NON-PARASITIC CHYLURIA*

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Non-parasitic chyluria is of infrequent occurrence on the American continent. The literature is chiefly European, especially German, few American writers having called attention to this curious clinical occurrence. Very little is known of the true causes underlying non-parasitic chyluria, and therefore it is essential that all cases be recorded. The presence of such a case on the University of California Urological Service of the San Francisco Hospital prompts the following report:

G. D., colored, single, twenty-one years of age, entered the hospital with the complaint of "cloudy urine." The family history was irrelevant.

The patient was born in South Carolina where he lived until the age of twenty years. During the last year he has been in California. His occupation has been various —cook's helper, boot-black and farm hand. He had measles and mumps as a child; no history of other illnesses. He has had five attacks of gonorrhœa in as many years, the last being two months ago; acute epididymitis and right inguinal bubo one year ago. Primary denied. Habits good. No history of any accidents. Inguinal bubo drained one year ago.

The present illness began three years ago, at which time he noticed that the urine was milky in color. Since then it has been intermittent, bearing no relation to diet, work, etc. Two months ago patient thought that some blood was present in the urine. During the last two months there has been a dull lumbar pain, especially on the left side. The remainder of the history is irrelevant except that the patient was still being treated for his last venereal infection.

The physical examination showed a well developed and nourished negro, in no apparent distress. General examination was negative. Blood-pressure 120/80. *Genitalia*: Slight urethral discharge; smear negative for Gram-negative intracellular diplococci. Prostatic massage 10 per cent. pus; normal amount of lecithin; many motile sperm.

Laboratory Data.—Blood: Hæmoglobin 80 per cent.; red blood cells 4,670,000; white blood cells 8800; polymorphonuclears 71 per cent.; lymphocytes 27 per cent.; transitionals 1 per cent.; eosinophiles 1 per cent. Examination of blood during night and day revealed no filariæ.

Urine: (voided specimen): Clear, amber, specific gravity 1.016; sugar negative; albumin negative. Micro.—Red blood cells rare; white blood cells rare; casts, none; epith. rare. Examination negative for filarial parasites.

Blood Wassermann: Negative.

Phthalein (intramuscular): 1st hour, 50 per cent.; 2nd hour 25 per cent.; total 75 per cent.

X-ray: Kidneys, ureters and bladder essentially negative.

Cystoscopic Examination.—Cystoscope F 26 easily inserted. No residual urine Bladder capacity—350 c.c. Bladder wall showed mild diffuse cystitis, otherwise negative for stone, tumor, ulcer, etc. Left ureteral orifice reddened and œdematous. Right orifice negative. Trigone markedly reddened and revealing some bullous œdema, espec-

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ially on the lower half and extending on to the vesical neck. Both ureters easily catheterized to kidneys. The left ureteral catheter immediately began to drain milky fluid with a pinkish tinge. The bladder urine had been clear.

	Right	Left	Transvesical
Size of catheter	F 6	F 6	
Flow	Normal	Normal	
Macroscopic	Clear	Milky	Clear
R. B. C.	Numerous	Numerous	None
W. B. C.	None	2–3 h. d. f.	2–3 h. d. f.
Epith	1–2 h. d. f.	2–3 h. d. f.	2–3 h. d. f.
Casts	None	None	None
Organisms	None seen	None seen	None seen

Phthalein (intravenous):

Appearance time	2 minutes	2½ minutes
1st 15 minutes	20%	17%
2nd 15 minutes	10%	4%
Total	30%	21%

Bladder leakage—none.

Cultures.—B. coli in left kidney and bladder specimens. Right kidney sterile. All acid-fast stains negative.

The urine from the left kidney could not be centrifuged clear and microscopically showed no morphology except an occasional pus cell and many cell blood cells. The specimen was immediately suspected as being that of a chyluria. The milky color cleared almost entirely upon shaking with ether; the residue of an evaporated ether extract stained readily with Sudan III. Upon standing, a rather firm, pinkish clot would form in the urine. This urine was positive for albumin, while the clear specimens had been negative. No parasites were found.

A pyelogram of the left kidney appeared normal except for a slight haziness about the upper calyx. (Fig. 1.) Right pyelogram was negative. The lumbar backache was not reproduced with either pyelogram.

Course.—With the finding of no parasites in either the blood or the urine, the case was considered as a chyluria, non-parasitic in type, and left renal in origin. No significance was placed in the slight finding of the upper left calyx as shown in the pyelogram. The urine continued to be intermittently cloudy, occurring four to five times weekly and usually in the morning. The presence or absence of fat in the diet did not seem to influence its occurrence.

