fine specimen of *Oxyuris vermicularis*. This was washed and transferred to a drop of water on a microscopic slide, and examined under the microscope with a magnification of 75 diameters.

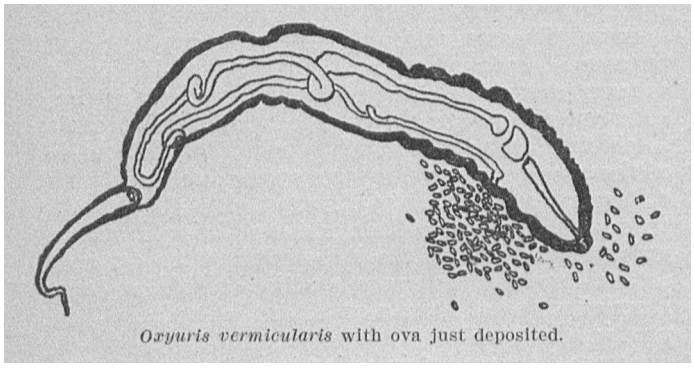
The worm, as a whole, presented no movement, but from almost one extremity to the other, with the exception of the awl-like pointed tail, contained, in its inner anatomy, a seething mass of eggs within a tubular structure that was in active state of contraction and expansion in various portions of its somewhat serpentine course.

This canal extended from the cephalic end of the worm to the caudal portion and back again, with numerous turns on itself on the way. One portion of this canal was engaged in shoving an egg, and another portion a great bunch of them, forward, only to be repelled by greater waves of peristalsis sending them back again, until overcome by still greater contractions which forced the ovular mass onward to the terminal portion of the canal. This opened at right angles to the body of the worm, back of the cephalic portion on the right side.

The contents, on reaching this point, seemed to rest awhile, as it were, in the "quiet before the storm," when presently a series of most violent contractions would occur accompanied by the discharge of the eggs, one at a time, from the body of the worm.

At times one or two made their exit in orderly succession, and on other occasions the violence and rapidity of their departure reminded one of the action, in miniature, of a modern magazine rifle.

After transferring the parasite from one slide to another and thus securing a half dozen specimens of the ova in "pure



Oxyuris vermicularis with ova just deposited.

culture," I transferred it to a slide, allowing the water to evaporate, and then mounted the specimen in Canada balsam.

The uterine contractions still continued, less forcibly however, and not until the entire mass of ova within the worm had been expelled into the balsam did such muscular action cease. (The specimen is shown at this stage in the sketch.)

The entire time for the discharge of all the eggs occupied more than two hours. The eggs are elliptical in outline, one side of the ellipse being of greater convexity than the other, with a capsule light greenish yellow in color, and measuring over all 28 by 51 microns.

The worm is 6 mm. long and presents a crenated appearance in its anterior third.

4008 Baring Street.

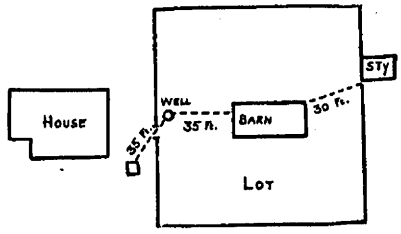
A MILK-BORNE TYPHOID EPIDEMIC

H. H. THOMPSON, A.M., M.D.
NOBLESVILLE, IND.

Noblesville is a typical county seat town of the central part of Indiana, with a population of about 5,000, where, previous to the year of this milk-borne epidemic, there had been only a few scattered cases of typhoid yearly. The sewage system was good and of ample proportions, and the city's water-supply came from deep-drilled wells, the ones supplying the largest amount of water being 300 feet deep and well cased. The principal milk-supply was from a dairy conducted by a man who made every effort to supply the people with pure milk and who tried in every way to run a strictly modern plant. But, as in every other city, there were several who sold milk in different parts of the city. Among these was a Mrs. H., who, living a mile from town, had established a milk-route that supplied about thirty-five families.

During the latter part of August and the whole of September, 1906, her husband suffered a severe attack of typhoid with a marked relapse. His case was a serious one and marked by three hemorrhages of some considerable moment. He had contracted the disease while working at his occupation, that of baker, in a nearby city where the disease was at that time prevalent. During the relapse of his disease he had been attended by a capable man who gave explicit direction as to the proper care of the excreta, but it is doubtful if they were carried out, as the patient was nursed by his wife and daughter. During the early days of the attack, however, and before the nature of the attack was definitely determined, all excreta were thrown into the privy on the premises without any attempt at disinfection, nor was the vault later properly cared for with any disinfecting material.

About the middle of January, 1907, an epidemic began in Noblesville, lasting through February. In all twenty-five cases developed during that time, three of which ended in death; and all but a few were of rather more virulence than usual. The city water was repeatedly examined and the results did not explain such a state of affairs. Then attention was directed to the milk-supply



of the city. It was very quickly ascertained that, of the eighteen families affected, fifteen were purchasing their milk from Mrs. H., these families, too, being the only families in which there was more than one case.

An inspection of the dairy and methods of Mrs. H. showed a frightful and shameful state of affairs. It was her custom, since she had only four cows of her own, to collect the needed extra milk from the neighboring farmers night and morning and keep it in dirty cans from ten to twelve hours till bottled for delivery. Asked as to how she cared for her cans and bottles, Mrs. H. replied that she "washed them with suds and then rinsed them in the clear, cold water from the well." The accompanying diagram shows the location of the well and out-buildings and from their relation it will be readily seen how this "clear, cold water from the well" was the intermediary between the typhoid and the milk.

