Dr. E. Carroll Morgan, of Washington, D. C., who has recently written a paper on "Hæmorrhage following Uvulotomy," writes me as follows: "Obstinate bleeding following uvulotomy is, in my opinion, often due to the condition your cases so well illustrate. Literary research has surprised me, I confess, and I have now collected seventeen cases of dangerous hæmorrhage after this simple operation. Twelve of these have never been published, and were obtained by personal letters. Strange as it appears, the possibility of an anomalous artery being a factor in the dangerous hæmorrhages which here followed uvulotomy has never been mentioned in connection with reported instances."

These arteries must also be taken into consideration in cases of surgical treatment of the tonsils. Many cases of hæmorrhage following tonsillotomy are reported. In most of them no mention is made of the finding of an artery of unusual size, but it seems to me that a careful examination would have revealed this condition in some of the hitherto unexplained cases of hæmorrhage.

Downie,⁷ speaking of tonsillotomy, says: "Of the vessels in the immediate neighborhood, the ascending pharyngeal is the only one which might be damaged, and this only in unwarrantably free incision into the tonsils, never in excision. Billroth⁸ removed the left tonsil of an hysterical lady. The organ was pulled toward the middle line and a fold of the pharyngeal mucous membrane was probably drawn out and cut with the tonsil. A fearful hæmorrhage occurred, which Billroth thought came from some large branch of the ascending pharyngeal."

In Schmidt's "Jahrbücher," Vol. 186, is related a case of severe hæmorrhage after cutting off the left tonsil. Various hæmostatics were tried unsuccessfully, and in three hours the common carotid was tied. In this case the cause of the hæmorrhage was thought to be some abnormal ramification of the vessels.

Other similar cases might be cited, but these will serve to show the importance of bearing in mind the possibility of having to do with a condition such as I have described, and also the need of making a thorough examination before operating on the throat.

A CASE OF EMBOLISM OF THE LEFT VERTEBRAL ARTERY, WITH AUTOPSY.¹

BY F. W. STUART, M.D., OF BOSTON.

G. W., aged sixty-two, came to the Carney Hospital on December 31, 1885, with the following history: His grandfather, father, two brothers and one sister had died of what he called "softening of the brain," and the account given of the disease, rendered it probable that they had had general paresis. In other respects the family history was negative. The patient considered himself well until three years ago, though he had for years been very corpulent, weighing at one time two hundred and fifty pounds. In the fall of 1882, he fell and injured his knee, but attached no importance to the injury, though it obliged him to limp about for a time. Soon after he began to have trouble with his eyes and was operated on for cataract

at the Eye and Ear Infirmary, where he learned incidentally that he had fractured the patella of the left knee.

For the last three years his health had been poor, loss of strength, weight, and appetite being the most prominent symptoms, added to which for the last few months there had been attacks of severe pain in the stomach, and vomiting, which lasted for from twenty-four to forty-eight hours and always began at night, when they were also most severe. The patient was positive that the attacks began about midnight, and the ingestion of food seemed to bear no relation to them.

The vomitus was as a rule, of a black or dark brown color, and once or twice was distinctly like coffee-grounds in appearance. The patient admitted having used alcohol rather freely during his younger days, though for ten years past he had been a total abstainer.

When at the hospital he was cachectic and some chronic affection was suspected. Physical examination failed to reveal anything except a decrease in the area of liver dulness. Careful examination of the urine, chemically and microscopically, showed nothing pathological. No diagnosis being made, an expectant treatment was entered upon, under which the patient improved, and ceased visiting the hospital.

On March 10, 1886, during the service of Dr. W. N. Bullard, he reappeared, and a diagnosis of probable cirrhosis of the liver was made. This was his last visit to the hospital, and nothing further was known of his condition until May 17th, when I was called to attend him.

I then learned that during the interval between March 10th and May 13th, no evident change in the patient's condition had taken place, though he had been subject to attacks of dizziness and dyspnea, so that he desired to have the windows opened, and these attacks had always been accompanied by profuse sweating.

He had on that day, May 13th, answered the door bell several times, but on returning the last time, he said that he had come near falling, and laid himself on the sofa. He answered several questions put to him by his wife, and nothing further was thought about his condition until an hour later, when it was noticed that he failed to recognize a friend who had entered the room. All attempts to rouse him were in vain, and finally he was put to bed, where after a few hours he became brighter, and it was not until May 17th, four days later, that I was sent for. I found the patient lying apparently comatose, though he could be aroused to answer questions, which he did slowly but intelligently. He moved all of his extremities promptly as requested, and continued to repeat the motion, as it were automatically, not even ceasing always when requested to do so. None the less there was distinct paresis. The patient recognized all visitors, and conversed with them intelligently as far as they noticed. It is certain that he recognized them sufficiently to greet them by name and properly, according to their relationship but a few minutes after they had gone he did not know of their visit, and often asked why they had not called. Difficulty in swallowing, indistinctness of articulation, and incontinence of urine completed the manifest symptoms. When asked if he wished to urinate he would pass considerable quantities of urine at a time, though repeated suggestions failed to relieve the dribbling. There was marked constipation. The patient himself complained only of weakness.

¹ Read before the Section for Clinical Medicine, Pathology and Hygiene, of the Suffolk District Medical Society, February 9, 1887.

⁷ Edinb. Medical Journal.

⁸ Lancet, 1870, Vol. II.

