TRANSACTIONS

OF THE

PHILADELPHIA ACADEMY OF SURGERY

STATED MEETING HELD MARCH 5, 1934

The President, Dr. Walter E. Lee, in the Chair,
Calvin M. Smyth, Jr., M.D., Recorder

EXPERIENCE WITH NEWER PROCEDURES IN CLEFT PALATE SURGERY WITH SPECIAL REFERENCE TO THE VEAU AND DORRANCE TECHNIC

Drs. Robert H. Ivy and Lawrence Curtis read a paper with the above title for which see page 502.

Dr. Warren B. Davis said that in cleft palate surgery one endeavors to obtain the best possible length of the palate and the least possible scar tissue formation. In his own cases, however, the most satisfactory results have been obtained by the use of osteoplastic flaps. This technic may be more difficult to master, but the method also has definite advantages. Having bone in the flaps prevents some of the contraction by acting as a splint, and also by this method the raw surface on the superior part of the flap is minimized. The "push-back" operation has definite value in selected cases with short palates. He has used it in eleven cases and has secured improvement in speech in every case. It has not been used in any cases so young as those shown by Doctor Ivy.

CONGENITAL SYPHILITIC OSTEOMYELITIS OF THE MANDIBLE

Drs. Robert H. Ivy and Lawrence Curtis read a paper with the above title for which see page 535.

ADVANTAGES OF PRE-OPERATIVE X-RAY IN KIDNEY TUMORS IN CHILDREN

Dr. Alexander Randall read a paper with the above title for which see page 462.

Dr. Albert E. Bothe remarked that the changes which occur in the mixed tumors of the kidney after Röntgen therapy are very evident when the microscopical sections are compared with radiated tumors. Although muscle cartilage and bone tissues may be found in sections of mixed tumors, the small round cells and cuboidal or low columnar are by far the prevailing types.

These studies show first that Röntgen therapy of mixed tumors of the kidney affects the embryonal small round cells and causes a fibrous displacement; second, the therapy has little or no effect upon the epithelial cells; and third, the therapy reduces the size and destroys most of the malignant nature but not sufficiently to disregard removal.

DR. E. P. PENDERGRASS said that embryonal tumors as well as tumors composed of rapidly growing cells are sensitive to radiotherapy. Stewart defines radiosensitivity as that combination of circumstances resident in the tumor or the host which permits marked or total local tumor regression under doses of radiation sufficiently small to preserve the integrity of the tissues of the host.

Desjardins states that susceptibility of tumors to irradiation agrees closely with the radiosensitiveness of normal cells of the same kind from which the tumors are derived. However, we know that morphology is not completely adequate for estimation of radiosensitivity. The general condition of the patient and his constitution also modify the effect of irradiation. Anæmic and cachectic individuals respond poorly to radiotherapy. There are probably hereditary, constitutional and nutritional influences that alter the response to irradiation in different patients afflicted with the same morphological type of tumor.

(1) *Pre-operative Irradiation.*—This should be adequate and should include the body from the neck to the tuber ischii.

The reasons for this are:

(*a*) Embryonal mixed tumors of the kidney are very susceptible to irradiation. They are reduced in size, thereby facilitating the operative procedure.

(*b*) General irradiation, in addition, may exert a favorable influence on the nutrition and metabolism as a whole, and reduce the deleterious effects of the tumor and thereby increase the resistance of the body against the tumor.

(*c*) Experiments and experience have show that general irradiation will render the soil unfertile for metastasis.

Russ, in the *British Journal of Radiology* in 1927, showed in the experimental animal that if one took a dumb-bell-shaped area and irradiated a portion of the area and then injected a malignant tumor, the growth would not grow in the irradiated portion.

Wood has shown that transplantable tumors will have a very small percentage of takes in the irradiated rats.

(*d*) At present, according to Ewing, the impression is that the operative removal of a primary tumor releases growth restraints about metastatic nodules which may appear in explosive form after operation. He therefore recommends pre-operative radiation.

A logical question after hearing what I have just said would be, if irradiation does all one says it will do, why subject the patient to operation? Our answer would be that we cannot give the patient sufficient irradiation to kill all of the tumor cells because some are embryonal, others more adult in size. Some cells are more radioresistant and quickly become Röntgen or radium fast.

