REMARKS ON ANTISEPTIC MIDWIFERY: EXPERIMENTS WITH LOCHIAL FLUID.

AN EXAMINATION OF BRAIDWOOD AND VACHER'S CONCLUSIONS.

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THE results of the following experiments with lochial discharge contrast so strikingly with those of Braidwood and Vacher, detailed in their "Reports to the Scientific Grants Committee of the British Medical Association, Third Contribution to the Life History of Contagium," that I hope they are of sufficient interest to obstetricians to justify publication, few though they may be in number.

In the JOURNAL of February 4th, 1882, page 145, Braidwood and Vacher state, as the result of their experiments:

"a. Normal* human lochial discharge of the fourth* day after delivery, is septic to rabbits.

"b. It invariably* induces in them septicæmia, as proved by *post mortem* examination.

"c. The fatal dose of the aqueous solution we employed, the method for preparing it having been already described, is from half a drachm to a drachm, according to the size of the animal operated on.

"d. When allowed to putrify, it induces local suppuration, like other irritant, putrid, organic fluids, as well as its own special characteristic visceral formations.

"e. No special constitutional symptoms indicate the important systemic changes which are going on.

"f. The surest method of inducing the constitutional alterations termed septicæmia by inoculation with lochial solution, is to bring it into contact with the pelvic peritoneal cavity, by injection *per vaginam* or *per perineum*.

"g. Antiseptic solutions, mixed with the septic lochial fluid, do not appear to modify its lethal influence.

"h. Micrococcus organisms are not present in, nor are they necessary for, the septic potency of the septic fluid."

From conclusion *d*, Braidwood and Vacher evidently consider they have proved that, in addition a property acquired by putrefaction, like that of "other irritant, putrid, organic fluids," and which almost everyone will allow, the lochial discharge has another, a special septic property, which they regard as "normal."

This is a question of very material interest to all who are practising antiseptic midwifery. During the last four years, I have treated every case of confinement, both during and after labour, with one of these same "antiseptic solutions," in the strong hope of preventing the infection of the lochial discharge with septic matters from without, or of destroying and diluting them when they had entered; also, being sceptical as to the existence of a special septic property in the discharge, or, at all events, considering it not proven, I trusted, if it did exist, that the antiseptic might, even then, be of some avail.

The following table shows at a glance Braidwood and Vacher's experiments with lochial fluid collected on the fourth day after delivery, and injected into the pelvic peritoneal cavity of rabbits. The lochial fluid used in these experiments was taken from patients not treated in any systematic antiseptic manner.

	Fluid.	Result.
1)	½ drachm injected pure	Died in 8 days.
2)	" " " " " " " " " " " "	" " 9 "
3)	" " with ½ drachm of a saturated solution of cupralum	" " 12 hours.
4)	" " after being dialysed, and having been in dialyser	" " 20 days.
5)	" " 3 days	" " 8 "
6)	" " the undialysed portion of the last, also in dialyser	" " 3 "
7)	" " 3 days	" " 5 "
8)	" " dialysed, and after being kept in dialyser 7 days	" " 3 "
9)	" " the undialysed portion of the last, also in dialyser	" " 5 "
10)	" " 7 days	" " 3 "
11)	" " injected pure	Recovered.
12)	" " with ½ drachm of a 5 per cent. solution of carbolic	Died in 36 hours.
13)	" " acid in water	Recovered.
14)	22½ minims, with 22½ minims of a 5 per cent. solution of	Recovered.
15)	carbolic acid	Recovered.
16)	½ drachm injected pure	Died in 9 days.
17)	" " " " " " " " " " " "	Recovered.
18)	" " " " " " " " " " " "	Recovered.
19)	" " " " " " " " " " " "	Recovered.

Note.—The experimenters do not, either in their tables or elsewhere, say what time elapsed between collection and injection of the fluid in Nos. 1, 2, 3, 8, 9, 10, 11, 12, and 13.

* These italics are mine.

