REPORT OF CASE

Girl, aged 9 years. When patient was 1 year old she commenced to have occasional digestive disturbances, during which she lost her appetite, became nauseated and often vomited. She was always extremely cross and irritable during these attacks and occasionally had a slight fever. It was during one of these attacks that the mother noticed for the first time the small brown specks in the stools. A dose of castor oil was given, the patient quickly recovered and coincidentally the specks disappeared from the stools. The frequency of the attacks varied from one week to three months. In December, 1908, at the age of 5 years, the patient had symptoms which were very suggestive of hip-joint disease, though her general condition otherwise was good and did not suggest tuberculosis. There was some pain with use of the joint, and the child walked with a slight limp. Apparatus was applied to protect the hip-joint and worn for several months, after which time it was discarded, because the recovery was complete. In May, 1910, the child was in excellent condition, growing rapidly, and walking without a limp and without aid of the splint.

The cross, irritable spells, accompanied by intestinal sand, persisted up to July, 1912. Since then, the patient has not been seen. Various diets were tried without any influence on the condition. No connection could be found between the appearance of the sand and bananas or any other fruit or vegetable. The sand, the analysis of which was given in the foregoing, was obtained in November, 1908, at about the time the hip-symptoms were developing.

SUMMARY

True intestinal sand may be present when no banana is eaten. The history in the case reported is suggestive of some connection between the sand and the intestinal symptoms. It is impossible to say whether or not the sand bears any etiologic relation to the intestinal or joint-symptoms or whether or not it is of any diagnostic importance.

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THE HISTOPATHOLOGY OF POMPHOLYX*

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Pompholyx was first described, as a form of dyshydrosis, by Tilbury Fox,¹ who was of the opinion that the condition was characterized essentially by "the retention in the follicles of the skin of sweat, rapidly and freely excreted," and believed that the affection bore the same relation to the sweat follicles that acne vulgaris does to the sebaceous glands. Hutchinson² who independently recognized and described the disease at about the same time, was opposed to this view, and, basing his argument on the symmetry and the spontaneous appearance and disappearance of the clinical manifestations, and on the fact that the condition was seen most frequently in persons whose vitality had been lowered by worry, overwork and similar agencies, concluded that it was an acute, inflammatory disease of the rete, neurotic in origin. He³ suggested for it the name "cheiropompholyx."

* Read in the Section on Dermatology of the American Medical Association, at the Sixty-Fourth Annual Session, held at Minneapolis, June, 1913.

1. Fox, Tilbury: Dyshydrosis, *Am. Jour. Syph. and Dermat.*, 1873, p. 1; Clinical Lecture on Dyshydrosis, an Undescribed Eruption, *Brit. Med. Jour.*, 1873, p. 365; Skin Affection Lately Described as Dyshydrosis, *Brit. Med. Jour.*, 1877, p. 799; Clinical Comments on Dyshydrosis and Its Morbid Anatomy, *Brit. Med. Jour.*, 1878, p. 749; Clinical Lecture on Dyshydrosis, *Atlas of Skin Diseases*, Plate II, p. 84, London, 1873.

2. Hutchinson: Notes on a Clinical Lecture Written Out in 1871, and Now Printed Verbatim, *Lancet*, London, 1876, p. 639.

3. Hutchinson: Cheiropompholyx, Letter to the *Lancet*, London, 1876, p. 307.

Robinson⁴ of New York first examined the lesions microscopically, and also analyzed the contents of some of the vesicles. The results of his investigations convinced him that the condition bore no relation to the coil-glands or ducts, and, in view of the fact that the feet also were sometimes involved, he proposed the name "pompholyx" for the disorder. Thin⁵ confirmed Robinson's findings, and agreed with him and with Hutchinson regarding the probable neurotic origin of the affection. Fox and Radcliffe Crocker⁶ published in 1878 their first pathologic report. They found signs of inflammation in the coil-glands, and many of the earliest vesicles, which always formed in the rete, were

Fig. 1.—Lesions on palm at height of attack, Case 1.

Fig. 2.—Large, multilocular lesion from palm in Case 1.

directly in a line with and interrupted the course of a sweat duct. Later, Crocker⁷ obtained some material from another patient, and examined it microscopically. In this case, he found that while a few of the vesicles were interpapillary, and had developed in the course of the coil-gland ducts, more often the cavities were super-

4. Robinson: Pompholyx, the Cheiropompholyx of Hutchinson and the Dyshydrosis of Tilbury Fox, *Arch. Dermat.*, 1877, p. 289.

