

believed in Bichat's days, that monsters resulting from retardation or arrest of development are partly permanent embryos. Without going deeply into the various theories, it seems the effect of maternal impressions in producing monstrosities is little when we consider that, as yet, not a malformation has been found that is peculiar to the human species. Ballentyne,² in his recent work, expresses his opinion that a definite impression upon a pregnant woman's mind never causes a defect in the fetus closely resembling the thing producing the impression, but he does say that the state of a woman's mind during gestation does have more or less effect upon the unborn infant's development and that the cases which have been advanced to prove effect of maternal impressions have been coincidences rather than the effects of alleged causes. External mechanical influences may act partly or wholly as the cause in some cases, but the most logical explanation is pathologic influences analogous to those which occasion morbid conditions in the body after birth. However, probably in every monstrosity numerous conditions have operated to bring about the anomaly.

That there was an abnormal implantation of the placenta in this patient's uterus, almost any physician would have thought and would have expected alarming hemorrhages at or before birth. The patient being a multipara, the previous nearly painless hemorrhages, etc., seemed to foretell that. This must have been simply a case of menstruation during pregnancy, or a metrorrhagia. Hemorrhages, however, unless caused by a vicious situation of the placenta, are very rare so late in pregnancy unless there has been menstruation during the entire gestation.

DENTAL FACULTIES IN MEDICAL SCHOOLS.

Presented in the Section on Stomatology, at the Forty-eighth Annual Meeting of the American Medical Association, held at Philadelphia, Pa., June 1-4, 1897.

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There is a sentiment abroad that some dental schools have not the equipment of faculties and instructors that they should have. It is a prerequisite for admission to the National Association of Dental Faculties, that the applicant shall have the endorsement of the board of dental examiners of the State in which it is located; and it is the rule of the National Association of Dental Examiners that an application for recognition by that body must come from a member of the Association of Dental Faculties.

"Dental schools are not being formed now from an educational necessity. Two impulses control this matter: 1, personal ambition to have a position in and be connected with a dental school, for the prominence it is supposed to give; and 2, a purely commercial spirit on the part of medical schools. Over 60 per cent. of our schools are appendages to medical institutions; and nearly every dental school started in these later years has been under this outside influence."

The Committee on Colleges of the National Association of Dental Examiners, recently expressed the view that more should be required to establish the right of dental schools to recognition than the fulfill-

ment of the rules of the Association of Dental Faculties; evidence should be furnished that the teachers are of high standing, and that they and the school have the confidence of the local members of the profession. The committee also called attention to the impropriety of schools advertising as instructors, practitioners who occasionally hold a clinic before the students, but are not a part of the staff of the institution.

While "anybody with fair mechanical ability could pull or fill a tooth, I have seen good fillings inserted in teeth by a man wholly ignorant of the science of dentistry, and we have all seen the botches which educated men have made in attempting a similar operation," yet (in the words of an editorial in the *Dental Cosmos*), "the ability to teach dentistry is an acquisition quite distinct from, though supplemental to, the ability to practice it. So important has the art of teaching become that the study and investigation of its principles now constitute a distinct branch of scientific work, viz., pedagogics. To know dentistry from the point of view of the practitioner is one thing. To know it from the teacher's standpoint implies not only all that is included in the educational equipment of the practitioner, but in addition to this the important qualification of ability to impart successfully this knowledge to others."

The plan of requirements of dental schools, hereafter making application for recognition by the National Association of Dental Examiners, provides that each dental school must have a teaching faculty of at least three professors of dental subjects, namely: for operative dentistry, for dental prosthesis, and for dental pathology and therapeutics; and at least five professors for medical subjects, namely, for anatomy, physiology, chemistry, pathology and for materia medica.

Let us consider one thought in the discussion of "the equipment of faculties and instructors." In none of the dental departments of the medical schools known to us is there, in the teaching faculty, a professor for "dental pathology and therapeutics." The title used by faculties is "M.D., professor of materia medica and therapeutics," as certified to by official documents. Now, we maintain that more than a medical education (so-called) is requisite to teach dental therapeutics. The therapeutics of dentistry, unlike its anatomy, physiology and pathology, differs from that taught in the medical schools. It is medical, surgical and prosthetic. In so far as it is a direction of medical science to the prevention, modification or removal, by medicinal or hygienic remedies, of the causes and effects of disease in the dental organs, it forms part of a physician's practice, just as does the treatment of cerebral, cardiac or pulmonary disease. In so far as it is an application of surgical skill to the extraction of teeth, to the removal of tumors, to the treatment of fractures or of fissured palate, it is simply oral surgery, involving only such knowledge and skill in the use of instruments as every surgeon must possess. But dental therapeutics includes a class of operations which medical men were not taught in medical schools, and which as physicians and surgeons they do not practice. The prevailing and distinguishing feature of dental therapeutics is the art of replacement; replacement of dental structure in such manner and with such material as shall prevent further action of the destructive agencies; replacement of dental organs by substitutes which shall

² Teratogenesis: An inquiry into the causes of monstrosities. History of the Theories of the Past, J. W. Ballentyne, M.D.

physiologically restore impairment of function, and esthetically restore the natural expression of the face; and this a person with a medical education alone is not qualified to teach.

