH A COLD?

AS we showed many years ago in "Surgery, Gynecology and Obstetrics" for June, 1918, the giving of a cathartic at the beginning of any medical or surgical treatment is a relic of ancient Greek medicine, and is based on the idea that hurtful humors must first be cleaned out of the body before any healing procedure can be carried out with hope of success. As is the case with many human customs, this one continued for hundreds of years after the theory on which it was based was given up and largely forgotten.

Now come Colonel Smith and Captain Baier, in the "Military Surgeon" for January, 1939, with a report of a study carried out to see if it really does help to give castor oil or magnesium sulfate to a soldier when

he is coming down with an acute upper respiratory tract infection. As Smith and Baier say, during the last twenty-five years the medical profession has gone a long way toward giving up this ancient practice, and some authorities now actually forbid it.

The study here commented on was carried out over a period of three years, during which time the physicians studied enlisted men on sick report at Fort Benning, Georgia. During this period there were three epidemics of respiratory disease during which 1013 cases were studied. In 303 cases the treatment was begun with a dose of castor oil, in 217 magnesium sulfate was given, and in 493 there was no purgation.

The figures show clearly that the purged soldiers lost their fever more slowly than did those men who were not purged, and purgation definitely delayed the return of the soldiers to duty. Ninety per cent of the men who were not purged were back on duty in four days, as compared with 79 per cent of those who had castor oil and 79.3 per cent of those who had magnesium sulfate.

Colonel Smith and Captain Baier concluded, then, that the best treatment for the respiratory infections is probably rest in quarters with forced fluids, restriction of diet, local treatment to the nose and throat, and ammonium chloride troches as indicated. Small doses of salicylates were used to relieve aches and pains.

It would be well if these officers would now make another study to find out whether the forcing of fluids, the restriction of diet, or the local treatments are of any value. The chances are large that they are not; perhaps they also are harmful.

Walter C. Alvarez, Rochester, Minn.

QUESTIONNAIRE ON FATALITIES DUE TO GASTROSCOPY

IN his "Clinical Gastro-Enterology" (St. Louis, Mosby, 1939) H. W. Soper wrote, concerning gastroscopy that "A considerable number of fatalities have occurred." It seemed to me that Dr. Soper must have been thinking of the experience with the old rigid gastroscopes. Dr. Soper has since written me that he knows "of no fatality with the use of the Wolf-Schindler Gastroscope." The use of rigid gastroscopes was certainly dangerous, and because of this the flexible gastroscope was constructed. I believe this instrument would be safe even in the hands of an awkward examiner if he were to be guided by the few contraindications. However, one occasionally sees the statement that gastroscopy is a dangerous method, and Renshaw, an expert gastroscopist, doubts the safety of the flexible gastroscope in the hands of an untrained physician.

However, in spite of all my efforts, I have been unable to hear of a single fatality due to the use of the flexible gastroscope. I realize that I am not able to keep in close touch with all specialists using this instrument, and it is well known that disagreeable accidents are seldom published immediately.

Gastroscopy has opened a new field of gastric pathology, and if it is to be used daily by the gastroenterologists as a routine method, as I believe it should be for the early diagnosis of gastric carcinoma, we should know if it involves any danger to the life of the patient. Perhaps it is surprising that no fatalities have yet been reported because fatalities due to inept

proctoscopy are well known, and even the X-ray examination is not quite harmless. Perforation of a gastric ulcer has occurred during strong palpation of the lesion back of the screen.

But even if a death occurs, it may be hard to prove that the instrumentation alone caused the disaster. Moutier published the case of a patient who, scheduled for gastroscopy, suffered a perforation of his ulcer the night before the examination. If this perforation had occurred twelve hours later the gastroscopy would doubtless have been held responsible for the man's death. If, considering all the dangers, a gastro-enterologist should decide to gastroscop a patient suffering from angina pectoris, and the patient should get an attack during the examination and die, the amount of blame to be ascribed to the instrumentation would be hard to establish.

In order to get at the facts, I am here and now asking all colleagues who are using the Wolf-Schindler gastroscope to write either to me or to the editor of this journal answering the following questions:

(1) Have you ever observed a death, following gastroscopic examination, which you attributed to traumatism caused by the instrument? Were the recognized contraindications excluded?

