5.55 P.M. Normal temperature taken for 12 consecutive minutes, 103.2 deg. Fahr.

Temperature		Temperature	
6 P.M.	...103.2 deg. Fahr.	6.45	...100.1 deg. Fahr.
6.5	...103.2	6.50	... 99.8
6.10	...102.9	6.55	... 99.4
6.15	...102.4	7.0	...100.0
6.20	...102.0	7.5	...100.2
6.25	...101.5	7.10	...100.1
6.30	...100.9	7.15	...100.8
6.35	...100.4	7.20	...102.1
6.40	...100.2		

Experiment v.—Rabbit, weighing 2 lbs. 8 ozs. One-thirtieth of a grain of picrotoxine was injected under the skin of the shoulder, at 6.54 P.M.; the normal temperature having been, by observations extending over 15 minutes, ascertained to be 102.0 deg. Fahr.

Temperature		Temperature	
6.55 P.M.	...103.0 deg. Fahr.	8.5 P.M.	... 96.9 deg. Fahr.
7.5	...103.2	8.15	... 97.6
7.15	...100.9	8.25	... 97.9
7.25	... 99.9	8.35	... 98.4
7.35	... 98.4	8.45	... 99.2
7.45	... 97.8	8.55	...101.3
7.55	... 97.4		

Experiment vi.—Rabbit, weighing 2 lbs. 10 lbs. One-third of a grain of picrotoxine was injected under the skin of the shoulder at 3.44 P.M.; the normal temperature having been ascertained to be 99.8 deg. Fahr.

Temperature		Temperature	
3.45 P.M.	... 99.9 deg. Fahr.	4.5 P.M.	... 96.6 deg. Fahr.
3.50	... 98.2	4.10	... 96.1
3.55	... 96.8	4.15	... 95.2
4.0	... 96.6		

Death took place at 4.16 P.M.

Experiment vii.—A terrier dog, weighing 10 lbs., had three-eighths of a grain of picrotoxine injected under the skin of the back. In eleven minutes, there were general tremor and shivering; and in twelve minutes, convulsions, ushered in by rotation of the head to the right, and twitchings of the cheeks, mouth, and fore-paws, and rapidly becoming general. The fit lasted nearly two minutes, and ended abruptly, when the head fell forwards as if the muscles of the neck had become powerless, and the breathing became stertorous. After a minute's interval, convulsions again came on with marked opisthotonos, in which the head was drawn back and the tail became erect and rigid. After four more fits, all terribly severe, and lasting each about two minutes, the convulsions became continuous, and then very soon feeble in character, while deep coma set in. The animal died just ninety-one minutes after the injection. On opening the head, the dura mater and its sinuses were found to be enormously engorged with dark blood. In the cavity of the arachnoid, was a large soft layer of dark clot covering the anterior half of the left hemisphere. All the vessels of the brain were much engorged with dark blood, as were also those of the spinal cord. The grey matter was much injected. The right side of the head was full of dark and clotted blood, and the left side was uncontracted, and contained a small quantity of dark fluid blood. The lungs were unusually pale and anæmic; and the liver was in the same condition. The bladder was empty, although no urine had been passed during the experiment. During the action of the picrotoxine, the respirations and cardiac pulsations of this dog were from time to time carefully counted, and its temperature was taken in the rectum.

TABLE I.—Showing Number of Respirations and Cardiac Pulsations and Temperature in a Dog after a Fatal Dose of Picrotoxine.