The fluid used in the experiments about to be described was collected from patients treated after the following method, which I have practised for more than four years with a few slight modifications, as these have suggested themselves, and which I need not detail here. A five per cent. solution of carbolic acid in water is used for washing the hands before each examination during labour, and for washing instruments when these are needed. If the hands are dried, a clean towel is used, and the fingers dipped into carbolised oil (1 to 20) before examining again. The bloody or mucus stained fingers are not washed in the solution. During the third stage of labour, I avoid, if possible, the introduction of the fingers into the vagina, and express the placenta with the left hand on the fundus uteri. Shortly after the termination of labour, I syringe out the vagina with a 1 to 30 solution of the acid, slightly warmed, and cleanse the external parts with a clean napkin dipped in a five per cent. solution of the same.

Daily Routine.—The vagina is syringed daily at 8 A.M. and 8 P.M. with a 2½ per cent. solution of the acid, after which, and at noon and 4 P.M., the externals parts are swabbed with a piece of clean old linen, dipped in a five per cent. solution, each rag being thrown away after having been used once; a clean napkin is then applied, and changed about every three hours, except during sleep—oftener, if necessary, during the first twenty-four hours. (In cases of ruptured perineum, I purpose using salicylic cotton pads.) The syringing is done once daily usually from the fifth day; but this is regulated by the amount and character of the discharge. Should there be any smell or suspicion of such in the napkins, a five instead of a two and a half per cent. solution is used, and thrice daily.

Collection of Fluid for Experiment.—The discharge was collected (the same precautions being used as in Braidwood and Vacher's experiments) in each case immediately before the evening syringing, *i.e.*, twelve hours after syringing with carbolic acid. The materials used were absorbent cotton, a large test tube, and a new syringe, the two latter first washed carefully with a five per cent. solution of carbolic acid, and then repeatedly washed out with freshly prepared distilled water. (In addition, for the first two experiments, I heated the test tube.) The patient, lying on her left side, the external parts were cleansed with the absorbent cotton dipped in the distilled water, a fresh plug of cotton was then inserted into the vaginal orifice, soaked with lochial fluid and removed. Two ounces of distilled water were next thrown into the vagina by means of the syringe, and what fluid escaped from the vagina was caught in the test tube, which was immediately plugged with the cotton already soaked with discharge. All the fluid that could be expressed from the plug after repeated soakings in that of the test tube, was mixed with the latter, before injecting.

Method of Injection.—The fluid was injected as soon after collection as possible, with a new hypodermic syringe, which was cleansed as before described, both before and immediately after injecting. As I could not obtain a syringe large enough to contain more than 25 minims, I had to disconnect from the needle and refill it in every instance, and it is possible that a little air was injected in consequence. The animal being chloroformed and laid on its back, the syringe needle was passed into the vagina, as far as it would go along the right wall, which it was then made to pierce, and so to enter the pelvic peritoneal cavity. On disconnecting the syringe to refill it, in no case did any fluid escape from the needle.

Mrs. S., from whom the fluid for the first two experiments was collected, was a primipara, very fat, delivered on 18th March 1882, with long forceps; her labour was complicated by the worst laceration of the perineum I have ever seen, the vaginal wall being split from within outwards, about two inches, the rectal wall one inch. Carbolised silk stitches were introduced immediately after the third stage terminated, two in the rectal and two in the vaginal mucous membrane; also three deep perineal, and five superficial skin stitches. The mouth temperature on the evening of that day was 100.2°. Next morning it was 99°; evening, 100°. On the third morning, 98.5°; evening, 99.4°. On the fourth morning, 97.8°; evening, 99.7°. The napkins till the fourth evening free from odour, then smelt distinctly of fæces, and I found that Mrs. S. had taken a dose of castor-oil contrary to instructions; had had a large motion, and had passed wind *per vaginam*. The perineum healed by first intention, excepting the upper part of the slit in the vaginal mucous membrane which had not been sutured; there was no recto-vaginal fistula, and the patient made a good recovery.

Experiment 1.—On the 21st March 1882, a female rabbit, weighing 4 lbs. 3 oz. was injected with 50 minims of fluid; half an hour after it was collected from Mrs. S., eighty-four hours after her delivery. The fluid in the test tube smelt slightly of fæces, and examined an hour after injection with a quarter-inch objective, by artificial light,

could be seen blood discs, epithelium, and numerous small single and double bright refracting bodies. With a more powerful eyepiece, movement could be made out in the field.