The patient received three pelvic lavages of the left kidney within a period of fourteen days, using each time 3 c.c. of 1 per cent. silver nitrate. The chyluria disappeared after the third lavage. This was followed by a rise in temperature to 100° F., which subsided in four days. During this time the patient continued to have a dull, non-radiating pain in the left flank. Two days later the temperature again rose, reaching a peak of 103° F. on the third day. Cystoscopy with catheterization of the left kidney revealed nothing; however, examination of the chest gave sufficient evidence to make a diagnosis of mild bronchopneumonia. This cleared up entirely in eight days. The temperature continued more or less normal, but the slight dull pain in the left flank persisted. The urine was clear at all times. Examination by careful palpation now revealed some spasticity of the lumbar muscles and a vague feeling of a mass.

A complete urological examination was again performed. The left pyelogram on first injection now showed a cavity 1½ x 3 cm. in size irregular in outline and lying out under the eleventh rib. (Fig. 2.) Further injection with the ureteral catheter pulled down demonstrated the left kidney pelvis and ureter, the lower calyces being normal, while the upper ones appeared somewhat deformed by pressure from without. It was

therefore concluded that there was present a large perirenal abscess at the upper pole which might communicate through the upper major calyx. (Fig. 2.)

Operation revealed the following: The lumbar muscles and fascias were very dense and fibrotic. A large abscess cavity was opened into and about 150–200 c.c. of dark brown pus and necrotic material evacuated. This had been preceded by a gush of about 50 c.c. of urine-like fluid. Culture of the abscess gave B. coli. Examination of the abscess cavity showed it to be the size of one's fist, intimately associated with the upper and middle parts of the kidney and extending anteriorly to the peritoneum. The abscess was found to communicate with the kidney through a small sinus-like aperture on the posterior aspect of the upper pole. Further examination could not be carried out because of the dense inflammatory adhesions everywhere. No definite cause could be established for the chyluria. An intracapsular nephrectomy was performed, the cavity thoroughly irrigated with 1–1000 mercurochrome, and the usual closure with drainage made. Uneventful convalescence, the wound healing by primary union, except posteriorly where drainage had been instituted. The patient, seen two months after the operation, was in good health and the urine was clear.

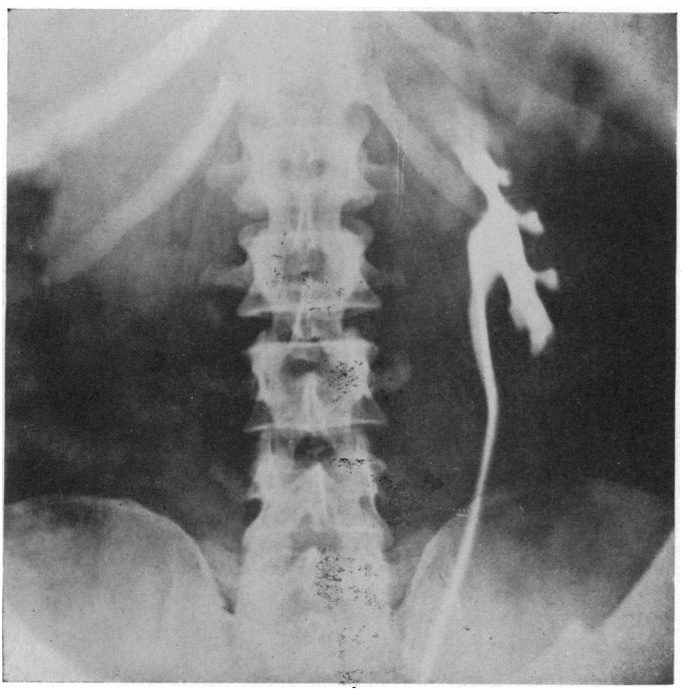

FIG. 1.—Pyelogram of left kidney six weeks prior to operation. There is a slight haziness about the upper calyx.

Gross Pathology.—The specimen consists of a kidney measuring 8 x 6 x 3½ cm. The external surface has adherent large masses of blood and necrotic tissue. The surface of the kidney is dull with flakes of fibrin attached. No capsule can be found. The cut surface shows fairly normal appearance, except that in the vicinity of the sinus above mentioned the tissue is dull and compact. Just below the convex border and on the posterior aspect is a small sinus communicating with the posterior minor calyx of the upper major calyx. Sinus blocked with necrotic tissue. (Fig. 3.)

Microscopic Pathology.—Microscopic sections show numerous glomeruli, varying in size from large to small. The latter are atrophic in appearance. Bowman's capsule has disappeared in some places, so that the glomerulus can hardly be seen. The tubules are often dilated. Cloudy swelling is marked in most areas. There is a very diffuse moderate lymphoid cell infiltration.

An irregular cavity is seen in one section. It has a ragged lining of connective tissue, heavily infiltrated with lymphocytes; plasma cells, endothelial cells laden with blood pigment and occasional eosinophiles. (This section was taken through the sinus connecting with the abscess.)

