also suffered from disturbances of sleep rhythm during the later two stages. During the whole course of observation she was mentally very unstable without exhibiting signs of genuine psychotic alterations.

The majority of the morbid phenomena as well as their fluctuability point to hypothalamic involvement, and their response to dehydrative therapy to cerebral oedema affecting various centres during the different stages (pseudo-tumour cerebri) as the underlying cause. This hypothesis is also readily compatible with the appearance and regression of the neurological and ocular manifestations.

On the strength of this and similar observations made by us, it is suggested that in cases of Cushing's syndrome in which evidence of gross pituitary or adrenocortical pathology is lacking a hypothalamic origin of the condition be taken into account. Such cases may respond well to conservative therapy—that is, drastic dietary restrictions and dehydrative measures—especially when a marked tendency towards water and salt retention is present, and may even regress spontaneously.

REFERENCES

- Anand, B. K., and Brobeck, J. R. (1951). *Proc. Soc. exp. Biol. (N.Y.)*, **77**, 323.
 Aschner, B. (1912). *Arch. ges. Physiol.*, **146**, 1.
 Bailey, P., and Bremer, F. (1921). *Arch. intern. Med.*, **28**, 773.
 Brobeck, J. R. (1952). *Ciba Foundation Colloquia on Endocrinology*, **4**, 148.
 ———, Tepperman, J., and Long, C. N. H. (1943). *Yale J. Biol. Med.*, **15**, 831.
 Brooks, C. McC., Lockwood, R. A., and Wiggins, M. L. (1945). *Fed. Proc.*, **4**, 9.
 Camus, J., and Roussy, G. (1913). *C.R. Soc. Biol. (Paris)*, **74**, 1386.
 ——— (1920). *Endocrinology*, **4**, 507.
 Crispell, K. R., and Parson, W. (1952). *Amer. J. Med.*, **13**, 247.
 Cushing, H. (1932). *Bull. Johns Hopk. Hosp.*, **50**, 137.
 de Groot, J., and Harris, G. W. (1950). *J. Physiol. (Lond.)*, **111**, 335.
 ——— (1952). *Ciba Foundation Colloquia on Endocrinology*, **4**, 103.
 Fortier, C. (1952). *Ibid.*, **4**, 124.
 Frühling, L., Boitelle, G., and Dubois, M. (1952). *Ann. Endocr. (Paris)*, **13**, 916.
 Harris, G. W. (1952). *Ciba Foundation Colloquia on Endocrinology*, **4**, 106, 115.
 Heinbecker, P. (1944). *Medicine (Baltimore)*, **23**, 225.
 ———, White, H. L., and Rolf, D. (1944). *Amer. J. Physiol.*, **141**, 549.
 Hetherington, A. W. (1940). *Endocrinology*, **26**, 264.
 ——— and Ranson, S. W. (1939). *Proc. Soc. exp. Biol. (N.Y.)*, **41**, 465.
 ——— (1940). *Anat. Rec.*, **78**, 149.
 Hume, D. M. (1952). *Ciba Foundation Colloquia on Endocrinology*, **4**, 87.
 ——— and Wittenstein, G. J. (1950). *Proc. 1st Clin. ACTH Conf.*, p. 134. Blakiston, Philadelphia.
 Keller, A. D., Noble, W., and Hamilton, J. W., jun. (1936). *Amer. J. Physiol.*, **117**, 467.
 Nonne, M. (1914). *Neue Deutsche Chirurgie*, **12**, 107. Enke, Stuttgart.
 Schunk, J., and Cornelius, H. V. (1951). *Z. ges. exp. Med.*, **117**, 497.
 Slusher, M. A., and Roberts, S. (1954). *Endocrinology*, **55**, 245.
 Smith, P. E. (1927). *J. Amer. med. Ass.*, **88**, 158.
 Weller, O. (1952). *Ärztl. Wschr.*, **7**, 818.
 Zondek, H. (1923). *Die Krankheiten der endokrinen Drüsen*, p. 371. Springer, Berlin.
 ——— (1924). *Dtsch. med. Wschr.*, **50**, 364.
 ——— (1925). *Ibid.*, **51**, 1267.
 ——— (1926). *Die Krankheiten der endokrinen Drüsen*, Springer, Berlin.
 (a) pp. 199, 204; (b) p. 198; (c) p. 369.
 ——— (1935). *The Diseases of the Endocrine Glands*, (a) pp. 268, 269; (b) p. 266; (c) p. 433. Arnold, London.
 ——— (1952). *Schweiz. med. Wschr.*, **82**, 36.
 ——— (1953). *Die Krankheiten der endokrinen Drüsen*, p. 585. Schwabe, Basel.