Next day the rabbit did not eat quite so well as usual, but did not refuse food; on the 23rd she was apparently all right. On the 27th she gave birth to a litter of five; on April 8th she weighed 3 lbs. 11 ozs.; May 30th, 3 lbs. 11½ ozs., when with the others she was removed from the hutch and allowed to burrow in the garden. June 25th, she weighed 4 lbs. 3 ozs., after which she had another litter of, I think, six. On 11th August she was quite well.

Experiment 2.—A doe, weighing 4 lbs 2½ ounces, was injected with fifty minims of the same fluid, and at the same time as the last rabbit. She did not appear to be disturbed in any way, ten days later weighing 4 lbs. 2 ozs. On April 7th she had slight diarrhoea, on the 8th she weighed 4 lbs. 2½ ozs.; on May 30th, 3 lbs. 7 ozs. For about a fortnight at this time we had very hot, sultry weather, and the rabbits were then in a small hutch only open in the front, and in a back verandah opening into a closed court admitting sun but no breeze. Two other rabbits looked out of condition at the same time, one of these being unaffected. I then removed the hutch to the garden, and allowed the rabbits to run at large and burrow, when the health of all improved. On June 25th she weighed 4 lbs. 10 ozs., and on July 9th gave birth to a litter of six. On August 11th she was quite well.

Four rabbits were injected with fluid collected from Mrs. T., a primipara, who had a tedious labour, was delivered on May 26th, 1882, with short forceps, and had a slight tear of the perineum into which two superficial carbolic silk stitches were introduced, though some might have considered these unnecessary. Healing took place by first intention. On the second evening, the mouth temperature was 99°, third morning, 99.2°; evening, 99.8°; fourth morning, 99.2°; evening, 98.6°. No odour was perceptible in the napkins at any time, and convalescence was good.

Experiments 3 and 4.—Sixty-five minims of fluid collected seventy-three hours after delivery from Mrs. T. were injected into these animals three-quarters of an hour after collection. The fluid was red, odourless, and exhibited under a quarter inch objective, a few epithelial cells, blood discs, granular matter looking like oil globules, and no moving particles were visible. These rabbits seemed in no way influenced by the operation. One weighed, on May 29th, 3 lbs. 8 ozs., and on June 21st gave birth to a litter of four, and on the 25th weighed 3 lbs. 15 oz.; while the other weighed 3 lbs. 14 ozs. on May 29th, on June 25th, 4 lbs. 10 ozs.; and gave birth to a litter of six on July 6th. On August 11th they were both well.

Experiments 5 and 6.—On May 30th, 1882, sixty-five minims of fluid, collected ninety-five hours after confinement from Mrs. T., were injected into these two animals an hour after collection. The fluid was reddish, odourless, and presented under a quarter inch objective, epithelial cells, broken down blood discs and granular matter—no movement was visible in the fluid. Next day both animals ate well, and were as active as ever; one gave birth to a litter of seven on June 9th, and to a litter of six on July 10th, whilst the other gained flesh greatly. Neither being in any way, apparently, influenced by the injection. Both were well on August 11th.

I injected eleven rabbits in all, but as five of these were with fluid collected on the second and third days after delivery, I shall omit them, though in doing so I weaken my case. I would call attention to the fact, that the conditions were somewhat more trying than those which accompanied Braidwood and Vacher's experiments. The fluid was not dialysed or mixed with any antiseptic in my case before being injected, in four cases it was collected during much hotter weather than occurs in England, the dose injected in every instance was larger, and both cases supplying the fluid were complicated with perineal rupture and the use of forceps.

It seems to me that the result of these six experiments, at least, throw a large amount of doubt upon Braidwood and Vacher's conclusions *a. b. c.* and *f.* It may be said, that in any experiments, some of the carbolic solution from the morning syringing remained in the vagina twelve hours. This is possible, but I reply that I habitually pressed the hypogastrium to squeeze out any blood or fluid that might have lodged in the vagina; that the solution used was a 2½ per cent. one; that there was not the faintest odour of carbolic acid in the lochial fluid collected, that if there had been any acid in the vagina, it must have been well diluted with the distilled water which was used to wash out the discharge. And, finally, Braidwood and Vacher cannot raise this objection, as they, in concluding, say, "antiseptic solutions mixed with the septic lochial fluid do not appear to modify its lethal influence."