5. Thin: Remarks on a Skin Affection Lately Observed and Described as Dyshydrosis, Cheiropompholyx and Pompholyx, *Brit. Med. Jour.*, 1877, p. 761.

6. Fox and Crocker Radcliffe: The Minute Anatomy of Dyshydrosis, *Tr. Path. Soc.*, London, 1878, p. 264.

7. Crocker, Radcliffe: Diseases of the Skin, P. Blakiston's Son and Co., Phila., Ed. 3, 1, 291.

papillary, and situated between the ducts. In no instance could he convince himself that the coil-gland was inflamed. The fact that, in his text-book, Crocker finally adopted the name "pompholyx" for the affection and classed the disease among the inflammations instead of with disorders of the coil-glands would indicate that he was far from positive regarding the correctness of his earlier deductions. Williams⁸ and Santi⁹ working in Unna's laboratory, both concluded, with Robinson, that the vesicles do not result from dilatation of the intraspinous portion of the coil-gland ducts. Williams studied 229 serial sections, from three typical lesions. He found that while many of the vesicles lay quite close to the sweat ducts, they did not communicate with the latter. Frequently the ducts were diminished in size, and pressed to one side, forming wide loops around the cavities, but not connecting with them in any way. Breda's¹⁰ conclusions, published at about the same time, but based on independent investigation, in Italy, were very similar to those of Williams. In particular, he emphasized the perivesicular looping of the coil-gland ducts in some of the specimens (an observation of Williams' the accuracy of which appears to have been questioned by Crocker.⁷) Paul Farey¹¹ who next made an exhaustive study of the disease, decided that the pathologic process did not involve the sweat apparatus in any way, but probably was due to a temporary exacerbation of a chronic vasomotor disturbance, and might be regarded as a toxiconeurodermatitis.

Despite the accumulated evidence, however, many expert clinicians still hold to the sweat-duct origin of the condition. Recently, Nestarowsky¹² working in Pawlow's laboratory in St. Petersburg, has examined a large number of sections (2,840) from six cases of pompholyx. He criticizes the work of other observers, in that he believes that their conclusions have been based on insufficient data. In his opinion, the affection is a disorder of the sweat-ducts, secondary to disturbance of the vasomotor or secretory nerves. He considers that hyperhydrosis, or the condition underlying it, is a predisposing factor. The distribution of the lesions, together with the fact that the disorder occurs most frequently (but not always) in individuals who are the subjects of hyperhydrosis is very suggestive, and Schamberg¹³ states that "the clinical phenomena rather support the views of Tilbury Fox and Crocker," while Pusey,¹⁴ a dermatologist of wide experience and admirable judgment, expresses the belief that "the disease is exactly analogous to miliaria on other parts, but presenting clinical differences on the palms and soles because of the thickened epidermis under which the sweat is retained."

It may be stated, in passing, that the very extraordinary case reported by Rasoni¹⁵ which is sometimes referred to as an instance of "generalized pompholyx," was very probably an example of the condition recently described by Ormsby¹⁶ under the name of "syringoma."

During the past summer, it was my good fortune to see a large number of cases of pompholyx, a rather unusual experience in the Middle West. All were in private practice, and, although ambulatory, quite well under control. At various periods during June, July and August, nine more or less typical examples of the disease were selected for study. Of these patients, seven submitted to biopsy (two at their own suggestion, when they found that I was particularly interested in their condition. Each of these had two specimens removed). Lesions at various stages of development were selected for excision. All doubtful cases, presenting vesicles on the sides of the fingers only, were rejected.

Figs. 3 and 4.—Lesions in stage of desquamation, Case 5.

SUMMARY OF CASES STUDIED

A brief summary of the case histories is of interest:

CASE 1.—L. G., man, aged 20, single, train despatcher. Referred to me by Dr. Leon Rosenwald of this city. Hands and feet affected. Fourth attack (at intervals of one year). Plantar and palmar hyperhydrosis. Two lesions excised from left palm.