(*e*) Careful watch should be kept upon the weight curve and weekly blood counts of the patients during Röntgen therapy. Too much irradiation may defeat the purpose for which it is given. An increasing weight curve and a white leucocyte count that does not fall below 2-4000 cells per cubic centi-

metre is a safe limit. There is a feeling among many that too much Röntgen therapy may remove or destroy the physiological processes that produce growth-restraining influences. In this connection, it may be said that irradiation does not stimulate or cause the growth to spread, but if improperly given, the growth restraining mechanism may be destroyed, and thereby allow the growth to grow as if it were stimulated.

The choice of time of operation is still a moot point. In one of Doctor Randall's patients, there was no delay in healing when operation was performed four weeks after irradiation. My choice would be at eight weeks, because at that time the reaction has disappeared. Ewing prefers twelve weeks.

(2) *Post-operative Irradiation.*—This should not be given routinely because the tissues develop an immunity to radiotherapy, and it should therefore be preserved for such time when the patient develops a recurrence. Furthermore, as indicated above, general irradiation will lower the blood count and lessen the patient's resistance to any infection. The patient should have frequent Röntgen examinations of the chest because that will show whether there is metastasis to the liver or lungs which are the places in which they most frequently occur.

In regard to the reported cases, I am sure that the first one was inadequately treated, as only the local lesion received therapy and that was less than we would give today.

The second case was overirradiated. She became anæmic and as reported could not resist an ordinary bronchopneumonia.

It will be interesting to watch the last case because we feel the irradiation here was given under ideal circumstances.

In closing, I wish to thank you for the opportunity of listening to and discussing Doctor Randall's most interesting presentation.

PERFORATED PEPTIC ULCER OF MECKEL'S DIVERTICULUM

Dr. S. Dana Weeder reported the case of a female child, aged nine months, admitted because of hæmorrhage on June 1, July 13 and September 27, 1932. On each occasion the physical examination disclosed nothing significant, the temperature was normal, X-ray examination was negative except for some slight persistence of barium in the cæcum which emptied after forty-eight hours and a blood count ranging at first examination from hæmoglobin 40 per cent., erythrocytes 2,670,000 to 20 per cent. hæmoglobin, 1,590,000 erythrocytes. She received a transfusion of whole blood by the direct method of 100 cubic centimetres on the first admission; two transfusions by the same method, 70 cubic centimetres and 100 cubic centimetres on the second admission; one transfusion of 80 cubic centimetres on the third admission. One week later she was admitted because of what appeared to be abdominal discomfort. She was awakened early in the morning apparently with abdominal pain. The legs were drawn up and the respirations were of the grunting type. The temperature was 100.4° by rectum and there was slight resistance in the lower right abdomen near the umbilicus. Peristalsis was diminished. A diagnosis of perforated peptic ulcer of Meckel's diverticulum was made and the abdomen opened through a right rectus incision. On opening the peri-

toneum a small amount of thin, somewhat milky fluid escaped. A mass was fixed to the lower end of the ileum which proved to be a Meckel's diverticulum folded over a perforation at its base sealed over with fibrinous exudate. The base of the diverticulum was near the attachment of the mesentery and it was there that perforation had occurred. A wide excision of the ulcer-bearing area and diverticulum was made. The opening in the bowel was closed in the long axis and the abdomen closed without drainage. Eighty cubic centimetres of blood were given by way of the longitudinal sinus through the anterior fontanelle. The child made an uneventful recovery and when last seen four months after operation had had no hæmorrhage from the bowel, constipation or other symptoms referable to the abdomen.

The microscopical examination showed the presence of both gastric mucosa and pancreatic tissue in the diverticulum.

Doctor Weeder remarked that Meckel in 1809 first described that remnant of the omphalomesenteric duct attached to the ileum which he called a diverticulum and since that time has borne his name.

