

In 1905, when the department began its operations, Pennsylvania was a typhoid-ridden state. The purification of the water supplies and the improvement in general sanitary conditions have been factors of tremendous influence in bringing about this marvelous reduction in the number of deaths from disease so often water-borne in origin. This combining of work essentially engineering in nature with medical work brings results and proves the value and propriety of utilizing the sanitary engineer in a public health organization.

#### ABSTRACT OF DISCUSSION

DR. VICTOR C. VAUGHAN, Ann Arbor, Mich.: The work that Dr. Royer has presented as done by the Commissioner of Health of Pennsylvania is a very good thing. Pennsylvania certainly needed to do this kind of work. Western Pennsylvania, as the doctor says, was a hot-bed for typhoid fever; and it was not confined to Pennsylvania but to the whole country. It was not safe for anybody to come into the region around Pittsburgh because of the possibility of getting typhoid fever. I think that many states have found it necessary to make the sanitary engineering department of the state health work very important. I know we have in Michigan. For some years we have had a very competent state sanitary engineer as an official of the State Board of Health and an engineering department; and we have the same rules, the laws that Dr. Royer has got for Pennsylvania. They say that the medical profession is the only profession that buries its mistakes—puts them out of sight. That is quite as true of the engineering profession as it is of the medical profession; and faulty engineering in this country has added greatly to the death list. It has not only added greatly to the death list, but it has increased enormously the expenditure of money. I had a letter only a few weeks ago from the editor of one of the engineering journals wanting me to write an article for that journal showing the advantage it would be to the engineering profession to have engineers examined like physicians are examined. Now understand me—wanted me to write an article showing the great value that it would be to the engineer to have state boards of examiners for engineers, just as the physicians have. I wrote him that state boards of medical examiners were not for the benefit of the medical profession; they were for the benefit of the public; and the same reason would apply to the examination of sanitary engineers. If anybody questions it, simply come to Michigan and travel around with me for a few days. I can show where bungling engineers have buried millions of dollars so that they cannot be resurrected, and at the same time have endangered the lives of, and probably killed, many people. The sanitary engineer is an important and essential adjunct to any health department. The public has the services of the United States, represented here by Dr. Rucker, as recognition of that fact. You cannot do public health work without the sanitary engineer.

DR. B. FRANKLIN ROYER, Harrisburg, Pa.: I am glad that Dr. Vaughan reinforced in a positive way why it is absolutely necessary that engineers' plans for water works and sewage works be submitted to a central health organization for review and approval. It is not only in the interest of the health of the community, but it saves municipalities untold sums of money. Plans may often be submitted by an engineer who is a very good civil engineer but a very bad sanitary engineer, and unless the entire plans are materially changed, would be entirely unfit for the community's public health needs.

**Popular Instruction Concerning Diet.**—There is one kind of instruction much needed by the American people, which would illustrate better than any other the desirable preventive functions of health officers and boards of health, namely, instruction concerning diet.—Prof. Charles W. Eliot, *Public Health*, September, 1915.

#### INTERMEDIATE TRACHELORRHAPHY

ITS USE AS A PROPHYLACTIC AGAINST THE PERNICIOUS EFFECTS SOMETIMES CAUSED BY LACERATION OF THE CERVIX

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It is not likely that any one doubts that extensive lacerations of the cervix during childbirth may do much harm, or, as lately has been shown again, by the studies of Schottlaender and Kermauner, that occasionally they may favor the causation of cancer. These authors found, in instances of cervical cancer, the presence of a laceration in the immediate vicinity in nearly every instance. Does it not then behoove us, if only as a prophylactic measure, to repair cervical tears, and to do this before pathologic changes, incident to the trauma, manifest themselves?

I purpose to plead for such procedure, and especially that it may be done when the sacrifice of material tissue is not a necessity. My justification lies in the fact that those who have made a careful study of the results of cervical tears almost invariably verify the assertion made by Dr. Thomas Addis Emmet concerning their deleterious effects. In support of this I call your attention first to the careful study of Brooks Wells, "The Etiological Relation of Cervical Lacerations to Uterine Disease," made from the clinical material of the late Paul F. Mundé and published in the *American Journal of Obstetrics* for 1888; and then to the paper read by Clement Cleveland before the New York Obstetrical Society, entitled "The Necessity for Early Operation upon the Lacerated Cervix," and published in the same journal for 1887. What those papers stated at that time holds good today. The analyses made by the authors cited I could multiply several times from my own practice, having, before and since then, seen thousands of lacerated cervixes from which I could verify the position taken by these writers.

It is true that the resulting ills have been exaggerated by some physicians, but this applies to most matters, everything depending on the point of view. Some, indeed, have gone so far as to say that every laceration, whenever found, requires repair. I see many patients with slight tears who have been told that they must have the lacerations repaired, although they have existed a long time—too long to do an operation without denuding the torn edges by cutting away tissue—and are causing absolutely no trouble.

It is not my purpose, however, to dwell on the pernicious effects that lacerations may cause. It is conceded by those who have observed such patients, that sometimes the tears may give rise to disturbances, which are usually in relation to the extent of the injury. My purpose, rather, is again to call attention to a slight operation, to be applied in properly selected instances, whereby eventual ailments due to such injuries may be prevented.

