

skin cancer implanted on the cicatrizing dermatoses belongs essentially to the spinous type; however, this latter class is not so conclusive, inasmuch as glandular elements and specialized structures of the skin are often conserved and usually somewhat in evidence in many of the chronic forms of cicatrizing dermatoses.

Furthermore, I am firmly of the opinion that the basal-cell epitheliomas of Krompecher spring essentially from hair follicles (trico-epithelioma) sweat glands and follicles (cylindroma), and other specialized structures of the skin; but not from the basal cells of the epidermis. This form of epithelioma may encroach on the epidermis and stimulate it by its abnormal presence to overgrowth and more active proliferation, as in chronic ulcerations and other inflammatory processes, but a distinct clinical and histologic borderline between these two well-established forms of cutaneous malignancy is definitely preserved in all cases.

CONCLUSIONS

1. Carcinoma épithéliale cicatrisans, or cicatrix epithelioma, is a well defined clinical group of skin cancer.

2. Carcinoma épithéliale cicatrisans embraces a group of skin cancer scarcely second in clinical importance and histologic and scientific interest to rodent ulcer, nodular and papillomatous epitheliomas.

3. Scar tissue is essentially below par in general resistance and predisposes to secondary cancerous degenerative changes.

4. Chronic cicatrizing dermatoses (lupus, lupus erythematosus, syphilis, leukoplakia, etc.), as well as deep extensive scars and atrophies from new growth, trauma, and Roentgen-ray, doubtless favor cancerous changes.

5. The predominating histologic type of skin cancer on scar tissue is a spinous-cell epithelioma.

6. Epithelioma derived from scar tissue must trace its origin from the epidermis.

7. Spinous-cell epithelioma is derived from the epidermis and any of its layers.

8. Basal-cell epithelioma is derived from the sweat glands or sebaceous glands and their ducts, from the hair follicles, and from the specialized structures of the skin. It is not derived from the epidermis or its basal layer of cells.

Annual Loss from Sickness.—There were in the United States, according to the census of 1910, 33,500,000 people who were engaged in remunerative work. Making an estimate from all available statistics, including those kept in Germany, it appears that there are probably, among the working people of the United States, 13,400,000 cases of sickness annually, entailing a total loss of time of 284,750,000 days. The losses in wages placing the average at the low figure of \$2 a day, and omitting Sundays, would be \$488,142,852. These enormous totals show what immense economic disturbance and financial waste from loss of time alone is inflicted by sickness. This necessarily causes an incalculable amount of destitution and misery from lack of necessities of life, aside from the terrible direct physical suffering from disease. In addition to all this, sickness compels the expenditure of immense sums for physicians, medicines and hospital bills.—Welfare Insurance, Rufus M. Potts.

THE TREATMENT OF MALIGNANT DISEASE ABOUT THE MOUTH BY COMBINED METHODS*

GEORGE E. PFAHLER, M.D.

PHILADELPHIA

I should like to refer to the recent review of 556 articles on tumors of the mouth by Blair,¹ and then confine my remarks to treatment.

As prophylactic measures, we, as physicians, should give close attention to the mouths of our patients. Their jagged teeth should be removed or treated. Pyorrhoea ulcers should receive proper treatment. Leukoplakia demands cessation of smoking and the elimination of syphilis, and if the lesion then existing does not disappear, or develops fissures or thickening, I believe it should be thoroughly destroyed by electrothermic coagulation. Smoker's stomatitis, of course, demands cessation of smoking. An ulcer which develops in the mouth of a patient who has a positive Wassermann test should show distinct evidence of healing within a few weeks after active antisyphilitic treatment has been given, or should be regarded as highly suspicious of malignant disease, and treated accordingly. The patient should not be allowed to

continue for months without improvement on a suspicious diagnosis of syphilis. Ulcers, fissures, crusts or warts that develop on the lower lip or at the angles of the mouth and do not disappear within three weeks should be thoroughly destroyed by electrothermic coagulation, and should receive Roentgen-ray treatment locally and on the glandular area under the jaw. The larger lesions should have a section removed for microscopic study, and then be immediately destroyed by electrothermic coagulation. Bloodgood has well stated that the removal of sections for diagnosis, and then delay in the radical treatment,

only aggravates the disease and gives no advantage. I believe that careful attention to these prophylactic measures will accomplish many times more than all of the best methods known today, separate or combined.

METHODS OF TREATMENT

It will undoubtedly be many years before the medical profession and the laity will realize fully the importance of prophylactic measures. We shall have to contend, therefore, with malignant disease in all stages, and I have come to believe that no single method is sufficient for the treatment of this malignant disease. We have at our command at least four different methods for the treatment of malignant disease, especially as applied to the mouth. These are surgical removal, local destruction by means of electrothermic coagulation, deep roentgenotherapy, and the application of radium in the mouth.

* Read before the Section on Dermatology at the Sixty-Seventh Annual Session of the American Medical Association, Detroit, June, 1916.

* Because of lack of space, this article is abbreviated in THE JOURNAL. The complete article appears in the Transactions of the Section and in the author's reprints.

