this score from a personal study of the reports of more than 1,600 Roentgen-ray examinations of gastric function.

In the group of cases with the type of pyloric spasm under discussion, routine examination by the fluoroscopic screen presents very similar pictures. The evidence in these hyperacidity cases is: hypertonic stomach, vigorous peristalsis, rapid visualization of the duodenum, tenderness or muscle spasm over the region of the pylorus, and possibly abnormal contractures on the greater curvature, which are readily mistaken for incisurae. There may be "physiologic" hour-glass stomach.

From a somewhat extensive experience, I have found the following fluoroscopic observations of value in the differentiation between the pyloric spasm associated with uncomplicated ulcer near the lesser curvature and that present when the lesion is solely in the appendix or gall-bladder:

1. *Technic*—The motor function is estimated by examination for evidences of the bismuth or barium meal at the end of a six-hour interval following its administration. The patient is then screened during and after his taking a standard buttermilk-bismuth (or barium) suspension.

2. *Similar Findings*.—(a) Unless marked gastric atony is present, rarely retention of the motor meal; (b) hypertonic stomach; (c) usually vigorous gastric peristalsis; (d) prompt visualization of the duodenum; (e) free movement of the stomach, laterally or vertically, by palpation or kneading; (f) tenderness to moderate or deep pressure over the pyloric region.

3. *Variable Findings*.—(a) Abnormal peristaltic waves, that is, true incisurae or incisura-like niches on the greater curvature, especially if the stomach is kneaded or tapped; (b) tender areas along the lesser curvature which move with change of position of the stomach; (c) tenderness in the midepigastrium, in the right iliac fossa or in the anatomic region of the gall-bladder.

4. The patient then receives $\frac{1}{50}$ grain of atropin sulphate hypodermatically. He is rescreened in a half hour. If much of the bismuth or barium mixture has left the stomach, more should then be given.

5. *Findings at Second Examination*.—(a) In true, uncomplicated ulcers on or near the lesser curvature, palpation carried on vigorously along the lesser curvature will usually locate a point of maximum tenderness. Palpation at this point will generally be accompanied by such permanent spasm of the circular muscle fibers of the stomach wall as to bring out a readily recognizable incisura on the greater curvature. This is approximately at the same level as the local tender area on the lesser curvature. The phenomenon may be elicited with the stomach moved laterally or vertically. The incisura thus brought out after atropin is readily distinguished from normal peristalsis. Tenderness over the pyloric region is a variable finding. There may be spasm or tenderness in the gall-bladder or appendix regions if these parts are also diseased.

(b) In cases of pyloric spasm associated with appendix or gall-bladder lesions but with no gastric ulcer present, vigorous palpation along the lesser curvature may be accompanied by evidence of tenderness, but fails to delimit local foci of distress associated with incisurae or incisura-like niches along the greater curvature, or areas of local tenderness that correlate with the stomach on its being moved about. Tenderness over the pars pylorica is a variable finding. Tenderness in the right

iliac fossa or in the gall-bladder region (especially at the end of deep inspiration) is often exhibited.

6. Reexamination of the patient on different days should demonstrate the constancy of the differential sign outlined above.

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THE EFFECT OF OPERATION ON KIDNEY EXCRETION AS INDICATED BY THE PHENOLSULPHONEPHTHALEIN TEST *

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Although the use of phenolsulphonephthalein in estimating kidney function is of only a few years' standing, it is to-day probably the most accurate index of renal elimination which we possess. It has been put to test all over the world and in all classes of cases with a resulting uniform praise of its accuracy, being considered superior to a chemical and microscopic examination of the urine in showing the actual work that the kidneys are doing.

Geraghty says that albumin and casts are no index of the severity of a kidney lesion, being present frequently in marked degree when the pathologic change in the kidney is slight, while on the other hand severely damaged kidneys may be present when there are very few abnormal constituents in the urine, whereas the phenolsulphonephthalein test, according to him, will practically always tally with the kidney changes. As a demonstration of this fact, I shall cite a case of a woman who was sent to the University Hospital by Dr. Fussell in June, 1913.

REPORT OF CASE

The patient had been ill for four months with a mass in the left kidney region, and one month previous to admission she developed a similar mass on the right side. She walked into the hospital and a phenolsulphonephthalein test performed on admission showed no excretion in two hours. The blood examination was negative; the urine had a specific gravity of 1.011 and contained a trace of albumin; otherwise it was negative. In view of these findings, the phenolsulphonephthalein test was repeated with the same result, although the woman was apparently in no dangerous condition. The woman died in uremic coma about two weeks after admission, having had an attack of hematuria a few days before death. The highest blood-pressure reading was 160 mm. Hg systolic, which was two days before death. The diagnosis was not definitely settled, as no necropsy was permitted, but it lay between congenital polycystic kidneys and hypernephromas of the kidneys. This case, I think, demonstrates clearly the superiority of the phenolsulphonephthalein test over the usual laboratory test for kidney function.

Contrary to Geraghty's opinion, several cases of severely damaged kidneys with a phenolsulphonephthalein output greater than normal have been reported, such as those reported by Pepper and Austin¹ within the last year. Phenolsulphonephthalein is recognized as the standard test, however, and has been used as such in the cases which form the basis of this report.

* Read before the Philadelphia Pathological Society, Jan. 22, 1914.

1. Pepper, O. H. P., and Austin, J. H.: Some Interesting Results with Phenolsulphonephthalein Tests, *Am. Jour. Med. Sc.*, 1913, cxiv, No. 2, p. 254.