The many dangerous hazards to which office workers all unsuspectingly expose themselves are the subject of a pamphlet entitled *Danger! Office Staff at Work*, recently issued by the Royal Society for the Prevention of Accidents (Terminal House, 52, Grosvenor Gardens, London, S.W.1; 6d. a copy, reduced rates for bulk purchases). Danger spots in offices include trailing telephone and electric cables, fires that have no guard to prevent papers from being blown into them, scissors, pins and needles left lying around, carpets and boards that trip up visitors even though the usual occupant of the office is familiar with them, filing cabinets that catch the unwary on the shins, and even, apparently, maniacal practical jokers who pull chairs away from under people. Office workers with slippery disks or whatever else it is that causes lumbago are shown in a neat little diagram how to pick up heavy boxes. A useful reminder in conclusion is that everyone should know where the nearest first-aid box and fire extinguisher are.

WILMS'S TUMOUR: ITS TREATMENT AND PROGNOSIS

BY

L. STUART SCOTT, Ch.M., F.R.C.S.Ed.
F.R.F.P.S.

Urological Department, Western Infirmary, Glasgow;
formerly of the Royal Hospital for Sick Children, Glasgow

In a previous paper (Scott, 1954) dealing with various types of renal tumours in childhood, I noted that the overwhelming majority were of the embryonic type known as Wilms's tumour (Wilms, 1899). An analysis of the reports of the Registrar-General for Scotland for the years 1941 to 1949 shows that, of 82,007 deaths in children under 12 years of age, renal tumours accounted for 0.07% of the total deaths and 17% of the tumour deaths.

The present review of the subject was prompted by the high mortality rate found in 61 cases of Wilms's tumour at the Royal Hospital for Sick Children, Glasgow (Scott, 1954). In an effort to obtain a clearer picture of the various factors which might influence treatment and prognosis, details of 1,141 cases treated at different centres and by different methods have been abstracted from the literature. These are discussed below, together with a more detailed study of my original 61 cases plus two additional cases that have since been encountered.

Historical

Because these tumours seldom produce symptoms referable to the renal tract, the diagnosis was for many years generally made at necropsy, and, although pyelography now permits earlier diagnosis, the mortality is still about 80%.

Jessop (1877) reported the first successful nephrectomy for Wilms's tumour in a boy aged 2 years; the child survived the operation but died nine months later from a recurrence under the scar. Israel (1894) recorded the first five-year "cure." Keith (1894) stated that "in young children it is doubtful whether it is ever right to operate; indeed, such operations must be looked upon as a surgical possibility rather than as an operation of advantage to the patient." This somewhat sweeping statement is not without justification, as a perusal of the literature shows that at the end of the nineteenth century nephrectomy in children was attended by a prohibitive mortality.

For several years deep x rays had been employed in the treatment of various types of tumour before Friedlander (1916) realized their potential value as the primary treatment of renal tumours in children. Foster and Mendilharzu (1925) implanted radium needles direct into the tumour, but although this was a popular vogue for some years it failed to stand the test of time.

To-day few surgeons favour treatment by radiation alone, although for a time this appeared to hold great promise; even fewer employ surgery alone. Radiotherapy by itself may still have a limited place in the treatment of advanced cases, occasional dramatic "cures" having been reported even in the presence of pulmonary metastases (Kerr, 1939; Silver, 1947). Radiotherapy used in conjunction with surgery is now the treatment of choice, but its exact role is still controversial.

Role of Surgery

If there is to be any hope of permanent cure it is now agreed that, in the absence of demonstrable metastases, the tumour mass must be excised at some stage in the treatment. Towards the end of the nineteenth century the operative mortality in these cases was often as high as 50% (Walker, 1897), but improvements in anaesthetic and surgical techniques, combined with a better understanding of the pre- and post-operative care, have greatly reduced this figure. In the Children's Hospital, Boston, where the large size of a tumour is not regarded as a contraindication to operation, there have been no operative deaths in the past twenty years (Gross, 1953). It is also interesting to note that, although Czerny (1881) found a marked reduction in his operative mortality when he changed from a transperitoneal to an extraperitoneal approach, it is now generally accepted that the kidney should be exposed transperitoneally to allow early ligation of the renal pedicle, thus preventing the escape of malignant cells into the blood stream while the kidney is being handled.

