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# AMERICAN ELECTRO-THERAPEUTIC

# AND X-RAY ERA

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R. FRIEDLANDER PUBLISHER

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# American Electro-Therapeutic
## AND X-RAY ERA

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THIS JOURNAL IS DEVOTED ENTIRELY TO ALL BRANCHES OF ELECTRO-THERAPEUTICS

Contributions of actual experience by physicians using the X-Ray as a therapeutic agent are highly valued by this journal, and the editor is always willing to reserve space for such communications.

# Contents




# American Electro-Therapeutic and X-Ray Era

Vol. III May, 1903 No. 5


## Original Contributions.

### PSORIASIS TREATED WITH X-RAY.

By E. S. Ferris, M. D., Henry, Ill.

Mr. A. H., age 50, blonde, married, occupation farmer. Has had the disease as long as he can remember, that during last fifteen years it has been more marked, spreading steadily. Says "he has a brother similarly afflicted." At intervals he has undergone both local and constitutional treatment; only result of this an apparent lessening of the scales for short time. Occasionally, even while under treatment, there was diminished activity manifested by disappearance of scales and paling of red patches, but the papules never disappeared. October 1, 1902, he presented for treatment. I found the disease involved the skin covering the front from neck to navel, the back, the scalp, forehead, the knees and elbows; appearing as slightly elevated, round and reddened patches of various sizes, covered with an abundance of dry, white scales. These patches were so arranged, especially upon chest and back, as to produce patterns of striking appearance. See cut No. 1. The scales had shed in large quantities on the patient's clothing. At no time were the mucous membranes, or nails involved.

I prescribed Fowler's Sol. and Cascara Sag., and during the months of October and November gave him fifty treatments with "Brush discharges" with no apparent improvement. I then stopped medicinal treatment and Brush discharges, and during December gave sixteen X-ray sittings *to back only.*

To cover the entire surface of back at one sitting, three exposures of ten minutes each were given. Medium hard tube and medium light, four to six inches distance; skin unprotected by clothing or mask. The above treatments were given almost daily. Owing to the redness peculiar to this disease,

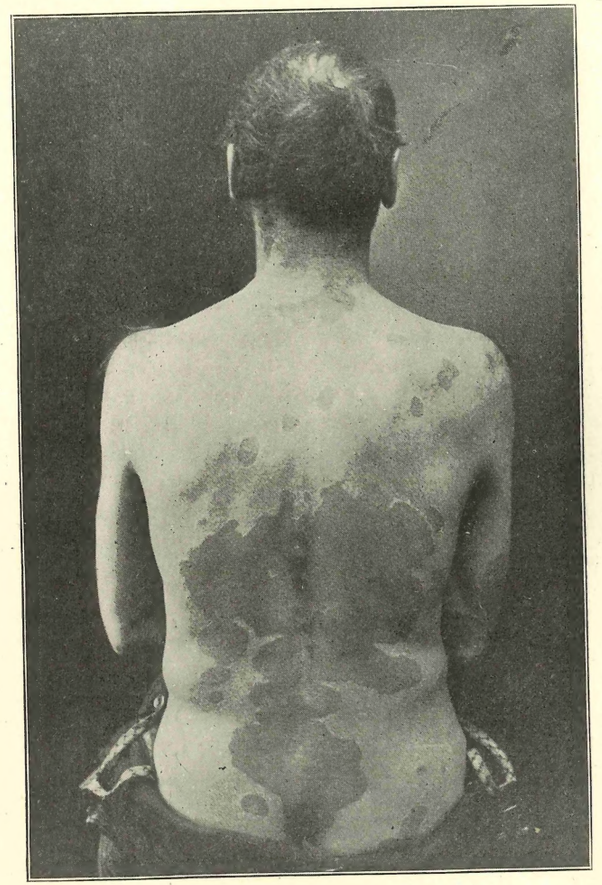

Fig. 1.

it was difficult to distinguish an X-ray erythema. On the day following the sixteenth sitting, I found the skin tender and of a dusky hue, later a more marked reaction. After ten days



all traces of the disease except slight redness had disappeared from part treated. Even this redness was gone in another week and strange to relate the lesion on the chest vanished at same time. This success encouraged me to apply the X-ray to all other parts involved, with same happy results. The

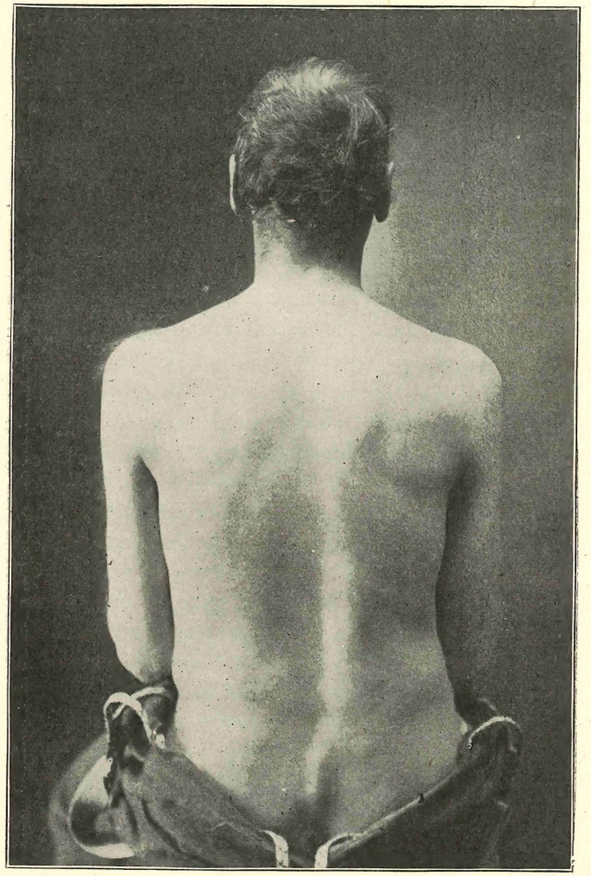

Fig. 2.

patient gained twenty-three pounds the last six months of treatment. At present time there is absolutely no trace of the former trouble, the skin is soft and smooth and of normal color.

## GENERAL ELECTRO-THERAPEUTIC AND X-RAY CLINIC.

SERVICE OF PROF. E. H. GRUBBE, ASSISTED BY DRS. LAURA J. BROWN AND CECILIA P. GALLOGLY.

*Paralysis.*—Walter W., age 12. When four years old this patient complained of severe headache. He went to sleep and slept for three days and three nights continuously. When he finally awoke he could not use the right leg. Various treatments have been resorted to, but no marked benefit has been derived. On making the test for the "reaction for degeneration" it was found that the functions of all muscles would react under the Faradic current, although it was necessary to use rather an abnormal quantity of current to bring about contraction in some of the muscles.

He has had the slowly interrupted spasmodic Faradic current alternated with the galvanic current (8-10 milliampere) now for nearly two weeks, *i. e.*, five treatments in all, and he reports continued improvement.

We are not optimistic enough to say that this patient will get entirely well under this treatment, but from the improvement already obtained, we are indeed very hopeful.

*Cancerous Induration of Breast.*—Miss L. D., age 60. This patient comes to us for the treatment of an extensive induration of the left breast. Several years ago she noticed a swelling in this breast which she thinks was due to pressure against a board while taking care of an epileptic relative. From the beginning there has been pain. Two years ago she entered a cancer sanitarium in Boston, undertook and continued an injection treatment for seven months. She thinks she received no benefit from this treatment. Later she began systemic treatment consisting of the internal use of drugs. X-ray treatment was begun March 25 of this year. Twelve-minute exposures were made almost daily. March 28 she noticed some improvement.

April 2 her former physician examined her and reported quite a change for the better.

April 7, on examination, nodules in axillary region are much smaller.



April 14, pain nearly all gone and parts are more flexible; tissue seems to be getting soft.

April 23, her physician after examination reports decided lessening of induration and patient says she "feels fine."

April 30, X-ray dermatitis present, as shown by local redness, heat and itching, but patient says she feels very good. A mask of lead X-ray foil was placed over burned area and also over neck and face, to prevent the spread of dermatitis.

The reports of this patient are certainly encouraging enough to warrant our continuing this treatment.

*Epithelioma.*—Mrs. C. F. F., age 70. This patient was referred to us by her home physician for X-ray treatment of a recurrent epithelioma involving the lower left eyelid, nose and cheek. In many respects we have here a typical history.

