the tissues or with those portions of the instruments which do come in contact with the tissues; nor are needles, sutures or ligatures to be handled with other than sterile instruments at any time. Rubber gloves cannot be trusted to come in contact with tissues, blades of instruments, needles or threads, because of the possible contact with other things or of a minute hole in the glove.

I may add that all but my first case were manipulated so. No one who has taken the trouble to master this technic seems to think there is anything very difficult about it.

In the paper which I read before the meeting of the American Medical Association in Los Angeles, last year, I gave my conclusions on a series of experiments intended to determine the force needed to dislodge thirty-four screws, half of them infected, from the long pipe bones of dogs, at intervals varying from one hour to seventy-one days. My conclusions were, that it requires but 41 7-9 pounds to dislodge an infected No. 3 screw from a dog bone, with a cortex of 2 mm. On the other hand, a pull of more than 95 pounds was required to draw the average clean screw of No. 3 gauge from bones of about 2 mm. cortex. The corresponding human bones have a much thicker cortex; moreover, No. 5 and No. 7 screws are used, which are much larger in every dimension, to say nothing of the fact that as many as ten of them are embedded at one time. It does not require much mental effort to picture the great amount of force needed to tear such a plate out of an aseptic wound when freshly applied, provided only it has been correctly applied, that is, by means of a drill the size of the screw-barrel with the screw threaded to its head. In the experiments here described the screws were not observed under actual working conditions, since there was no pull or other external force acting on them during the healing process, as is the case when a Lane plate is used in the human being. I believe, too, that most surgeons consider the usefulness of the plate about over when a snug splint has been applied externally.

The primary object of a paper read at the 1911 meeting of the American Medical Association was to determine what happens when plates are screwed to fractured dog bones and the animals are allowed full freedom, without splint, or bandage.

Eight of my fifteen dogs in which a bone plate was used thus died as a result of the operation. One was an ether death, but the other seven were lost as a result of wound infection, if we can include one which mysteriously disappeared and on which I have no definite data. This extremely high mortality has, of course, very little bearing on the situation as it confronts the human being, since it is impossible to keep splints and dressings on dogs' legs, to say nothing of the fact that they run about and bite out the skin stitches.

In no instance was a screw or plate found, at remote autopsy, to be directly in contact with the bone, there being always much intervening granulation tissue or fibrous connective tissue around the screws and plate. Hence, one cannot properly say that a screw does or does not hold in a bony socket. In the course of time bone in contact with metal disappears. In spite of this, as shown by my experiments, screws do hold remarkably well, even in infected wounds in many instances.

The results of my clinical and laboratory work incline me to the belief that extreme discrimination will be the rule in choosing our future subjects for open fracture operations.

I must say that I am doing a smaller per cent. of this work now than at any time since a visit to Mr. Lane's clinic stirred my enthusiasm some two and one-half years ago. However, certain carefully selected simple fractures must be operated upon and it is my conviction that a great majority of such can be more accurately approximated by the Lane plate than by any other device now at our command.

UNILATERAL HEMATURIA IN CHRONIC NEPHRITIS.*

BY F. E. TRUESDALE, M.D., FALL RIVER, MASS.

CASE 1. P. A., female, aged 70 years, married. With the exception of a small healed area of tuberculosis in the right lung, there was nothing of importance in the family or previous history of the patient.

In Oct., 1909, she noticed blood in the urine. From that date until the time that she entered the Highland Hospital in May, 1910, hematuria was almost constantly present. Other symptoms were those which usually accompany a secondary anemia. In January, 1910, ureteral catheterization disclosed a right-sided hematuria; examination of the urine was negative except for the presence of blood.

Among other things employed in the medical treatment were fresh human blood serum and rabbit serum. After injecting the rabbit serum there followed a period of three days when the urine remained clear, a respite which may or may not have been influenced by the serum. With this possible exception no form of medical treatment employed had any apparent worthy effect on the hematuria.

