

was entirely gangrenous. It is needless to say that he was beyond hope and that he could only live a day or so. The point was my surprise at the condition which I found upon opening the abdomen. The man who performed the postmortem over-looked the sac and I again examined the body to verify its existence. There was a distinct pouch which could contain six ounces of fluid. Other cases have come under my notice in which the condition found was very different from what had been expected, and it is well to emphasize that we can not tell what the pathologic condition will be until we have opened the abdomen.

DR. PHILIP MARVEL, Atlantic City.—I wish to report a case which will be of interest from a surgical standpoint because of what did not exist. About six months ago I was summoned to see a lady who had fallen in a store, and who for ten hours had seemed to be in hysterical convulsions, which had recurred at intervals of about half an hour. Total suppression of urine existed from the time she was brought to me. Autopsy showed but one kidney, which was on the right side in the normal position. Examination showed a movable capsule and macroscopic and microscopic examination showed it was not diseased. From the time the lady was taken, when she was in perfect health, until the time of death, she was in a semi-conscious condition.

DR. McRAE, Atlanta.—I would like to mention one case in this connection which has been of great interest to me and which I have reported once before. I report it because of its extreme rarity and its medico-legal interest. The condition was due to a stab received between the sixth and seventh ribs six months prior to the time I saw the patient. When I saw him he had been suffering with intestinal obstruction for three days. The diagnosis made by the physician who was first called in attendance was that of cramp colic and he administered morphin. On the third day a consultation was held and it was thought that the patient had a hernia of the diaphragm. The physician who had attended the man when he was first injured was then called in and he confirmed the diagnosis. I was telegraphed for to operate, and when I saw the man at nine in the evening he was in an extremely bad condition. He had a rapid pulse, a pinched expression and other symptoms. I stated the case very clearly to the physicians as well as to the gentleman himself, and I think the man really desired an operation because of its medico-legal interest, as he felt that he had been the subject of an unprovoked assault. He also felt that he was entitled to the bare chance that an operation would give him, but he desired to make his will, so the operation was postponed until next morning. Considering the condition in which I found him I think the Association will consider that it was not with a great deal of assurance that I went into the abdomen. I did so with much hesitation, as I believe up to that time no cases of operation for hernia of the diaphragm had been reported. There was an opening in the diaphragm, with a band of adhesive tissue extending up to the exact point where the stab wound was. At the point of the scar there was a tumor and it was impossible to draw the intestine down. It was clear that the man would die, and I felt justified in proceeding with an investigation of the case. I enlarged the opening in the diaphragm until I could put my hand into the left thoracic cavity. I found a portion of the small intestine in the pleural cavity and the lung was compressed. I kept on until I had removed the hernia. The adhesions were very dense. The condition of the bowel was one of beginning gangrene. The patient came out of the anesthesia and died about 5 o'clock. The interesting feature was the same as that mentioned by Dr. Ferguson. I placed my hands around the heart, which would continue to beat immediately upon being released. Another interesting point was my position on the stand. The man who did the cutting was declared not guilty.

DR. MACLEAN, in closing the discussion.—If the result of my paper and the discussion is summed up in a single sentence, it is that the surgeon should have the courage of his conviction and should go boldly and honestly and sincerely before his patient and the friends and advocate an early exploratory operation. My case was lost for the want of early operation, and the same is true of all the cases of which we have heard to-night. The chances are reduced to a minimum by delay. I have this to say as my belief, and I am sure it will command the approval of others, that we should not hesitate or shrink from advocating an exploratory operation in all doubtful cases of abdominal trouble. Some of these cases get well of themselves, but for every one that does, ninety-nine do not. The object of my paper, and I think the lesson taught by this discussion is, that when we are brought face to face with an abdominal injury or an acute attack of abdominal inflammation, we should lay down the law with a degree of confidence that will convince our patient that operation is the right and only thing to do. If in

my paper and in this discussion this lesson is impressed upon the members of this Section, I certainly shall feel that any little trouble to which I have been put has been repaid a thousand fold.

REPORT OF CASES ILLUSTRATING THE ADVANTAGES OF A NEW AND ORIGINAL METHOD OF OBTAINING MATERIAL FOR SKIN-GRAFTING.

Read in the Section on Surgery and Anatomy at the Forty-seventh Annual Meeting of the American Medical Association, at Atlanta, Ga., May 5-8, 1896.

BY Z. J. LUSK, M.D.

WARSAW, N. Y.