(2) How many gastroscopies have you carried out?

I will try to place these questions in the "Arch. F. Verdauungskrankheiten." (Now appearing in Basel), in the "Arch. d. Maladie d. L'Appareil Digestif," and in the Japanese "Folia Gastro-Enterologica." The results of this questionnaire, if there are any, will later be published. Names will be omitted. It is evident that a prompt reply is not only in the interest of our patients but of the method and of all gastroscopists. Only complete frankness can prevent gastroscopy from

sharing the fate of cystoscopy, which for thirty years was a suspected and opposed method of examination.

R. Schindler, M.D., Chicago, Ill.

A POSSIBILITY IN THE STUDY OF THE SEVERAL FRACTIONS OF GASTRIC ACIDITY

ONE of the things most to be desired in the study of gastric secretion is the identification and separate analysis of the several constituents of the gastric juice. There are at least four different types of cells in each gastric fundus gland. As Hollander showed, the secretion of the parietal cell appears to be practically nothing else but hydrochloric acid and water. It is thought that the secretion of the chief cell contains pepsin, salts and water. The neck cells probably produce a fluid containing mucus and salts, and the foveal cells produce probably the flocculent type of mucus. By graphing certain data and then extrapolating, Hollander and others have gotten a pretty good idea of the composition of the alkaline or neutral secretion of the stomach.

It may be worth noting that Bickel, in 1905, made what may prove to be a very useful observation. In volume 42 of the Berliner klinische Wochenschrift, Bickel reported that in the fourth stomach of the goat the two types of juice, one alkaline and the other acid, are secreted alternately. The basic alkaline juice was secreted while the animal was fasting, and the acid secretion came when it was fed. These changes could be shown in a Pavlov type of pouch made from the fourth stomach. The great advantages of studying gastric secretion in such an animal must be apparent to every experimentalist.

Walter C. Alvarez, Rochester, Minn.

Book Reviews

Studies on the Changing Incidence of Peptic Ulcer. By Gunnar Alsted, Copenhagen, Ejnar Munksgaard, 148 pp., 1939. Price d. Cr. 11,20.

THIS is a thought-producing little book based on some remarkable data which have been collected in Denmark during the last thirty years or more. If we could only understand what these data mean we could probably know much of what we need to know about the causes and means of prevention of ulcer. It appears that the incidence of chronic ulcer has been increasing rapidly in men while it has been steady or falling off slightly in the case of women. As a result, during the years the male to female ratio has been changing from less than 1 to 1 to about 3 to 1, as it is here in the United States. There has also been a tremendous change in the ratio between gastric and duodenal ulcers, so that whereas formerly most of the ulcers were gastric, now there are ten or more duodenal ulcers to one gastric ulcer.

There is much evidence to indicate also that thirty years ago ulcers tended to be acute and not chronic. Hence the older clinicians were perhaps justified in their view that they could cure patients with ulcer. Nowadays about all a gastro-enterologist hopes to do is to heal the ulcer that is present at the time the patient comes. That it will break open again some day is expected.

Another remarkable fact brought out by Dr. Alsted's statistics is that if one plots the incidence of hematemesis as ordinates and the figures for the growing population of Copenhagen as abscisses, one gets a curve which rises slowly up to the year 1917. Then there is an abrupt and marked fall, and after that there is a much more marked rise in the curve, a rise which is much steeper in the case of the men than in the case of the women. In the case of the men the curve is now almost a vertical line. As one would expect, there has been in recent years a tremendous increase in the incidence of melena, with again a more nearly vertical line for the figures for men.

Alsted perhaps wisely does not attempt to theorize very much as to the possible causes for these remarkable changes in the incidence of peptic ulcer.

Le Cancer de l'estomac au début. By René Gutmann, Ivan Bertrand and Th. J. Péristiany: Etude clinique, radiologique et anatomo-pathologique. Paris, G. Doin et Cie., 493 pp., 563 illustrations, 1939.

THIS beautiful volume marks the culmination of Dr. Gutmann's and his associates' years of study of the earliest manifestations of cancer of the stomach. Any book that is based on years of fact-gathering and study is likely to be good, and this is