Although providing adequate exposure for most operations on the kidney, the usual lumbar incision is totally inadequate for the radical excision of a Wilms tumour and does not permit early ligation of the pedicle. As most of these tumours are very large by the time the patient reaches hospital, a transabdominal exposure through a T-shaped or wide transverse incision is recommended. For very large tumours an even wider exposure may be had by a thoracic approach or the dorso-lumbar flap incision of Nagamatsu (1950). If any obvious tumour tissue is left behind, metal skin clips may be inserted into it to allow more accurate direction of subsequent radiotherapy (A. L. Dean, 1954, personal communication).

Small infants are best treated by early nephrectomy without pre-operative therapy. Deming (1923) successfully removed a Wilms tumour from a boy aged 29 days; Campbell (1951) reported a seventeen-year survival following nephrectomy in a child aged 6 weeks, and one of our own patients is alive and well four and a half years after nephrectomy performed at the age of 8 weeks.

Role of Radiotherapy

Radiotherapy was at one time thought to be preferable to surgery in the treatment of these tumours, and Dean (1937) even went so far as to state that "probably if all operations upon these patients were abandoned and full doses of radiation substituted, the survival rate would greatly improve."

Bothe (1935) showed that, although embryonic connective tissue cells were completely destroyed, epithelial elements showed very little evidence of change. From these observations he deduced that tumours with a preponderance of epithelial cells would be largely unaffected by radiotherapy; thus explaining the occasional case that shows no clinical evidence of regression following therapy.

From time to time occasional dramatic results following radiotherapy alone have been published, ten-year survivals being reported by Sauer (1948) and by Nesbit and Adams (1946). It is now used in conjunction with surgery because, in spite of the "shrinking" effect which it produces in the majority of these tumours, in every tumour which has been studied histologically after radiotherapy, viable cancer cells have been found, and it is not uncommon for metastases to appear four or more years after an apparent "cure" by radiotherapy alone (Kerr, 1939; Bixler *et al.*, 1944; Nesbit and Adams, 1946). Dean (1954, personal communication) quoted a case treated by radiotherapy in which the tumour completely disappeared. Fourteen years later, when the kidney was removed because of infection, histological examination revealed "a considerable amount of viable Wilms's tumour" although the patient had long been regarded as cured.

Most of these tumours are so highly radiosensitive that large, bulky, and apparently inoperable tumours can be

made to shrink to an "operable" size. In some clinics pre-operative radiotherapy is given routinely, and Rusche (1951) looks upon it "not as a cure but as a procedure, much as iodine is used preparatory to thyroid surgery." Shrinkage of the tumour mass is noticeable within a few days of starting radiotherapy, but in our cases the mass has always remained palpable. It is now generally agreed that as soon as maximum regression has taken place the tumour should be promptly removed. If no visible or palpable reduction is noted after six or eight treatments it is unlikely that it will begin at a later date; in these circumstances pre-operative therapy should be discontinued and nephrectomy performed.

Although there is still disagreement over the therapeutic value of pre-operative therapy, most surgeons would agree that radiotherapy plays an essential part in the post-operative regime. There is ample evidence in the literature that, in children, early post-operative exposure to x rays has little or no effect on wound-healing (Gross, 1953), but many clinics still wait two or three weeks to allow the wound to heal. At the Boston Children's Hospital, radiotherapy is started immediately after operation—before the child has recovered from the anaesthetic—and, following the institution of this regime, their survival rate has increased to 47.3%.

Sixteen of our cases were treated by a combination of surgery and radiotherapy; nine of them developed a recurrence under the scar, and in every case the recurrence proved to have developed a high degree of radio-resistance.

Effects of Radiotherapy

On Leucocytes.—In children leucocytes appear to be vulnerable to the high dosage of x rays in these cases. Daily white-cell counts have shown that the value occasionally drops alarmingly low; in some of our cases it led to temporary cessation of radiotherapy.