At the meeting of the New York State Medical Association on October 17, 1895, I read a paper describing a "new and original method of obtaining material for skin-grafting," reporting two cases in which it had been successfully employed.

The paper was subsequently published in the *Medical Record* Dec. 7, 1895, Vol. 48, page 800. It was illustrated with three cuts of Case I, showing his condition nine months after over 800 square inches of raw granulating surface had been healed. The accident which deprived this large surface of its integument occurred on Jan. 14, 1895, and was caused by patient falling into a pan of boiling brine at the salt works. His injuries were so severe and shock so profound that I did not think it possible for him to long survive. He rallied, however, and negatived my prognosis from day to day for four weeks, when I began to think the fellow had a possible chance of recovery.

I quote briefly from the paper published: "He was in a condition of extreme emaciation, with nearly one-fourth of the surface of the body in a raw granulating condition. Skin-grafting became necessary, and I was at a loss to know where material could be obtained sufficient to heal this enormous surface. No one could be found willing to contribute strips of skin required in the Thiersch method, and certainly none could be obtained from patient. Meantime, while reviewing the various methods employed in skin-grafting, an idea occurred to me, suggested by the numerous patches of exfoliated epithelium, the result of vesication; they were hard, dry and crisp, having been separated from the cutis now nearly five weeks. Believing that this material could be utilized, on February 16, in the presence of attendants and others, I did skin-grafting, using a patch of this dried epidermis adhering by one edge to dorsal surface of right foot. A piece about one inch square was softened and sterilized in a warm boric acid solution, and divided into twelve grafts which were applied to the anterior granulating surface of left thigh. The result was eminently satisfactory. Seven of the twelve grafts took nicely, developing into vigorous islands of skin. The subsequent treatment consisted in the use of this dried epithelial tissue, with which these large surfaces were covered with substantial skin by April 1. At the spring meeting of the Wyoming County Medical Association, Dr. Roswell Park, of Buffalo, New York, who was present as our guest, complimented me on my discovery, commenting particularly upon the integrity and firmness of the skin, the perfect use of joints, and the entire absence of cicatricial contraction."

At this meeting I expressed the opinion that epidermis raised by cantharides could be successfully

employed in skin-grafting. An opportunity of verifying this statement occurred three months later, when I successfully healed a large varicose ulcer of eight years' standing with grafts raised by vesication with cantharides. Since reporting my experience in October, 1895, I have done skin-grafting on the following cases:

Case 1.—M. C., Irishman, twenty-three years of age, salt-lifter at Empire Salt works, slipped into a pan of boiling brine Dec. 23, 1895, severely scalding both legs, large blisters filled with coagulated serum covered dorsal surface of both feet. The epidermis on both legs was torn, hanging in shreds, with blood oozing from calf of left leg. Sloughing took place later, leaving a raw granulating surface five inches long by three wide, two inches above internal malleolus of left leg.

December 23 I did skin-grafting, using a patch of dried skin adhering by one edge to dorsal surface of right foot. The granulations were first thoroughly irrigated with warm sublimated solution followed with normal saline solution. The patch of epithelium was softened in warm solution of boric acid, and placed conveniently for cutting grafts. With a pair of common artery forceps, the skin was caught up at one corner and a narrow strip from one to two inches in length cut off and held with the free end resting at a point where a graft is to be applied. A piece about one-twelfth inch square is clipped off and carefully pressed into granulation; then it is moved from three-fourths to one inch where another graft is applied, and so on until a suitable number have been planted. A layer of sterilized gauze, saturated with a mixture composed of balsam of Peru and castor oil, in the proportion of one dram to the ounce, is applied over grafted surface, and over this three or four layers of sterilized cotton, which are held in place with strips of adhesive plaster and finally covered with a roller bandage.

In three or four days the condition of things can be easily ascertained by separating the cotton covering, which can be done without disturbing grafts. In this case dressings were not changed until the fourteenth day. A majority of the grafts had taken nicely, and on January 24 the surface was completely healed and he was up and about. On December 26, the date skin-grafting was done, I removed several patches of the dried epithelium, placed them between thin layers of borated cotton, tucked them into an envelope and laid them away in a drawer in my office desk to be tried on my next case of skin-grafting.

Case 2.—On January 7, I was called to attend F. H., German; while chopping wood, December 24, with a double bitted ax, it became set in the log, and in his efforts to liberate it, it flew out, striking the dorsal surface of right foot over tarso-metatarsal articulation, cutting a gash two and a half inches wide, paring off the skin for about two inches. Two weeks later, when I was called to see him, his foot was swollen with a surface two and a half inches wide by two inches long, covered with unhealthy granulations.