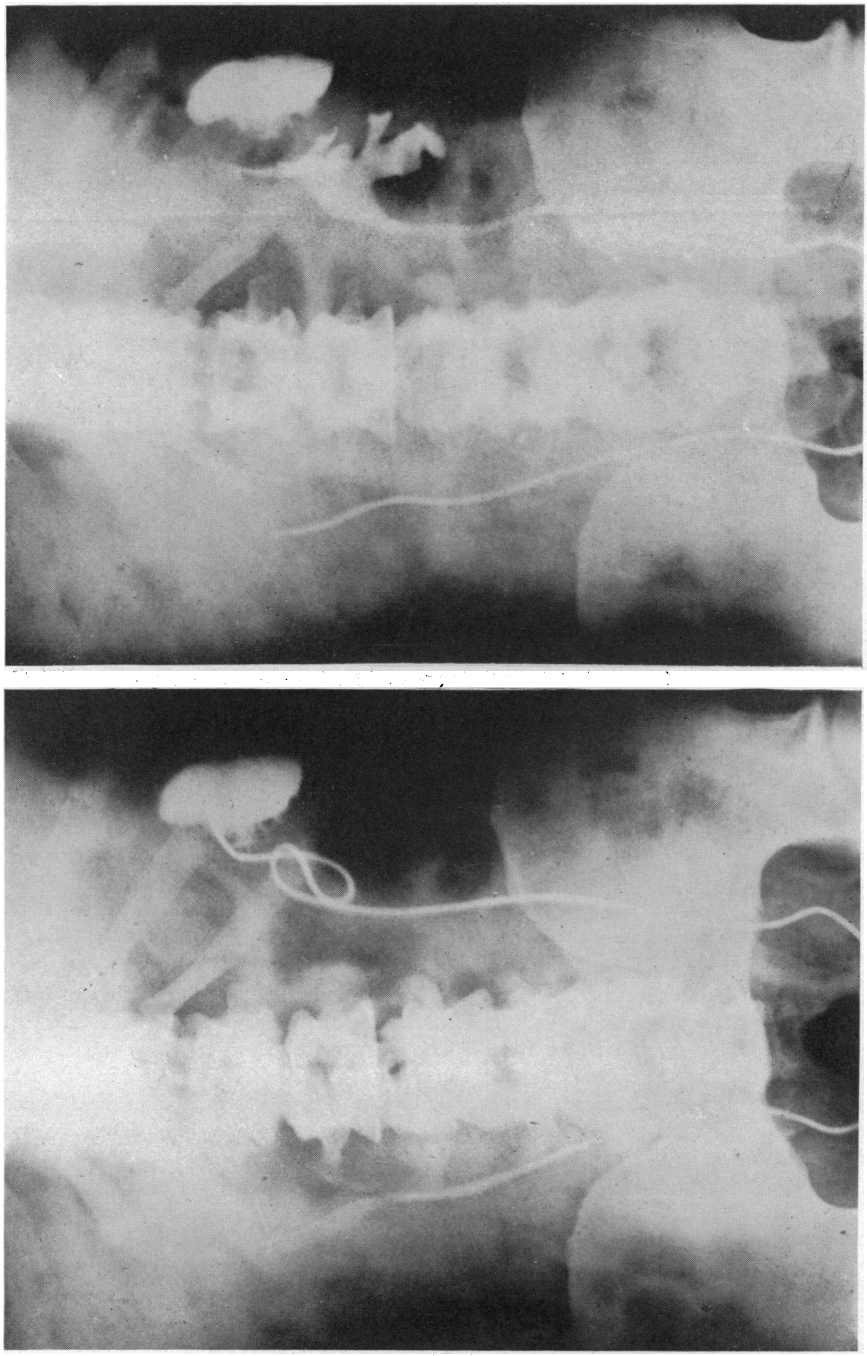

FIG. 2.—Pyelograms of left kidney just before operation. The first shows the perirenal abscess injected; the second pyelogram was taken immediately afterward with the ureteral catheter drawn down. Note the relation of the abscess to the kidney pelvis and the deformity produced in the upper calyces.

A layer of connective tissue, moderately infiltrated with mononuclear cells lies external to the cortex and is the abscess wall. (Figs. 4 and 5.)

Diagnosis.—Perinephritic abscess with chronic diffuse nephritis. Communicating sinus between abscess and kidney pelvis.

The case was considered as being one of non-parasitic chyluria because of the characteristics presented by the urine and the absence of parasites. The duration was over a period of three years and yet the patient was not incapacitated in any way. The co-existence of the perinephritic abscess and its communication with the kidney pelvis probably had no relation to this patient's chyluria. It is not likely that the abscess had been present for three years and yet not given rise to more symptoms. The history of lumbar pain over a period of two months probably indicates the existence of the abscess.