1. Blair: Tumors of the Mouth, Surg., Gynec. and Obst., February, 1916.

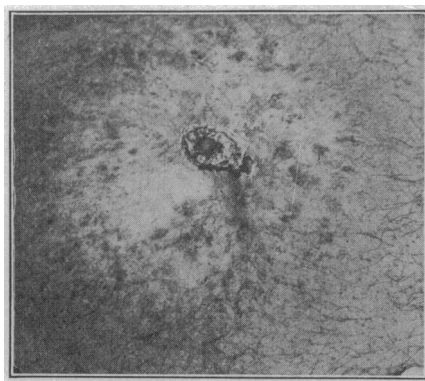


Fig. 6.—Epithelioma of the umbilicus emanating from an extensive atrophic scar following severe Roentgen-ray burn.

Every case of epithelioma about the mouth should have the disease destroyed locally by electrothermic coagulation, or thoroughly excised surgically. I have come to believe that the local destruction in the mouth or about the lips by means of electrothermic coagulation will give better results than excision, and generally with less loss of tissue; but I also would urge when palpable metastatic glands are present in the neck, that they be excised surgically even though the disease inside the mouth or on the lips is destroyed by electrothermic coagulation. Following this destruction or removal, deep roentgenotherapy should be thoroughly applied

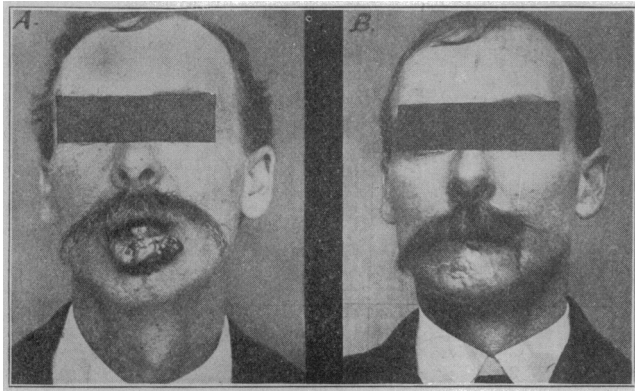


Fig. 1.—Epithelioma of the lower lip following a fever blister. (A) Began two years before. Had been treated by a plaster unsuccessfully. This was associated with enlarged submental and submaxillary glands. Treated at first for two months by fractional doses of Roentgen rays. It was then excised by Dr. Laplace, and treated the following day by Roentgen rays again. The patient is well today, thirteen years later. (B) Well after a year, and still well, 1916.

over the wound, and over the glandular area, making use of as much crossfiring as is possible. I am sure that this will give an improvement in the results over those cases in which surgery alone is depended on.

Surgery.—The surgical removal of malignant disease about the mouth has been so thoroughly reviewed recently by Blair and by Bloodgood that I need only refer to their writings. Their results show that when surgery alone is depended on, thorough local excision and complete dissection of the glands draining the diseased area give the best results.

*Electrothermic Coagulation.*²—As the name implies, there is produced a coagulation of the tissues by means of heat, and the heat is generated by the electricity. It differs, however, from the thermocautery for the removal of the disease, in that the heat is generated in the tissue, and is produced by the resistance offered to the flow of electricity through the tissues, while the thermocautery is merely transmitted heat and necessarily produces a more superficial effect. The effect can be thoroughly controlled by varying the relative sizes of electrodes so that one can make the conductive heat approximate a cone or cylinder. When one of the electrodes is a point, the greatest amount of destruction will develop at the point, and then will radiate in a more or less cone shape toward the opposite electrode, thereby giving a zone in which the tissues are heated to the destructive degree for malignancy, but in which healthy tissues will not be destroyed. We therefore obtain the same advantages that are given by the Percy method.

2. Pfahler, G. E.: *Electrothermic Coagulation and Roentgenotherapy in the Treatment of Malignant Disease, Surg., Gynec. and Obst.*, December, 1914, p. 783.

Technic: The technic of the electrothermic coagulation is similar to that described by Nagelschmidt, and in principle is identical. The d'Arsonval current is generally used; or a combination of the d'Arsonval and Oudin current. An instrument is necessary which will generate from 1,000 to 2,000 milliamperes of current. The amount of current will, of course, vary with the amount of destruction of tissue necessary. The amount of destruction of tissue needed with the depth is a matter of clinical judgment.

The two electrodes are used attached to the two poles. We, of course, know that the d'Arsonval current is alternating in character. The shape and character of the electrode will vary with the character of work required. For instance, if one desires to remove a considerable portion of the lip, I would use on the inside a ball electrode about three-eighths inch in diameter, and on the outside a needle point electrode. Then I would outline the area of the diseased tissue to be removed by allowing the current to flow from this point toward the ball electrode on the inside, and I would then coagulate the entire diseased tissue. At first I depended on the needle electrode actually to carve out the diseased tissue, but now I find it simpler to cut this away with a pair of curved scissors after coagulation, always cutting within the coagulated tissue. In this way there is no bleeding, and the edges are completely sealed off. The blood vessels and lymphatics are at no time opened, which I believe to be a distinct advantage in the prevention of metastasis and in ultimate cure of the patient. In destroying an extensive lesion in the cheek, I use a flat electrode 1 inch in diameter, on the inside, and a point electrode on the outside. In destroying a portion of the tongue, I have used two point electrodes. The electrodes are held in contact with the tissue. In destroying leukoplakia patches or superficial lesions, I commonly attach one