In 1891 she noticed a nodule at the outer side of the lower left eyelid, which gradually increased in size, even though the patient was constantly under treatment of some kind or other, until four years ago, when it became an open ulcer about the size of a silver dollar. She was operated upon and the wound healed nicely and remained closed until nearly two years ago, when it broke out again and spread rapidly, involving the whole of the left cheek and the nose. In August, 1902, she began X-ray treatments with her physician and in about two months the lesion had entirely healed. She considered herself entirely well.

Last winter she was unfortunate enough to have a severe attack of "grip" and swelling and redness developed in the cheek and she came to us for X-ray treatment.

She has received several treatments and each time she returns with a good report. You can readily see that we have very little to treat at present, and we may say that for the present at least she is symptomatically well.

*Tubercular Glands.*—Mrs. M. H., age 37. Puberty at 12 years; regular for two years; came to America from Germany and menses ceased for one year. Always irregular after that until married, 12 years ago, when she became quite regular, missing only occasionally. She thinks she was pregnant once and had a miscarriage. Family history, mother living and well; father died three years ago of cancer of the stomach.

One year ago last January she noticed an enlargement of the glands of the neck on the left side. On July 5th, Dr. Rawson operated for this condition. On January 16, 1903, Dr. Kahlke performed a second operation on the same side. At this time the glands on the right side were also enlarging, but could not be removed. She has a regular elevation of temperature and there is no doubt about the diagnosis. Referred to our clinic for X-ray treatment April 23. Treatment consists of the use of a low vacuum tube and direct exposure of the glands of both sides for ten minutes every other day

This patient has not been under this treatment long enough to allow us to form any opinion of the value of the treatment, but we have had several of these cases in whom marked beneficial results have been obtained, and since operation of these glands has proven unsuccessful, of course we will try anything which offers a ray of hope.

*Anterior Poliomyelitis.*—Edith G., age 3. Referred from Dr. Cobb's Clinic. In November, 1902, this patient had prolonged fever with paroxysmal contractions of the limbs. When the fever and other acute symptoms subsided it was noticed that paralysis of the right leg had developed. In the course of a few days, however, the patient gradually began to walk again. Still, motion was decidedly impaired and atrophy of some of the muscles was noticed. After testing the muscles and nerves by means of electric currents we decided to alternate a weak galvanic current given for ten minutes with a slowly interrupted Faradic current. She has received treatment now since February 26. The mother reports that the child lifts the foot higher than before and also that the child has more confidence and is able to walk about unaided. The leg looks more plump and the muscles feel firmer. Continuation of this treatment, I am confident, will bring about a favorable outcome.

*Tuberculosis of the Skin.*—Mrs. C. F. T., age 65. Referred by Dr. Strawn. General health has been poor for a number of years. Fifteen years ago was told she had pulmonary tuberculosis; went west and seemed to recover. Three years ago had pneumonia followed by the formation of an abscess in the



right lung. After this subsided numerous abscesses developed in different parts of the body and especially in the axillary regions and about the shoulders. Constantly troubled with pleuritic atttacks. Nine months ago an ulcer appeared on the calf of the right leg. This refused to heal in spite of care and the best of local treatment. Five months later a gluteal gland became enlarged. This finally suppurated and to improve drainage was lanced, but it refused to heal. Dr. Collins saw the case at this time and pronounced it tubercular ulcer and she was referred to us for X-ray treatment. She has received quite a number of treatments and on examination we find the leg ulcer entirely healed. The gluteal ulcer, however, is not yet well. This part of course is exposed to irritation continually. Every time the patient walks or moves the parts are active and therefore we expect to have more difficulty in healing this than is usual. The patient has just had the edges of the ulcer trimmed and the parts are very sensitive, so we will not treat her to-day.

*Malignant Abdominal Growth.*—Mrs. C. B., age 56. This patient was sent to us by Dr. Bailey, who considered the case inoperable and recommended X-ray treatment not as a curative agent, but simply as a palliative measure. For some time she has had an uncomfortable feeling in the abdomen which is relieved by flexing the thighs on body. Feels exhausted and cold and even in warm weather she has to resort to hot water bags to keep warm. Nearly two years ago she had an attack of severe pain in the right hypochondriac region. This pain was almost constant and morphine was resorted to. Following this "neuralgic" pains developed in the epigastric region.

Physical examination revealed a hard indurated mass in the epigastric region extending downward to umbilical line and on the right side to the duodenal line. Glandular involvement.

She was placed under X-ray treatment November 11 and has taken the treatment at intervals of from one to two weeks at a time. The result is simply remarkable. She is very intelligent concerning her condition and will answer any questions you may care to ask. I might add that the tumor is decreasing in size constantly and that the patient is gaining strength and flesh at a rapid rate.

*Hemorrhoids.*—Mrs. E. C., age 57. Referred from Gynecological Clinic. The particular condition for which the patient seeks relief is that of bleeding hemorrhoids. In addition to this trouble she was a uterine laceration and endometritis. The treatment consists of the use of the positive galvanic current 10 milliamperes for 10 minutes every other day. An electrode composed of copper which is decomposed when attached to the positive pole is inserted into the rectum and allowed to remain during the seance. She has had only two treatments and her report is extremely gratifying.

*Lupus Vulgaris.*—Mrs. C. S., age 69. Referred by Dr. A. N. Fuller. About seven years ago this lady noticed a small nodular growth on the lower right eyelid. This itched and burned and gradually increased in size until three years ago the whole of the right eye and cheek and also the entire nose became involved.

X-ray treatment began April 2. A low vacuum tube was used for eight minutes every other day.

April 4.—Reports itching nearly all gone.

April 7.—Quite comfortable.

April 14.—Feels much encouraged and says she thinks she will finally get well. No itching but crusts are dropping off and wound is discharging profusely.

April 18.—About one-third of the original diseased area free from crusts and new skin forming.

April 25.—One-half of original diseased area free from crusts and covered with healthy skin. No discharge. Patient says she can see to read. Before undertaking this treatment she could barely see a powerful light placed before the affected eye.

In this case there is no doubt about the ultimate outcome of the treatment. She will get well. There is also no doubt but what the X-ray is the specific remedy in the treatment of lupus of all forms.

*Paralysis-Anterior Poliomyelitis.*—Agnes R., age 19. When 19 months old had enterocolitis with brain fever. After acute symptoms subsided, right arm was found paralyzed. As she grew, some slight improvement was made, but the extensors of the hand have always remained practically useless. Galvanism and Faradism have been alternated in the treatment of this case. Much the same procedure is applied as in a previous case of paralysis. She reports decided improvement. Arm is much stronger. She can close the hand over a dumbbell weighing 1½ pounds and lift it above her head for five or six minutes at a time and repeat this every two hours. The improvement is very gratifying to her, as she has frequently been told by physicians that there was no hope for her.



*Neurasthenia.*—Mrs. R., age 25. Principal complaint constant headache (top and forehead) and pain in the eyes. Extremes of temperature aggravate all symptoms. Eyes pain constantly unless she wears smoked glasses or covers them with a handkerchief. Feeling of fullness in bowels and frequent desire to defecate, but no stool without the use of cathartics. Local systematic examination reveals nothing abnormal. Treatment: Static head breeze and spinal breeze, 10 minutes of the former and 5 minutes of the latter. She has had only a few of these treatments, but reports improvement.

*Carcinoma.*—Mr. L. J. B., age 56. Referred by Dr. Chislett. This is a case of secondary carcinoma following sebaceous cyst formation in various parts of the body. Four years ago he had the middle finger of the left hand amputated for an exostosis. Two years ago sebaceous cysts appeared on various parts of the body. The first appeared on the head. This was removed surgically. Several others developed, among them one on the shoulder which gave considerable trouble and was operated upon. The last cyst to appear was one on the nose. Later these cysts developed on the forehead, the back of the neck, both axillæ and on buttocks.

The only one which at present is malignant is the cyst on the nose. X-ray treatment has been given nearly every other day since April 25, and the patient reports less pain and a diminution in size of the organ.

*Trachoma.*—Mrs. I. B., age 28. This lady was sent to us by Dr. Haseltine. She complained of inflammation, soreness and sticking together of the eyelids, photophobia and poor sight. History: No trouble before marriage. Her husband often had trouble with the urinary organs. Once he was confined to bed for several weeks; died six years ago of "rheumatic" trouble. She has three children and all developed

similar eye trouble about one week after born. Her own trouble dates back to her third month of married life, when her husband first manifested urinary symptoms and had a profuse discharge from penis. His eyes also were affected about this time.