CASE 2.—A. N., woman, aged 32, married, housewife. Hands and feet affected. Numerous previous attacks at brief intervals, during past five years. The vesicles develop rapidly, and an attack usually lasts only a few days. Patient extremely

8. Williams: Cheilropompholyx, *Monatsh. f. prakt. Dermat.*, 1891, p. 41.
9. Santi: Zur Frage der als Dyshydrosis, Cheilropompholyx und Pompholyx beschriebenen Hauterkrankung, *Monatsh. f. prakt. Dermat.*, 1892, p. 93.
10. Breda: Pompholyx, Robinson, Osservazioni clinico-istologiche, *Riv. clin. e terap.*, 1891, p. 547.
11. Farey, Paul: Thèse de Paris, 1896.
12. Nestarowsky: Dyshydrosis, *Dermat. Ztschr.*, 1906, p. 183 et seq.
13. Schamberg: Diseases of the Skin and the Eruptive Fevers, W. B. Saunders Co., Phila., 1911, p. 98.
14. Pusey: The Principles and Practice of Dermatology, Appleton & Co., New York, 1911, p. 948.
15. Rasoni: Tr. Internat. Med. Cong., London, 1881, III, 146.
16. Ormsby: Jour. Cutan. Dis., 1910, p. 433.

nervous and excitable. Cold extremities. Plantar and palmar hyperhydrosis. One lesion excised from left palm.

CASE 3.—S. M., woman, aged 34, widow, governess. Referred to me by Dr. J. M. Frankenburg of this city. Hands affected. Second attack, the first having occurred in June, 1911. One lesion excised from left palm.

CASE 4.—F. G., man, aged 38, single, clerk. Referred to me by Dr. Joseph Nutz of this city. Hands and feet affected. Palmar and plantar hyperhydrosis. Third attack (annual).

CASE 5.—H. S., man, aged 46, married, judge. Hands and feet affected. Second attack, the first having occurred in July, 1911. Two lesions excised from palm.

CASE 6.—P. K., man, aged 41, married, bookkeeper. Referred to me by Dr. Eugene Carbaugh of this city. Hands and feet affected, former severely, latter slightly. First attack.

CASE 7.—E. M., woman, aged 24, married, housewife. Referred to me by Dr. Fred Kyger of this city. Hands and feet

Fig. 5.—Pompholyx lesion occurring in line of coil-gland duct. The canal was of normal caliber throughout its course.

Fig. 6.—Two vesicles from palmar surface in Case 7.

affected. Second attack, the first having occurred in August, 1911. Lesion excised from right palm.

CASE 8.—L. I., woman, aged 29, single, stenographer. Referred to me by Dr. N. E. Lake of this city. Hands affected. Third attack, the first having occurred in May, 1910, the second in September, 1911. Hyperhydrosis of hands and feet. One lesion excised from left palm.

CASE 9.—A. R., woman, aged 34, married, housewife. Referred to me by Dr. Eugene Carbaugh of this city. Second attack, the first having occurred in August, 1910. Hands and feet affected, latter only slightly. No hyperhydrosis. Lesion excised from thenar surface of left hand.

EXAMINATION AND TREATMENT

For anesthesia, Schleich's solution (No. 1) was employed, the preparation being injected subcutane-

ously, at a distance of about 1 cm. from the margin of the lesion. The bits of tissue were removed by means of a medium-sized cutaneous punch, and immediately placed in a 4 per cent. aqueous solution of formalin. One of the specimens from Case 1 was frozen, and a number of sections (eighty-four) were cut from it. The others were passed through the usual solutions, mounted in celloidin or in paraffin, and cut serially. The greater number were stained with hematoxylin-eosin, although a few Weigert and Gram-Weigert preparations were made. In all, 2,028 sections were examined. The findings corresponded in almost every respect to those of Robinson, Santi, Williams and Breda. No displaced coil-gland ducts were found, however, and no bacilli, such as have been described by Unna,¹⁷ as occurring in Williams' sections, were to be seen. In only two specimens, one from Case 5 and one from Case 9, was there any visible connection between the vesicles and the ducts. In sections from these two lesions, the coil-glands and the epithelial lining of the lower portion of the ducts showed no inflammatory or degenerative changes, and there was every indication that the involvement of the sweat-apparatus was purely accidental (an occurrence which one could not consider as unusual in

Fig. 7.—Lesion from palm, very early stage (Spencer, 0.25 Obj., no ocular).

a region so thick in coil-gland elements as the palmar surface of the hand).