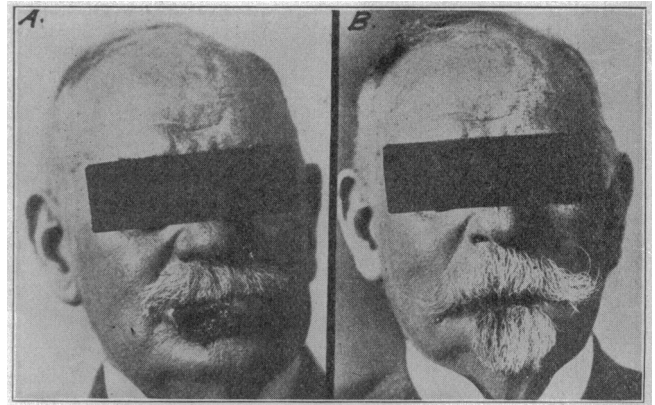


Fig. 2.—Epithelioma of the lower lip (A). Duration one year. Removed by electrothermic coagulation, Feb. 17, 1914, and followed by deep roentgenotherapy. (B) Thoroughly healed in about two months. Photograph taken July 27, 1914. Patient wearing, attached to his teeth, an artificial lip, to which is attached the beard.

pole to the Oudin current, and the other pole to the d'Arsonval. One must always be as sure as possible always to destroy the entire diseased area, for there is danger of rapid extension from the periphery if all the disease is not destroyed, unless it is possible to control this tendency by the deep roentgenotherapy. The tendency to the increased rate of growth in areas not removed by this process or by operation is probably due to increased congestion which is brought about by the subsequent reaction.

Cases Suitable for Electrothermic Coagulation: 1. Those cases in which the disease can be destroyed completely locally without regard to saving blood vessels or nerves, for in this coagulation process the blood vessels and nerves in the diseased area are destroyed in the same manner as the diseased tissue. It is, therefore, applicable to lip cases, epitheliomas on the inside of the cheek, the tongue, the floor of the mouth, and the alveolar process, but it is not suitable for use on the metastatic glands of the neck. 2. Those cases in which one can combine the local destruction of the disease in the mouth with the surgical removal of the diseased glands in the neck. 3. It is of doubtful utility in sarcomas, and I believe that sarcomas will give better results by deep roentgenotherapy alone than with the combination of these two agencies.

Advantages of Electrothermic Coagulation: 1. The disease is destroyed by conductive heat which gives a zone of devitalization without actual destruction of healthy tissue, thereby saving local tissue when necessary. 2. There are no raw tissues to permit the transplantation of malignant cells. 3. There are no blood or lymphatic vessels opened up through which the disease can be disseminated during the operation. 4. One does not have hemorrhage to contend with, though, in tongue cases, there is some danger of a secondary hemorrhage. 5. There are no open wounds and no danger of local infection.

Disadvantages of Electrothermic Coagulation: 1. There is complete destruction of all the tissue between the two electrodes. Therefore, there is no chance of saving the blood vessels or nerves which are in close proximity to the disease. 2. There is necessarily considerable sloughing and foul odor associated during the first two or three weeks, but there is no danger of infection, and I have never had infection of the tissues develop in any case of electrothermic coagulation in any part of the body. There is considerable reaction during the first few days after the operation. 3. It leaves an open area which is healed by granulation, but at times this healing must be followed by a surgical plastic operation to close the mouth or correct some deformity. It is truly remarkable how a very ugly wound in the early stages will close in and develop rounded edges so as to become very insignificant. I have in mind the lip, cheek and tongue cases.

Deep Roentgenotherapy.—Object: The object of the roentgenotherapy is to control or destroy the out-

lying cells or metastases that may be missed in the coagulation process. Therefore, the treatment must be thorough and given with the understanding that disease may still be present; for if one is sure of having destroyed all of the malignant disease, there is no object in adding the roentgenotherapy. This treatment must always be given with the technic used for deep disease, for one should never leave any superficial or visible disease behind.³

Radium.—I believe that the place of radium in the treatment of malignant disease about the mouth is within the mouth and not on the outside. I can see no advantage of radium over Roentgen rays, and much disadvantage because so much less in quantity, and so less definitely controlled when applied externally. The Roentgen rays can be applied externally with more power and their direction and distribution perfectly controlled, while the quantity used is immensely greater than that obtained from any quantity of radium of which I know today. When the radium is applied inside the mouth, however, all these arguments disappear, for one is able to bring the radium in close contact oftentimes with the disease, and when filtered through at least 0.5 mm. of silver, and when one applies approximately 600 milligram hours of radium, a very decided, and I believe, beneficial effect can be added. I believe, however, that even when the radium is used within the mouth, there should be nothing lost, and much gained by adding the deep roentgenotherapy from as many angles as possible, applied externally. The advantage of radium is that we are adding this inside treatment. In other words, we are applying another crossfiring effect by means of radium. It is this combination which I use, and I believe the most practical.



Fig. 5 (Case 8).—Extensive epithelioma involving the lips and inside of the cheek and the angles of the jaw (A and B). No glands palpable. Destroyed by electrothermic coagulation, Jan. 20, 1913, and followed by deep roentgenotherapy and radium. (C) shows the opening in the mouth nine days after the destruction. This opening closed to within $\frac{3}{8}$ inch by $1\frac{1}{2}$ inches. January, 1914, (D) the mouth was closed by Dr. Laplace. The patient is still well, June, 1916.

CLASSIFICATION AND REPORT OF CASES

Time will not permit a record of all of the cases that we have treated by these combined methods. In doing this combined treatment, I am indebted to the surgeons who have referred the patients and cooperated with me in their treatment. I would mention especially Drs. Laplace, Deaver, Warmuth, Burns and Schwarz.