CATAPHORESIS VS. THE DIRECT APPLICATION OF THE GALVANIC CURRENT FOR OBTUNDING SENSITIVE DENTINE AND HOW TO EXCLUDE BOTH.

Presented to the Section on Stomatology at the Forty-eighth Annual Meeting of the American Medical Association, held at Philadelphia, Pa., June 1-4, 1897.

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When I speak of cataphoresis and the galvanic currents without medicaments, in 1856 to 1859, you will see that with all that has been done by the few workers in our profession, a quarter of a century had passed and no one thought there was anything in electricity until some one in medicine attempted to keep up with electricity in other branches and carry medicaments through the tissues as copper is supposed to be carried from one pole of a battery to the other as in electroplating; and now some dentist takes that up and tells us that cocain can be carried through the dense tissue of dentinal tubuli, and every one is ready to take it up as an insignia that makes it no better than an advertisement that he can perform all operations on the teeth painlessly. I remember, when I sent out a circular, on going into a new town in Delaware to get practice, what a commotion was set up and how every one was ready to try the new obtunder. Now after so many years have passed and this comes again to the light, do you wonder that I am more amused than chagrined?

At the meeting of the Odontological Society of New York, in October last, I presented before them the original patent gotten in 1859 for obtunding dentine and extracting pulps by the electric current alone. I made no effort at the time, nor since, to sell a single right to any one.

At this late date I submit to you the original document obtained by me in 1859 for doing then by the current alone what you are now called upon to believe can only be done by cataphoresis.

Aside from my own statement that I did successfully produce analgesia by the current alone as early as 1856 to 1859, you may have the many strong testimonials of Dr. Horton of Cleveland, Ohio, who has been doing the same thing by an improved galvanic battery and apparatus. "Why did I not continue to use it?" My reply is that I found, while experimenting with electricity, something better, which I have used all these years with other additional means.

Now, what have I to say about cataphoresis? Is it a fact that a drug can be dissolved in water, or any other media, and be made to traverse the dentinal tubuli and enter the pulp chamber and produce an anesthetic or analgesic effect by osmosis? Or can it directly paralyze the sensitive dentine upon its surface and sufficiently deep to enable the operator to cut with impunity, painlessly, as is claimed for most obtunders now found in the market? All who support this, claim that some effect is produced through osmosis and electricity the power that enables the drug to produce its effect by direct circulation through the tubuli of dentine.

I should not attempt to quibble over osmosis, or how or what does produce this supposed effect, but my long experience, dating further back than Dr. Richardson of London, entitles me to ask what is the real agent in this so-called wonderful discovery after nearly one-half a century's burial.

There are so many means of influencing, not only the human being, but all animals below man, as to make them believe almost anything you wish, even to the complete annulling of pain, that we must be very conversant with past history in this line to enable us to say what agent has produced this so-called cataphoresis or, as with other pain annullers, what is the true philosophy or *modus operandi* in analgesia? It is a subject that has called forth the thought and research of men through all time, and there is still a mystery, though the agents are still appearing and the last is claimed as the best.

Osmosis, according to the best authorities, can only take place between two fluids of dissimilar natures or densities or gravities, where a porous membrane of tissue intervenes, or where a porous porcelain cup is used, as where salt of different specific gravity is used on either side of a porous membrane, when the fluids will in a short time, without any electricity, become of the same strength or gravity; or, in a Bunsen battery, where the porous porcelain cup that holds the bichromate solution, or nitric acid, and the glass or outer cup holding the sulphuric acid solution of 1 to 12, when the current is passed, what effect is produced on the liquids and what becomes of the bichromate or sulphuric acid? Do they pass around through the galvanic apparatus or coil and through the interrupter? You know this can not be. They are simply neutralized and lose their power to produce an electric current. How can copper be carried through a porous cup and be deposited upon the opposite pole? How can you take the fluid containing cocain and pass it through a membrane that is not porous? Dentine is porous only when the tooth has been extracted and dried and is void of all organic matter. So long as it is in the mouth it is full of fluid that is not interchangeable by osmosis, unless you can produce in the pulp chamber and canal a different density to the fluids in the peridentium. If equilibrium exist between this medium of dentine on either side of it, then there is a *statu quo* condition and no osmosis. You might as well tell me that a cup can be made of dentine to take the place of the ordinary porous porcelain or burnt clay cup in a Bunsen battery.

Now, when I assert that in 1856 I did all this obtunding by the simple galvanic current, without dam or any other adjunct, and that Dr. Horton has done the same thing with his improved instrument and battery, what can you say in refutation? Why will you persist in this absolutely useless and unnecessary procedure; in loss of time; demoralizing your patients; trying to believe you are doing something that was never done before and is superior to all that was ever done in the past history of dentistry?

It is well to try to alleviate pain in any operation, but when all this can be done without it, and the patient is enabled to see that dentistry is not the inhuman thing dentists would have them conceive, and have them feel and know that they can be taught to bear all the pain consequent upon any operation upon the teeth, in excavating or removing pulp why should you not adopt means long ago in your grasp.

From the many experiments of others in electro-