At the beginning, I must frankly acknowledge that I shared the view of Tilbury Fox and Crocker and Nestarowsky and Pusey, and, subconsciously it may be, the work was undertaken with the intention of proving the correctness of this supposition. When the first lesion was examined, however, and no evidence of a connection between the vesicles and the coil-glands or ducts was found, I was somewhat disconcerted, and determined to employ other methods of investigation in addition to the examination of serial sections. The patient (Case 1) was immediately placed on pilocarpin hydrochlorid, 0.005 gm., gradually increased to 0.02, by mouth, every four hours. At the end of forty-eight hours, the lesions showed little, if any change, although sweating had been profuse on all parts of the body during the entire time. Patients 3 and 4 received the same treatment, with similar results, or rather lack of results. Patient 2 was in

17. Unna: *Histopathology of the Diseases of the Skin*, Walker's Trans., Macmillan and Co., New York, 1896, p. 179.

the middle of an attack when first seen. She was placed on atropin sulphate, 0.0003 gm., gradually increased to 0.0006, by mouth, every four hours. The condition appeared to improve rapidly, and both the patient and I were greatly pleased. Three weeks later, however, she had another attack, and the same drug, pushed to the physiologic limit, failed to have any effect whatever on the lesions. Cases 7 and 8, similarly treated, also showed no signs of improvement, consequently it is very probable that No. 2 was just on the point of getting well when treatment was instituted. Patients 3, 4, 5, 6 and 8 were given potassium iodid, 0.6 gm. in aqueous solution, by mouth, after meals and at bed hour, for periods of from two to five days. In addition, Patients 5 and 6 each received two doses of pilocarpin, hypodermically, on the third day of the iodid medication.

At various times during the period in which iodid was administered, fluid was carefully withdrawn from several of the vesicles in each case, and tested for iodine. Under the direction of Dr. Roy Cross, of the Kansas City Testing Laboratory, this was done by placing a few drops of the fluid in a small test-tube, adding some crystals of potassium permanganate, and, after placing a bit of moist starch-paper (made from quantitative filter material) at the mouth of the tube, adding a few drops of concentrated sulphuric acid. In only one instance, the lesion being on the left palm of Patient 3, was an iodine reaction obtained. Some of the vesicles were quite large, a centimeter or more in diameter, and from 3 to 12 minims of fluid were withdrawn from each. The test is an exceedingly delicate one, and it is hardly probable that if iodine had been present it would have escaped detection. Only a few cultures were made, as the problem was undertaken from a purely histopathologic point of view. Agar, glycerin-agar and blood-serum were used as mediums. The staphylococcus (albus and aureus) was the only organism found.

CONCLUSIONS

The pathologic changes in pompholyx are confined almost wholly to the prickle-cell layer, only a slight perivascular infiltration being present in the derma.

The coil-glands are not involved, and the ducts are implicated only by accident. At bottom, the condition is very probably a neurosis, the direct exciting cause being a toxin other than locally microbic in origin.

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ABSTRACT OF DISCUSSION

DR. JOSEPH ZEISLER, Chicago: I was particularly interested in listening to Dr. Sutton's views on the histopathology of pompholyx because the results of his work support what I have taught for many years. My associate, Dr. Simpson, will bear me out in my statement that I have always impressed on my students the neurotic character of these cases, and have held that there was no real involvement of the sweat-glands. I have always maintained that the term "dyshidrosis" was a misnomer, and I am glad that my ideas on this point have been supported. I have always held that any eruption that occurs in the form of grouped small vesicles indicates a neurotic element, and I believe that we have good reasons for looking on the pemphigus group as the result of an underlying neurosis, and the same is true of pompholyx. This eruption sometimes appears along the course of the ulnar nerve and reaches no further.

DR. ISADORE DYER, New Orleans: Perhaps no one in this audience is more interested than I in the general proposition of pompholyx, for the reason that perhaps no one sees more cases of pompholyx than we do in New Orleans, where we number our cases by the score, and where, during the warm

season, from May to October, we see anywhere from one hundred to two hundred cases. It is rather unusual to see these cases during the colder weather, and if we do see them during the winter months it is because the weather is unseasonably warm. The eruption is sometimes preceded by an elevation of temperature. As to the pathology of this disease, basing my opinion on clinical observation, I have held for a number of years that pompholyx is a disorder of the sweat-glands, those associated with hyperhidrosis, and in that connection I would mention its frequent occurrence on the feet instead of the hands. While Dr. Sutton and others who have studied the histopathology of this disease may not agree with our observation, yet those of us who have lived in the atmosphere of this disease and have so frequently seen the evidence that it was associated with seasonal changes, still argue in favor of its relation to the sweat-glands, although this relationship has not been established.

My observation has been that pompholyx occurs with much greater frequency in males than in females—perhaps ten to one; that it rarely occurs excepting among excessive smokers, and that reduction in the quantity of tobacco consumed materially assists in controlling the disease. In addition to this, I usually reduce the amount of proteins in the diet and order strychnin, and occasionally give the high-frequency current or the Roentgen ray.