Epithelioma of the Lip.—Early in our work, we depended on the Roentgen rays alone in the treatment

3. For more details, see the Transactions, reprints, and Roentgen Therapy in the Treatment of Deep-Seated Malignant Disease, THE JOURNAL A. M. A., May 1, 1915, p. 1477.

of small epitheliomas, but today we always destroy the lesions on the lip by means of electrothermic coagulation, no matter how early, for one can obtain more definite results, and can get them more quickly by thus combining the local destruction with deep roentgenotherapy applied locally, and in the glandular areas leading therefrom. I have treated many cases of extensive recurrence both locally and in the tissues of the neck. Generally speaking, such cases do not yield to roentgenotherapy or even to combined methods of treatment, and I will dismiss this whole group with this remark. I will refer only to the primary cases which had not been treated actively by other methods preceding our treatment, and which I have treated in my private office, for it seems impossible to keep control of dispensary cases. I have treated in my private practice:

1. Primary Cases Treated by the Roentgen Rays Alone: In this group there are eight cases. Of these eight, seven patients recovered, and have remained well from a few months to eight years. The eighth patient was a locomotive engineer who developed the epithelioma after being struck on the lip by a hot cinder. He recovered, remained well about a year, then was struck again by a hot cinder, developing a recurrence. He was operated on surgically and developed a second recurrence, from which he died.

2. Primary Cases Treated by Electrothermic Coagulation and Roentgen Rays: In this group there are fifteen cases. All of the patients have recovered, and so far as I am able to learn, have remained well to the present date, which is from a few months to seven years.

3. Primary Cases Treated by Surgery and the Roentgen Rays: In this group there are four cases. All the patients have recovered, and have remained well from two to thirteen years.

4. Local Recurrences Following Excision Treated by the Roentgen Rays: The three patients in this group have recovered. One has since died from intercurrent disease, but had remained well for several years. One other is well, after two years, and the third had, in addition to the local recurrence, a small metastatic nodule in the submental region. This disappeared under Roentgen-ray treatment, and he has remained well seven years since.

5. Recurrent Cases Treated by Roentgen Rays and Electrothermic Coagulation: The two patients have remained well approximately a year each.

It will be seen, from a study of this group of cases, that the results will compare favorably with any other

single method of treatment, no matter how extensive it may be. It will be noticed, however, that these lip cases, for the most part, have been early cases, and there were no palpable glands, excepting in two cases in which palpable glands developed after operation. These disappeared under Roentgen treatment.

It will be justly argued that since microscopic studies were made in only a few cases, some of these cases may not have been malignant. This is a just criticism, and the only answer which I can make is that the patients should be treated in this early stage when there is no glandular enlargement, and as early as possible, when we may hope for 100 per cent. cures by simple measures instead of a local extensive excision by surgery and an extensive resection of the lymphatic glands of the neck. With reference to metastatic involvement, however, Bloodgood's⁴ statistics show that in the cases in which the glands were dissected out, 37 per cent. were found to show metastatic involvement. Therefore, it is fair to assume that had at least some of the patients whom I have treated been operated on and the glands resected, there would also have been shown metastatic involvement. As to the probabilities of these lesions on the lower lip being malignant, I should like to refer also to Bloodgood's statistics up to December, 1913, in which he reviewed 200 lesions of the lower lip. Of these 200, fifteen, or about 7 per cent., were found microscopically to be benign. Therefore, the probabilities are that 93 per cent. of the cases that I have treated were also malignant. They all had the clinical appearances and history of malignant lesions, though some of them were early.

The next criticism, which is also a just one, is that some of the patients with these lesions have been well only a few years. Answering this, however, we all recognize

that most recurrences will develop within the first six months, though a recurrence or metastasis may develop many years after the primary lesion.

Another criticism is that the number of cases treated is comparatively small. To this there is no answer excepting that the results obtained are sufficiently encouraging and represent, I believe, a distinct improvement on any single method of treatment which would prompt us into making more general use of combined methods in treatment, and particularly the use of Roentgen rays after electrothermic destruction or operation.

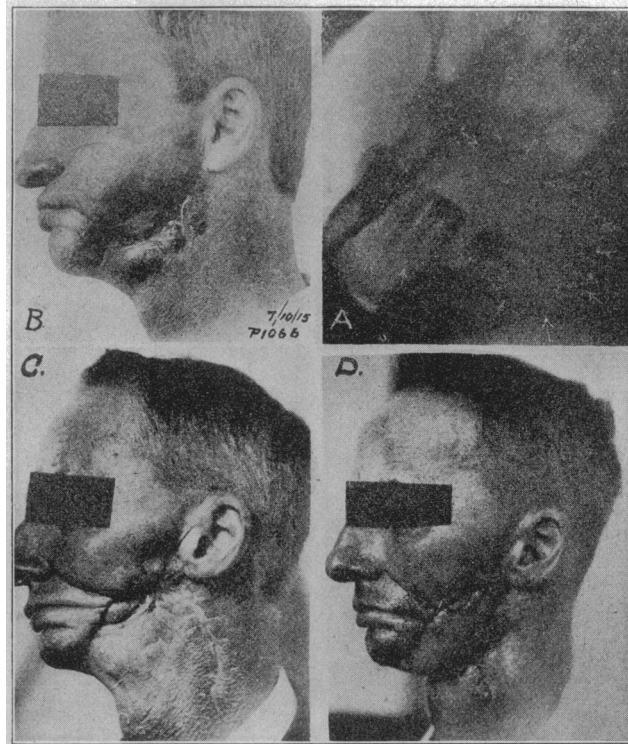


Fig. 6 (Case 7).—Extensive squamous cell carcinoma involving the cheek and the upper and lower jaw, with metastasis to the neck (A). The disease was destroyed, June, 1915, by electrothermic coagulation, together with the removal of the metastatic glands in the neck, and resection of the jaw, done by Dr. Laplace. B, the wound with a healthy appearance one month later; C, the wound, June, 1916; D, after a plastic operation by Dr. Laplace.