No. of minutes after injection	Condition	Respirations	Cardiac Pulsations	Temperature
2	Somewhat agitated	—	138	100.
8	Quiet and natural	17	66	99.7
11	General tremor	30	126	99.4
15	Much convulsed	38	164	98.1
18	Severely convulsed	—	132	98.6
20	" "	—	69	98.8
22	" "	36	63	99.3
28	" "	18	—	99.4
33	" "	18	25	99.4
43	Coma	33	—	99.4

Experiment viii.—Guinea-pig, weighing 1 lb. 6 oz. One-fortieth of a grain of picrotoxine was injected under the skin of the back. In six

minutes, it was dull and stupid, and its respirations were much hurried. In nine minutes, there were general shuddering and quivering of the upper and anterior part of the left ear. In thirteen minutes, sharp paroxysms of general shivering continued to recur every few seconds. In nineteen minutes, it voided a large quantity of urine, and its bowels acted. In twenty-four minutes, the head was drawn to the right, there were munching movements of the right side of the mouth and right cheek, and the left paw was raised off the ground, and performed a number of rapid beating movements in the air. The fit lasted twelve seconds. In twenty-seven minutes, there was another and more severe fit, in which the head was drawn to the left, and there were violent twitchings of the face and fore-paws. Throughout the fit, consciousness was not apparently lost, and after it the animal was quite lively and well.

Experiment ix.—Guinea-pig, weighing 1 lb. 3 oz. One-thirtieth of a grain of picrotoxine was injected under the skin of the back. In eight minutes, it was drowsy, and there was quivering of the ears. In fifteen minutes, there were shakings of the head. In sixteen minutes, the head and mouth were slightly drawn to the left. In thirty-five minutes, the bowels acted, and the animal was very unsteady in its movements, stumbling as it endeavoured to walk about. In thirty-nine minutes, there was a fit. The head shook, the mouth twitched, the body was thrown first on to the left and then on to the right side, after which the animal regained its feet. By a series of jerky movements, the body was then raised, the fore-paws drawn backwards until they were off the ground, and the animal tumbled over when the fit ceased, upon which there were violent sneezing, and severe foaming at the mouth. In forty-four minutes, there was another fit, followed by repeated yawning and drowsiness. After this, there were several violent fits, accompanied by unconsciousness, incessant low cries, and copious flow of saliva, distinct nystagmus, and crunching and grinding of the teeth. Then came continuous clonic spasms, gradually becoming feebler, coma, and death sixty-two minutes after the injection.

(To be continued.)

SOME NEW RESEARCHES ON THE CAUSE AND ORIGIN OF FEVER FROM THE ACTION OF THE SEPTINOUS POISONS.*

By B. W. RICHARDSON, M.D., F.R.S.

THIS was a continuation of the author's paper read before the Society ten years ago, viz., in 1865. The author commenced his present lecture by giving a *résumé* of that which he had read in 1865. In that communication he had shown, from a series of experiments made with the serous fluids derived from a patient suffering from pyæmic fever, and under the care of Mr. Spencer Wells, that such fluid when inoculated into healthy animals, produced a distinct and fatal disease which could be transmitted to other animals through several series or generations. To the poisonous matter thus produced he had given the name of *septime*, and he had laid before the society specimens of salts obtained from the septicinuous matter, viz., a hydrochlorate and a sulphate, both of which possessed poisonous properties similar to those belonging to the mother liquor. He had inferred, therefore, that the poisonous substance was of an alkaloïdal character. He had also, in the same paper of 1865, stated the following conclusions as the result of his experimental researches.

1. All the organic disease-producing poisons are modified, *i. e.*, poisonous secretions.
2. The secretions are rendered poisonous by two processes: (a) by contact with organic poison pre-existing; (b) by direct decomposition.
3. The poison of each secretion possesses several qualities: it can only be absorbed by particular channels, and it can only provoke farther disease by coming into contact with a secretion allied to that from which it was itself derived.
4. The reproduction of the poisons depends on the continuance of the process of physical changes in a continuous secretion. The force of secretion is the force of reproduction.
5. The poisons kill by various means: (a) by the secretion causing obstruction of necessary function; (b) by exhaustion from excessive secretion; (c) by extreme irritation of nerve and reflex injury; (d) by the absorption of the poisoned secretion into the blood and disorganisation.

From this point Dr. Richardson went on to describe that since the announcement of the facts had been put forward originally respecting septime, similar results had been obtained by Coze and Felz, Davaine,

* Abstract of a paper read at the Society of the Medical Officers of Health.