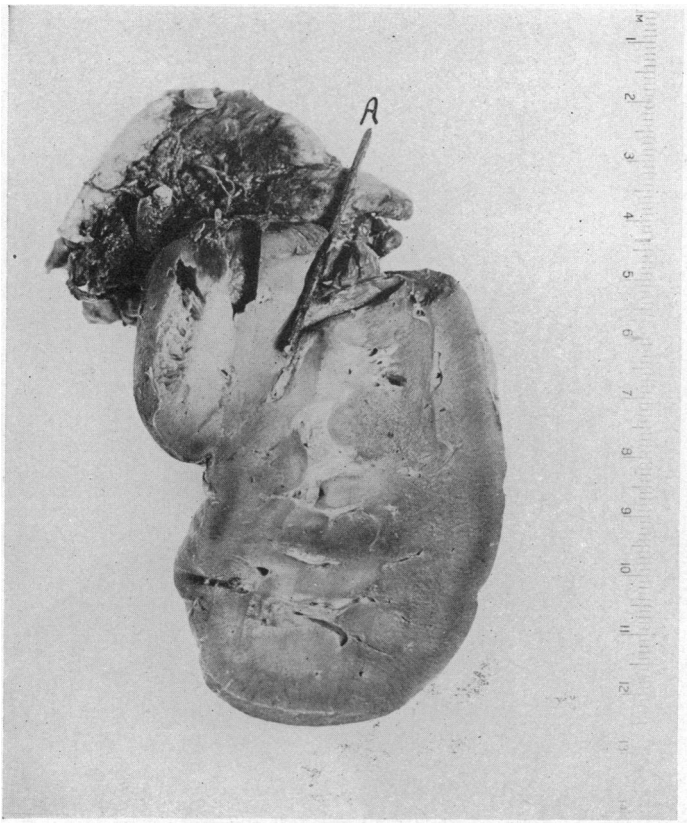

FIG. 3.—Photograph of left kidney in longitudinal section. The stick (A) marks the path of the communicating sinus between the perirenal abscess and the upper calyx of the kidney pelvis. The tissue attached to the upper pole is part of the abscess wall and kidney capsule.

Detailed fat studies were not carried out because of the lack of facilities. The case presents many similarities to others reported in the literature, namely, periodicity as to occurrence intermittently and time of day. Various authors have found that chyluria was present in the night or morning urines and cleared as the patient became more active during the day. The various characteristics, such as the pinkish milky color, absence of morphological characteristics microscopically except for red and white blood cells, failure to centrifuge clear, even at a high rate of speed, clearing with ether, prove this to be a case of chyluria. The failure to find filariæ in the blood and urine, places it in the non-parasitic group.

Historical Note and Discussion.—The recognition of fat in its various forms as occurring in the urine is no new one. The mention of fatty and oily urines has been found in the ancient writings of Hippocrates, Galen and Theophile (Sanes and Kahn). Its significance was variously interpreted as approaching delirium, convulsions, death or the excretion of milk in the