As the diagram shows, the well was situated directly about 20 feet to the rear of the house within the barn lot. This is a "dug well," 30 feet deep, walled with brick and with a driven well in the bottom, 30 feet deeper. Thirty-five feet farther on in the lot was a cow stable, back of which, about 30 feet, was the hog-pen and shed. At the time of my visit the roof of this was encumbered with carcasses of two newly-born lambs on which the chickens were greedily feasting. Thirty-five feet to the southwest of the well was the privy into which, during the previous August and September, had

been thrown the discharges from her husband, then suffering from typhoid. This privy was open and the walls of the vault made of boards which were badly rotted. The open fall and winter with plenty of rain had really made of this well a cesspool for the drainage of the entire place.

At this time a bacterial examination of milk from this place showed more than 9 million bacteria per cubic centimeter with streptococci, but no typhoid; and the water from the well gave the following analysis:

Odor, very slight. Color, 00. Turbidity, marked. Sediment, much reddish. Free ammonia, 0480. Albuminoid ammonia, 0010. Nitrates, 0100. Nitrites, 0000. Chlorin, 5000. Total solids, 36.6. Fixed solids, 30. Hardness, 26.3. Iron, 0.22. Bacteria, 35 to the cubic centimeter.

Deeming this evidence sufficient, I ordered a discontinuance of the sale of milk from this place, and coincidently the typhoid stopped.

DISTRIBUTION OF CASES OF TYPHOID BETWEEN THE DAIRY ROUTES

Date Reported	H. Dairy Cases	Other Dairies Cases	Date Reported	H. Dairy Cases	Other Dairies Cases
1/19	1	.	2/10	1	.
1/25	2	2	2/11	1	.
1/26	4	.	2/13	1	4
1/27	1	.	2/23	3	.
2/1	3	.	2/28	1	.
2/5	1	.			
			Total,	19	6

Of this total of nineteen cases on the H. route there were fifteen families affected, or about one-half the number of families supplied.

Evidently the contamination was carried from the vault to the well and thence, in "the clear, cold water from the well," to the milk-cans and bottles and thence to the unsuspecting consumers. Though the typhoid bacilli do not live long in water, it has been proved that they may exist for weeks and even months in the soil. In this case they had lain in the privy from August, until the heavy rains of December had caused a drain into the well.

Since this epidemic occurred the state has provided for a more or less rigid and systematic inspection of all dairies, but I believe that such disgusting details and conditions still exist in many places, especially the smaller cities and towns. The large cities have of necessity rigid rules and inspection of their supply, and the smaller cities and towns must realize this danger and adopt plans for their protection.

THE VALUE OF CYSTOSCOPY IN SURGICAL DISEASES OF THE KIDNEY*

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In cystoscopy we have a means of exact diagnosis which is not generally utilized. In the male the electric cystoscope is used, while in the female we may use either the electric or the open-air method, the technic of which I shall briefly describe. I use, in women, exclusively the Kelly air-cystoscope, not because better results are obtained by it, but because, (1) its simplicity and (2) because, as an assistant to Kelly for a number of years, I am far more familiar with that method.

The external urethral orifice is thoroughly cleansed with boric acid solution, the patient then catheterized, and the catheterized specimen of urine saved in a sterile vessel for microscopic, chemical and bacteriologic examination if desired. A sterilized medicine dropper is then filled with 10 per cent. cocain which is injected into the urethra. The patient is then placed in the knee-chest position, and the urethra dilated. The cystoscope, which is simply a hollow tube, is introduced, and as soon as the obturator is removed, the bladder dilates from atmospheric pressure. By means of a head-mirror, light is thrown into the bladder, and a direct and thorough examination can be made. The cystoscope can then be turned to either side, and urine collected through it from either ureter. This gives a fair, although not absolutely accurate, method of comparing the urines from the two sides. A catheter may be run into the kidney and urine collected directly from that organ, while urine is collected at the same time from the other kidney, transvesically. If further and more accurate comparison of the functions of the two kidneys is desired, a catheter can be run into the opposite kidney. The urines obtained from the kidneys are subjected to bacteriologic, chemical and microscopic examination and compared with the mixed urine obtained from the bladder.

The patient is now turned on her back, each catheter connected with a sterile graduated vessel and the following observations made:

1. The amount of urine collected from each kidney in a definite time. The longer the time the more accurate the comparison. If we collect for only a few minutes, there is apt to be a tremendous error. For example, suppose the right kidney is hydronephrotic, holding 20 c.c. of urine and the left kidney is normal. During the first ten minutes the hydronephrotic sac will have emptied itself of the 20 c.c., while the normal left kidney was secreting possibly 5 c.c., making it appear that the right kidney was doing four times the work of the left, while, as a matter of fact, that 20 c.c. stored up in the kidney pelvis might represent several hours' work of the right kidney. Each succeeding ten minutes that the urine is collected will show a gain for the left kidney and in the course of an hour the true state of affairs will be apparent.

2. The manner in which the urine is secreted. The normal healthy kidney expels its urine in intermittent spurts of several drops at a time, while in a diseased kidney it is usually a continuous dripping, like that caused by a leak in the roof of a house. So, in the example mentioned above, the left kidney would have the regular intermittent spurts, while the right kidney would at first have a profuse continuous flow until the hydronephrotic sac was emptied and then start in with its dripping.

3. The estimation of what each kidney can do under stimulation, or what it could do provided the other kidney were removed. After having collected the urine for half an hour to determine what the kidneys are doing without stimulation, have the patient drink two or three glasses of water. Before very long there will be an increased output of urine, and if the one kidney is markedly diseased and the other has developed compensatory power, the difference in the increased output will be very striking. In other words, the healthy kidney has far greater power of responding to increased strain than has a diseased kidney.

* Read by invitation before the Tri-State Society of the Carolinas and Virginia, at Columbia, S. C., Feb. 21, 1912.