We have given her galvanic electricity 4 to 10 mil. amp., using a wet sponge electrode. She will tell you that she is very much better, but due to the fact that her work will not allow her to come to us as regularly as she ought to, it will be some time before we can pronounce her well. If she were a private patient, daily treatments would be given.

*Cancer of the Rectum.*—Post operative.

Mrs. L. S., age 52. Referred by Dr. Watter of Joliet. About a year ago she complained of pain in the rectum and down the thighs. Gradually grew weaker until last January; an operation was performed and an artificial anus formed. She came to us for her first treatment April 2. She had been told that her case was a hopeless one, and so our treatment was only for the purpose of relieving her extreme and constant pain and if possible to give her the tonic influence of the X-ray. At first she had to have a constant attendant, but now she can walk about without any assistance. She feels decidedly stronger, her appetite has returned and her pain returns only occasionally.

*Anaemia.*—Mrs. E. C., age 32. This patient comes to us for the relief of sterility. Puberty at 15. Menstruation quite regular. Pain in pelvis accompanied by vertex headache for several days before the flow appears. These symptoms are relieved when flow is established. Flow usually quite profuse. Leucorrhea occasionally. She was married at 22. She thinks her husband is normal. She has had herpes and hives frequently. Her teeth are loose because gums recede. Local examination of pelvic organs reveals no abnormality excepting that parts are very anaemic. On close questioning, we become suspicious of the existence of specific trouble. Treatment: Static insulation and spinal spray for 15 minutes every other day. She is not to exert herself in any way and to get out of doors as often as the weather will permit. The tonic influence of the static current is well-known and in this class of cases decided results may be obtained. Her few treatments have benefited her very much.



*Diabetes Mellitus.*—Mrs. M. S., age 52. Eleven years ago she complained of severe attack of pruritus of the vulva and itching in other parts of the body. Her physician after examining the urine attributed this attack to diabetes. She dieted for about a year, took his medicine and was pronounced cured. One year ago last February the pruritus and itching again appeared and urine again contained sugar. The old treatment and diet did not improve her condition, however, and hearing that static electricity had brought about good results in some cases resolved to try it. She has received the static insulation and spinal spray treatment quite regularly since February 1st.

She reports constant improvement. For a time (about two weeks) not a trace of sugar could be found in the urine. This week's report, however, is not so favorable. This may be accounted for perhaps because she was allowed fruits and she may have indulged too freely. Since the pathology of diabetes is not definitely settled, and since practically all our remedies for the treatment of this disease are used empirically, this electric treatment deserves a prominent space, for it has demonstrated in many instances that it does not have a favorable effect in this condition.

*High Frequency—High Potential Currents.*—One of the doctors asked to see the high frequency apparatus used. Due to the fact that all our patients to whom we give this current failed to come, we will have to demonstrate its action upon each other.

This current is extremely small in quantity, but it comes with great force, a force equal to from 50,000 to several hundred thousand volts. The electrodes are composed of glass vacuum tubes and are shaped in various forms to conform to the part of the body to which we wish to apply the current. The enormous pressure of this current may be realized when we connect one of these tubes to the coil. The tube begins to glow with a bluish light when the tube is low in vacuum. This current may be applied internally, as well as externally. Its principal effects are those of a sedative and it is therefore extensively used in the treatment of neuritis and rheumatic conditions. Due to the fact that, as the current passes through

the slight air space between the outer electrode surface and the tissues of the body, the air is decomposed and its elements separated into the nascent state, we have the local effect of ozone.

This allows us to use this form of electricity in the treatment of many skin diseases, prominent among which we might mention acne, eczema, psoriasis, simple lupus, ulcerated areas, etc.

The spectroscopic analysis of the rays which emanate from this tube also show a large quantity of ultra-violet rays, which are known to possess bactericidal properties.

## ELECTRICITY IN GYNECOLOGY.

BY F. ROBERT BOYD, A. M., M. D.

After using electricity for some twelve or fifteen years as a remedy in the treatment of disease, and being ever alert as to the best methods, efficiency of new and improved apparatus, etc., and while I find my enthusiasm gradually growing stronger for it as one of the chiefest of efficient agencies in therapeutics, yet I also find a growing spirit of conservatism for the remedy as a whole. My own tendency has been, as has that of most men, to allow my enthusiasm for some special modality to absorb too much attention and to detract from the best interests of some old, tried and true method, which has stood me well in hand for years. We find in the literature of the subject this same tendency. The Roentgen ray, for instance, was born



in 1895, and yet we find in text-books and electro-therapeutic journals everywhere a much more abundant literature on it than any other department of electro-therapeutics. This is not because the subject, as pertaining to the various uses of the currents by galvanism, Faradism, etc., has been exhausted, nor is it because the needs are any less great for a better technique and broader understanding of these most efficient modalities. The fact is, that, even with the attention of the profession generally bent in one direction, the use of these old methods has kept a lively pace with other departments of the science.

I think the wonderful developments of the X-ray have done much to awaken the whole profession to the truth of the existing power latent in electricity as a therapeutic agent; and in this indirect way have no doubt driven men back to first principles, and a much better knowledge of electricity in its physical characteristics has been the outcome. I think I am also safe in saying, that, could all men who to-day are attempting to use the X-ray, and who are enthusiastic over the results attained, both by reports from others and their own experience, have as full a knowledge of the physics of the currents and the clinical advantages to be derived by their use, outside the field of X-ray work, there would be a wave of enthusiasm never known since the days of Benjamin Franklin. Somehow the profession will cling to old prejudices in spite of every-day facts which are so abundant that they ought to clear the whole atmosphere and rescue forever from the hands of the quack and Charlatan an agent of such priceless worth. We all remember too well the attitude of the profession as a whole toward the X-ray. Only two to five years ago some of our most prominent men decried it and made all sorts of uncomplimentary remarks about its advocates, who to-day are themselves using it in practice and in some instances have become enthusiasts. This is largely due to the fact that the spectacular phenomena and the tangibility of the results attending the demonstration of the X-ray have been too palpably effective for the objections of this class of men. It is doubtful indeed to the clinician who has, during the past three or four years, treated disease by the galvanic, Faradic and Sinusoidal methods, and has kept pace with the improvements and discoveries growing out of the use of these

modes of current application, whether, after all the X-ray can show any greater achievements. I think my friends in the profession who know by experience what I mean by this statement, will corroborate it.

The object of this paper is not to detract in any degree from the popular sentiments toward the X-ray. There is no electro-therapeutist who is not glad to welcome for it all the honors it can win by a faithful and energetic profession. We claim it as a part of our armentaria and hail with delight every development it can make. But for the present I may be excused if I omit saying anything about a modest array of formidable cases coming under my care in which it has wrought some most gratifying results, and devote a little time to the consideration of other modalities. In glancing over my case-book I find a few cases which have been of great interest to me, and I can scarcely see how they can fail to be so to any physician who shall happen to read this article.

REPORT OF CASES.

Mrs. O., aged thirty; three children, youngest four years. Came to me in March, 1901, suffering from what she called piles, from which she had suffered since the birth of her baby. Her pain had been more or less constant, but most severe when the bowels moved, and attended by a thin irritating discharge. She was emaciated and extremely nervous and showed signs of having suffered severely. Upon examination of the rectum I found great tenderness and the parts so sore and irritated as to interfere seriously with making a proper examination. I finally succeeded, however, in discovering a deep, ragged fissure running from the anus clear across the posterior surface of both sphincter muscles. The whole surface of the rectal mucous membrane was inflamed and discharging a thin, ichorous fluid, which carried poison wherever it touched. The general appearance of the parts suggested an examination of the whole pelvic contents, which revealed the same red and highly inflamed, yet relaxed condition of the mucous membrane of vagina, cervix, and as nearly as I could determine, the whole utero-tubal tract, the uterus was enlarged, tender and discharging a muco-purulent