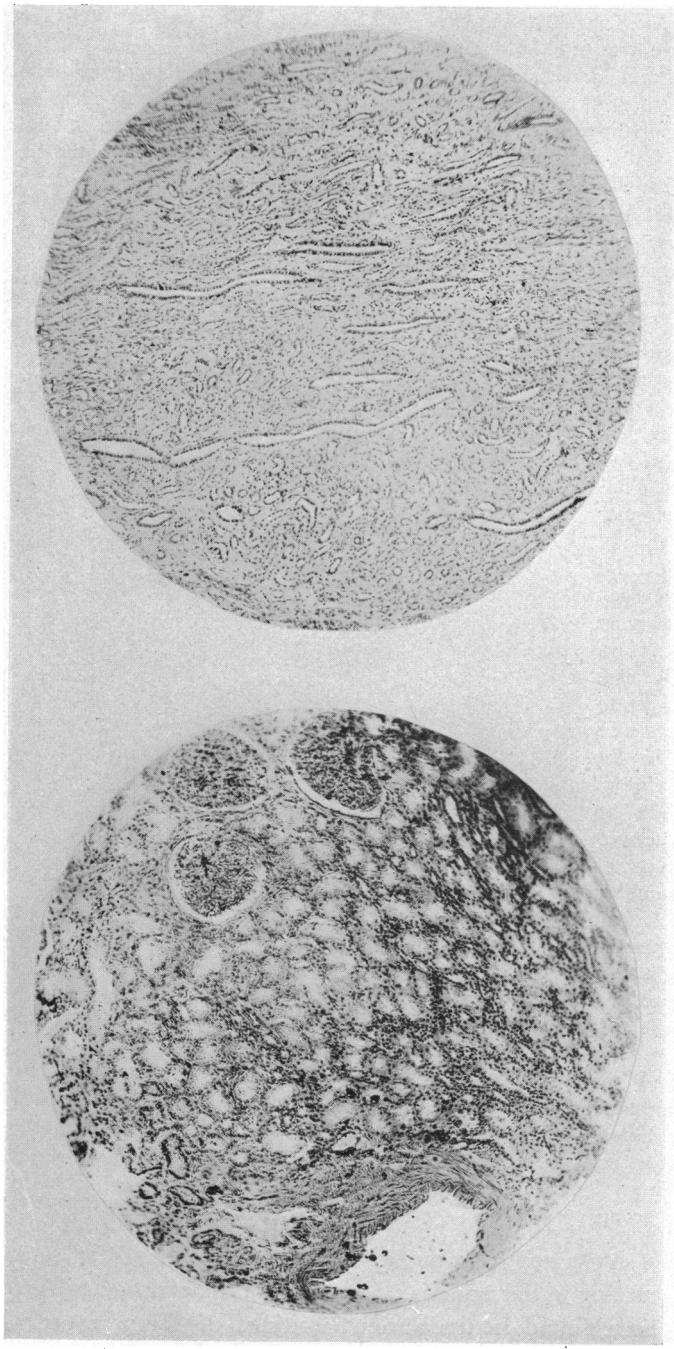

FIG. 4.—Photomicrographs (low power) showing some cloudy swelling of the convoluted tubules and sclerosis of the blood-vessel walls. In the medullary part of the parenchyma there appears to be some dilatation and decrease of the collecting tubules with a corresponding increase of œdematous interstitial tissue.

urine. The writers of the middle ages added but very little. Actuarius (thirteenth and fourteenth centuries), Gordon (fourteenth century) and others ascribed it as a symptom of hectic fever, phthisis and a very grave indication of impending death. In 1670, Moellenbroccius designated the condition as chyle in the urine and called it "mictio chylosa." This trend nearer to the truth had probably been brought about by the discovery of the lymph circulation by Pecquet in 1651. Stalpart van der Wiel (1687) wrote an extensive treatise at this time, citing Florentinus, who mentions probably the first case occurring in a child (thirteen-year-old boy). He concluded that the substance was chyle and based his theory on the bladder lymphatics described by Bartholinus and that the milky urine was due to a compression of the bladder channels (vasa lactea). Peu in 1694 found a chyluria occurring in a parturient woman and ascribed it as a means of eliminating excessive milk fat. Morgagni in his discussion felt it to be of renal origin. There followed but few studies, those of Stöller (1777), J. P. Frank (1794) and Vogel (1807). Stöller was the first to use the terms, "diabetes lacteus," "chylarius" and "cœliacus urinalis" and differentiated them from phosphaturia and pyuria. Frank's case was that of a chylous diabetes. Alibert and Cabelle (1817) designated the condition as "urine laiteuse." Many excellent studies and observations followed—Prout (1835), Rayer (1838), Golding-Bird (1843), Bramwell (1858), Beale (1861), Bence-Jones (1862), Roberts (1872), Oehme (1874—first autopsy in a non-parasitic case), Goetze (1877), Glazier (1877), Haddon (1879), Vogelius (1879—associated with pernicious anæmia), Brieger (1880), Concatto and Guareschi (1881) and many others. Probably the best studies of non-parasitic chyluria have been those of Senator (1883 and 1894), Franz and Stejskall (1903) and Magnus-Levy (1908).

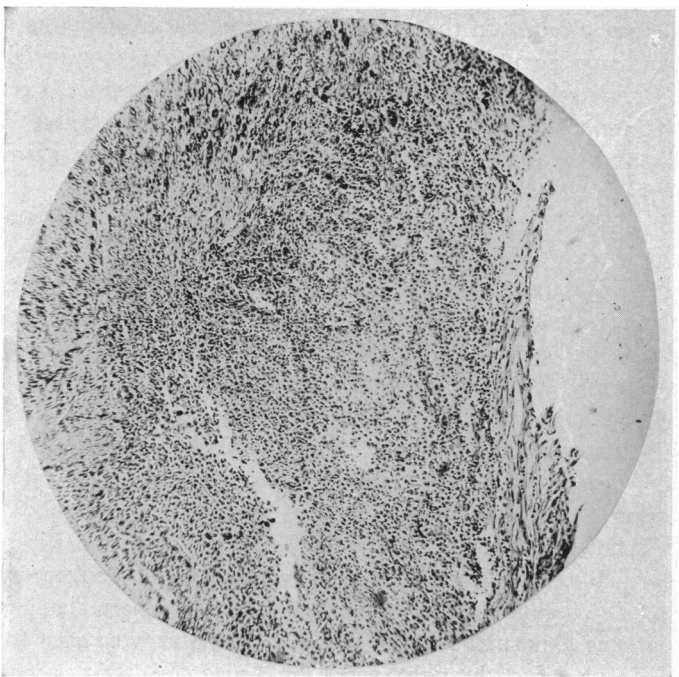

FIG. 5.—Photomicrograph (low power) through wall of communicating sinus showing marked fibrosis and round cell infiltration.