Béhier, Vulpian, and MM. Thin and Clementi. It had further been discovered by Davaine that the intensity of the poisonous matter increased in the most marked degree, and in a manner that seemed to defy computation, with the transmission of the poison through fresh series of animals.

The author now proceeded to the details of his new research, illustrating it step by step by experiment. He had put to himself the question, Why does the poisonous septinous matter produce a definite order of morbid symptoms, and why, specially, does it produce fever? In the first parts of this inquiry he had put aside altogether the animal body, and had tried to learn what effect the poisonous substance would exert when it was brought into contact with other organic bodies of unstable composition. Would it act like ferment on saccharine substances? Would it modify the process of acetification? Would it interfere with the oxidation of readily oxidisable matters? Without entering into details that were negative, he found, he said, one affirmative fact from his experiments, upon which he should base to-night a new theory on the cause of the fever and other symptoms that occur in the living animal under the influence of septine. He found that it was the property of all the septinous poisons to liberate oxygen from that solution of oxygen known as peroxide of hydrogen. This fact was illustrated by showing the action of minute portions of pyemic poison, vaccine, pus, decomposing blood, and other similar bodies. The solution, which contained ten volumes of oxygen, was placed in tubes, and was inoculated with the various specimens of septinous matter, with the effect in each case of causing a rapid evolution of the oxygen. The same result was produced by the action of fibrine on cellular tissue, but was shown to be negative with mucus, upon which fact, the author incidentally remarked, a new diagnostic test between mucus and purulent matter is established. The septinous matter in every form seemed, from its action upon peroxide of hydrogen, to have been derived, either from fibrine or from cellular tissue, or from derivations of these bodies.

From the action of the septinous product on oxygenised water, the author indicated their action on oxygenised blood. To a specimen of blood which had been charged with oxygen, he added solution of the peroxide to saturation. Into this he now plunged a thermometer, the bulb of which was armed with a little fibrine. Upon this oxygen began to lib-rate from the blood with evolution of heat, the mercury in the thermometer rising four degrees.

After adding some other experimental facts and summing up the results of all the facts he had placed before the Society, Dr. Richardson stated the theory at which he had arrived as to the effects of the septinous matter on the living organism, with special reference to the febrile state. The theory was that the septinous product acts upon the blood in the extreme circulation, when it has accumulated in sufficient quantity by liberating a portion of the oxygen. Upon this occur the same phenomena as had now been observed in experiment; but, as the poisonous organic product is itself destroyed in the process, the effects it produces may remit until a new charge of the poison has been produced in sufficient quantity to cause a repetition of the febrile state. Thus the theory suggested a simple reason for the remittency of fevers.

The various phases of febrile disturbance were next adverted to. It was indicated that in some instances, as in the most malignant forms of small-pox, the blood may be so charged with septinous matter as to be unable to take in oxygen in the process of respiration, then death takes place by asphyxia after a brief period of febrile heat. In another variety of cases the liberation of the oxygen is so persistent that remission of the fever is hardly perceptible; and in other exceedingly light cases, where the quantity of poison is very small and is not reproduced, one sharp paroxysm of febrile phenomena may be all that is witnessed. In cases of abscess or of cavity in the lung this same order of phenomena may be observed in a modified degree.

The lecturer continued by showing that some chemical agents added to water charged with the peroxide solution tended to fix the combination and to neutralise the action of substances which liberate the oxygen. An experiment illustrating this fact by the action of quinine brought the lecture to a close.

OBSTETRIC MEMORANDA.

DOUBLE MONSTROSITY: MATERNAL IMPRESSION.