I then called Dr. W. N. Bullard in consultation. The patient's condition was noted to be as above. Physical examination showed the patient to be pale and cachectic in appearance, temperature normal, pulse 80. There was a cataract in the right eye, and iridectomy had been performed on the left, so that both pupils were dilated. The left reacted to light. The reflexes were normal, and no anomaly of sensation could be detected beyond that due to mental obtuseness. Further examination revealed nothing pathological except the small liver.

Though the cause of the existing condition was recognized as distinctly cerebral, the exact nature of the lesion could not be determined upon, though a hæmorrhage was considered to be the probable cause of the trouble.

From this time, May 19th, until his death, the patient lay in bed in a semicomatose condition, replying to questions intelligently, in spite of some aphasia which appeared to be ataxic in character, but when not addressed or otherwise roused, apparently unconscious of his surroundings. There was no aphasia, properly so-called, that is, he always used the proper word when he spoke at all, although his speech was hesitating and indistinct. The paresis, which nowhere amounted to absolute paralysis, continued unabated. There were no convulsions and the patient gradually sank away, becoming constantly weaker and weaker, and died May 27th, ten days after I first saw him.

Autopsy was made May 29th, thirty-six hours after death. The body was of medium development, somewhat emaciated. The relations of the cranium to the head, and of the head to the face, were normal. The cranium alone was opened. The bone was normal in thickness, the dura, everywhere strongly adherent, could not be removed except with great difficulty. The longitudinal and transverse sinuses were empty. The pia mater was much injected, the vessels being dark and swollen. There was no fluid in the meshes of or under the pia which was neither adherent nor thickened. The brain was of normal size and consistency, its bloodvessels everywhere dilated and very prominent. They all contained numerous atheromatous patches, yellow, hard, and not contracting on section of the vessel. These patches occupied one-third to one-quarter of the whole extent of the larger arteries from the vertebral upwards. Between these hardened yellow patches the arteries were dark blue and dilated, though little or no blood was found in them.

There was no fluid in the lateral ventricles. Puncta cruenta were very few and not well-marked. The choroid plexuses were dilated and enlarged. No signs of hæmorrhage or softening were found in the substance of the cerebrum, cerebellum, pons or medulla oblongata. A grayish body the size of a pea was found at the anterior portion of the falx, there adherent. A small white thrombus was found occluding the left vertebral artery and extending into the basilar, which it partly occluded.

—An "American System of Gynecology," Messrs. Lea Brothers & Co., of Philadelphia, is announced as shortly to appear. Among the contributors are such prominent authorities as Professors Barker, Battey, Englemann, Garrigues, Goodell, Reeves Jackson, Lusk, Mundé, Reamy, Thomas, Van de Warker, and others.

RECENT PROGRESS IN PUBLIC HYGIENE.

BY SAMUEL W. ABBOTT, M.D., SECRETARY MASSACHUSETTS STATE BOARD OF HEALTH.

WATER-PURIFICATION.¹

DR. PERCY FRANKLAND's paper upon this subject, before the British Institution of Engineers, is one of general interest, and treats of the effects of the following processes upon purification of water.

- (1) By filtration.
- (2) By agitation with solid particles.
- (3) By precipitation.
- (4) By natural agencies.

The experiments conducted had reference both to the chemical and to the biological phases of the question.

(1) *Filtration.* The following table shows the results of some of the biological experiments, with reference to the effect of filtration.

Filtering material.	Efficiency.	Organisms per cubic centimetre.		Reduction per cent.	Gals. ¹ per sq. ft. per hour.
		Unfiltered water.	Filtered watered.		
Ferruginous green sand.	Initial.	80	—	100	—
	After 13 days.	8,000	1,000	88	0.73
	After 1 month.	1,280	780	39	1.14
Animal charcoal.	Initial.	Too many to count.	—	100	—
	After 12 days.	2,800	—	100	0.46
	After 1 month.	1,280	7,000	447 ²	0.16
Iron sponge.	Initial.	80	—	100	—
	After 12 days.	2,800	—	100	0.40
	After 1 month.	1,280	2	99.8	0.45
Pulverized red brick-dust.	Initial.	3,000	730	76.0	—
	After 5 weeks.	6,000	400	93.0	0.48
Coke.	Initial.	3,000	—	100	—
	After 5 weeks.	6,000	90	98.5	0.50

¹ Approximate rate of filtration. ² Increase.

The unfiltered and filtered waters were both submitted to chemical analysis, and in the case of coke and also of wood-charcoal, the chemical action of the filters was insignificant. The waters employed were urine-water and an aqueous extract of garden-soil.

The filtering stratum was made six inches in depth, and the filtering material made to pass through a sieve of forty meshes to the linear inch.

(2) *Agitation with solid particles.* In these experiments water containing micro-organisms was shaken for a definite length of time with a given quantity of finely divided matter, of similar fineness to that employed in the previous experiments on filtration. The water was allowed to subside and the clarified water submitted to examination — as soon as possible after complete subsidence had taken place — as it appeared probable that if the organisms were simply carried to the bottom by the subsiding particles, without suffering any injury, they would rapidly again become distributed through the upper layers of water by multiplication. This was amply verified by experiment.

Spongy Iron. Water shaken with one-tenth of its weight of spongy iron for fifteen minutes. Water allowed to subside for a half-hour before examination.

¹ Water-purification; its biological and chemical basis. By Percy F. Frankland, Ph.D., Associate of the Royal School of Mines. A paper read before the Institute of Civil Engineers, April, 1886. London.