The omphalomesenteric or vitelline duct connects the vitelline sac with the primitive gut tract passing through the umbilicus in company with the allantoic stalk. By the sixth week of fœtal life it becomes nothing but a small patulous cord which by birth should entirely disappear. Faulty obliteration results in various abnormal remnants, in 6.3 per cent. an umbilical fistula, in 10 per cent. a partially obliterated cord attached to the umbilicus and the tip of a diverticulum and in 82.5 per cent. the typical diverticulum given off from the antimesenteric surface of the ileum. It is in this type that peptic ulcer most commonly occurs. In the remainder of cases we find the giant diverticula and umbilical polyps. We find Meckel's diverticula in 2.5 per cent. of humans predominating in the proportion of two to one in the male. Shaetz in 1925 studied in serial section thirty cases and found 16 per cent. contained gastric mucosa, two cases both gastric and pancreatic tissue, one with pancreatic tissue, one with carcinoid mucosa and one of doubtful heteroplasia. His figures show gastric mucosa alone or in company with pancreatic tissue in 23.3 per cent. of cases. This figure, probably low as other cases of typical history and operative findings without a careful microscopical examination, would with a more careful study have shown gastric mucosa.

The pathological changes which may occur are characteristic of those in the same type of tissue found elsewhere. We find, therefore, inflammatory processes analogous to those of appendicitis ranging from simple inflammation to gangrene and perforation. If gastric mucosa be present we may have those pathological processes as occur in gastric mucosa elsewhere, namely, ulcer, hæmorrhage, perforation and carcinoma. Lindau and Wulff believe that they have demonstrated an ulcer gastritis in Meckel's diverticulum with gastric mucosa similar to those changes in ulcer of the stomach and duodenum which they have described. This suggests that a wide dissection of the ulcer-bearing area is of equal importance in peptic ulcer of Meckel's diverticulum as in excision of ulcers of the stomach, duodenum or jejunum. The behavior of these peptic ulcers of Meckel's diverticulum are in every way comparable

to the behavior of peptic ulcer in other parts of the gastro-intestinal tract producing hæmorrhage, perforation and digestive disturbances. Deetz in 1907 was the first to suggest the peptic nature of an ulcer of Meckel's diverticulum although Gillman in 1881 first observed aberrant gastric mucosa in the remnant of the omphalomesenteric duct which he reported as a "Congenital Prolapse of Gastric Mucosa through the Umbilical Ring."

One case of healed peptic ulcer of Meckel's diverticulum has been reported occurring in a woman forty-one years old with a history of digestive disturbances for twenty-four years and bleeding from the bowel for ten years. Malignant changes, both carcinoma and sarcoma, have been reported by a number of writers. Fried first reported a leiomyosarcoma of Meckel's diverticulum in 1902. Since then Kauffman in 1911 reported a case of spindel-cell sarcoma in a woman seventy-two years old and in the same year Tschinkinowerow a spindle-cell sarcoma in a woman sixty-two years. Haessner reported in 1913 a spindle-cell sarcoma in advanced degeneration. Symmers in 1919 reported a leiomyosarcoma in a male aged twenty-two years and Crile in 1925 a spindel-cell sarcoma in a woman aged forty-one years. Methews in 1925 removed a sarcoma with extensive pelvic involvement five years later. Hicks and Kadinsky were the first to report a case of carcinoid tumor in 1922. Stewart and Taylor reported another in 1926 and Michell and Bell a true deno-carcinoma in a male aged sixty-seven years in January, 1932. Coley described a case of Meckel's diverticulum complicated by tuberculosis.

Much has been written on the symptomatology. Those cases with inflammatory processes and even those of peptic ulcer and perforation have been usually diagnosed as appendicitis. Acute obstructive signs may be added. The outstanding symptom of those with peptic ulcer in the reported cases is hæmorrhage from the bowel as it was in foregoing instances. Frequently it is the only symptom. Callender in 1911 was the first to demonstrate that the bleeding arose from an ulcer of Meckel's diverticulum. Pain if present is of a vague character and may be post-prandial. Later signs of perforation with rapidly developing peritonitis may follow. In the cases with malignancy, chronic obstructive signs may be added to the picture. Since 1927, of the reported cases of Meckel's diverticulum with peptic ulcer, only four have been diagnosed pre-operatively. This report increases the number to five.