On Bone Growth.—Experimental work on the effects of radiotherapy on bone growth in animals (Gates and Warren, 1943; Barr *et al.*, 1943) has shown that 600 r causes some retardation of epiphyseal growth; complete inhibition being produced by 1,200 r or more. Neuhauser *et al.* (1952) studied 34 children who received radiotherapy to fields including the spine, and they found that a tissue dose of less than 1,000 r seldom produces gross permanent deformity of the vertebrae. Children of 2 years of age can tolerate between 1,000 and 2,000 r, but tissue doses in excess of 2,000 r produce retardation of bone growth irrespective of the child's age.

On the Tumour.—It has been possible to study the clinical effect in six cases, in each of which radiotherapy was used as the primary treatment. In one of the two cases treated by radiotherapy alone there was a steady decrease in the size of the tumour mass although it remained palpable; in the other there was no apparent change. Four cases had pre-operative radiotherapy, and in each case the tumour diminished in size. On naked-eye inspection of five of these tumours (one at necropsy and four after nephrectomy) the tumour was always still quite evident (Fig. 1), but the degree of liquefaction and necrosis was very much greater than is seen in an untreated Wilms tumour. On histological section

FIG. 1.—Bisected kidney, showing Wilms's tumour of the upper pole, which had been treated by pre-operative radiotherapy.

the most noticeable changes were a marked increase of necrotic and fibrous tissue, and, although islands of active tumour cells could almost always be found (Fig. 2), the degree of destruction was sometimes so great that it was extremely difficult to detect the presence of any renal elements at all.

On Metastases.—Although radiotherapy was directed at localized metastases in a few of our cases, it was always given more as a placebo to the child's parents than as a serious attempt at obliterating the growth, and as a result it has not been possible to assess its true value in this field ;

FIG. 2.—Photomicrograph of a Wilms tumour after a course of radiotherapy, showing islets of malignant cells surrounded by extensive fibrosis.

however, Nesbit and Adams (1946) published a ten-year "cure" following irradiation of pulmonary metastases, and four-year "cures" have been reported by Kerr (1939) and others.

Results Obtained by Different Methods of Treatment

Owing to the fact that the majority of recurrences and metastases appear within a year of treatment, a two-year survival is now universally accepted as the standard of probable cure. While accepting survival for this statutory period as a probable cure, one must remember that metastases have appeared as late as five years post-operatively (Gross and Neuhauser, 1950). In order to compare the published results in the literature it has been necessary to review the cases on the basis of this "standard of cure," and, henceforth, reference to the words "cure" or "survival" should be taken to mean freedom from recurrence or metastases for a period of two years after instituting treatment.

In the Glasgow series the mortality in the treated cases was 85.7%, but as this figure is based on a relatively small number of cases, the literature has been extensively reviewed, and an analysis of 1,141 treated cases is shown in Table I. Only those published cases in which the method of treatment was clearly stated have been considered.

TABLE I.—Results Obtained by Different Methods of Treatment (Published Cases)

Method of Treatment Used	No. of Cases	No. of Survivors	Survival Rate
Radiotherapy alone	118	13	11.0%
Nephrectomy	463	87	18.8%
Radiotherapy + pre-operative	81	21	25.9%
Nephrectomy + post-operative	347	83	23.9%
Radiotherapy	132	42	31.8%
Nephrectomy + pre- and post-operative radiotherapy	132	42	31.8%
Total	1,141	246	21.5%

In our own cases the most satisfactory method of treatment proved without doubt to be nephrectomy combined with post-operative radiotherapy (Scott, 1954), and in Boston, where this form of treatment is employed routinely, Gross and Neuhauser (1950) claim the most favourable results ever published for a large series of cases. It is their contention that, although pre-operative radiotherapy admittedly reduces the size of the mass, tumour cells may be liberated into the blood stream to form metastases during the time required for this treatment to take effect. It is also significant that Dean (1954, personal communication)—so long the champion of pre-operative therapy and, in the earlier days, of radiotherapy alone—now employs early nephrectomy followed by immediate post-operative therapy.

In spite of this powerful evidence in favour of nephrectomy and post-operative therapy, the results depicted in Table I suggest that, if a surgeon has had little or no experience in dealing with these tumours, a combination of nephrectomy with pre- and post-operative irradiation would probably give the best results, as the nephrectomy is undoubtedly facilitated by the pre-operative shrinkage.