At the suggestion of Dr. F. E. Keene the phenol-sulphonephthalein test was applied to about twenty patients on admission to the gynecologic ward at the University Hospital. These patients were selected without preference. All had been sent in for operation and consequently had been supposed to be good surgical risks by their respective attending physicians. It was decided to note the amount of elimination of phenol-sulphonephthalein before operation, the duration of anesthesia, the character of the operation, the position of the patient while on the table and again the amount of elimination of the drug approximately twenty-four hours after operation. The patients all received the routine preliminary preparations, which consisted merely of a purgative the night before operation, there being no reduction in the amount of food or drink until the morning of operation. Each of those who had abdominal operations received an enema of 2,000 c.c. of sterile water on the table at the completion of the operation and a hypodermic injection of $\frac{1}{4}$ grain morphin sulphate and 1/150 grain atropin sulphate soon after operation. In two patients the tests were never completed; one, who had a cholecystostomy, being too sick after operation to be disturbed, while the other who had a phenolsulphonephthalein excretion of 30 per cent. on admission, died the following day, not having been operated on. Necropsy showed a large hydronephrosis of the right kidney caused by a calculus occluding the renal duct.

The amount of phenolsulphonephthalein excretion before operation varied from 20 to 90 per cent., while the excretion after operation varied from 25 to 80 per cent. The average duration of anesthesia was about one hour, and the operations were for the most part pelvic and plastic, although there were two kidney cases and one case of intestinal resection. There were four positions used on the operating-table, namely, dorsal, lithotomy, Trendelenburg and the lateral posture for kidney cases.

The examinations showed that four patients excreted the same amount of phenolsulphonephthalein after operation as before; two of these had albumin and casts in the urine before operation. Eight patients showed a decrease after operation, this decrease amounting to 15 per cent. or less in every case but one. This patient had a cloud of albumin and granular casts in the urine before operation, but was excreting 90 per cent. of phenolsulphonephthalein; after operation, however, the excretion dropped to 25 per cent., although the patient merely had a plastic operation and showed no symptoms of any renal disturbance afterward. A case in which nephrectomy was performed for renal calculi showed a decrease of only 5 per cent. In this case the indigocarmine test also was performed before operation and showed that the diseased kidney was entirely functionless while the opposite kidney began to excrete the dye in twenty-six minutes, thus showing that the length of the delay in the excretion of indigocarmine does not always indicate the amount of decrease in the function of the kidney. The remaining six cases showed an increase in the excretion after operation; in two cases the increase amounting to 30 and 45 per cent., respectively, the latter case only showing 20 per cent. before operation.

Although ether has long been known as a renal irritant, and kidney irritation following its use, as evidenced by the appearance of casts in a previously normal urine, is a common observation, nevertheless there has been absolutely no relation between the length of anes-

thesia and the diminution in the excretory power of the kidneys in these cases—assuming, of course, that phenol-sulphonephthalein is a reliable guide.

Bovée² states that chloroform and ether and also the Trendelenburg posture have little effect on the production of albumin and casts in the urine, although these agents all decrease the rate of urinary excretion and the amount of urea, but that in any event the quantity and quality of the urine is practically always normal at the end of twenty-four hours after operation. In this series the quantity of the urine and the amount of urea were not observed, but the position of the patient on the table, the character of the operation and the administration or omission of proctoclysis likewise gave no evidence of having any special effect on the kidney function. Although many of the patients had traces of albumin and even hyaline or light granular casts in the urine before operation, there was no greater diminution of excretion in these cases than in those with normal urine, and in some there was an increase after operation. The only patient who showed a marked decrease after operation was also the only one who had a cloud of albumin with casts in the urine before operation.

It is noteworthy that in all the cases which showed a diminution after operation, the diminution was most marked in the first hour; the excretion during the second hour usually increasing after operation, which seems to indicate that the damage to the kidneys is slight if anything.

TENTATIVE CONCLUSIONS

Although this series is entirely too small to serve as a basis for any definite conclusions, nevertheless, as far as it has gone it seems to indicate the following:

1. The effect of ether anesthesia on healthy kidneys is practically *nil* so far as reducing the excretory power of these organs is concerned.
2. Traces of albumin in the urine before operation should not give much concern, but clouds of albumin accompanied by casts should be considered seriously before the performance of elective operations.
3. The duration of anesthesia in any given case does not in itself signify the amount of injury which the kidneys will sustain.
4. The position of the patient on the table, the character of the operation and the administration of proctoclysis have not shown any effect of the percentage of phenolsulphonephthalein excretion after as compared with that before operation.
5. In one-third of the cases there is an increased excretion after operation.

I wish to express my indebtedness to Dr. John G. Clark and Dr. Floyd E. Keene for the privilege of reporting these observations.

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2. Bovée, J. W.: Renal Excretion during the Administration of Chloroform and Ether in Gynecological Surgical Operations. *Tr. Am. Gyn. Soc.*, 1909, xxxiv, 270. The Influence of the Trendelenburg Position on Quantity of Urine Excreted during Anesthesia. *Tr. Am. Gyn. Soc.*, 1910, xxxv, 443.

Public Instruction in Temperance.—Drunkenness cannot be eliminated or materially reduced unless the public demands such reduction. The public obviously will not force the prevention of drunkenness until convinced of the harm caused by intemperance. It is of greatest importance, therefore, that the public should be continuously informed of the evil effects caused by the abuse of alcohol and of the cost of drunkenness to the state.—Report of Commission to Investigate Drunkenness in Massachusetts.