As to treatment, the study of thirty-three cases made recently by Mason and Graham is very illuminating. Five cases were treated medically with a mortality of 100 per cent. Of fourteen cases with perforated ulcers treated surgically there was a mortality of 42.86 per cent.; of thirteen non-perforated ulcers surgically treated there was no mortality. There is undoubtedly an increasing interest in the subject as from 1903 to 1922 seven cases of hæmorrhage from Meckel's diverticulum were reported while since 1924 twenty-six cases have been reported. In this case, hæmorrhage was the outstanding feature occurring intermittently for four months before operation.

DR. WALTER ESTELL LEE remarked that the literature in the last four or five years has been replete with discussion of intestinal hæmorrhage arising from gastric mucosa in Meckel's diverticulum. Pædiatricians at the present by a number of writers. Fried first report a leiomyosarcoma of Meckel's time are very enthusiastic about this possibility and are constantly on the alert for it. Doctor Lee thought he had three cases in the last year at the Children's Hospital. In each one there was a history of a hæmorrhage from the bowel followed by symptoms of an acute abdominal catastrophe. Pre-operatively, elongated tumors were palpable through the abdominal wall in each case. At operation a Meckel's diverticulum was found in each case, but the Meckel's diverticulum was the cause of an intussusception and the intestinal hæmorrhage was the result of the intussusception. Gastric mucosa was not found in any of the three diverticulæ that were removed.

ISOLATED RADIAL DISLOCATION OF CARPAL SCAPHOID

DR. B. FRANKLIN BUZBY reported the case of a physician, aged forty-seven years, who was driving his car when it had a collision with another on July 7, 1933, in which he sustained an injury to his left wrist apparently when the steering wheel turned suddenly in his hand, forcibly deviating the hand ulnaward in mid-flexion and extension.

He was taken to the Underwood Hospital at once where an X-ray showed complete dislocation and rotation of the scaphoid to the radial side of the wrist with a displacement to the ulnar side of the semilunar bone which still articulated without rotation with the radius. However, the ligamentous structures between the third and fourth metacarpals must also have been ruptured because the first, second and third metacarpal bases were shown to be centrally displaced three-sixteenths of an inch. Three attempts were made at reduction, two under an anæsthetic, before the reporter saw him on July 10, 1933. Then again under nitrous oxide closed reduction was attempted, this time successfully, by strong traction on the index and middle fingers to overcome the central displacement of these structures and to widen the radio-metacarpal space, with strong ulnar deflection of the hand for the same reason, and with digital pressure on the dislocated scaphoid. The bone returned to its normal position with a loud snap. Following this manipulation the entire carpal area was manually molded and forcible hyperextension with digital pressure over the flexor aspect in the region of the scaphoid and semilunar. This was again accompanied by an audible snap following which the wrist appeared normal in shape and guardedly showed full range of passive motion. A split case was applied which on July 12, 1933, was replaced by a plaster cock-up splint which was kept on for one month when passive motion was about half normal in all directions but painful if forced beyond these limits.

Physiotherapy was begun on the twelfth day and kept up until two months after injury when he lacked twenty degrees of full flexion and thirty-five degrees of extension both actively and passively. Swelling was still present over the carpometacarpal joint. His grip was good and he was driving his own car and had resumed the full practice of medicine. However, there was appearing at this time some atrophy of the thenar eminence without any other symptoms referable to the thumb.

At present, eight months after his accident, there is pain on certain movements in rotation of the wrist, but no aching on weather changes. The part does not seem weaker than its fellow and there has been no progress in the

atrophy about the thenar eminence, instead, the atrophy has almost disappeared. His grip is normal. He has full flexion and extension lacks but ten degrees of being normal. There is no thickening or tenderness about the wrist and an X-ray taken February 23, 1934 shows no death of the carpal bones nor signs of arthritis, in fact it appears like the X-ray of a normal wrist.