They were curetted and treated antiseptically, and on January 12, 1896, I did skin-grafting, using a patch of the dried epidermis taken from Case 1, as described. Twelve grafts were applied. Ten days later, when dressings were changed, six of the grafts had taken nicely. At the next dressing two more appeared, making eight in all. The discharges had ceased altogether, and ten days later the wound was thoroughly healed.

Case 3.—Mrs. B., 48 years of age, cancer of left breast. I operated for its removal Jan. 26, 1896, leaving wound open except in axilla. February 3, there was a healthy granulating surface five and a half inches long by three wide in the center. A patch of cuticle was raised using for the first time a blister

plaster called canthos, which is superior to anything of the kind I have tried, producing vesication in from one to three hours. In this case less than three hours sufficed to raise a blister three inches long by two wide, two inches from ant. sup. spinous process.

Care is necessary in removing the blistered cuticle, otherwise it may become wrinkled and ragged, being easily torn, making it difficult to determine the proper surface to be applied. It is easily removed after separating by carefully clipping around the edges; then covering with moist, sterilized gauze, when it is caught up by two edges, cuticle and gauze, and turned over so that its distal or outer surface rests on the gauze. The proximal surface is covered with the same material, the whole secured at each end by pins and placed in sterilized boric acid solution; after moisture is absorbed with sterilized cotton it is placed where grafts can be conveniently cut. The technique followed is the same as that employed in previous cases. About forty grafts were applied, a majority of which took nicely, and on March 6 this surface was healed with a covering of substantial skin.

Since the publication of my paper in December, 1895, clinical reports of the successful use of epidermis raised with cantharides have been published as follows: Dr. Leonard Freeman, of Denver, Col., (late Prof. of Surgery in the Woman's Medical College of Cincinnati), in a letter published in the *Medical Record* Jan. 25, 1896, claims to have done skin-grafting, using epidermis cut from a cantharides blister. His case was an aged darkey with an old crural ulcer, "probably syphilitic." He cut a plaster of appropriate size and left it on the man's thigh over night, when it was separated and transferred to the ulcer, on the surface of a pad of gauze. An attempt had been made to sterilize the ulcer with bichlorid compresses. He states that some suppuration occurred about the margins, but much to his surprise the graft "took nicely."

In a letter dated April 4, published in the same journal, page 499, Dr. Frank Overton of Patchogue, New York (late surgeon of the City Hospital, New York), describes his experience as follows: Just above the angle of the jaw of a nervous girl, 17 years of age, there was an ulcer two inches in diameter, the result of curetting a wen Jan. 3, 1896. On January 10, granulations looked perfectly healthy, when a blister was raised by cantharides and two grafts applied, each the size of a thumb nail to the anterior part of the wound. Iodoform gauze dressing was applied to the wound. "On the 16th this was removed and with it one of the grafts. Another of the same size was raised and applied. On the 24th the area of the first graft seemed to be covered with epithelium, but thin. On the same day the lower part of the wound was grafted according to the Reverdin method, with four or five pieces of skin taken from the mother. On January 29, both the areas of blistered grafts looked healthy, and had nearly covered the ulcer, but those from the mother were growing far more rapidly than those from the blister."

Dr. Robert T. Morris of New York City, in his book just published on, "Appendicitis with Notes on other Subjects," has on page 151, a note headed "Skin-grafting from Blisters," in which he says: "Skin-grafts for application according to the method of Thiersch may be obtained from blisters;" that the idea of using grafts of this sort first occurred to him while treating burns in which large blebs had

formed. After securing and cleansing the separated cuticle in physiologic saline solution, it was replaced upon the sterilized wound where it adhered well. That since that time he had obtained blister grafts with cantharides and had successfully applied them to small wounds.

Just when the idea first occurred to the author or how long he has been doing skin-grafting by this method, is not stated. In his preface he mentions a list of periodicals in which he says, that the substance of many of the notes have appeared. Among the number mentioned I can find no reference to skin-grafting with blisters, hence I conclude that the first publication of his experience is that which appears in his book just published, 1896. It will be observed that in all cases reported, grafts of large size were used. In that of Dr. Freeman, cantharides was applied of appropriate size and allowed to remain until the following morning, when it was transferred directly to a septic surface and under these conditions "took nicely."