fluid, which originated in both tubes, both of which were also swollen and tender; both ovaries enlarged and extremely tender. No pelvic adhesions nor fixation of any organ, but all so sensitive that the examination had to be conducted with care. This examination brought out a history of gonorrheal infection which she stated was received from her husband some months before the birth of her baby; inquiry revealed the fact of a gonorrheal ophthalmia in the child. She had consulted two physicians before coming to me, both of whom had told her nothing could be done but to go to the hospital and submit to a hysterectomy. I immediately abandoned the idea of divulsion of the anal sphincters under anæsthesia, which I had thought of at first, before the vaginal examination, and without promising her anything, suggested electricity, which she very willingly accepted. I began by washing out the vagina and cervix with a hot sterile solution of common salt; after which I placed a water soaked pad, 4x4 inches large, under the hips, attached to the negative pole of the galvanic current, and to the positive pole attached a cotton covered, copper ball electrode placed against the os, well up in the vagina and turn on 10 ma. for 20 minutes, after packing the vagina with sublimated gauze, directing her to return on the second day. I kept up this treatment three times a week for two months with no change except to increase the volume of the current to 20 and later to 30 milliamperes. The treatment brought very marked benefit to my patient in many ways. I desire to add that I also had her use hot enemas per rectum daily, of a saturated solution of boric acid. The cervical discharge, however, continued to annoy, and I finally resorted in the intra uterine, mercury amalgamated zinc electrode for five minutes with a current volume 30 mas. once a week with a large dispersing negative electrode on the abdomen; in the intervals I still kept up the copper-covered vaginal with small pad on sacrum, smaller volume and longer time. With some variations, such as leaving off the strong intrauterine application and using such other therapeutic measures as seemed indicated, I kept up my treatment for a little more than one year, when I discharged my patient cured. The discharge, which was swarming with gonococci at first, was sterile some weeks before the patient was dis-

missed, and remains so now—one year afterward. The condition of the pelvic organs are natural, as far as can be determined, and the woman enjoys excellent health. The anal fissure healed spontaneously, or with no other treatment.

Case 2. Young woman, aged twenty-two. Came under observation October, 1901. Appearance good. Well developed and showing no external evidence of disease. Yet she had been suffering for three years and had been under treatment for pelvic disease by three physicians, two of whom are skillful gynecologists, and both of whom had urged hysterectomy, the last refusing longer to treat her without. She came to my office presenting the following history: Country girl, virgin (at least I have every reason to believe her such). Healthy family history, and had, previous to nearly four years ago, had good health, at which time she reports having caught cold while menstruating and was sick in bed for some time with fever and chill, from which she made a slow and imperfect recovery, trying afterward to follow her usual avocations, but most of the time being unable to walk much. She had other attacks at intervals, and finally, by advice of her family physician, went to see a specialist, who told her, after six months' treatment, she could hope for nothing without an operation. She then left this physician and went home for some months, afterward being treated by another specialist who refused, after three months, to treat her longer unless she submitted to an operation. This she had about yielded to when she was brought to me. The above history will suffice. Upon physical examination I found all the organs of the true pelvis massed together by inflammatory adhesions, so that upon attempting to move the uterus everything moved *en masse*. There was swelling and tenderness of the whole abdomen. Tenderness in vault of vagina extreme. Cervix greatly elongated. Womb fixed immovably. The abdomen so tense I could not map out the ovaries but through the vaginal wall I could make out the tube on the right side greatly swollen and boggy; the left swollen some, but no evidence of any fluid in it. There was an intermittent discharge from the cervix, not protuse, but bloody and mixed with pus. Menstruation very irregular, and painful during whole period with only moderate flow. Walking, more than a few steps carefully taken, was very difficult and followed by pain and soreness, and generally with rise of temperature.



Treatment consisted in thoroughly cleansing the vagina and for six successive days placing the negative, cotton covered ball electrode in vagina, and water-soaked pad 4x4 inches on right side attached to positive pole; sixteen milliamperes was used for ten minutes, followed by the rapidly interrupted secondary without changing contact, for twenty minutes. After the sixth day, the tenderness having subsided somewhat, I placed a small nickle olive point on an insulated carrier, and after sterilizing both electrode and cervix, passed it up the mouth of the right tube, and with a pad six inches square on right abdominal surface turned on slowly ten mas., with negative in the womb, for fifteen minutes the first time, afterward using the bipolar in vagina with high tension secondary for twenty minutes. The latter I used every day for its sedative effect and the intrauterine every other day; after the tenth treatment the tube on the right side emptied itself of a great mass of bloody water in a sudden gush, while she was returning to her room; she returned to the office two days afterward, reporting that she had been unwell and had suffered less pain than for four years. Examination revealed a collapsed tube with greatly diminished tenderness and a remarkably increased mobility. I then followed up with a negative, cotton covered ball electrode in the vagina, with a large pad on abdomen ten ma. ten minutes, followed every day by secondary fifteen minutes without changing contact, until she complained no more of pain, and general improvement had taken place. The weight in the pelvis began to disappear and she gave promise of a good final result up to the end of the sixth month, when she again began to complain of pain and tenderness. She had up to this time made very little perceptible improvement in the menstrual function. I now began to saturate the cotton on the negative ball electrode with a 5 per cent solution of tinct. iodine with a grain or two of potass. iodide in it to render the solution perfect. I kept up the iodine diffusion for another month with only very slow progress. I then began to use mercury cataphoresis, on copper ball, uncovered, according to Massey's method. I used it every other day in vault of vagina,

after thoroughly sterilizing same, turning on forty ma. for five minutes and changing location each time until I had the space around the cervix pretty sore. I then abandoned it and began using daily the vacuum electrode unipolar with the high frequency current for from five to fifteen minutes. The parts soon healed and still I found considerable tenderness, and the pelvis by no means free from inflammatory deposit. I now kept up my high frequency current with vacuum electrode and for three times at intervals of four days used the mercury application intrauterine on small zinc amalgamated electrode; after this the parts began to soften up and a symptomatic cure followed at the end of eleven months.

I do not know whether to credit myself with the best that could have been done in this case or not. I have read reports of cases, seemingly as bad, cured in a much shorter time, but I am inclined to believe my case a more difficult one than any so rapidly cured. Some may say eleven months was a long time to struggle with a case that could have been operated on in twenty minutes. Well, to one who has seen much of the hopelessness following emasculation and mutilation, remembering from what this young lady was rescued, and to what she is restored, the answer is self-evident.

Case 3. Lady aged thirty-two. Married nine years. Never pregnant. Good family history and has always enjoyed health until seven years ago, since which time she has been a constant visitor to some doctor's office, but, as she states, without any other result than gradually growing worse each year. She had finally been told that nothing remained for her but the operating table, to which she always objected. About eighteen months ago she was brought to my office. After a careful study of the case, my diagnosis was catarrhal inflammation extending up through uterus and oviduct of the right side, with moderate thickening and immobility of that side. The left tube also involved, but nothing more than the mucosa. The inflammatory process did not involve the deeper structures as it did on the right side. The ovary of this side was enlarged to twice its normal size and there was great tenderness, extending all over the right side and in the right fornix of the vagina. She was unable to do any work or to be on her feet but a short time without great suffering. The inner surface



of the cervix presented a well defined zone of deep red tissue extending about half way through from which hung the usual plug of mucus. The left side had escaped with but little involvement, but the right seemed to have been the gradual thickening of an inflammatory evolution, which sooner or later would have swept through the entire pelvis. Here was a case where two forms of treatment was indicated. The first being the secondary Faradic bipolar, as a sedative to these irritated tissues, followed by a few minutes of the constricting positive with a copper ball, cotton covered electrode applied for ten minutes with a strength of ten mas. This treatment I began with and followed until the tenderness in the side and relaxed tissues of vagina and uterus showed signs of improved nutrition. I then changed to a negative ball electrode in the vagina with large abdominal pad, turning on 10 mas., gradually increasing to 40 mas. twice a week, and in the interval each day using the primary coil with slow interruption for a few minutes only, followed by the high frequency current applied through a vacuum tube electrode attached to one pole of the machine, the circuit being closed by the patient holding in her hands a small geissler tube, the rest of the circuit being through the air of the room. I have since come to regard the return circuit as unimportant. This mode was kept up in the main for five weeks, when I ceased using the galvanic and gave her three treatments per week, alternating the high frequency with the static positive insulation for ten minutes. She has been well for nearly a year and is quite as rugged as any well woman.

It is very interesting to watch the progress of such cases as these, the rapid changes which take place are often phenomenal, as illustrated by almost any case of simply catarrhal cervicities. Under the old regime any of these cases of catarrhal inflammation presented to the gynecologist a formidable task, well drawn out; but the skillful electro-therapeutist can at once control them, and generally cure them in a few treatments—often in two or three.