The thesis I presented for admission to the American Gynecological Society, in 1887, was on "Intermediate Trachelorrhaphy." Under the rules of the society at that time, no papers coming before it were permitted to be published elsewhere than in the records of its activities. My thesis, therefore, appeared only in the society's transactions for 1888. Now, after so many years of added experience with intermediate trachelorrhaphy, I deem it but proper to place it before the profession at large for what it is worth.

My analysis at that time was based on 3,000 women who had borne children, in which number there were 109 who had lesions that were directly traceable to the tear. While I have not since attempted another analysis, yet from the recollection of my observations I am constrained to hold a similar view today.

From the foregoing it will be seen that I do not claim that all lacerations are productive of pathologic changes; neither do I claim that there is any time limit as to symptoms showing themselves after the injury. According to Cleveland the average time in his cases was four years and six months; but this may be shorter or longer.

Montrose A. Pallen, whose assistant I was during the early part of my professional life, held that all tears should be closed immediately after delivery; but it will be conceded that this is not practical or necessary, except in case of hemorrhage from an exceptionally extensive tear. It is far better to wait until the effect of contusion has passed off and bleeding has ceased, so that one may inspect with exactitude. Moreover, many small tears heal spontaneously post partum. After, say from four to six weeks post partum, however, the genital tract should be inspected, particularly in primiparas, because for these the operation is particularly intended, and if a tear of some extent is found, it should be repaired.

#### TECHNIC

My present method of repair is simpler than formerly—so simple, in fact, that any one with a little surgical ability can easily adopt it.

The patient is placed in the lithotomy position and the customary disinfection attended to. If she is not hypersensitive and not nervous, no anesthetic is required, for the operation is not very painful.

The cervix is pulled down with a pair of well-working bullet forceps, and exposed with vaginal retractors. The bullet forceps are then adjusted, one pair in the line of the cervical canal on the anterior lip, and one pair similarly applied on the posterior lip. With a narrow but very sharp scalpel—sharp especially at the point—a superficial film of tissue is scraped off the torn surface, taking particular care that the angles of the tear are made raw. For sewing I usually use a full-curved, medium-sized Martin needle, which has cutting edges; but one may use any other needle, if more accustomed to it. A No. 2 chromic catgut is passed so as to include the entire depth of the tear. Usually two sutures suffice for each side of the tear. Sometimes only one suture is required for one side, it frequently being the case, in instances of bilateral tear, that the extent of the tear on the sides are unequal in extent. This also holds good for stellate tears. Care should be exercised in tying. The surfaces should be brought together just snugly, never too tight, so that the sutures may not cut into the tissue. No after-treatment is necessary, and the patient may be about as usual after the operation.

It will be seen from the foregoing that the operation is not applicable to any case in which the tear has existed long enough to cause pathologic changes, in which scar tissue is present in the angles. In all such patients the scraping, or making the torn surfaces raw, does not suffice. That is why I say that it is particularly applicable for primiparas who have not previously sustained a tear, and that in the case of every primip-

ara it should be part of the accoucheur's duty to make a visual inspection in about four to six weeks subsequent to delivery, and then to repair any existing laceration (unless it be of negligible extent) in the way outlined.

It is understood that in scraping the edges scrupulous care should be taken to avoid the mucosa of the cervical canal.

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### A METHOD OF TESTING MUSCULAR STRENGTH IN INFANTILE PARALYSIS \*

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The determination of the strength of partly paralyzed muscles in infantile paralysis, if made at all, has been done in the past by the roughest sort of guess, most often by pressing the hand against the contracting muscle. It was suggested to the physiological department of Harvard University in the winter of 1914-1915 that a more accurate means of estimating muscular strength would be of great value, and the method here described was formulated, with the following aims:—

1. To enable a more accurate diagnosis to be made in the way of picking out the seriously affected muscles after an attack.

2. To obtain a means of indicating the muscles which were most promising for mechanical or operative treatment.

3. A quantitative measurement of this sort which would give a means of gaging the effectiveness of different modes of treatment.

4. A method of this kind might enable one to pick out from supposedly abortive cases certain cases in which remained a residual muscular paralysis too slight to be perceived by other methods.

To be of service the technic should be relatively simple and the results reliable. The method, which has been developed and used in a large series of tests extending over six months, seems to satisfy both these criteria to a reasonable degree.

The index of muscular power employed is the resistance of the muscle group to a steady pull sufficient to overcome it. A sling is adjusted in an assigned position over the part of the limb in which the muscle group to be tested has its insertion. The sling is fastened to an accurate spring balance through which the pull is exerted. The balance must be held carefully in a line at right angle to the axis of the part of the limb to which the sling is adjusted, and is read either at the instant the muscle yields, as in the test of plantar flexion, or when the member is drawn into an assigned relationship with the body, as in knee extension.

A standard technic has been worked out for each of the following movements: In the legs, plantar and dorsal flexion, inversion and eversion of foot; adduc-

\* From the Department of Physiology of the Harvard Medical School and the Orthopedic Department of the Children's Hospital, Boston. The preliminary report to the State Board of Health of Vermont of an investigation conducted under their auspices.

\* The funds for the pursuit of this inquiry were furnished by an interested citizen of Vermont.