In view of what Dr. Sutton has told us I shall no longer teach that pompholyx is due to a disturbance of the sweat-glands. In many of the cases that I have seen the eruption never reaches the stage of vesiculation. The patient may, for a period of years, show an eruption similar to that presented in some of the photographs exhibited here to-day, and without any vesiculation. The lesions may simply consist of small scaly spots.

DR. WILLIAM A. PUSEY, Chicago: I agree with Dr. Dyer that this disease may not have its inception in the sweat-glands, but I am not convinced that it is not a sweat eruption. My idea of pompholyx is based largely on the facts of the condition as we see it. We see it in sweating feet and to a less degree in sweating hands—not necessarily in hyperhidrosis but in the ordinary sweating during hot weather. I have seen a good many cases in Chicago, especially recurrent attacks affecting the feet, in patients who have an attack summer after summer. To my mind the situation is this: There is a maceration of the epidermis by the sweat, with the formation of sweat-cavities in the epidermis which may or may not become inflammatory. These cases may become infected by the *Staphylococcus albus*, which is always there.

The fact that Dr. Sutton does not always find his vesicles in the site of the sweat-channel, does not prove that the lesions are not due to the collection of sweat in the epidermis. The sweat-channel in the epidermis is not a closed channel; the sweat percolates between the epidermal cells and, when excessive, may collect at sites of least resistance which may not be in the line of the sweat-channel—just as water in a marsh forms pools in depressions regardless of their relation to the stream which feeds the marsh. I think you can very readily conceive of the lesion of pompholyx being produced by the sweat and only in a certain proportion of the cases occurring directly in the sweat-channel. As to the neurotic theory of pompholyx, one reason, perhaps, for my aversion to it is my objection to neurotic theories in general for skin eruptions. To my mind, the neurotic involvement is secondary rather than primary, and I believe we possess a much more rational explanation for the lesions of pompholyx in a vasomotor disturbance of toxic origin or any other rather than in a purely nervous origin. The patients I see with pompholyx belong to the ordinary run of individuals whose hands and feet sweat in hot weather. Some of them smoke, perhaps to excess; others do not smoke at all. They present other lapses from the ideal standard of personal habits—just like other mortals—to which I would attach as much or as little importance.

DR. FRANK E. SIMPSON, Chicago: I believe that there are two types of pompholyx, that we do not always see or describe the same type, and that in some of these cases there

is a distinct neurotic element. These are probably the cases of true pompholyx. In other cases, we are dealing, not with pompholyx, but with a condition allied to, or identical with, miliaria.

DR. M. L. RAVITCH, Louisville, Ky.: A discussion of this kind is good evidence of the fact that the text-books are not infallible. Every text-book on the subject tells us that children do not suffer from pompholyx, but in my section of the country they do. I believe Crocker was right when he said that the lesions were due rather to hyperhidrosis, than to dyshidrosis, and so on, and in all the cases which I have seen there was a neurotic element present. I am also inclined to believe that the use of tobacco in the shape of excessive smoking or chewing has some etiologic bearing on it.

A year ago Dr. Dyer advised the use of salicylic acid and strychnin in the treatment of pompholyx. I have tried this treatment with very good results, and I have also found that these patients often recovered with a change of climate. Some authorities, among them Unna, assert that the eruption has a bacterial origin. In some of these lesions we find the staphylococcus, but I regard that as an incidental occurrence.

DR. K. A. ZURAWSKI, Chicago: I think that the histologic features of pompholyx as described by Dr. Sutton may be considered as final, and that the various theories that have been advanced in the discussion as having an etiologic bearing on the disease are not incompatible with the histopathologic picture he has advanced. We know that in pompholyx we have an accumulation of fluid in a certain slow-forming cavity. The question arises whether or not this is due to a neurotic element. There is no reason why a local or general neurosis should not alter a secretion to such an extent that it will become less permeable and will result in the local accumulation of such a secretion. Likewise, the theories advanced by Dr. Dyer that the disease is almost invariably met in heavy smokers and is very common in warm climates are not at variance with the histopathologic picture of Dr. Sutton, which I believe is practically conclusive. It now only remains for us to investigate pompholyx from the point of view of the chemolysis of this particular secretion, through which we may reach the final solution of the etiology of pompholyx and perhaps many other of the vesicular eruptions. We may learn that it is due to some organism which produces some chemical change in the secretion, or that perhaps this alteration is the result of a nervous disturbance. This problem still remains for us to solve, but whatever its solution, I do not think that it will alter the histopathologic findings of Dr. Sutton.