4. Bloodgood: Carcinoma of the Lower Lip: Diagnosis and Operative Treatment, Surg., Gynec. and Obst., April, 1914, p. 404.

It will be noticed that even in the cases treated surgically, none had a dissection of the glands from the neck, and while in the hands of a very competent surgeon this operation is perhaps not a serious matter, it is serious in the hands of many men who feel competent to remove the local lesion, but are not competent for these extensive neck dissections. By combining methods, such as I have outlined in this paper, we can save the patient the shock of a serious operation and the scars and the probabilities of implantation, etc., which are likely to follow operation.

Epithelioma of the Tongue.—1. Epithelioma Involving the Dorsum of the Tongue: In this group there are six cases. One patient, who had also metastatic involvement, did not recover. Four have recovered and are well after from one to four years. The sixth patient has been under treatment one month. The posterior two thirds of the left side of the tongue are involved; ulceration had taken place. He is being treated with radium placed in the fissure and deep roentgenotherapy applied both inside the mouth and externally, and has shown marked improvement at the end of a month. I will report briefly two of these cases:

CASE 1.—Mrs. A. C., aged 52, was referred by Dr. Cleveland, Dec. 1, 1911, with an epithelioma on the left side of the base of the tongue, seven-eighths inch in diameter, elevated about one-eighth inch, with an indurated base, associated with enlarged glands in the submaxillary region on both sides, but more on the left. She had been treated previously by Dr. Schamberg for syphilis, but had recovered under treatment from all the other lesions, and a clinical diagnosis of epithelioma was made by Drs. Schamberg, Deaver, Burnstein and Gildersleeve, all of whom advised excision, which she refused. Under Roentgen-ray treatment she improved very promptly, and was shown at the dermatologic congress, Dec. 28, 1911; but Roentgen treatment produced no further improvement excepting that the enlarged glands in the cervical region had disappeared, and, July 19, 1912, the lesion on the tongue was destroyed by electrothermic coagulation. This was followed by Roentgen treatment, and today, so far as any of us can tell, she is well, four years after treatment.

CASE 2.—Dr. X., woman, aged 48, referred to me by Dr. Kate Baldwin, Dr. William J. Taylor, and Dr. Robert Abbe, with an indurated ulcer about one-half inch in diameter on the posterior surface of the right side of the tongue, had also been seen by Dr. Charles Frazer. A section had been removed for microscopic study two weeks previously, and had been examined by Drs. Meine, Peckham, McFarland and Pearce. All reported carcinoma. The patient was seen by Dr. Abbe and the section examined by him, after which he advised against radium treatment. Dr. Taylor advised against excision. There was no evidence of metastasis. The diseased area was destroyed by electrothermic coagulation in the presence of Drs. Taylor, Baldwin and Cohen. This was followed by treatment with radium, the capsule being placed under the right side of the base of the tongue, and the patient was treated by deep roentgenotherapy inside the mouth and over the glandular area. She is perfectly well up to the present time.

2. Epithelioma Under the Tongue, and Involving the Floor of the Mouth: In this group there have been six cases. All showed extensive disease. All were destroyed by electrothermic coagulation locally, followed by deep roentgenotherapy. All healed primarily, but five developed recurrences, and three patients have died. Three are still under treatment.

Epithelioma of the Cheek.—1. Without Palpable Glands: In this group there have been three cases, all developed on the basis of leukoplakia. In only one was a section removed. This showed squamous cell

carcinoma. This patient has only recently been treated, but seems to be doing well. The other two have remained well two and three years, respectively.

2. Epithelioma or Carcinoma Involving the Cheek, Gums, Jaw Bone, and the Submaxillary Glands: In this group, I have treated a number of recurrent cases, and generally speaking the results have as a rule been disappointing. In the primary group, in which combined methods of treatment were used, and in which there had not been previous destructive treatment, the results are much more encouraging, even though the disease is very extensive. Therefore, I shall confine the reports to this group of primary cases.

CASE 3.—Mr. J. M. L., aged 59, seen in consultation with Dr. Laplace, Dec. 14, 1914, at which time he had an epithelioma on the inside of the left cheek $1\frac{1}{2}$ inches in diameter, which had been developing during a year, also had a mass of metastatic glands under the jaw. Section showed squamous cell carcinoma. We gave him a course of preliminary treatment inside the cheek, outside the cheek, and over the glandular area, and the next day destroyed the disease inside the cheek by electrothermic coagulation, thus saving the cheek, which otherwise would have had to be excised, after which Dr. Laplace removed the metastatic glands. In two weeks, another course of deep roentgenotherapy was given, and four subsequent courses of deep roentgenotherapy, or six in all, were given, the last being April 10, 1915. So far as we can tell, he is entirely well today, and free from symptoms.