In Dr. Overton's case grafts no less than one-half, probably three-fourths inch square, were applied. Six days later one was removed with dressings when another of same size was applied, and finally developed into a healthy covering, by February first, twenty-one days after first graft was applied and fifteen days after second.

My experience with large grafts was invariably attended with negative results. With careful attention to asepsis, little septic blebs would lift the grafts in places, so that in changing dressings, if not removed, little evidence of life could be seen. Very often they will become disintegrated and disappear in the secretions. If on the eighth or tenth day pus is not materially lessened in quantity, you may be pretty sure that your grafts are a failure. On the contrary, if the secretions are materially augmented, you may be satisfied that grafts have taken and are doing well. Grafts not larger than one-twelfth inch square when properly applied nearly always take nicely. On the tenth or twelfth day the grafted surface will be studded with numerous depressions surrounded with atrophied granulations and from this time their growth is surprisingly rapid. The epidermis raised with cantharides is less porous than that separated by the knife according to the Thiersch method. I am convinced that the method of applying dressings, permitting frequent examinations without disturbing proximal covering and the application of the aseptic mixture is followed with better results on granulating surfaces than the so-called dry dressings.

Various experiments have been made to ascertain the limit of vitality of grafts separated from the body. The longest period of which I can find any record is ninety-six hours.¹ In my first case, I successfully healed a granulating surface three and one-half inches in diameter with grafts which had been separated from the body forty-eight days. In the case reported by Dr. Freeman, the cantharides plaster was attached to the cuticle from twelve to fourteen hours, which demonstrates one important fact in connection with the cuticular epithelium and that is, that it will undergo any treatment short of total annihilation and yet, when returned to its natural environment, it will become revitalized and awakened into new life and activity.

¹ Georges Martin, *Encyclopedia of Surgery*, Vol. I, p. 543.

What are the advantages of this method as compared with those generally employed? 1. By the Thiersch method the operation by which material is obtained is exceedingly painful, so much so that in cases weakened by their injuries and especially in children, the surgeon has to seek kind and obliging friends of his patients in order to obtain the necessary grafts. Such friends, as a rule, are very scarce under these circumstances. 2. The technique requires the skilled operator to properly cut or shave off the grafts. There is also the danger of transmitting syphilis or other infectious diseases. The same objection would apply to the Reverdin method, though to a less degree, being less painful.

By the method which I have described, the advantages are: 1. The material for grafting can be obtained from the patient *per se*, without causing pain or discomfort, with the danger of transmitting syphilis or other diseases eliminated. 2. The technique is simple. A surgeon or general practitioner with a knowledge of antiseptics and ordinary surgical skill can successfully operate. 3. It is quite as potent in healing wounds of large size more rapidly and with results as perfect as by any method known, the skin produced being soft and pliable with no keloidal cords and in many places so natural that it can scarcely be distinguished from normal skin.

A SAFE METHOD BY WHICH ANESTHETICS MAY BE ADMINISTERED WITH OXYGEN.

Read in the Section on Surgery and Anatomy, at the Forty-seventh Annual Meeting of the American Medical Association at Atlanta, Georgia, May 5-8, 1896.

BY J. N. DEHART, M.D.

BROOKLYN, N. Y.

Since the discovery of the application of ether by Dr. Morton, of Boston, and its first use in the Massachusetts General Hospital by the late Dr. J. C. Warren as an anesthetic in 1846, there has been a great desire that some means should be devised by which all danger might be allayed, so that the patient could not be rendered cyanotic, especially when there was disease of the heart or kidneys that complicated the patient's condition. While ether has had the preference to chloroform in our country, yet in Europe the latter has been more universally used, and at the present day is also being adopted for anesthetic purposes in many private sanitariums, either alone or in the A. C. E. mixture.

Among the advantages derived from the use of chloroform are that it requires a much smaller amount to produce anesthesia, the patient becomes unconscious more rapidly and there is less bronchial irritation and excitability, there is a more prompt return to consciousness and hence less unpleasant effects afterward; all of which are worthy of consideration, and with care on the part of the person administering the anesthetic would tend to lessen the mortality in such cases where chloroform was used.

Since the early part of last year many surgeons in various cities of the United States have been devising means by which anesthetics could be given with oxygen gas during surgical operations. The most important factor in this mode of giving them was a properly constructed inhaler, by which the patient could breathe the anesthetic with oxygen gas and at the same time expire the carbonic acid gas; the latter would often cause cyanosis and also nausea when given in the usual way with a cone.