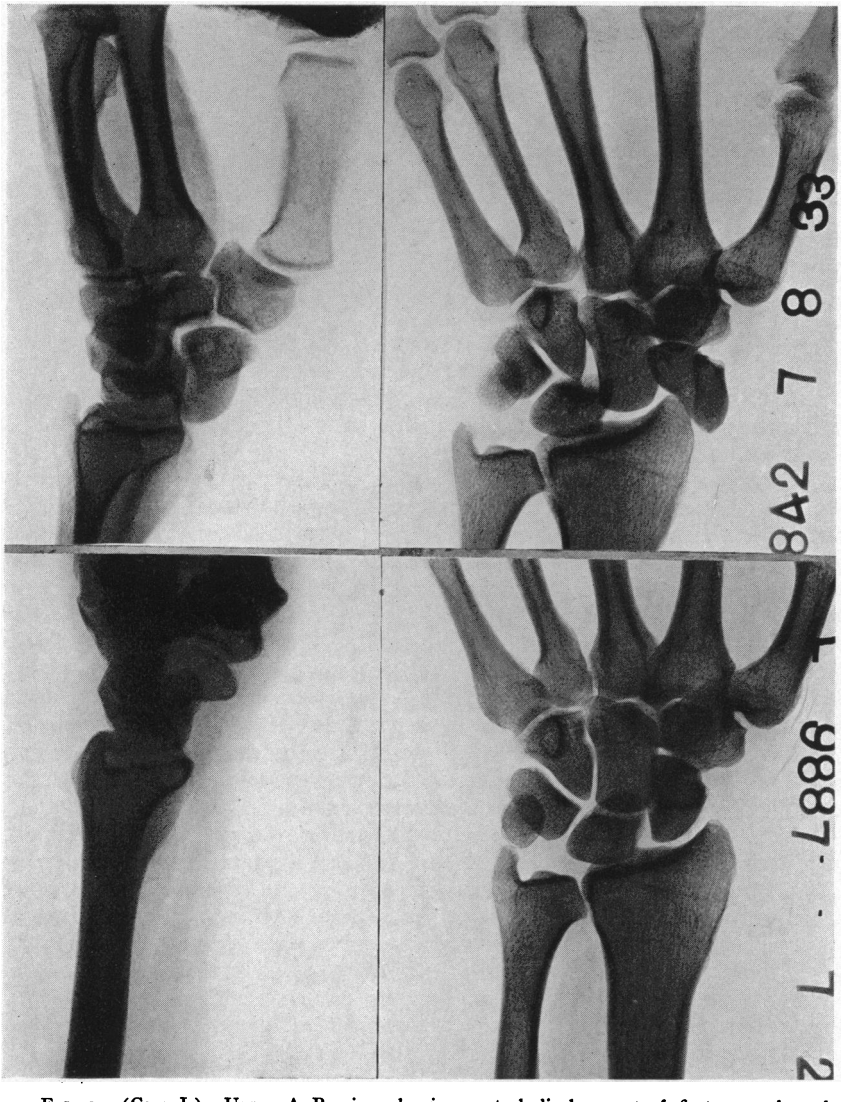

FIG. 1.—(Case I.) Upper A.-P. view showing central displacement of first, second, and third metacarpals, mesial displacement of semilunar and dislocation of scaphoid. Lower prints showing replacement of bones.

All authorities agree that isolated dislocations of the carpal scaphoid without fracture or dislocation of associated carpals or fracture of the radial or ulnar styloid are exceedingly rare and when they do occur they are all dorsal in direction.

This case brings out several pertinent facts:

(1) The occurrence of an isolated dislocation of the carpal scaphoid, not dorsally but radially and not accompanied by any fracture.

(2) The associated central displacement of the lateral metacarpals through which the force must have been transmitted.

(3) The traction and manipulation necessary for reduction, previous attempts by direct force having failed.

(4) The very useful and rather prompt return of function by conservative treatment.

PALMAR CARPO-METACARPAL DISLOCATION OF THE FIFTH METACARPAL

DR. B. FRANKLIN BUZBY reported the case of a woman, aged forty-eight years, who was in an automobile accident on June 24, 1933, in which the car she was driving was struck by a truck. She sustained multiple lacerations and contusions of her left forearm and left leg and an injury to her right hand, probably the result of forcible turning of the steering wheel. She was cared for at home by her family physician who felt that her hand should be X-rayed, but an insurance examiner assured him it was just a bruise and the doctor was swayed accordingly. Her continued complaints about her hand with persistent swelling in the heel of her hand and numbness and loss of function of her little finger caused an X-ray to be made on July 10, 1933, two and one-half weeks after the injury, which showed palmar and radial displacement of the base of the fifth metacarpal so that it was overlying the bases of the third and fourth metacarpals.