DR. EVERETT S. LAIN, Oklahoma, Okla.: I wish simply to say a few words touching on the treatment of pompholyx. About three years ago a patient was referred to me who suffered from recurrent attacks of pompholyx. One day when I was out of the city my assistant, unintentionally, gave the patient a massive dose of the Roentgen ray, somewhat similar to the treatment described by Dr. MacKee. The immediate result of the treatment was rather severe, but the patient has been free from attacks of pompholyx since.

DR. JOSEPH ZEISLER, Chicago: I am afraid that not all of us who have taken part in this discussion have had the same affection in mind. Sweating feet, for example, I do not regard as pompholyx, although hyperhidrosis of the feet may be complicated by blisters. I saw many such cases during my service in the army, but I do not class those cases as pompholyx, nor do I call the formation of small vesicles occurring on the hands as the result of summer heat pompholyx. Dr. Sutton's paper referred to pompholyx proper and not to something else.

DR. RICHARD L. SUTTON, Kansas City, Mo.: I do not think that Dr. Dyer and I are so far apart clinically, after all. The fact that the majority of his cases occur in tobacco-users, the frequency of the disease in midsummer, and the line of treatment suggested by him all serve to bear out this contention. Nervous breakdowns occur oftener during the hot months than at any other time; excessive smokers of tobacco are usually neurotic individuals, and but few therapists have found strychnin beneficial in the treatment of the known

disorders of the coil-glands. In New Orleans the majority of the women go north for the summer; hence the preponderance of male patients is readily explained.

Dr. Pusey's assertion that practically all sufferers from pompholyx are also afflicted with hyperhidrosis may hold good in his clientele; it does not in mine. Fully one-third of my pompholyx patients had never been troubled with disturbances of the sweat-glands of the hands or feet at all prior to the date of consultation. The chemical characteristics of the vesicle contents were so thoroughly investigated by Robinson (whose findings have been confirmed by the vast majority of later observers), that I considered the matter closed. In a measure, I agree with Dr. Simpson: all medical men are subject to errors of judgment when it comes to questions of diagnosis, and I have found the majority of dermatologists exceedingly human, after all. I am afraid that Dr. Ravitch misquotes the late Professor Crocker. If Dr. Ravitch will carefully read the reference cited, I am sure that all his doubts regarding the matter (in so far as Rudcliffe Crocker's conclusions are concerned) will speedily vanish. Change of climate, particularly if a cooler temperature is selected, undoubtedly benefits many cases of pompholyx, just as it does other neurotic disorders, but one of the worst cases of plantar hyperhidrosis I have ever seen occurred in a professional iceman. If Dr. Zurawski's suggestion regarding the "everglade" character of the superglandular epidermis were true, the iodid solution should penetrate the "marshy" tracts as readily as does the fluid in which it is dissolved, and the contents of every vesicle should show traces of the drug. Inasmuch as only one of them did, I am forced to acknowledge that I believe that the contamination was accidental and not pathognomonic.

CONGENITAL STRICTURE OF THE PROSTATIC URETHRA

WITH BLADDER HYPERPLASIA, URETERAL DILATATION AND MULTIPLE ABSCESES OF BOTH KIDNEYS

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Congenital stricture is described as an occlusion of the urethra which may occur at three different places: first, at the meatus; second, at the outer limit of the fossa navicularis, and third, at the membranous urethra.

None of the text-books describe a stricture of the prostatic portion. Keyes¹ says that stricture in the deep urethra is exceedingly rare; one text-book² denies its existence below one-fourth inch from the meatus. Such strictures are caused by inaccurate apposition in the embryo of separately developed sections of the urethra. The stricture is endodermic in origin.

Guibe³ relates an interesting fatal case in which the stricture admitted only a needle. Stricture of the meatus and fossa is quite common and is often overlooked because it gives rise to few, if any, symptoms.

The case I wish to report occurred in my practice and the patient died in the seventh week of uremic convulsions.

REPORT OF CASE

History.—R. W. S., boy, born Sept. 7, 1912, of normal parents, was the first child although the parents had been married thirteen years. Family history was negative. Father was 36 and mother 37 years of age. Mother had had no miscarriages. Child weighed at birth 5½ pounds and on examination was normal-looking except for size. He was

1. Keyes: Genito-Urinary Diseases, p. 170.

2. Lydston, G. F.: Venereal and Sexual Diseases, p. 182.