One peculiar necessity on the part of the physician using the currents is to be skilled in his diagnosis. A mistake in a diagnosis, or in current application, often not only delays, but actually renders a case much worse. I recall a case a number

of years ago, when I first began the treatment, of a lady suffering from a retro-versio-flexion. The flexion being acute and attended by great mechanical irritation to the rectum and severe menorrhalgia. The vaginal wall was much relaxed with an abundant leucorrhœa. This I mistook as an indication for the positive pole and kept using it with a gradually increasing severity of the trouble, and somehow was unable to see my error until my patient all at once failed to show up and sent her husband to tell me she thought my electricity no good. Had I changed my technique right around so as to have gotten the softening effect of the negative galvanic with a stimulating, slowly interrupted primary, used with discretion, I should have helped my patient anyhow, and perhaps have cured her.

In reporting these cases I have said but little concerning special indications for the use of special forms of current. I have tried to portray, as nearly as possible, the pathological condition, leaving with the reader his own idea of the most desirable remedy to meet these changes, and then shown how much more effectually these indications have been met by the intelligent use of the electric currents than they could have been done by any remedies heretofore known. If I am to take the text-books on gynecology, backed up by an experience of twenty-eight years, I am left with but little encouragement for results in any other field of therapeutics. In any or all of these cases very little hope presented for rescuing the patient from a life of pain and physical degradation. The surgeon's knife with its attendant ills perhaps promised more than anything else, but in this means we have no restoration in any case; if health returns to the unfortunate victim it must be at the sacrifice of that toward which any refined, highly cultured, or finely maternal mind must feel a sense of revolt and humiliation. Instead of such a spectacle think of an awakened molecular activity, a stimulated cell life, an increased glandular function and consequent absorption and elimination of old inflammatory products; a gradual but sure release of imprisoned tissue together with increased resistance and ultimate awakening to normal life and the joy of restoration with no mutilation, no emasculation, but all to hope for and all to live for.



Have I overdrawn this picture? Ask such men as Apostoli, Massey, Snow, Newman, Neiswanger and others who have given their toil and energy to the consummation of such possibilities. You will find no discord, no argument that does not fully corroborate in the main what I have said.

Century Building, St. Louis, Mo., May 1, 1903.

## A SUIT FOR MALPRACTICE FOR AN X-RAY BURN.

The patient, a man named Shelly, brought suit against Dr. G. W. Spohn of Indiana claiming ten thousand dollars damages for X-ray burns upon his face and left hand. The patient was treated for a cancerous growth on the under part of his tongue. He was warned of the possibilities of a burn before the treatment was instituted. After about two weeks a slight dermatitis developed on the patient's face and the treatments were then discontinued. The patient claimed that the doctor directed him to hold down the lower jaw with his left hand during his treatment. It was proved on trial that the only real injury was to the hand and this was shown to be caused by infection of a wound on the hand. The hand became infected because the patient persisted in wiping the saliva from his mouth against the advice of his physician. The court decided in favor of the physician.—(Abstract from the Medical Review of Reviews.)

# Editorial.

## MINUTES OF THE APRIL MEETING OF THE CHICAGO ELECTRO-MEDICAL SOCIETY.

The meeting was called to order by the President, Dr. Burdick.

The minutes of the March meeting were read.

Dr. Burdick called attention to the omission of the name of Mr. R. Friedlander from the list of associate members. The name had been acted upon by the Board of Directors. The minutes as corrected were accepted.

Dr. Elmer E. Prescott was duly elected to membership.

A paper was read by Dr. Burdick, on "The Treatment of Stricture by Electrolysis."

The paper was discussed by Drs. Brubaker, O'Neill and Grubbe.

The society then adjourned.

C. H. TREADWELL, *Sec'y.*

April 28, 1903.

## NOTICE OF THE NEXT MEETING OF THE CHICAGO ELECTRO-MEDICAL SOCIETY.

The next meeting of the Chicago Electro-Medical Society will take place May 26th, 1903, 8 p. m., at 301 Schiller Bldg.

Dr. A. A. O'Neill will read a paper entitled: Electrolysis in its relation to scar tissue, constituting urethral and other strictures.



# Abstracts and Reprints.

## THE TREATMENT OF STRICTURE BY ELECTROLYSIS.

(Abstract from a paper read before the Chicago Electro-Medical Society by Dr. Gordon G. Burdick.)

There are two general methods of treating stricture, one by the injection of an antiseptic; the second by administering large doses of some irritating balsam. This too often causes edema of the kidneys and in fact irritates the whole urinary tract even though a discharge is temporarily stopped. There are grave objections to both systems of treatment as usually carried out. The continuity of the mucous lining of the urethra is destroyed by strong drugs and cicatricial tissue is formed. This tissue, if disturbed, will break down and will contract more and more until the lumen of the urethra is diminished in caliber. Considerable force must then be used in micturation. Some of the urine will be retained and fermentation will take place. Infection follows and may extend through the ureters to the kidneys.

In cases of gonorrhea the tubercle bacillus may gain a foothold, in which cases it is very difficult to stop the discharge by ordinary methods. Presence of both gonococci and tubercle bacilli are proved by double straining.

The ordinary methods for the treatment of stricture are very inadequate. Dilatation of the urethra with sounds is objectionable because of the traumatic violence usually exercised, which opens up the deeper structures of the urethra to the gonococcus infection. The use of the urethretome should be discouraged because every cut is replaced by cicatricial tissue and because the subsequent passing of sounds is very painful.

Newman and Lydston proved that the cicatricial tissue could be readily absorbed by means of the galvanic current. The negative pole is placed in contact with the stricture.

Their imitators failed through defective knowledge of the use of the current. Many operators easily dilated the urethra but found there was a subsequent growth of connective tissue. The method fell into disuse except in expert hands.

The olive-pointed metallic bougie used by Newman dissolves all cicatricial tissue encountered in the urethra but these are unsuitable for general use. I have devised a set of olive-pointed bougies for use on very tight strictures. The bougie is entirely insulated excepting a metallic blade that projects anteriorly. With this instrument the urethra may be dilated as large as required at one or two sittings without pain or discomfort. I then use the metallic olive bougie as a negative electrode, carefully insulting all the olive with gutta-percha excepting that part to be placed in contact with the stricture. I use a mild current of two milliamperes. The cicatricial tissue is absorbed without destroying the mucous membrane. The stricture remains patulous to the sound until a complete cure takes place. This method has been used in eighty cases, a few of which had had external urethrotomy. Many of my cases have been cured for three years.

My main trouble has been to control the infection. The X-ray will destroy the tubercular infection in obstinate cases, and only a few treatments of the ray will accomplish what many months of faithful treatment would not effect by other modes of treatment. *However,* some cases will not yield to the X-ray, and on these I have tried the high frequency current applied by a glass urethral electrode. The electrode is attached to a high frequency coil. Ozone is produced and by its marked antiseptic action readily destroys bacteria. Occasionally the bacteria are too deeply imbedded in the tissues to be reached by the above methods and it is then necessary to resort to copper electrolysis. A copper electrode is covered over with pericardium and is made the positive electrode. On being passed into the urethra the current drives the copper into the tissue. The treatment must be continued until the tissues are stained to a deep blue. About 2 ma. of current are used. Length of treatment, ten minutes once per week. The well-known antiseptic action of copper will destroy the infection.

The alternating sine current will accomplish the work even more satisfactorily than the direct current. Not only are the



copper ions sent into the tissues, but the irritating acid effect of the positive pole is neutralized at each reversal of the current. This prevents the hardening of the mucous membrane of the urethra. Tubercular ulcers in the urethra will granulate readily under this treatment and the pain and soreness will leave, when they have resisted other forms of treatment though applied faithfully.

All instruments used in the urethra must be thoroughly sterilized, although the mechanical construction of the electrodes renders this a difficult process. I have kept my electrodes in a solution of Formalin. They cannot be boiled because the insulating material will not stand the boiling temperature.

DISCUSSION.

Dr. Brubaker said that he could heartily assent to the statements in the paper for he was generally successful in treating stricture with the negative urethral electrode. He considered the method a great improvement over surgical and other treatments.

Dr. O'Neill said that the paper was too general in its discussion; it did not define absorption or electrolysis, the terms seeming to be used interchangeably at times. There was no differentiation made between recent or old strictures.