CASE 4.—Mr. S. R., aged 68, was referred to me, May 28, 1912, by Dr. Laplace for postoperative treatment. May 27, 1912, Dr. Laplace removed an epithelioma which had been growing for a year, and had involved the inside of the left cheek, extended up along the alveolar process and on the palate. He was given postoperative treatment, and is well, June 12, 1916.

CASE 5.—Mr. J. O., aged 57, referred to me by Dr. Laplace, March 10, 1914, for postoperative treatment; had had a growth involving the left side of the lower lip and extending on to the cheek for two years. He had always been a heavy smoker. There were present also metastatic glands in the left submaxillary region which had been excised. He was given active postoperative treatment, and was well, so far as we could tell, March 20, 1915. In June, 1915, he developed rather suddenly a tumor under the left jaw which was excised by Dr. Laplace, found to be cystic and believed not to be malignant. After this he was given two courses of postoperative treatment, with instructions to return at the slightest sign of any recurrence. He is probably still free from symptoms.

CASE 6.—Mr. J. W., aged 75, was referred by Dr. Richard Barrington, Jan. 12, 1916, with an epithelioma involving the gum on the right side of the upper jaw in the region of the canine tooth, and extending through the cheek. This had followed a bruise by a piece of iron two years previously, and had not healed in the meantime. During the last six months, it had been painful. The indurated area was approximately three-fourths inch in diameter. The old teeth were extracted, the whole area was destroyed by electrothermic coagulation, making a hole in the cheek at least one-half inch in diameter, followed by Roentgen treatment, the wound healed up completely (even the cheek closing), and so far as we can tell, he is entirely well today.

CASE 7.—Mr. T. G., aged 52, was referred to me, May 7, 1915, by Dr. Laplace, with an extensive carcinoma involving the entire left cheek, and with a vegetative tumor mass growing outward in the region of the lower left first bicuspid. April 15, 1915, Dr. Charles Frazer had removed the metastatic glands from the neck. The growth in the cheek had also been incised externally a few days before coming to me. There was induration in the neck tissues. I destroyed the whole side of the cheek by electrothermic coagulation. Later Dr. Laplace removed, at my request, the left half of the lower jaw which had been rendered lifeless. The cheek and tissues of the face healed, leaving an opening about 2 inches

by 1 inch in diameter, and appeared to be healthy, but later a recurrence developed in the tissues of the neck posterior to the surgical operation, which I was unable to control, and the patient died, October, 1915. It is of interest to note that there was no recurrence at the site of electrocoagulation, but recurrence in the primary operative area.

CASE 8.—Mr. J. L. P., aged 58, was referred to me, Jan. 20, 1913, by Dr. H. W. Dachtler, roentgenologist, Toledo, Ohio, and Dr. H. E. Deemer, Antwerp, Ohio, with an epithelioma at the left side of the angle of his mouth, about $1\frac{1}{4}$ inches in diameter, and involving half of the lower lip, a portion of the upper lip, and the whole inside of the cheek extending back to the angle of the jaw. The whole area was destroyed by electrothermic coagulation, followed by deep roentgenotherapy externally and radium inside at the angle of the jaw. Section showed squamous cell carcinoma. January, 1914, when we felt sure that all evidence of malignant disease had disappeared, at my request, Dr. Laplace did a plastic operation for the closure of his mouth with excellent results, and he is still well, after approximately three years.

CASE 9.—Mr. W. E. R., aged 40, was seen in conference with Dr. Ernest Laplace and Dr. W. L. Shindle, June 10, 1915, at which time he had an epithelioma involving the entire inside of the left cheek, the gums on both the upper and lower jaw, the alveolar process of the upper jaw, and almost the entire half of the left lower jaw, with a mass of metastatic glands in the neck. It had been growing at least eight months. Microscopic section removed showed it to be squamous cell carcinoma. It was considered surgically inoperable by Dr. Laplace. As a result of our conference, Dr. Laplace resected the metastatic glands from the left side of the neck. We then destroyed the disease inside the mouth by electrothermic coagulation, then resected the left half of the lower jaw, and followed by deep roentgenotherapy externally, and into the open wound, with the radium capsule applied under the posterior surface of the upper jaw. In this way we were able to get entirely rid of the malignant disease. Section showed squamous cell carcinoma. Oct. 3, 1915, as part of the necrotic bone was separating from the upper jaw, a severe hemorrhage developed which could not be controlled until the external carotid artery was ligated by Drs. Shindle, Gass and Gill. Feb. 15, 1916, the patient returned free from malignant disease. The opening in the mouth had closed to an oval shape 1 inch by $1\frac{1}{2}$ inches in diameter and by wearing a patch over this opening, the patient was able to eat all kinds of food, and he returned to his occupation as a traveling salesman. At this time Dr. Laplace sutured the two edges of the opening, but there was too much tension, and the tissues separated again. A second attempt was made, April 15, 1916, with similar result. He returned a few days ago still free from any malignant disease, and this time Dr. Laplace made an effort to close the wound by means of the transfer of a skin flap and has obtained a beautiful result. We are hoping for a complete success this time. We are, however, gratified at the good result in the fight on the malignancy.