Goebel (1921) has written a good discourse of its rare occurrence in children. These do not include the host of workers on the parasitic chyluria; in these, Wücherer (1869), the first to demonstrate filaria in parasitic chyluria; Manson, discoverer of the filarial parasite; Mackenzie, Carter, Waters, Low and many others are worthy of mention. From time to time lengthy discussions have appeared as to etiology of non-parasitic chyluria, but they differ very little to-day from those of the earlier writers.

Etiology.—Chyluria may be divided into two types: (1) Parasitic or tropical group, (2) non-parasitic or non-tropical group. A third group, called functional chyluria (Sanes and Kahn, Marion) can well be placed in the second group. In the parasitic type the filaria sanguinis hominis is the chief causative agent, although chyluria has been mentioned with tænia nana (Predtetschensky), eustrongylus gigas (Stuertz), cercomonas hominis (Rosenheck and Rodhenburg), malaria (Quarelli), etc. Wücherer, in 1869, showed the filaria to be present in patients with parasitic chyluria (Welfeld). It is, however, the mechanism that has given difficulty. In the non-parasitary chyluria, both the etiologic and mechanical factors are upon a theoretical basis.

Since the discovery of the lymph circulation by Pecquet in 1651, the mechanism and point of entry into the urinary tract has been sought for. Prout and Rayer brought forth the theory that chylous urine was separated from the blood and that there were no abnormal communications between the lymph system and the urinary tract. To support this, they assumed a chylous blood condition—"chylöse blutbeschaffenheit"—with a lowered threshold of substance exchange and thereby leading to a pathological filtering through the kidney. This theory later found supporters in Eggel, Thudichum, Brieger, Virchow, Goetze, Cohnheim, Wolff, Waldvogel und Bickel. This theory has gradually lost ground until it has very few if any adherents.

The second and more feasible theory has been that of lymphatic obstruction and abnormal communication with the urinary tract for the chyle to enter. This was first brought forth by Carter in 1862, reporting two cases of filariasis with lymph scrotum. It was assumed that the filaria obstructed the lymph flow, caused inflammatory changes and ruptured into the urinary tract. Tropical chyluria has lent itself well to explanation on this basis. The work of Mackenzie and the substantiating evidence by Manson have given strength to this theory. Numerous workers—Dickinson, Havelburg, Siegmund, Myers, Grimm, Vieillard, Feuerstein and Panek, Slosse, Prebtetschensky, Magnus-Levy, Port and others—have adhered to this theory. It is the one most universally used at present to explain chyluria. We, therefore, have to assume an anatomical lesion of the lymphatics (Carter) rather than a constitutional anomaly (chylöse blutbeschaffenheit). Evidence, much of it questionable, has been offered from time to time to strengthen the theory and to determine the point of entry into the urinary tract. Cases of non-parasitic chyluria have come to autopsy and revealed no information (Oehme, Roberts and Hertz). Port's case showed large caseous mediastinal glands obstructing

the thoracic duct, but no point of entry into the urinary tract. Havelburg at autopsy found a large multilocular dilated lymph sac extending from the left kidney to the bladder, where its attachment was sieve-like and thereby allowed the chyle to pass through. Ponfick's case was similar, but there was some skepticism about such portal of entry (Virchow). Lüdke thought his case to have a point of entry in the bladder. To further substantiate that chyluria is due to blockage in the lymph system, Magnus-Levy cited an eleven-year-old girl who had a swelling on the left hip which later led to the exuding of chyle. Fifteen years later a chyluria resulted and the chyle fistula disappeared.

Pope demonstrated by cystoscopy a chyle sinus on the bladder trigone. In connection with this; the case of Bloch is of significance. A girl seventeen years old had chyluria, especially in the morning, of several years' duration. Cystoscopy revealed a white dome-like structure just above the right ureter. On the medial aspect was seen a small opening from which came forth a strong stream of chyle. The cyst was destroyed and thoroughly cauterized. The chyluria ceased immediately. The patient was followed for a period of days and the urine remained clear. Cystoscopy has been a great aid in location of the chyluric source. Cases are reported as either being unilateral or bilateral or vesical in origin.

The route between the intestinal and renal lymphatics has been of much speculation. According to Magnus-Levy, the chyle must first go from the mesenteric lymph channels through the mesenteric lymph glands to the thoracic duct. Thence, because of obstruction, there is a retrograde flow to the upper lumbar lymph-glands which drain the renal lymphatics. To obtain such a retrograde flow, an insufficiency of the valvular system of the lymphatic channels must be assumed. Hampton has likened the renal lymphatics to the cerebral arterial vessels as points of lowered resistance. Assuming a lymphatic block in that system there may then occur a leakage of chyle through the kidney just as a cerebral hemorrhage due to hypertension. These points are all hypothetical. Possibly with a bettering of pathologic studies in the future, these points may well be proven and demonstrated. According to the researches of Stahr and Kumita, the lymph channels of the fibrous and fatty capsules, communicating with the lymph channels in the renal cortex, can be injected from the capillary bed of the muscularis of the small intestine (Quincke).