In 1887 he had become enthusiastic over the reports of Dr. Newman, and had tried the effect of the galvanic current on all favorable cases. On a very conservative estimation he had treated more than four hundred cases, and had been obliged to abandon the method. Some of his patients had been under treatment for a year and a half or over. The galvanic current, if of considerable milliamperage, is sure to destroy the surface epithelium, in which case an eschar would be formed and a stricture of greater density would result. There is great danger of producing this even when using currents of only one to two and a half milliamperes.

It is true that the application of the electrodes will for a time dilate the size of the urethra because the water will be driven out of the tissues, but the old condition is sure to return.

Dr. O'Neill asserted that it was absolutely impossible to destroy connective tissue, whether in the hand where the process can be seen or in the urethra, when using weak galvanic currents. If strong currents are used there will indeed be an electrolysis of the tissues, but connective tissue will form more abundantly in the area cauterized and a denser stricture will result. Such cases should be given into the hands of a surgeon. The patient will be but three to five days in bed.

Dr. Grubbe said that the paper related purely to treatment of the male urethra, but the same principles apply to the female urinary tract. In his experience the galvanic current is of decided value. No doubt Dr. Newman was enthusiastic; this, however, was only natural, for he was very successful in his early cases. Dr. Grubbe uses the galvanic current on all strictures, whether organic or functional. The treatment is applied under the most favorable circumstances when the patient can remain in the hospital where its diet, rest, etc., can be properly regulated.

The lining of the urethra is a mucous surface and is therefore moist because of the continual pouring out of its exudate. The resistance to the passage of the electric current will therefore be very small as compared with the resistance from the epidermis. It is therefore evident that one-half a milliampere will accomplish what a large current would not do on a dry surface. It cannot be denied, however, that the surgical operation is also of value. It is good practice to increase the size of the bulbs two or three times at one sitting, thus insuring a considerable dilatation of the urethra. It accomplishes more than if only one size of electrode is used. The quantity of current should be regulated by the sensation of the patient; some individuals can take only a small current. Treatment can be carried out without causing cauterization.

Dr. Grubbe differed with Dr. Burdick as to the bactericidal properties of the positive pole, and the non-bactericidal quality of the negative pole. Most of the common bacteria cannot exist in an acid medium and are therefore destroyed at the positive pole, but the negative pole would certainly destroy bacteria that could not exist in an alkaline medium. It is altogether a matter for chemical study.



Dr. O'Neill arose to state that in speaking of the effect of the negative pole upon scar tissue on the skin, he had meant that the skin should be properly moistened.

Dr. Burdick said he was sorry that the paper had been misunderstood as being antagonistic tc surgical procedures. He had a large male practice and had operated upon the strictures. But he had found that the patient could not perform his work satisfactorily for from four to six weeks. Instead of using the knife under an anæsthetic, he now uses a special electrode attached to the negative pole. This will pass through the stricture without pain to the patient. The canal can then be dilated with olive-pointed electrodes attached likewise to the negative pole. He did not agree with Dr. O'Neill that connective tissue cannot be absorbed under the action of the negative pole. He had used the urethrascope in a number of his cases and could see the size of the stricture diminish and the connective tissue disappear. One case had a small pedicled mass attached to the side of the canal. This he perforated several times with a negative needle and the mass sloughed out. There was no return of the scar tissue.

About a year and a half ago he performed his last operation on these cases. Since then he has used electricity. In that operation the bladder was distended and it was some three hours before he could pass the filliform bougie through the stricture and relieve the bladder. He cut through the stricture thoroughly and dilated with No. 20 sound. About 48 hours after this gangrene of the testicles set in and there was a large infiltrating abscess through the perineum. Fortunately he was able to save the life of the patient. The case illustrates how careful we must be under and in all conditions to guard against infection. We can get patients to submit to electrical treatment when they refuse absolutely surgical operation.

## REMARKS ON THE ORIGIN, FREQUENCY AND PROPERTIES OF THE ROENTGEN RAY BURNS.

DR. BRUNO SCHUERMAYER, HANOVER.

As it has always happened in medicine, there have been from the beginning authors who were able to explain the etiology of the X-Ray burn without their having been able to protect themselves and others against this accident. A few only could say that they had seen none or only sporadic burns, and it was their conviction that "Faulty Therapeutics," a "Too High Degree of Radiation," an "Incorrect Dosage," "Unsuitable Hardness of the Tube," "Too High Voltage," etc., etc., and similar kinds of nice sounding phrases, were the only cause of the accident. To get an idea of the significance of the X-Ray burns, we have first to ask, under what conditions they happened in a single case; secondly, how often they happen compared with the use of the ray. To illustrate under what conditions the burns originate, we select several instances from the literature of the subject.

### ACCIDENTS THROUGH THE USE OF THE X-RAY FOR DIAGNOSTIC AND THERAPEUTIC PURPOSES.

*Case* 1. Leppin; acquired himself a burn of the second degree (1896). This communication, which as the first possesses historical value, reads: "It may not be generally known that the much talked of X-Rays have the property similar to the rays of the sun to burn the skin. I did much work with Roentgen Ray and used my left hand as the most convenient object for examination. This hand after several days showed a peculiar redness," etc., etc.

*Case* 2. Fuchs. For the purpose of examining some tubes the own hand was radiated for about one hour, not continually, but with intervals. Right after, a stinging pain was noticed, especially in the finger joints, which later on became unbearable. In this a 16-inch coil was used, the intensity of the primary 20 amperes, pressure 12 volts.

*Case* 3. Marcuse, a 17-year-old patient, was radiated for about four weeks almost daily once, sometimes twice, for from 5 to 10 minutes for diagnostic purposes. Distance of the tube never less than 25 cm; the burn needed 2 weeks to develop.

*Case* 4. Schrivald. Patient 13½ years old; abdomen uncovered; tube very strong; spark length 6 cm; distance of tube from photographic plate 35 cm; exposure 45 minutes. Time of incubation of burn, 2 weeks.



*Case* 5. Gocht. technique; older tubes of Miller-Hamburg. Pressure not under 50 volts. Number of seances, twice daily, 15 to 30 minutes; age of patient 3 years. Purpose, X-Ray Therapeutic removal of a nævus. Duration of treatment, for two weeks very intense radiations. Incubation 4 days, then erythema.

*Cases* 6-14. Albers-Schoenburg. Therapeutic application of the X-Rays; 30 volts; 4-5 amperes, about 39 minutes exposure daily. Distance, 15-25 cm; spark length, 15 cm.

*Case* 6. Lupus. Duration of radiation 6 months (with long intervals); reaction after 18 radiations.

7. Fifteen seances within 8 months; slight excoriation after 9 radiations.

8. Duration of treatment, 6 months, with long intervals. Reaction after 5 radiations; no excoriation.

9. Twenty-eight radiations within 3 months; reaction after 2 exposures; no excoriation.

10. Forty-six radiations within 3 months. Reaction after 7 radiations.

11. Eleven radiations within 1 month. Reaction after 4 radiations, which increases despite of stopping of treatment until the 16th day, when excoriation occurs. Healed after 23 days.

12. Left cheek 15 times. Right cheek 10 times; within 2 months. Reaction after 15 radiations; distinct excoriation.

13. Left cheek radiated 16 times within 2 months; reaction after 2 radiations; nevertheless treatment continued.

14. Sixty-eight radiations, long intervals. Excoriation after 27 radiations on one side of the side; after 12 radiations on the other.

*Cases* 15-19. Gassman and Scheakel. Lupus. Technique; Muller-Tube; 30 volts; 3 to 4 amperes, Kohl's 45 cm. coil. Duration 30 minutes. Number of interruptions 1400-1600 per minute, lead protection. Distance 20 cm.

15. Complains of pains after 19 days; dermatitis after 21

days; treatment discontinued for two weeks, dermatitis healed. New radiations; inflammatory redness after 13 days; heals after 6 days; treatment taken up. One radiation daily for 4 days, right after inflammation intervals of 18 days; again pains after 16 radiations. Total, 75 radiations.

16. After two days' swelling, complains of burning.

17. First a radiation of 20 minutes' duration; distance 15 cm. After 3 hours, redness and swelling of skin. After an interval of 2 weeks the same treatment. After 2 days again, reaction with dermatitis, increasing for the next 7 days. Treatment discontinued for 10 days; then 15 radiations, then again redness. After three more days skin comes off; discontinued after a total of 45 seances. After 12 days of this period, ulcer; after 26 more days, sloughing (combined with itching). After 3 more months necroses still on the increase. Twenty days later scraping was tried; at last with the help of other medication, healing after a duration of over 5 months.