ON November 18th, 1874, I was called to assist Dr. Bourns of Oxted in a case of difficult labour. I found that the patient, who had borne several children without misadventure, had had labour-pains, more or less for two days; that, six hours before my visit, the head had been delivered by forceps, having been within reach, and making no progress for some hours previously; and that all the effort and power that had

been applied had been insufficient to deliver the body. The woman was tired, and full of apprehension, but her condition otherwise was not unfavourable. On placing my hand on the abdomen, I was led, from the size of the womb, to pronounce at once that there were twins. A large head and shoulders protruded from the vagina, much decomposed, livid, and with cuticle peeling off at a touch. On carrying my left hand along the child's back in the hollow of the sacrum, I felt a small foot and leg packed down between the pelvic brim and the child's pelvis; and my impression was, that the case was one of locked twin, the obstruction to delivery arising from the lower extremity of the second child having descended below the pelvis of the first. I tried to push up this leg, but unsuccessfully. Taking a firm hold of the shoulders, and using all the force of which I was capable, I could not move the child in the slightest degree. I now extended the arms above the head, wrapped them in a towel, to give a firm hold, and, whilst using powerful traction, made an effort to rotate the trunk. This was successful in moving the body, and, by continuing the force, the lower part of the body was brought down. The leg which I had felt, proved to be a supernumerary limb attached to the sacrum of the child; and, by continuing my manipulations, I was soon able to bring down the breech and two proper legs of the child. But, now it was evident that a second body sprang from the abdomen of the first; and, by a little further forcible traction, the delivery was completed. The child had one pelvis, with two well-formed lower extremities and a third smaller one attached to the sacrum, forming a tripod. Male genital organs and rectum were apparently perfect; there were a single cord and umbilicus. From the level of the umbilicus there were two distinct trunks, each with perfectly formed upper extremities and heads, well nourished and of full size. Plate 83 in Dr. Ramsbotham's *Obstetric Medicine* gives a fair idea of the monster, if a third leg be added. It was remarkable that the body of the second part was pink, and looked as though it were viable, whilst that first extruded was livid and decomposed. The cord did not pulsate; the placenta was removed without difficulty, and the uterus contracted well. When the delivery was accomplished, during which nothing had been said to give the woman a hint of what she had brought forth, I told her that she would do well, but had got a dead child, adding that it was deformed. She replied: "I thought it would not be all right; for I was frightened, at Limpsfield fair, by two men outside a show, who kept hugging each other closely and posturing. I was frightened by them, but could not keep my eyes off them." This fair happened when she was about three months pregnant. Anyone who has Ramsbotham's *Midwifery* will see at once that the figure in plate 83 resembles exactly two men hugging in a wrestling match. The mysterious subject of maternal impression has been so well handled in two good papers in the JOURNAL of February 6th, that I will add no more.

C. ROBERT THOMPSON, M.R.C.S.

CLINICAL MEMORANDA.

CASE OF POISONING BY CHLORAL HYDRATE: RECOVERY.

SHORTLY before one o'clock on the morning of February 26th, I was summoned to see a druggist's assistant, who, it was stated, had fallen down, and was totally unconscious. On my arrival, he was lying on the floor of the sitting-room adjoining the shop, quite insensible, breathing heavily, and at times almost stertorously; his face was dusky; pupils much contracted; pulse weak and about 76. He could not be roused, and he made no attempt to reply to questions put to him. I was informed that he had been out spending the evening with a friend, returned at 12.30 perfectly well, and conversed with the inmates of the house in his usual manner. He had been in the habit for some time of taking chloral hydrate; and, on leaving him alone in the sitting-room, the druggist charged him not to take any that night. On returning, however, after only three or four minutes' absence, his master found him lying on the floor in pretty much the state above described. He immediately sent for me, and not much more than twenty minutes elapsed before my arrival. A stomach-pump not being at hand, an emetic was immediately administered. He vomited freely, rousing himself at each act, and uttering some inarticulate sounds, but falling back into a more or less insensible condition. Gradually, however, the breathing improved; consciousness returned; he looked about him, answered questions, and soon after 2.30 was taken up stairs to bed. After a few hours' rest, he appeared perfectly well. He admitted having taken the chloral, and that he drank it out of the bottle used in the shop, containing a solution of the strength of a grain to a minim; and, from fear of being caught, drank it hurriedly, and took more than he intended. It is difficult to estimate the quantity that he took; but,