Goebel states that to have a chyluria, two conditions must be fulfilled: (1) The lymph channels must open into the urinary tract, and (2) the lymph channels through recurrent channels must empty their contents into these lymph channels of the urinary tract. Where only the first condition is fulfilled, there ensues a "lymphuria without chyle" and where both conditions are fulfilled, chyluria results. He further adds that it is known that there are connections between the lymph channels of the adventitia and muscularis of the ureter and bladder with the lymph channels of the intestinal mucosa and at the other end with the hypogastric and lumbar lymph channels. If, therefore, an opening occurs between the lymph channels of the mucosa and

the lumen of the urinary tract, a "lymphuria" occurs, recognized by the albumin content of the urine. Furthermore there must not be a continuous stream of lymph through the existing communication, but it must occur only under particular pressure relationships over the threshold for that particular channel. This threshold pressure relationship is likened to the lymphatics of the leg which are under increased pressure when the muscles are contracted as on standing or walking.

Marion's theory is somewhat more comprehensive. He has assumed that there are two types of non-parasitic chyluria; (1) secretory and (2) excretory. In the first type he cites the experimental work of Loeper and Ficai, who produced a lipuria by injecting mono-butyrine into the blood of rabbits. In the second type a fistulous communication is assumed, allowing the chyle to enter the urinary tract, due to traumatic rupture of the lymphatics or tumors, chronic inflammatory changes, etc., causing a lymphatic obstruction.

The influence of diet on non-parasitic chyluria seems pronounced in some case reports. Lüdke was able to cause a disappearance of the chyluria by fasting. Tezner, Welfeld and others have been able to substantiate this to some extent.

Nearly all of the theories are insufficient and little better than those promulgated a half century ago. Such questions as unilateral chyluria with thoracic duct block, the rarity of chyluria and yet the frequency with which large abdominal and thoracic tumors occur are a few of the points in need for further explanation. The theory of lymphatic block and direct urinary tract communication is probably the most sufficient for the present.

CLINICAL DISCUSSION

Occurrence.—Non-parasitic chyluria is rare, especially on the American continent. The greatest number of cases are those of European observers, who have called the condition "European chyluria" to distinguish it from the parasitic or tropical variety. This designation is a misnomer, the condition having been described elsewhere than in Europe. Goebel, in 1921, was able to collect 73 reported cases. These occurred chiefly in Europeans who had never resided in tropical countries. A review of the literature has brought the number well over one hundred. The occurrence in children is even more infrequent, but 12 cases having been reported. The occurrence of parasitic or filarial chyluria is more common, having been found in as high as 2 per cent. of inhabitants in some regions (Magnus-Levy).

Clinical Picture.—Non-parasitic chyluria occurs chiefly during early and middle adult life, although it may be found at all ages. Brandenburg's case was a seventeen months' old female baby, while Whelan's, Frank's and Rayer's cases were sixty-seven years, seventy years and seventy-eight years, respectively.

The milky or turbid appearance of the urine is usually the only presenting symptom with a sudden onset. An accompanying backache or renal colic may be the chief complicating complaint. This is considered as being due

to the fibrin clots occurring in the chyliform urine and moving down the ureter.

Chyluria has presented some interesting features as to time and duration. It may be either continuous or intermittent. In Osterode's case it was intermittent for five years, occurring but several weeks each year, before becoming continuous. The relationship to time of day has been peculiar. Some observers have noted it to be present at all times; many have observed it in only the night urines, it clearing as the patient became active during the day (Oehme, Haddon, Goetze, Franz and Stejskall); still others noted chyle in the day urine only (Berri, Bence-Jones, etc.). Concatto found it only when his patient was in motion. Because of these various relationships to posture, a comparison to orthostatic albuminuria has been made. However, in this respect it differs from albuminuria since it usually occurs while the patient is lying down.

The urine has been the subject of much study. Magnus-Levy in a right kidney specimen found it fractionally to be 35 per cent. urine and 65 per cent. chyle. The fat content, using the Babcock method, has been estimated from 1 per cent. to 3 per cent. Welfeld's first case contained 4.2 per cent. The albumin content may also be high, varying from 3 per cent. to 3½ per cent. Other substances found in these urines have been lecithin, cholesterin, fibrinogen and soaps. Grossly the color of chylous urine varies from a cream or yellowish color to white. It may be tinged slightly red due to the presence of blood. Microscopically, the presence of occasional white blood-cells and red blood-cells can be demonstrated. The fat is in molecular form and therefore presents no morphology. The specific gravity is slightly less than normal. Since chyle is alkaline in reaction, some observers have shown chylous urine to be less acid than normally.