CASE 10.—Mr. D. G., aged 48, was referred, Feb. 20, 1915, by Dr. Paul Traub, with an epithelioma involving the inside of the right cheek and the left alveolar border, with metastatic glands under the right jaw. Microscopic section removed showed this to be squamous cell carcinoma. This case was treated similarly to Case 9. The metastatic glands were

removed by Dr. Stillwell Burns, the disease was destroyed inside of the cheek by electrothermic coagulation, followed by radium inside the mouth, and deep roentgenotherapy externally, with resection of a portion of the jaw. Today, so far as we can tell, he is free from malignant disease. He has a hole in the right side of his mouth about one-half inch in diameter, which will be closed later.

CASE 11.—Mr. D. L., aged 48, was referred, July 8, 1915, by Dr. J. F. Schamberg. Two years previously, Dr. Schamberg had treated him for syphilis until he was free from symptoms. About Jan. 1, 1915, he began to have evidence of disease in the left side of the mouth, for which he had two teeth extracted, February, 1915. When he saw Dr. Schamberg and myself in July, 1915, he had an epithelioma involving the entire inside of the left cheek, a portion of the alveolar process, and the upper surface of the alveolar process of the lower jaw, together with well marked metastatic carcinoma in the left submaxillary region. A clinical diagnosis of epithelioma was made by Dr. Schamberg. After conference with Dr. Stillwell Burns, he resected the metastatic glands from the left side of the neck, and at the same time I destroyed the malignant disease inside the mouth, followed by radium applications inside, and deep roentgenotherapy externally. Pathologic examination of the section removed showed this to be squamous cell carcinoma. He seemed to be getting well, but in February, 1916, there was evidence of recurrence in the cheek. I had made the attempt

to preserve the cheek and destroyed only the disease inside. After this recurrence of the disease, I destroyed the entire left cheek by electrothermic coagulation, as well as the left lower jaw. Today most of the left side of the lower jaw has separated as a sequestrum. There is no evidence of malignant disease or metastasis. Later we are hoping to be able to close the mouth.

One other similar case was treated with ultimate failure, and two less advanced cases of epithelioma of the cheek have been treated with success.

Epithelioma of the Tonsil: Following are reports of four cases:

CASE 12.—Mr. M. U., aged 80, referred by Drs. Reed and Laplace, Nov. 2, 1911, with carcinoma of the tonsil which was about the size of a thumb, indurated, adherent, and ulcerated, also had enlarged submaxillary glands. A section had been removed and examined by Dr. Hammond, state pathologist at Trenton, and pronounced epithelioma. Under Roentgen treatment applied internally by means of a Morton tube, and externally by deep roentgenotherapy the disease completely disappeared. The patient died Feb. 17, 1913, but was reported to be without recurrence.

CASE 13.—Mr. A. P. U., aged 63, was referred to me, March 7, 1913, by Drs. Gleason, Warmuth, Murray and Dickerson (each separately), with epithelioma of the tonsil as an inoperable and hopeless case. The section showed squamous cell carcinoma. The disease was completely destroyed by electrothermic coagulation, followed by deep roentgenotherapy. April 29, 1913, he returned apparently free from all evidence of the disease, which opinion was confirmed by Drs. Gleason and Warmuth. He remained apparently well six months, until Oct. 13, 1913, when a small ulcer, one-quarter inch in diameter, developed in front of the anterior pillar of the fauces. I delayed in active treatment at this stage because I was uncertain whether the ulcer was due to roentgenotherapy or to the disease. It was a recurrence from which he died.

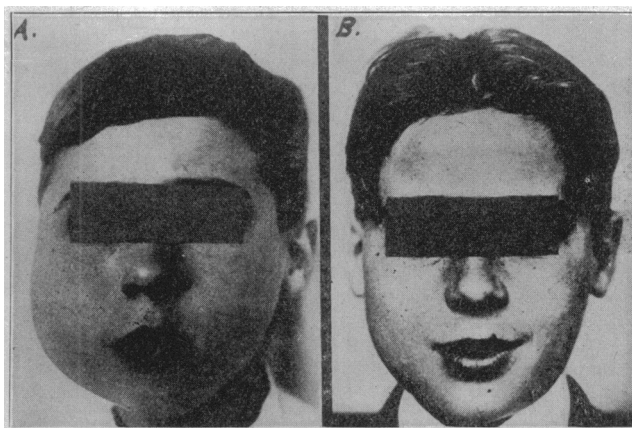


Fig. 8 (Case 16).—(A) Sarcoma involving all of the right lower jaw, part of the upper jaw, together with the soft tissues, Jan. 8, 1916, treated by deep roentgenotherapy (A); B, same patient apparently free from disease, May 8, 1916.

CASE 14.—Mr. M., aged 41, referred, Oct. 7, 1912, by Drs. George W. Pfrohm and M. P. Warmuth, with an epithelioma involving the right side of the soft palate, the alveolar process about the molar teeth, and the cheek. The whole area was completely destroyed, followed by roentgenotherapy. Dec. 6, 1912, the molar teeth were removed, and the disease about the alveolar process again destroyed. Up to the present time he has remained well. Dr. Warmuth considered this case entirely inoperable.

CASE 15.—Mr. E. L., aged 43, was referred, Oct. 5, 1915, by Dr. H. M. Goddard with an epithelioma involving the right tonsil and extending on to the palate. The Wassermann test was negative. A section removed at the Jewish Hospital showed it to be carcinoma. It was considered inoperable. Another section was removed, and immediately the whole diseased area was destroyed by electrothermic coagulation, followed by radium internally, and the Roentgen treatment externally. Microscopic examination of the section removed showed squamous cell carcinoma. So far as any of us can tell today, there is no evidence of malignant disease present.