The table at the commencement of this paper records thirteen expe-

riments. Braidwood and Vacher performed many others* with the lochial fluid; but I have rejected—

1. All that were injected with fluid other than that of the fourth day. (See Conclusion *a.*)

2. All experiments with other animals than rabbits. (See Conclusion *a.*)

3. All that were treated otherwise than by injection into the pelvic peritoneal cavity. (See Conclusion *f.*, where it is stated that this is "the surest method".)

The numbers bracketed together in the table were injected with fluid collected from the same patient. It is of "normal" lochial fluid that the production of septicæmia is predicted. Nos. 4 and 5 were injected with fluid which had been kept in a dialyser for three days, and Nos. 6 and 7 for seven days, after collection. I do not suppose that the experimenters assume fluid thus treated to be "normal". Again, No. 3 had thirty minims of a saturated solution of cupralum; No. 9 thirty minims, and No. 10 twenty-two and a half minims, of a 5 per cent. solution of carbolic acid injected along with the lochial fluid—mixtures which are not "normal". Deducting, therefore, seven cases as abnormal, there were six rabbits injected with normal lochial fluid of the fourth day, with three deaths and three recoveries—a ratio which cannot surely warrant the use of so strong a term as "invariable", particularly when the proof of septicæmia is stated to be a *post mortem* one. Conclusion *b* runs thus: "It invariably induces in them septicæmia, as proved by *post mortem* examination." Braidwood and Vacher use the expression "normal lochial discharge" without defining the term normal.

From the six experiments which I have described, it is safe to infer that human lochial fluid, collected on the fourth day after confinement from patients treated after the antiseptic method described, is not septic to rabbits, when it is injected into the pelvic peritoneal cavity of these animals soon after its collection in the manner described, and in doses of sixty-five minims and less; and this affords at least a presumption that the septic influence (when present) of the discharge on patients so treated is lessened, and, it may be, destroyed.

From the experience of the last four years, I am in a position to claim the following advantages for the antiseptic (would that we could call it aseptic!) method of procedure described.

1. The shorter duration of the discharge; there being only bloody and serous, instead of red, green, and white stages.

2. Its lessened amount while it lasts.

3. Its freedom from odour.

4. Increased comfort to the patient from the above three, and its anæsthetic effects on the parts.

These points have been remarked by the patients as well as by myself; and, even if there were no other and supposed greater advantage, they alone would, in my opinion, much more than compensate for any disadvantages. Besides the trouble involved, the only drawbacks that I have observed are the sensation of burning when the patient is syringed, most pronounced when there is breach of surface; and twice I have remarked giddiness immediately after syringing. The former feeling passes away almost before the washing is over, and the recurrence of the latter can be avoided by diluting the solution. These objections only apply to the antiseptic used, and not to the principle involved. I have had no case of puerperal fever since I began the systematic practice described. But there is no branch of the healing art in which the fallacy of "a run of cases" is so common as in midwifery; and no statistics, unless those dealing with large numbers, can be of any use in a matter such as this.

SALICYLATE OF SODA (1) IN TONSILLITIS, AND (2) AS A LOCAL APPLICATION IN GOUT.

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(1) A PAPER by Mr. Hormazdj, recently published in a contemporary, treats of a clinical point deserving, I think, more attention than it has yet received—I refer to the value of salicylates in tonsillitis. The good effect of these salts, when prescribed for that complaint, has been illustrated by the clinical records of Fowler, L. Browne, Hunt, and others, in the JOURNAL of one or two years back; but is not yet so widely recognised as to be independent of further evidence. My personal experience is not large, but is based upon several very severe and acute cases in which ulceration had occurred before salicylate of soda had been administered. It was then given in ten-grain doses every two to four hours, and in each case I

* BRITISH MEDICAL JOURNAL, January 28th, 1882, pp. 108-11, Table of Septicæmic Experiments.