Prognosis

In order to appreciate the gradual but steady decrease in the overall mortality, 1,581 cases have been abstracted from the literature, many of which received no treatment whatsoever, as they were regarded as inoperable; in others the form of treatment was not stated. The overall picture is shown in Table II, the results having been divided into three arbitrary periods for the sake of comparison.

TABLE II.—Comparison of Survival Rates in Different Eras (Published Cases)

Period of Study	No. of Cases	No. of Survivors	Survival Rate
Before 1935	458	39	8.5%
1935-44	411	74	18.0%
1945-54	712	158	22.2%
Total	1,581	271	17.1%

Before 1935.—A period when practically all the operable cases were treated by nephrectomy alone. A relatively high percentage were admitted in a moribund condition and received no treatment.

1935-44.—A period during which radiotherapy was added to the surgeon's armamentarium and earlier diagnosis was facilitated by pyelography.

1945-54.—A period during which improved anaesthetic techniques led to more varied and wider exposures of the tumour and, in addition, there was marked improvement in pre- and post-operative care as a result of antibiotics and the more frequent use of blood transfusions.

From Table II it can be seen that only 17.1% of the cases survived for two or more years. At the Royal Hospital for Sick Children, Glasgow, radiotherapy was not used in the treatment of these tumours until 1945, but since its introduction the survival rate has increased from 2.6 to 20%. It is also significant that whereas 50% of the cases admitted before 1945 were regarded as inoperable, only two cases fell into this category after the introduction of radiotherapy; both of these patients died within a few days of admission.

Factors Affecting the Prognosis

Sex of Child.—As these tumours involve the sexes with equal frequency, I was impressed by the fact that of the six cures in my series (Scott, 1954) five were males, but a review of the published cures has failed to substantiate this apparent predominance of male survivors.

Side Involved.—Both kidneys are involved with equal frequency, and approximately 3% are bilateral (Scott, 1955), but there is no evidence that either kidney is a more favourable site from the viewpoint of survival.

Age at Onset.—The great majority of Wilms's tumours appear in the first four years of life (Fig. 3). It is considered significant that four of the six survivors were under

18 months on admission, and on reviewing the published cures it has been found that 40% were in that age group. Table III shows that in the Glasgow series 17.6% of those

FIG. 3.—Age incidence of 1,000 published cases.

the Wilms tumour appears in the first year of life. This is consistent with the findings of Harvey (1950).

Duration of Symptoms.—Frequently, by the time the child's mother discovers the lump in the abdomen the tumour is already too far advanced for any prospect of permanent cure, and it is notable that three of the six survivors in our series were admitted for treatment within forty-eight hours of the appearance of the first symptom.

TABLE III.—Effect of Age on the Survival Rate

Age in Years	No. of Cases		No. of Survivors		Survival Rate	
	A	B	A	B	A	B
Under 1	17	161	3	28	17.6%	17.4%
Over 1	46	844	3	77	6.5%	9.1%

A = Cases from the Royal Hospital for Sick Children, Glasgow.
B = Published cases whose ages were stated.

Haematuria.—This was present in 25.4% of our cases and all these patients died within nine months; perusal of the literature shows that, with few exceptions, haematuria has nearly always been followed by death within a year. This is almost certainly due to the fact that haematuria denotes involvement of the renal pelvis, and, as Wilms's tumours remain encapsulated for a considerable length of time, they tend to compress and distort the pelvis by sheer bulk and do not invade it until the tumour is very advanced.

Delay in Instituting Treatment.—Gross (1953) stresses the danger that "these abdominal masses are apt to create considerable interest on the part of physicians, nurses, and students, with the result that they are handled unnecessarily often," and it seems probable that delay in starting treatment may well be an important factor affecting the prognosis.

Summary and Conclusions

Wilms's tumour is the commonest tumour of the renal tract in infancy and childhood. It may appear at any age, but the great majority of cases arise in the first four years of life.

Three basic methods of treatment have been discussed, and, although it has been shown that these tumours are generally highly radio-sensitive, a combination of surgery and radiotherapy produces much better results than those obtained by employing either method by itself. Whether or not radiotherapy is given before operation, a further course should be given post-operatively in order to destroy any remaining malignant cells.