In May, 1910, seven months after the onset, the patient's hemoglobin was reduced to 50 per cent., and in her general condition there was evidence of exhaustion from a prolonged and severe secondary anemia. The urine from the right kidney now resembled blood slightly diluted with water. The specimen from the left kidney contained an occasional hyaline and fine granular cast, otherwise it was normal. Examinations of the sediments for organisms including the tubercle bacilli proved negative. A fruitless search was also made for tumor cells.

Nephrectomy was done May 27, 1910. Dr. Annie C. Macrae examined the kidney and reported as follows: Specimen, a right kidney 10 cm. by 4 cm. and weighed 113 gms. The capsule stripped off easily leaving a smooth but blood-shot surface.

* See plate opposite page 164.

On section the surface presented a dark reddish color especially marked at one pole; at this place the blood vessels of the pyramids were defined as bright red lines. The cortex was $\frac{3}{4}$ cm. thick and was diffusely reddened. The branches of the renal artery were sclerosed. Microscopical examination showed a marked cloudy swelling of the parenchyma. The glomeruli appeared larger than normal and showed an increase of the connective tissue of the capillary tufts and in some of them patches of hyaline change. There were also foci of increased connective tissue between the tubules, more marked around the glomeruli. Enlarged blood vessels were numerous and in the pyramids were multiple small hemorrhages. The arteries showed thickening of the intima, also thickening and degeneration of the media. Sections stained with Sudan 111 showed fatty degenerations of many tubules. Sections stained with iodine for fatty degeneration were negative. The pathological process was restricted to one pole. Sections from several other parts of the kidney showed almost normal renal parenchyma.

Diagnosis: chronic interstitial nephritis. Fatty degeneration. Arteriosclerosis.

There was no recurrence of the hematuria and the patient's condition improved steadily. She remained well for about a year. On July 24, 1911, she died after a short illness from uremic symptoms.

The onset of the hematuria in this case was insidious and without assignable cause. The hemorrhage was unilateral, persisted for seven months, and was not controlled by medical treatment. The urine from the affected kidney examined twice failed to show any evidence of chronic nephritis. While an occasional hyaline and granular cast were found in the urine from the left kidney, none was found after a careful examination of the sediment from the urine from the right kidney. At operation there was nothing in the gross appearance of the kidney to explain the hemorrhage. Nephrectomy was done as the operation involving the least risk and affording the best chance of immediate relief.

CASE 2. W. L., aged 52 years, male, married. Mother died from phthisis. Occupation a moulder, and for 30 years has handled plumbago, which is a form of lead dust. For the past few years he had complained of indigestion in a mild form, consisting of epigastric distress with eructation of gas coming on soon after meals. These symptoms improved after he left the foundry. He had never experienced attacks of colic, vomiting and headache nor had he ever had wrist-drop. Except for his present illness he claims to have always been well. He is 5 ft. 11 in. in height and weighs 140 pounds. His weight before the onset of present illness was 164 pounds. For about a year he has had nocturia, getting up two to four times. Hematuria came on without any apparent cause in April, 1911. For two weeks there was an abundant loss of blood. He gave up work complaining of a dragging discomfort in the lumbar region and a marked loss of strength. Thereafter the amount of blood in the urine varied, but it always had a smoky appearance. Medical treatment failed to control the hematuria.

On August 22, 1911, he entered the Highland

Hospital. His appearance was anemic and decrepit. The temporal arteries were plainly visible and a trifle indurated. Heart and lungs were negative. No lead line. The liver was normal in size and the kidneys were not palpably enlarged. Urine, 24-hour amount, 60 oz. Sp. gr. 1012. Albumin, a trace. No sugar. Sediment contained hyaline and granular casts. Ureters were catheterized. The specimen from the right kidney contained blood in large quantity. Urine from the left kidney contained a large trace of albumin, no blood, great number of casts, hyaline, granular and epithelial.

X-ray examination showed no evidence of stone. No tubercle bacilli or tumor cells were found.