Due to uncontrollable circumstances appropriate treatment could not be instituted at once. On July 26, 1933, open reduction was undertaken through a palmar flap exposing the dislocated metacarpal base which was surrounded with rather tough scar tissue. The bone was mobilized and its normal bed cleared of scar tissue which latter contained some callous-like material. This being accomplished it was found impossible to fasten the bone in place through the palmar incision and a dorsal incision was made through which the base of the metacarpal was sutured in place by No. 2 chromic catgut through it and the fourth. Except for a skin slough in the angle of the palmar flap the wound healed kindly.

On August 29, 1933, she could bring the index and middle finger to the palm and the ulnar nerve numbness present before operation had gotten much less and the weakness of grip and the fullness in the heel of her hand had gone. X-ray showed the metacarpal base in normal relationship to the rest of the hand. Having moved away from the community her present condition cannot be reported but the speaker has heard that the motion and function of the hand are satisfactory to the patient.

Speed, in his "Fractures and Dislocations," says that "isolated dislocations of every metacarpal bone except that of the little finger have been reported." All authorities insist that single and multiple carpometacarpal dislocations show the metacarpals to be invariably dorsally dislocated but that all are rare singly.

The foregoing case is one to controvert both of these statements.

The striking things about this case are:

(1) Rarity of lesion both as to bone involved and as to location in dislocation.