Diagnosis rests chiefly on a careful history and thorough urinary studies. Places of residence must be ascertained. The urine is to be differentiated from lipuria and marked pyuria. In the former the fat is present in the droplet form, although occasionally emulsified to the extent of a milky color. In such cases the presence or absence of fibrinogen, cholesterol or lecithin will be of significance. Lipuria is usually found associated with fractures, eclampsia, intoxication due to phosphorus, arsenic and carbon monoxide, diabetes, fatty degeneration in abscesses and degenerative renal processes. Usually in such conditions, the fat is found in the urine in large drops or after cooling, as tallow-like masses. It is brought through the blood stream (lipæmia) or may originate through the fatty degeneration of the renal constituents. Chronic nephritis with lipoid degeneration is a classical example (Ridder). The elimination of fat is not always pathologic. The researches of Sakaguchi upon himself and others have shown that there normally occurs 0.0085 of a gram in the urine per twenty-four hours. The presence of a greater amount than this figure, either macroscopic or microscopic, should be considered pathologic and the underlying cause sought for. Microscopic examination will differentiate the severe pyurias. Careful blood and urine examinations for

parasites should be performed. The history of residence in a tropical country though no parasites be found, should always make the observer suspicious of a parasitic chyluria. Manson has shown that filarial infections tend to disappear in later life, yet the changes made in the lymphatics may be productive of a chyluria.

Chyluria has on rare occasions been found associated with other diseases. Diabetes mellitus and chyluria have been noted by various observers (Stöller, Frank, Vogel, Magnus-Levy, Sanes and Kahn, Brandenburg). Pregnancy and chyluria, as well as chyluria post-partum, have also been found associated (Golding-Bird, Berri, Concatto, Varaldo, Davis, Veis, Bugbee). Mohr's case occurred in a four-year-old child with pharyngeal diphtheria. Trauma has also been mentioned (Whelan, Ciauri). Keersmæcker's case is doubtful; an eight-year-old girl cleared of her chyluria following dilatations for enuresis. Tuberculosis of the peritoneum and carcinoma in the region of the kidney have also been named (Le Dantec), as well as pernicious anæmia (Vogelius).

Non-parasitic chyluria is usually a disease of long duration and because of its benignity has a fair prognosis. Rayer's case in a seventy-eight-year old woman was of fifty-five years' duration. Vieillard's case was twenty years, while Koopman's nineteen-year-old patient had had the condition since early childhood. Welfeld reported his case of fourteen years' duration. Very often the condition clears spontaneously while in others the loss of chyle leads to severe debility and finally death from exhaustion. The nature of the obstruction is of importance, since in case of malignancy the prognosis is poor. The nature of the associated conditions is also of importance.

The treatment has been one of great variation and diversity as would result in a disease so little understood as non-parasitic chyluria; hence it is chiefly symptomatic. The patient should be put on a low fat diet. Lavages of the kidney pelvis with weak silver nitrate solution (1 per cent. to 3 per cent.) may be used. Lower and Belcher cleared their case with neoarsphenamine. Should a patient progress poorly, renal exploration or even nephrectomy may be performed. The presence of any associated or complicating condition should also be treated. Fulguration or cauterization should be used where the point of communication can be demonstrated as in Bloch's case.

In the parasitic or filarial cases some success in treatment has been achieved in recent years. Deschamps using neoarsphenamine and Chabanier and Lobo-Onell with arsenobenzol reported successful treatment. Diamantis cured his case, using antimony and sodium tartrate intravenously.

The use of sodium citrate has been found commendable in those cases suffering with renal colic due to the clotting of the chylous urine.

SUMMARY

1. A case of unilateral non-parasitic chyluria, associated with a perirenal abscess is reported.

2. Non-parasitic chyluria is of rare occurrence, especially on the American continent.

3. Its etiology is still on an hypothetical basis, the most probable being that of lymphatic obstruction with an abnormal communication between the lymph channels and the urinary tract.

4. The symptomatology is characterized by the sudden onset, the milky urine, its periodicity and chronicity.

5. Diagnosis depends chiefly on a careful history as to residence, urinary studies, and the failure to find parasites in the blood and urine on repeated examination. Non-parasitic chyluria is to be differentiated from lipuria and severe pyurias.

6. Non-parasitic chyluria has been found associated with diabetes mellitus, pregnancy, pharyngeal diphtheria, trauma, pernicious anæmia, tuberculosis of the peritoneum, as well as large growths in the region of the kidneys and the mediastinum.

7. The prognosis in non-parasitic chyluria is usually good.

8. Treatment is empirical. The intravenous use of neoarsphenamine and pelvic lavages with 1 per cent. to 3 per cent. silver nitrate have given encouraging results. Kidney exploration and nephrectomy have been done in the poorly progressing cases.

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