On account of the condition of the left kidney it seemed best to temporize with a view to doing nephrectomy if the hematuria persisted. For three days after ureteral catheterization there was an abundant hematuria after which it gradually subsided, and had entirely disappeared at the end of a week. Accordingly, the patient was allowed to leave the hospital. On Nov. 29, 1912, he returned giving the following story: In Dec., 1911, three months after leaving the hospital, his weight returned to 164 pounds, and his general health had greatly improved. There was a respite of six months, the hematuria returning in March and persisting for seven months. He observed that the amount of blood in the urine was greatest during the hottest days, and especially upon days when the humidity was high. The 24-hour amount of urine is now approximately 90 oz. Sp. gr. 1015. Albumin, slightest possible trace. The sediment contains an occasional hyaline and granular cast. No blood. The patient is engaged at present in an out-of-door occupation as a gardener; has gained rapidly since the hematuria stopped in October and weighs 155 pounds.

Until the onset of the hematuria in April, 1911, this patient had not consulted a physician, so that no knowledge of the urine was available prior to that time. The hematuria was the first symptom which led to the discovery of his chronic nephritis. It persisted for many months through the hot season and stopped coincidentally with ureteral catheterization, recurring in the spring of 1912. This second attack of hematuria incapacitated the patient by its continuous presence until the following October when it stopped spontaneously. During the periods of hematuria from the right kidney, the pathological process in the left kidney was aggravated, evidenced by the presence of an increase in the amount of albumin and the number of casts. Upon cessation of the hematuria the amount of albumin and number of casts diminished.

The subsequent course of this case will be followed with interest.

Not until 1897 was the term "essential hematuria" explained by the lesions found in chronic interstitial nephritis. Keersmaker was the first to call attention to this symptom in relation to cause and effect. He did nephrectomy for abundant unilateral hematuria. The kidney examined microscopically showed lesions of chronic interstitial nephritis, whereupon Keersmaker insisted that many of the cases of so called essential hematuria, if carefully examined, would probably show the same lesion.

Albarran followed a year later with an essay

supporting the findings of Keersmaker and contending further that in nearly all cases of essential hematuria some lesion could be found to account for the hematuria. A hemorrhagic kidney removed by Nicolich was examined and found negative. Albarran sought the specimen and with Motz examined many sections from different parts of the organ, finding typical lesions of chronic nephritis which had been overlooked in a more superficial examination. He discredits the terms "essential" or "idiopathic" renal hematuria, and emphasizes the great frequency and importance of recognizing chronic nephritis as a cause of hemorrhage in the cases previously reported as essential hematuria.

Klemperer, Schede, Senator and others adhered firmly to the theory of essential hematuria, hemophilia and angio neurotic renal hematuria. They based their conclusions on their personal observations and the cases already reported. Fowler recently recorded a case similar to many cited by the above authors. The patient was a colored laborer aged 26. For one month he had a persistent and abundant unilateral hematuria. Nephrectomy was done. A large number of sections was made from different parts of the kidney without finding any adequate cause for the hematuria. Fowler places this case in the class with many others in literature, "hematuria with cause unknown."

F. Legueu and Malherbe presented a report of their investigations before the Congress on Urology in 1899. They stated that they had found an anatomic interpretation of all the cases thus far reported, and for any conclusions to possess authoritative value they should be based on a minute examination of the entire kidney.

Graff and Gaudiani arrived at the same conclusions: that a localized nephritis always existed to account for the hemorrhage. Kotzenberg recorded four cases of hematuria showing incontestable lesions of chronic nephritis. He, too, states that histological examination does not yield these results unless the greatest care is exercised by the examiner, who should make sections from divers parts of the kidney.

Fowler, of Washington, made interesting and valuable comments on the literature up to 1905, reporting a case under his own observation, from the results of which he summarized as follows:

(1) The onset of the hematuria was spontaneous and without apparent cause. It was not associated with any other urinary disturbance.

(2) The hemorrhage was profuse and continuous. It had persisted for four years in spite of repeated attempts by various means to control it.

(3) The hematuria was unilateral.

(4) Repeated examination of the urine failed to show any evidence of nephritis. The presence of albumin in the urine was accounted for by the blood present. No casts were ever

found. There was never an interval when the urine was free from blood.