18. Time of radiation 15 minutes. Distance 20 cm. After 19 days slight redness of skin, which passes into severe dermatitis.

19. Sycosis parasitica. Beside the usual dermatological treatment daily radiations. 20 minutes, 20 cm. After 9 radiations, redness and swelling; later dermatitis.

*Case* 20. Jutassy. Naevus of face. 1897. Technique; Kohl's 45 cm coil. 20-25 spark length, 22-25 volts, 4½-5 amperes, distance 20-30 cm. Within 6 days, 8 seances, with a total exposure of 4½ hours' duration, consequently 30 minutes on an average. Reaction of skin in the form of a redness, which on the 10th day passes into dark brown. Slight itching. Speedy healing.

*Case* 21. Jutassy. Eleven seances, cheek and forehead. 10 hours, nose 4 hours; total 14 hours. Dermatitis after 20 days. Pain in jaw and bones of the face. After 2 weeks eczematoid excoriation. Healed within one month.

*Case* 22. Berall. Hypertrichosis of face. Technique; 1½-2 amperes, 10-11 volts, distance 20 cm. Duration of each seance, 15 minutes, for 4 days; 3 exposures per day. For the following 9 days, 4 per day. On the 15th day, after a total exposure of 9 to 11 hours, tension of face and neck; deep brown discoloration. Mucous membrane of the lips swollen, hangs down in



shreds. Dirty covering on the gums, the hard palate and the mucous membrane of the cheeks. Nose and gums are bleeding, blisters on chin, throat, chest; oozing of a serous fluid.

*Case* 23. Deutschlander; skiagraph. Several exposures in succession, 5 within 2 days; the first one of 15 minutes' duration, the second half an hour later, 20 minutes. On the afternoon of the following day, 3 more exposures, the first of 10 minutes, the second of 5 minutes and the third of 2 minutes' duration, all within 3 hours. Technique; storage battery of 16 cells, pressure 34 volts, current strength 2½ amperes; 52-inch coil; high vacuum tube; 800 interruptions per minute. Distance of tube from plate, 30 cm; from the skin of the patient, 15 cm. Within 10 days erysipelatoid erythema; later excoriation and necrosis.

*Case* 24. Hoffa-Gocht. 1898; skiagraph of a patient who by another physician has for therapeutic purposes been radiated 36 times, each time from 25 to 40 minutes. Technique; primary current strength 1½-2 amperes; 70 to 80 volts; 55 cm coil; 600 interruptions per minute. Duration of exposure 25 minutes; distance of tube from abdomen 30 cm. A month later X-Ray burn which caused a suit to be brought against Professor Hoffa.

*Case* 25. Testaz; seven exposures on 2 days of 25 minutes each and a distance of 1 (!!) 3 (!!), 5 (!!) cm. The following day, skin yeast colored, which develops into an ulcer over a dollar size, increasing the following week to 10x20 cm. Patient is disabled from work for several months. Even after two years, healing not complete, the size of the ulcer being still 12x5 cm.

*Case* 26. Schürmayer (not published).

Hypertrichosis in a blonde about 30 years old. Two years before she had been treated electrolytically, but with no permanent success. As this case led to a forensic suit and as the details are of great value to the radio-therapeutic worker, I shall describe it more thoroughly.

Technique; Kohl's coil; 45 cm spark length with 5 amperes; not more than 1½ amperes employed, corresponding a measured spark length of 20 to 25 cm, mercury interruptor, 1500 revolutions per minute; tube Allgemeine Electricitäts

Gesellschaft medium soft, i. e., suitable for thorax skiagrams. Diameter of tube 17 cm, distance of surface from anticathode 7 cm, distance of anticathode from skin first, 27 cm; later 22 cm; at last 17 cm. Duration of each radiation, 10 to 15 minutes; extensive lead protection so that the whole face is covered by means sheet lead 2 mm thick and cut out diaphragms of as small size as possible to allow the radiation for the part to be treated. The lead goes below the skin as a protection for the neck a distance of 10 cm. The tube is aways directed vertically to the surface of the "masque." First period of treatment from January 29 to March 27th, 1900.

Treatments were given January 26 and 28. February 1, 3, 5, 9, 11, 13, 17, 20, 22, 24, 26. March 2, 4, 7, 9, 11, 14, 18, 22, 26. Result negative; light terra-cotta like discoloration of the whole face which disappears on April 3. Second period of treatment from April 3 to July 24. Treatments given on April 3, 8, 14, 21, 26, 29. The return of a skin reaction. May 1, 5, 9, 11, 16, 20, 22, 26; June 6, 10, 16. Again light terra-cotta color; radiations interrupted until June 28th and while skin is just a trifle discolored, continued on July 7, 11, 23, whereupon the discoloration, without the patient feeling uncomfortable, increases. Patient leaving for summer resort, cure given up for the present. Result: the hairs, especially the big long one on the sides of the face, those on the upper lips and on the chin have fallen out; the fine lanugo hairs fall out easily; the result is, in regard to the very extensive original hypertrichosis, perfectly satisfactory from the physicians' standpoint. Third period. At the end of October, 1900, patient returns, dissatisfied with the result; she says that the hairs have grown again. From the physicians' standpoint this can only in a limited degree be admitted. Patient insists upon being perfectly cured and refuses to pay. She is told that the papers read at the congress in Paris and in Aachen have shown that the technique everywhere practiced is in favor of a more forceful treatment. If patient were willing, I would be, to apply such a treatment. Patient has from the beginning been instructed that burns may happen. She has twice shown the first symptoms of the accident herself. Also pictures of it have been occasionally shown her. She agrees to undergo any kind of treatment to get rid of the hairs. This period,



named forceful, was as follows: Technique as before, tube brought nearer to a distance of 12 cm; radiations of from 17 to 20 minutes' duration given on Oct. 14, 15, 17, 19, 22, 23, 24, 25, 26 and 27. First a trial was made if the skin, which looked perfectly normal, could stand such a treatment. After two seances, on Oct. 14 and 15, an interruption of one day, then radiations as indicated above. On Oct. 27, patient says she feels warm in her face, whereupon treatments were interrupted. I did not hear from the patient till November 9, 1900. On that day I asked to see her and found a swelling extending from the eye to the skin. Under careful treatment by means of salve dressings the whole skin of the face peeled off, but at the end of the year was renovated to the corner of the mouth without scars and without discoloration. Around the corners of the mouth were light little folds, while the chin, the neck and the chest down to the middle part of the sternum were denuded of epidermis and covered with a muddy detritus. In the course of two months this zone healed slowly, the lightly reddened edges of the skin forming new skin tissues and growing over diseased area, thus the higher level of the excoriated places being brought down to the normal level of the rest of the skin. Mention has already been made of occurring exurbations in the form of an erysipelatoid inflammation. In March, the patient went into another physician's care, because my treatment was not the right one, according to the statement of a physician who had never seen or treated an X-Ray burn.

After a latent time of 20 days, if we make the first radiation responsible, or after a time of 12 days, if we lay it at the door of the last radiation, we have a very severe burn accompanied with blistering and necrosis. Eight months are necessary to cure it, but part of the delay in healing is caused by unsuitable treatment.

*Case 27.* Schürmayer; unpublished. Capitalist, 40 years old. Therapeutic application of the X-Ray to relieve pain in gout. Radiation of the toes from the plantar side of the foot. Technique as above; no lead protection; distance of the same; A. E. G. tube, 20 cm; radiations of 15 minutes' duration on May 28, 29, 30 and June 1, 2, 3, 4, 5. As the pain had entirely disappeared, patient is discharged and warned to take good

care of the foot, which inclines to hyperidroses despite of personal cleanliness. Also any exertion prohibited. But patient goes hunting for three days, whereupon five days after the last radiation, the whole planta pedis becomes painful, followed by typical X-Ray burn with blisters and partial necrosis, also of the upper layers of the cutis on the plantar side of the toes and in the folds between them. July 25, i. e., about 40 days after the first symptoms of the disease, patient was fully recovered again, the treatment following the principle not to irritate.

*Case* 28. Schürmayer. Lady about 30 years old. Brunette. Hypertrichosis of the face. (Not published.) Technique as above. Seances of 15 minutes. Distance of tube, A. E. G., 10 cm.