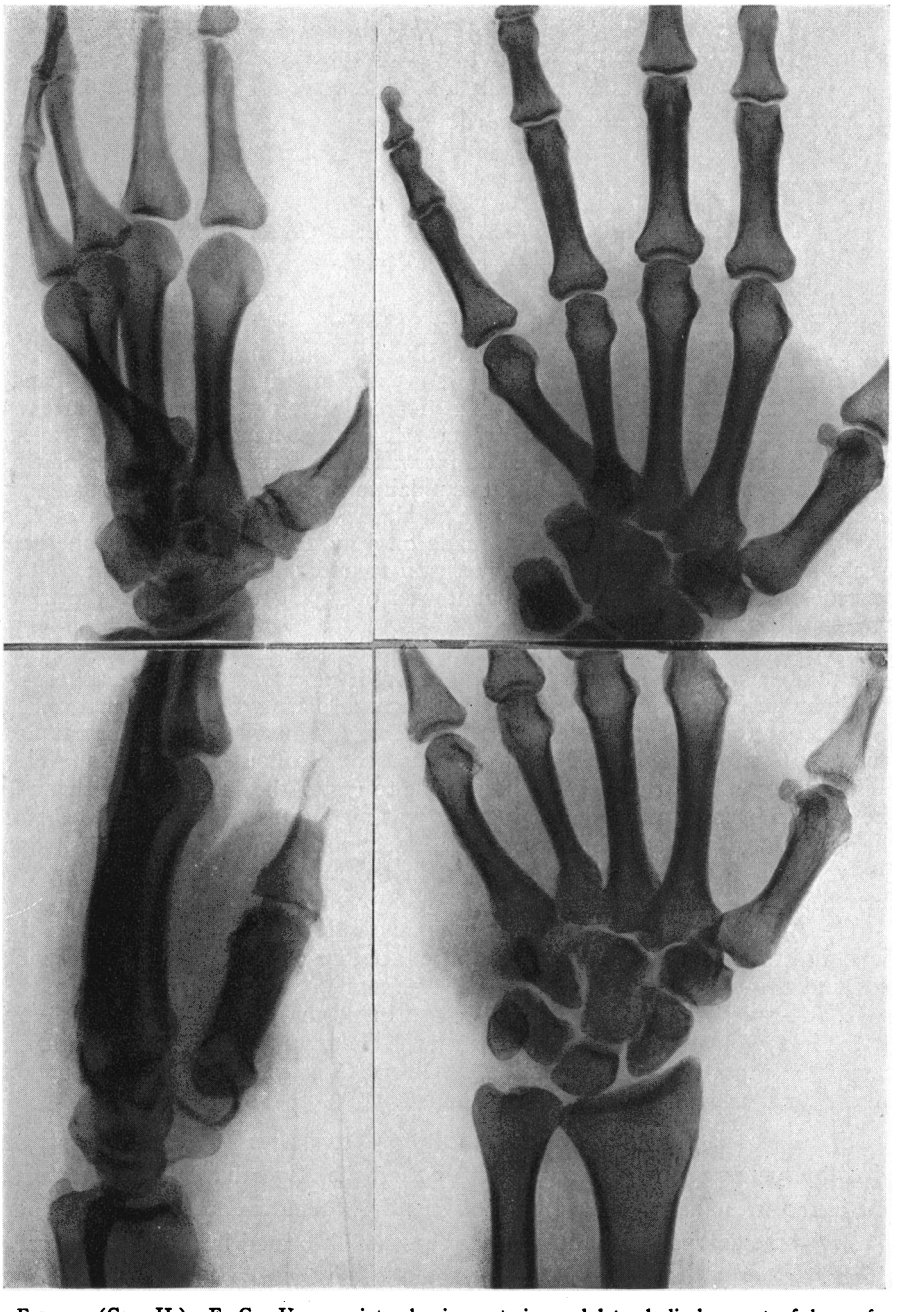

FIG. 2.—(Case II.) F. G. Upper prints showing anterior and lateral displacement of base of fifth metacarpal. Lower prints, after operative reduction and fixation.

(2) Probable mechanism by forcible turning of tightly gripped automobile steering wheel.

(3) Necessity for dorsal incision to fasten bone in position.

(4) End-result of the later operative reduction and fixation.

PERINAVICULAR-LUNAR DORSAL DISLOCATION OF THE WRIST WITH COMMINUTED FRACTURE OF THE NAVICULAR

DR. B. FRANKLIN BUZBY reported the case of a man aged thirty-eight years, a machinist, who about six weeks before he was referred to the speaker, on December 16, 1933, had gotten his left wrist caught between a transformer which was being moved and a screen. He had his elbow flexed and he says his wrist was forcibly palmar-flexed. He was immediately disabled by intense pain and marked swelling. He was treated primarily by a splint for three weeks without any manipulative effort being made to correct the condition found, although several X-rays were taken during the intervening six weeks.

On December 16, 1933, on examination, he had a typical low silver-fork deformity with the radius being normal. There was but ten degrees each of flexion and extension in his wrist, accompanied by pain if forced. The distal row of carpals was prominent dorsally as were the proximal row on the flexor surface of the wrist. He was able to flex his fingers only a few degrees at each of the metacarpophalangeal joints and the interphalangeal joints. An X-ray taken on that date showed a comminuted fracture of the carpal scaphoid with a posterior dislocation of all the carpals except the semilunar and scaphoid—the "perinavicular-lunar dorsal dislocation" of Speed which he says is very rare, and which in this case is complicated by a comminuted fracture of the scaphoid *without* displacement of the fragments.

At operation on December 29, 1933, eight weeks after injury, the scaphoid was entirely removed and after forcibly breaking up the adhesions in the dislocation by a blunt heavy dissector the posterior dislocation was manually reduced, but had a tendency to recur unless the wrist was held in flexion of thirty-five degrees. A posterior plaster splint was applied in this position. This was replaced by a straight plaster splint in one week and all external fixation was removed nineteen days after operation.

He returned to light work in one month after operation, being able then to get his ring and little finger tips strongly against his palm, his middle finger to within one-quarter of an inch and the index to within one-half inch of his palm. The wrist motion was painless within limits of thirty degrees each of flexion and extension. On February 17, 1934, seven weeks after operation, he lacked only five degrees of full flexion and twenty-five degrees of full extension and was using the wrist vigorously without pain, had a good grip and made a good fist.

While too early to give a functional end-result, his recovery is advancing rapidly and although eventually he may lack some extension, the part is useful and painless.

An X-ray on January 16, 1934, showed much decalcification of all bones of the wrist and hand, the dislocation being reduced and of course the scaphoid missing.