(5) On exploring the kidney it appeared normal except for the markedly granular appearance of the surface. Nothing was found microscopically to explain the hemorrhage. The operation was followed by an immediate cessation of the hematuria. Convalescence was rapid. The patient's general condition improved.

(6) Histological examination of the kidney showed a chronic interstitial nephritis of a moderately severe grade, in which the hemorrhagic tendency was well marked.

In a recent personal communication from Dr. Fowler I have learned that the present condition of the patient reported above is excellent. He is at work daily and has had no recurrence of the hematuria. Examination of the urine shows an occasional cast and slight albuminuria, elements which were present in the urine from the remaining kidney at the time of operation. Fowler stated in his article that numerous observers have drawn attention to the fact that hematuria may be the first and only sign of renal sclerosis occurring sometime years before other symptoms make their appearance, that the diagnosis of hematuria due to chronic interstitial nephritis prior to that time had been made only in a comparatively small number of cases for the obvious reason that only during the previous few years was chronic nephritis recognized as a cause of abundant hematuria. Until then the diagnosis had been made and confirmed at operation by those only who had the largest experience with this class of cases.

Hamonic reported five cases in which hematuria occurred as the first symptom years before the true nature of the kidney lesion was manifest. The first case was that of a man aged 42 years who had several attacks of hematuria during a period of two months. Except for the blood the urine was normal. For five years this patient was under observation being treated at intervals for minor complaints. During this time repeated examinations of the urine showed nothing abnormal. Suddenly there was an explosion of acute parenchymatous nephritis accompanied by other attacks of hematuria.

Albarran divided the nephritic hematurias into three clinical groups, as follows:

(1) The hematuria appears along with other unmistakable symptoms of nephritis.

(2) The hematuria precedes the evolution of nephritis, possibly for years. After a longer or shorter period other signs of nephritis appear.

(3) Hematuria is the only symptom. It is spontaneous, without apparent cause and is not modified by exercise or repose. The patient goes about her work as if nothing were wrong for days, months or years.

Barringer recently made a study of 73 cases of the hematurias of nephritis. In his classification he considered that a large proportion

were of mild toxic nephritis, another small proportion infectious nephritis, also another small percentage of typical toxic nephritis. Finally, an indefinite number of cases of pelvic conditions, variously named varicose veins of the papilla, pyelitis cystica, metaplasia of the renal pelvis, etc., giving rise to unilateral hematuria. In a large proportion of cases these pathological conditions of the kidney pelvis or papilla he considered to have been caused or accompanied by a nephritis toxic or infectious.

There were 11 cases in this total of 73 which were between the ages of 50 and 70 years, yet no case of the chronic interstitial type was recorded, which is evidence that the condition is not only rare, but occasionally must escape the observation of both surgeon and pathologist.

Occurring as it does in the degenerative period of life the hematuria of chronic interstitial nephritis is not easily differentiated from that due to a beginning neoplasm, especially when the examination reveals the kidney normal to palpation and a urine negative except for the presence of blood.

The first step in the diagnosis should be to obtain ureteral specimens in order to determine the affected kidney as well as the efficiency of the other kidney. Careful examination should be made for tubercle bacilli and tumor cells. A guinea-pig test should also be carried out if no great risk is involved in waiting.

Should the patient be under observation for a period of one, two or more months without a perceptible enlargement of the affected kidney, hypernephroma, if not all forms of new growths, may be reasonably ruled out. An x-ray examination should be made for calculus.

Having eliminated neoplasm, tuberculosis and calculus there remain the nephritides of infectious origin, which can be eliminated by the absence of the products of infection, except such cases of chronic nephritis, as in Chute's classification, which were of infectious origin but had become non-infectious at the time of hemorrhage.

Exceptionally one finds cases of varices of the papilla similar to that reported by Whitney. Pilcher has reported cases of this type. There are several more in the literature, and the condition is generally admitted to be difficult, if not impossible to recognize.

The hematuria of chronic interstitial nephritis comes on insidiously, is spontaneous, unilateral, usually continuous, but may be intermittent. It may persist for weeks, months, or years. For a period of many months the general health of Case 1 was not greatly impaired. The secondary anemia was slowly progressive, yet the patient went about as usual up to the time she entered the hospital.