A wide transperitoneal or transthoracic exposure of the kidney is recommended to allow early ligation of

the renal pedicle and to permit a wide dissection of the adjacent fatty tissue and lymphatics. It is suggested that the ideal form of treatment is prompt nephrectomy following minimal pre-operative handling, together with intensive radiotherapy to the loin (beginning immediately after operation). If the surgeon has had little or no previous experience in dealing with these tumours, nephrectomy will be greatly facilitated by pre-operative radiotherapy. It is unjustifiable to postpone nephrectomy because of a dramatic improvement following radiotherapy, as viable tumour cells will still be present in the growth, and delay only increases the chance of their dissemination.

The destructive effect of x rays on leucocytes has been noted, but it is suggested that the effects on wound healing are less marked in childhood and should not prevent early institution of post-operative therapy.

Experimental work on the effect of x rays on bone growth has been reviewed, and it is seen that, whereas tissue doses of less than 1,000 r seldom result in permanent vertebral damage, 2,000 r or more will generally retard bone growth irrespective of the age of the child.

The effects of radiotherapy on the tumour have been studied histologically in five cases, and it was noted that, although there is a marked increase in the amount of necrosis and degeneration, focal islets of actively malignant cells can generally be detected.

It is noted that the overall mortality is in the region of 80%, although recent papers on the subject suggest that as a result of earlier diagnosis and consequently earlier treatment this figure is now being reduced.

The mortality in males is as high as it is in females, but it is noted that if the tumour makes its appearance before the child is 1 year old the chances of survival are much improved.

Haematuria, which denotes ulceration or invasion of the renal pelvis, has a grave prognostic significance.

These tumours are very prone to recur within nine months of nephrectomy, and recurrences following radiotherapy tend to be highly radio-resistant.

I am indebted to the staff of the Royal Hospital for Sick Children, Glasgow, for permitting access to the relevant case records. I thank Mr. Matthew White and Dr. A. M. Macdonald for all their help and advice. The illustrations are the work of Mr. Mason, of the pathology department.

REFERENCES

- Barr, J. S., Lingley, J. R., and Gall, E. A. (1943). *Amer. J. Roentgenol.*, **49**, 104.
Bixler, L. C., Stenstrom, K. W., and Creevy, C. D. (1944). *Radiology*, **42**, 329.
Bothe, A. E. (1935). *J. Urol.*, **33**, 434.
Campbell, M. F. (1951). *Clinical Pediatric Urology*. Saunders, Philadelphia.
Czerny, C. (1881). *Trans. int. Med. Congr.*, **2**, 242. London.
Dean, A. L. (1937). *Amer. J. Surg.*, **38**, 80.
Deming, C. L. (1923). *J. Amer. med. Ass.*, **80**, 902.
Friedlander, A. (1916). *Amer. J. Dis. Child.*, **12**, 328.
Foster, E., and Mendilharzu, J. R. (1925). *Sem. méd. (B. Aires)*, **32**, 926.
Gates, O., and Warren, S. (1943). *Arch. Path. (Chicago)*, **35**, 323.
Gross, R. E. (1953). *The Surgery of Infancy and Childhood*. Saunders, Philadelphia.
— and Neuhauser, E. B. D. (1950). *Pediatrics*, **6**, 843.
Harvey, R. M. (1950). *Radiology*, **54**, 689.
Israel, J. (1894). *Arch. klin. Chir.*, **47**, 302.
Jessop, K. (1877). *Lancet*, **1**, 889.
Keith, W. (1894). Quoted by Walker (1897).
Kerr, H. D. (1939). *J. Amer. med. Ass.*, **112**, 408.
Nagamatsu, G. (1950). *J. Urol.*, **63**, 569.
Nesbit, R. M., and Adams, F. M. (1946). *J. Pediat.*, **29**, 295.
Neuhauser, E. B. D., Wittenborg, M. H., Berman, C. Z., and Cohen, J. (1952). *Radiology*, **59**, 637.
Registrar-General for Scotland (1941-9). Annual Reports. H.M.S.O., London.
Rusche, C. (1951). *J. Urol.*, **65**, 950.
Sauer, H. R. (1948). *N.Y. St. J. Med.*, **48**, 497.
Scott, L. S. (1954). *Glasg. med. J.*, **35**, 33.
— (1955). *Brit. J. Surg.*, **42**, 513.
Silver, H. K. (1947). *J. Pediat.*, **31**, 643.
Walker, G. (1897). *Ann. Surg.*, **26**, 529.
Wilms, M. (1899). *Die Mischgeschwülste der Niere*. Georgi, Leipzig.