The mechanism of this dislocation theoretically is forcible hyperextension of the wrist with rupture of the posterior ligaments of the os magnum and cuneiform where attached to the semilunar, and thus the two rows of carpal

bones are separated and the distal row and hand forcibly pass on posteriorly. This patient insists, however, that his wrist was forcibly flexed. Of course this may be inaccurate. Theoretically also the scaphoid should not have fractured or if so the distal half should have been dislocated posteriorly along

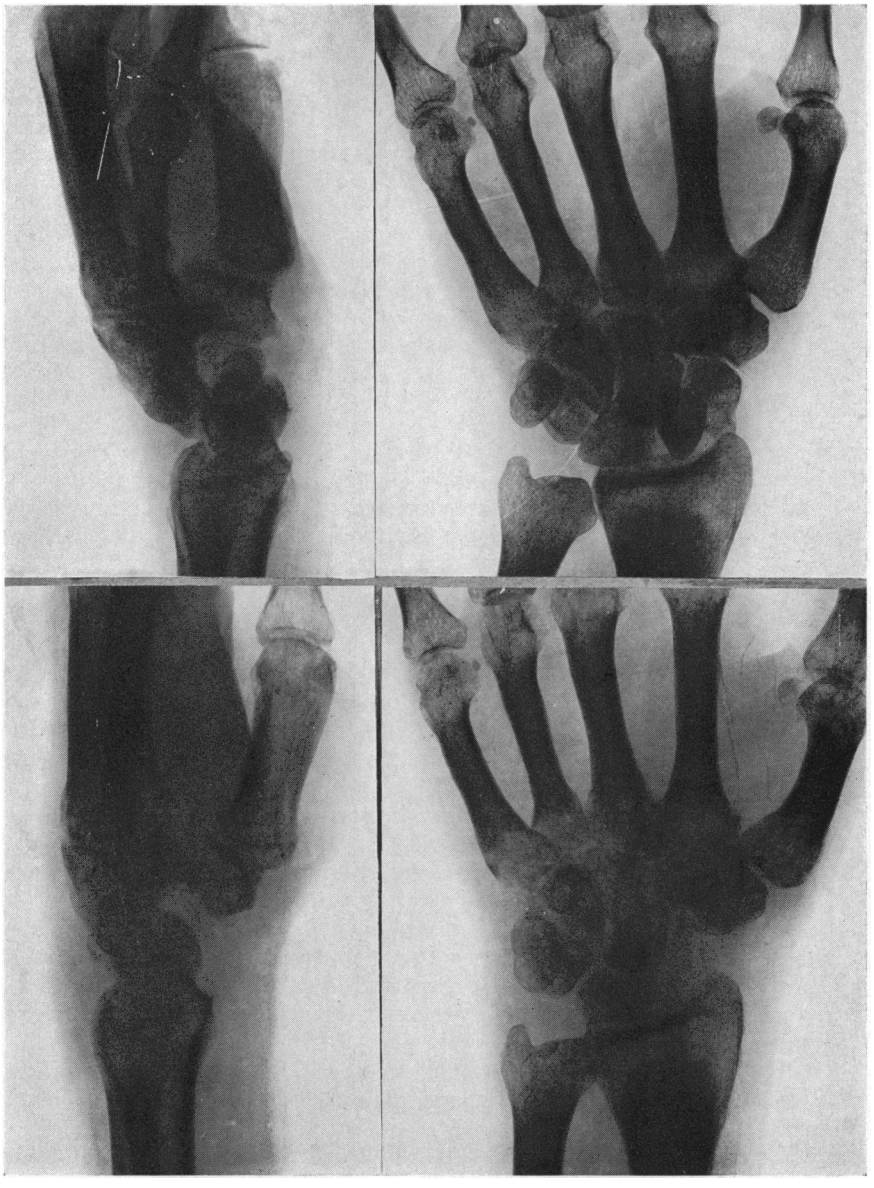

FIG. 3.—(Case III.) H. A. Upper prints show posterior dislocation of distal carpals with fractured scaphoid. Lower prints, after scaphoidectomy and open reduction of dislocation.

with the distal carpal row which apparently it has not done. The rapid return of function, especially that of the fingers, after operation was most gratifying as well as striking.