Exploratory operation is the final step to clear up the diagnosis. If inspection of the kidney does not show any gross lesion, nephrotomy may or may not expose the hemorrhagic area. The chance of missing the affected tissue may be

realized when one reads the report of a case by Albarran. At operation he found the kidney enlarged and congested. He incised it widely into the pelvis. No stone, tuberculosis, or neoplasm was found, and the kidney tissue appeared normal. On more careful examination, however, a small grayish nodule the size of a millet seed was seen at the base of one of the pyramids. This was removed, and on histological examination showed chronic interstitial nephritis. Albarran calls attention to the fact that had the kidney been opened up less widely, or had the incision passed a few millimeters to one side, this small focus of disease would have been missed entirely. It is fair to assume that a surgeon of less experience and ability would not achieve success in similar cases.

While cessation of the hemorrhage has followed nephrotomy, manipulation of the affected kidney or even ureteral catheterization, recurrence of the hematuria frequently follows any operative procedure which does not excise the hemorrhagic tissue of the kidney. Nephrectomy affords immediate relief, and, in the experience of most surgeons, is accompanied by less risk. In Barringer's series of 73 cases the direct mortality from nephrectomy was less than from nephrotomy. Nephrectomy and nephrotomy appear to have an equal number of advocates. The choice of operation must necessarily vary, not only according to the findings in the laboratory and at the operating table, but also according to the experience and judgment of the operator.

The danger from suppression of urine after nephrectomy should be carefully considered. This is more likely to follow the operation when the pathological lesion is small and a large amount of normal renal parenchyma has been removed. The risk involved in suddenly increasing the work of one kidney is generally well recognized. While this can be minimized by splitting the capsule of the remaining kidney, many operators appreciating the danger of anuria, prefer to do nephrotomy. Unless the hematuria is abundant and the constitutional symptoms marked, sufficient time may be occupied in medical treatment to furnish opportunity for a careful study of the functional capacity of the other kidney.

In Case 2 the left kidney showed the influence of extra work during the period of hemorrhage from the right kidney by the presence of albumin and a large number of casts. Any further tax upon its capacity would probably have produced serious symptoms.

The investigations thus far seem to indicate that hematuria as an early sign of unilateral chronic nephritis is more common than is generally supposed, and the removal of the kidney under these circumstances affords an opportunity for the study of this disease in the period of its earliest manifestation.

BIBLIOGRAPHY.

- Keersmacher: *Annales d. l. Soc. Belge d. chir.*, 1897-8, Vol. 5, p. 159.
 Albarran: *Annales de Maladie de org. genito urin.*, 1898, p. 449.
 Klemperer: *Deutsch. Med. Wochen.*, Feb., 1897.
 Schede: *Jahrbuch der Hamburger Staatskrankenanstalt*, 1899, p. 235.
 Senator: *Berlin klin. Woch.*, 1891, Vol. xxviii, No. 1, p. 1.
 Fowler: *Amer. Jour. of Urology*, May, 1912.
 Legue et Malherbe: *Des hematuries essentielles. Rapport a la IV. Session de l'Ass. d. Urologie*, 1899, p. 7.
 Graff: *Ueber Wassersblutungen aus den Nieren ohne Pathologischen Befund. Folia Urologica*, Vol. v, 1908, p. 274.
 Gaudiani: *Sulla etiologia delle Nefriti Unilat. Folia Urologica*, Mars, 1908, p. 571.
 Kotzenberg: *Ueber Nierenblutungen. Zeitschr. f. Urol.*, 1908, p. 125.
 Fowler: *N. Y. Med. Jour.*, Nov. 25, 1905, p. 1111.
 Hamonic: *L'Assen. française d'urologie*, 1899, p. 115.
 Albarran: *Monatsberichte f. Urologie*, 1904.
 Barringer: *Amer. Jour. of Urology*, May, 1912.
 Chute: *Ibid.*, p. 230.
 Whitney: *BOSTON MED. AND SURG. JOUR.*, 1908, p. 797.
 Pilcher: *Renal Varix—Annals of Surgery*, 1909, Vol. xlix, p. 652.