Sarcoma of the Mouth.—In this group I have had under treatment eleven cases. All have shown good results. In one there was metastasis to the spinal column and ultimately death. This patient had been previously operated on and had a recurrence. The others have recovered or are improving, but for brevity's sake, I will confine my report to one case, which I think should convince the most skeptical:

CASE 16.—A boy, aged 11, brought to my clinic, Jan. 8, 1916, had been seen four months previously by Dr. John B. Deaver, and pronounced inoperable, after which he received Roentgen treatment at another hospital for two months without any apparent effect. He was then treated for another month at a different hospital, by means of the Roentgen rays, without any effect, after which he saw Dr. J. C. Da Costa, who advised against operation, and also advised that it be left alone. All had diagnosed sarcoma. Jan. 8, 1916, he had a tumor involving the entire right lower jaw, part of the upper jaw, and the soft tissues over the entire right side of the face, and extending up into the temporal region. Roentgenoscopy revealed total absorption by the disease of the lime salts from the right side of the lower jaw, with partial absorption of the upper jaw, and destruction of the outer wall of the antrum. The patient was given fifteen doses, January 18 and 19, crossfiring on this disease from fifteen different angles. When he returned in three weeks for the second course of treatment, the tumor tissue had been reduced to half, and there was distinct evidence of recalcification of the bone. He has had six similar courses of deep roentgenotherapy, and so far as we can tell at present he is free from disease, and there has been almost complete recalcification of the bone.

CONCLUSIONS

1. The cases forming the basis of this report, excepting those involving the lower lip, were almost entirely inoperable, and therefore every success is a distinct advance and every failure only a loss of time, energy and effort.
2. Any lesion about the mouth which does not show a tendency to heal within a few weeks should be looked on with suspicion of being malignant, and in case of doubt should be destroyed or removed.
3. I believe that early lesions about the mouth can be destroyed by electrothermic coagulation with less loss of tissue, and more success than by any other means.
4. Deep roentgenotherapy should be added to any other method of destruction or removal of malignant disease.
5. Combined treatment by surgery, electrothermic coagulation, radium and deep roentgenotherapy will cure some patients who are otherwise hopeless.

1321 Spruce Street.

RADIUM IN THE TREATMENT OF CANCER AND VARIOUS OTHER DISEASES OF THE SKIN*

FRANK E. SIMPSON, M.D.

CHICAGO

Although some do not admit that radium acts on the skin and other tissues in a manner different from Roentgen rays, I am convinced of the error of this view. There are both theoretical reasons and strong clinical evidence for the opinion that the effects of these two agents differ.

The rays emitted by radium are of three, and according to some of four distinct kinds, known as alpha, beta, gamma and delta rays. From the Roentgen-ray tube are given off rays that are similar to but by no means identical with the gamma rays or radium. The

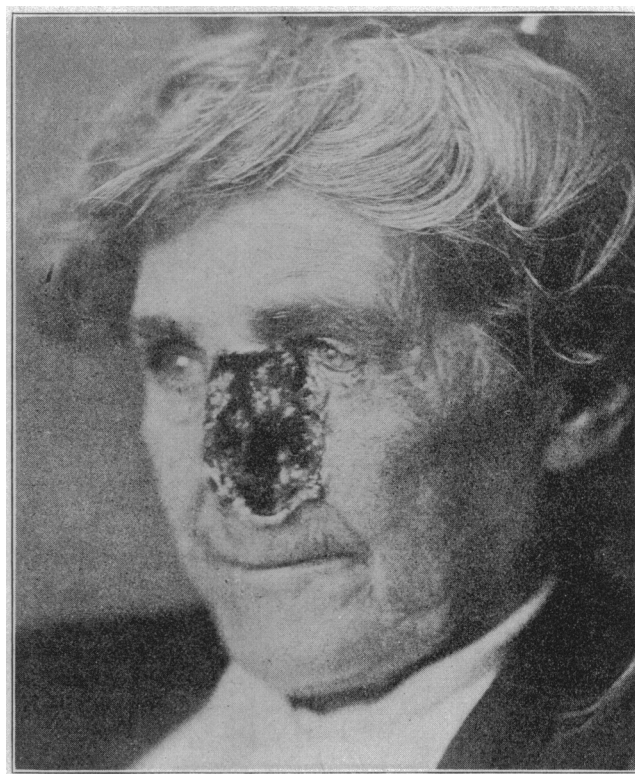


Fig. 1.—Epithelioma of nose, upper lip, cheek and eyelid. Photograph taken September, 1914.

character of the rays emitted by the Roentgen-ray tube and radium being different, one would expect that the reactions in the skin would be different. And this is what we find to be the case when critical examination is made of the results obtained with both agents.

The reactions in the skin differ in several important particulars, some of which may be briefly considered.

Both Roentgen rays and radium may produce in living tissue, first, a selective and, second, an inflammatory action.

By selective action is meant a retrogressive change in the tissues that goes on without visible macroscopic inflammation. The meaning of inflammatory action which is produced by Roentgen rays or radium is self-evident.

* Read before the Section on Dermatology at the Sixty-Seventh Annual Session of the American Medical Association, Detroit, June, 1916.