First the chin is radiated, no protection. The effective rays go a little from below toward the point of the chin. Seances on May 23, 24, 27 and 30; June 2, 4, 7 and 9. On June 12, a redness of the chin has developed which causes necrosis of the whole epidermis down to the larynx. This defect heals very slowly, but patient can with dressing make a trip in the middle of July. On August 26, after her return, healing is not perfect, the newly formed epidermis always peeling off under necrosis. Burn entirely cured on Sept. 6 and then the treatment of the lateral parts of the face is taken up. The new covered skin shows a peculiar pink color which makes a vivid contrast with the dark complexion of the patient. Changing the shape of the protecting lead, I continued the treatment during October, November, December, 1901, in such a manner that on alternating days the right and left side of the face were radiated. Under the influence of this treatment there appeared on the still reddened chin now and then pretty serious rednesses which, however, without any special treatment disappeared under the application of a cooling ointment. The hairs of the face now fell out without any reaction of the skin, slowly, but continuously; but the radiation had to be extended into the months of January, February and March, 1902. Then all the hairs disappeared in the last week of the treatment; there appeared on the left os zygomaticum a sudden redness and a slight swelling; an area of a little over a dollar size became even bluish red after several days. It



was kept by mistake in a longer contact with the lead screen. But the stopping of the radiations and the above mentioned treatment made the redness disappear by the middle of April. From the latter part of March until the middle of April there was an effluvium over and behind the left ear reacting in front to the zygomatic os. The area, two fingers wide, became perfectly bald without showing any reddening. Faradization by means of my "bi-polar double dry plate" in alternation with the faradic double brush caused a normal growth of the hair again. In the face irradiated so very frequently there reappeared on several spots a few hairs, which can, however, be easily removed. Under a longer treatment of the skin by electricity the skin on the chin changed so that one year after the beginning of the burn, not only the natural delineation of the skin has reappeared, but also the coloring became normal. The case was peculiar in that the same patient first developed an X-Ray burn with necrosis of the skin, which took a long time to heal. Then for nearly a half year patient was daily radiated without any irritation appearing in the face. As if by chance, toward the end of the treatment there were transitory symptoms of it, which, however, disappeared in a very short time. After discontinuation of the radiations there appeared on a limited area a malnutrition of the hair. The technique was, except some changes in the protection, always the same.

*Case* 29. Schürmayer (unpublished). Patient 24 years old; lupus faciei for 12 years; by amputation of the point of the nose ten years ago the process became more general, so that today the neck, the face up to the ears and eye brows are changed into area evenly covered with lupus nodules. There are areas of the size of a watch, thickly covered. From the middle of January, during February and March and during 13 weeks, almost daily, radiations. Technique as above. Hirschmann's tube with red-hot mirror. After 15 daily seances in January there was the following reaction: The whole face became dark red bluish, the skin stretched and shining, the face frequently bloated so that the eyes seem to retreat; also conjunctivitis at one occasion the beginning of a Keratitis in spite of lead spectacles. Mostly from Saturday evening till Monday evening, when there is no radiation,

the reaction has gone back under a simultaneous application of a cooling salve so that seldom the patient could not be radiated on Monday evening. Toward the eleventh week the reaction phenomena were so pronounced that even the eyes have disappeared entirely, but the patient always felt well; there was never any fever. Patient discontinues the treatment after 14 weeks. The result is surprising, but the reaction still present. Three weeks later she writes that the whole face is clearing up and the redness has entirely disappeared.

*Case* 30. Schürmayer (unpublished). Woman 50 years old; lupus of nose; had been present two years ago, which caused the performing of several operations. Now the whole point of the nose is gone. It looks very suspicious, rather as carcinoma. On the hard palate communicating with the nasal cavity and kept open by constant secretion, there is found an area the size of a quarter, covered with yellowish granulations. The discharge is fetid and corrodes the edges both on the nose and on the palate. Diagnosis doubtful. Carcinoma probable. Daily radiation for one month. After three weeks, deep reddening of the face around the diseased nose, severe "toothache," so that the seances were discontinued. Later on, during another month, about one every 8 or 10 days, the same flaming redness, but we do not pay any attention to it and keep up the radiation every other day. Result fine; not marred by frequent reactions of the skin of the healthy face. These cases could be multiplied, as Gocht, in 1899, counted over 70.

For our purposes the reported cases are sufficient to show that under the most widely different circumstances, often under a frightful influence of the rays, often after one radiation of a mild dose *"lege artis,"* often even under the same technique and modus of treatment, over-reaction occur from obscure causes which have been above described as to their appearance and inner structure. The shortest time for the appearance of an over-reaction or a visible reaction is, after Albers-Schönburg as found in his own observation, from 2 to 18 days. Generally it took a longer time, 3, 5, 8, 10, 14 and 18 days; in one case which was irradiated for the epilation of hair on the chest it was impossible, despite a very small



distance and a new tube, to get a reactive reddening at all. The characteristic symptoms of all these "burns" is that they so often appear without any warning, suddenly, just as lightning from a clear sky; at other times only after a more or less long incubation. Typical for the majority of these burns is the slow healing, even under an adequate treatment and a careful holding off of every further irritation.

Translated from the Aerztliche Rundschau by Dr. A. Decker, Chicago.

[Continued in the next issue.]

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## THE EFFECT OF THE X-RAYS ON NORMAL AND ABNORMAL HISTOLOGIC STRUCTURES.

(Abstract from a paper by William Allen Pusey, A. M., M. D., read before the Chicago Medical Society.)

### CHANGES IN NORMAL TISSUES.

The epidermis is first affected. There is great increase in the number of the cells of the stratum spinosum. This is followed by an atypical karyokinesis. A complete disintegration of the cells may result. Similar changes in the appendages of the skin are noted which lead to alopecia, atrophy of nails, and glands.

In the corium the changes are of an inflammatory character, namely, exudation of leukocytes and of plasma. The connective tissue fibers are swollen. The inner coat of the blood vessels are inflamed and the cells exhibit signs of proliferation in some places falling off into the blood vessels.

### CHANGES IN THE DISEASED TISSUE.

Dr. Pusey's studies have been more particularly confined to carcinomata. Sections were taken from tumors in different stages of reaction. Sections taken from nodules on the surface show that the first effects of the X-ray is confined to the periphery of the cell masses. Some of these cells break down and disappear. The nuclei are broken up leaving only shapeless fragments that do not react normally to haemotoxylin. The blood vessels are affected. Those within the nodule subjected immediately to radiation show the inflammation of the intima noted above. Others farther away from

the field of exposure do not exhibit these changes. When a carcinomatous ulcer has lost its nodular character, sections from it show that the diseased tissue is being filled by connective tissue. In the course of the treatment the changes seem to be a destruction of the superficial cells followed by those more deeply seated, the degenerated substance being absorbed.

A very important fact is that the changes in the blood vessels do not precede changes in other tissues, since they follow the first changes in the epithelial cells. It seems evident therefore that the changes in the cells are not primarily the result of disturbance of the circulation.

It must be our aim, then, to produce a degeneration and absorption of diseased cells, replacing them by healthy connective tissue without destroying healthy stroma.

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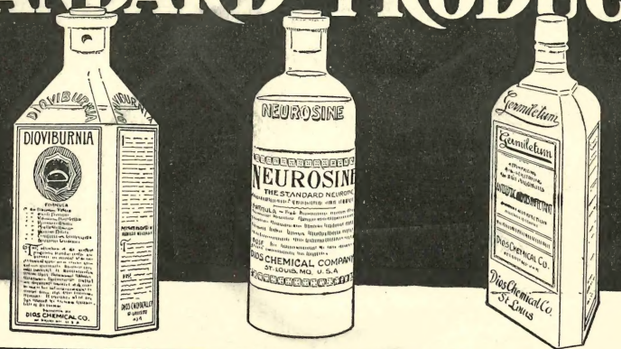


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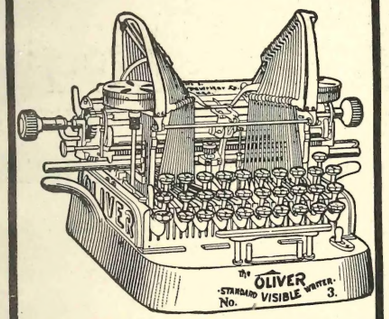


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