STUDIES IN SPEECH DISORDER.*

No. 1.

NEGLECT LISPING: CASE AND TREATMENT.

FROM THE VOICE CLINIC, OUT-PATIENT SERVICE,
 PSYCHOPATHIC HOSPITAL, BOSTON.

BY WALTER B. SWIFT, M.D., BOSTON,

*Assistant to Physicians for Nervous Diseases, Boston City Hospital;
 Assistant in Neuropathology, Tufts Medical School.
 In Charge of Voice Clinic Psychopathic Hospital.*

THE title of my paper was quite misquoted on the postal announcing this meeting. There it said "Neglected Lispings," when I merely intended to demonstrate a case of neglect lispings. True it is, it might well be called neglected lispings, especially here in Boston, for we all know that speech defects, from apasia down to merely the simple sigmatism, are all persistently neglected in our clinics. When a bad stut-terer appears no help is offered; when an extreme lisper—like the one to be presented to you tonight—comes along, it is passed by unassisted; when any individual burdened with a severe speech defect is as much crippled as one with anterior poliomyelitis, appendicitis, or a copiously odoriferous Riggs' disease. And sometimes even more crippled, because a good frank speech defect cuts a person out of three enviable spheres of activity—school, social intercourse, and later in life, out of a job. Few diseases—cutting out bedridden types—cut one's life out of so much. Therefore, all these types of speech defect are well worthy of treatment, for they put the children back into school, give the speechless, isolated hermits companions again, and older cases give the worthy boy an occupation. It has therefore been thought wise to open, in connection with the out-patient service of the new Psychopathic Hospital in Boston a Voice Clinic. As this voice clinic develops, it is the idea of the directory of the Psychopathic Hospital to accord to it the proper space, instruments, and library facilities. As matters stand,

* No. 1 of the Psychopathic Hospital Publication Series, read before the New England Pediatric Society, November 2, 1912.

enough space is available; the instruments for everyday diagnostic work have been installed and a beginning has already been made at a small library concerning speech disorder. This is not a new venture in the medical world. Berlin University has a voice clinic, with a professor at the head of it furnishing the material for three courses of lectures in the Medical School. In Bonn is another large clinic. In New York an assistant in Psychiatry heads a speech defect out-patient department in the Vanderbilt Clinic.

The subject, then, of this demonstration is neglect lispings. Lispings itself is the inability, through failure in perception or in execution, to enunciate clearly. There are many forms, all requiring separate and appropriate treatment according to the diagnosis, each of course improving in varying degrees as the appropriate treatment is given. There is organic lispings, which may be illustrated by the "th" used in place of "s" when the tongue is tied. Then there is the rarer form of neurotic lispings, whose etiology and forms are too complicated to enter into in the space of this short paper. Then there is neglect lispings in almost innumerable forms, one of which I present to you tonight. This little girl came under my care at the voice clinic some six weeks ago. At that time her enunciation was so markedly indistinct, her teachers could not understand her; no child could talk with her, and only her parents could intelligibly interpret her sayings. She was discharged from school, was alone, without playmates,—an endured but hopeless burden upon her parents. When she first came to the voice clinic she said the familiar poem, "Mary had a little lamb," about as follows:—

"ar a a il am,
 I ee a i a o
 Ewy air ar e
 Er a a ua u o"

A careful study of this will show that almost every consonant in the whole verse is omitted. In her whole conversation it was the same. No wonder no one understood!

In the course of about three weeks' treatment, she could say the first verse of "Mary had a little lamb" and put every consonant in correctly. The treatment consisted in a dramatically enforced attention upon the expression of the consonants individually; this enforced attention was elicited by compelling the patient to pound her arm down with a quick, forced movement at the utterance of each word of the poem. Through the elements of slowness, timing and interval, the result was secured. The slowness gave time for the coming word concept to get duly crystallized in consciousness before utterance; the timing enabled the utterance of the word emphasized to come simultaneously with enforced mechanical emphasis (which latter enhanced the former); and the interval let past concepts vanish from consciousness, rested!