disease terminates fatally under any and all known methods of treatment. This fact is the sum total of human experience to the present time. The duration of the malady and the degree of suffering depend largely upon the type of the disease, its location, upon the personal equations of temperament, stability of the nervous system, treatment pursued, etc. We may prolong life, we may relieve suffering, we may occasionally effect a permanent cure, but notwithstanding any and all qualifications that can be advanced in relation to the above statements, the stubborn fact remains that a very large proportion of malignant disease terminates fatally.

Such being the facts, the question arises as to the best method of caring for these cases as met in our daily practice. Does the incurability of a person justify refusal of all treatment other than surgical and their consequent neglect during the inoperable and often most distressing stages of the malady? Is the profession justified in taking any course in relation to these poor sufferers that will be pretty sure to lead them to seek relief at the hands of charlatans and pretenders? Are we not thereby aiding in the support of an army of that sort of false prophets? Are we to withhold our intelligent, sympathetic attention simply because the patient cannot recover? On the contrary, is it not our duty to make our patients' last days as comfortable, mentally and physically, as circumstances will permit? Are we not called upon to extend to these unfortunate people all possible comfort and encouragement even under the most discouraging conditions? In many instances is not passive deception preferable to the erratic, foolish course pursued in numerous cases? Is it not frequently a kindness to shield them from the truth, to ease them along over the most anxious period of their struggle even at the expense of a portion of that frankness which under ordinary circumstances it is our plainest duty to extent to our patients?

While these important questions must necessarily be answered by each one of us as circumstances may indicate, the writer feels that a certain amount of honest deception, if he may be allowed the expression, used tactfully and kindly, is entirely justifiable in many instances solely for the welfare of the patient, that more good than harm will result from this procedure, while an opposite method might be unwise, unkind and in some cases positively cruel.

Finally, we have that best of all known drugs for suffering humanity, the "divine poppy," without which the great Sydenham declared that he would not practice medicine. The time comes in the life of most of the victims of malignant disease when this agent, in some form, is their best friend, the only nepenthe this world can furnish. Given in small doses, seldom in large ones, it is nature's ally in bringing about that kindly indifference to the ordinary affairs of life, that peculiar hebetude of mind, that resignation to the inevitable, which robs the final struggle of that dread of dissolution which is so universal while in ordinary health. Poor, indeed, would these unfortunate persons be without this prince of drugs, the "divine poppy."

Will you permit me in closing to call attention to the importance of our faithful, personal services to the class of patients under consideration in the words of the genial "Autocrat," as follows:

"The morning's visit — not till sickness falls
In the charmed circles of your own safe walls;
Till fever's throb and pain's relentless rack
Stretch you all helpless on your aching back;
Not till you play the patient in your turn
The morning's visit's mystery shall you learn.
'Tis a small matter in your neighbor's case
To charge your fee for showing him your face;
You skip up stairs, inquire, inspect and touch,
Prescribe, take leave, and off to twenty such.
But when at length, by fate's transferred decree,
The visitor becomes the visitee,
Oh, then, indeed, it pulls another string;
Your ox is gored, and that's a different thing!
Of all the ills that suffering man endures,
The largest fraction liberal Nature cures;
Of those remaining, 'tis the smallest part
Yields to the efforts of judicious art.
. . . . . .
And last, not least, in each perplexing case,
Learn the sweet magic of a cheerful face;
Not always smiling, but at least serene,
When grief and anguish cloud the anxious scene.
Each look, each movement, every word and tone,
Should tell your patient you are all his own;
Not the mere artist, purchased to attend,
But the warm, ready, self-forgetting friend,
Whose genial visit in itself combines
The best of cordials, tonics, anodynes."

— *British Medical Journal*, March 11, 1905.

EARLY TREATMENT OF SOME EPITHELIOMAS BY PURE RADIUM SALTS.*

BY FRANCIS H. WILLIAMS, M.D., BOSTON.

IT is recognized that the same therapeutic agent is not the best one for every form of malignant disease nor even for all stages of the same disease in the same patient. In suitable cases radium is surprisingly efficient as far as my experience of five years may serve to estimate it. To make more clear the reason why radium may rightly claim a part of the field in which x-rays have been used, a few facts regarding the rays that issue from an x-ray tube and from radium may be called to mind.

The rays given off by an x-ray tube are not always the same in kind or amount; hence their successful application is difficult and many practitioners, being ill informed in regard to the physics of the rays, have not yet learned to use them to the best advantage. In marked contrast to this we have in radium a substance which gives off rays uniform both in quantity and quality, so that the dosage can be exactly controlled, and of the different kinds of rays, one kind, the beta, is especially suited to the treatment of certain forms of malignant disease. The cause of the great success that follows the use of radium in certain cases is, I believe, the excellent *quality* and the *uniform amount* of the rays given off. Its application is painless.

* Read before the Suffolk District Medical Society meeting conjoined with the Boston Medical Library, Dec. 16, 1908.
Some patients who had been treated successfully by radium were shown at the meeting.

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The first point to consider is the kind of case that is best suited for treatment by radium. The amount of pure radium in the world is small, a single grain of the pure salt, a quantity possessed by few, is not as large as a pea. Therefore, to treat any large area by so small an amount of powder is inconvenient or impracticable; consequently the best opportunity for the use of radium is in cases in which the affected area is not very large. The next consideration is the depth of the disease. The beta rays, which are present in a larger amount than the gamma, have remarkable healing properties, but do not penetrate deeply. Their range may be about one-half inch to one inch below the surface. In using radium, then, we are limited in two directions: in the size and in the depth of the affected area. Obviously, this remedy is best adapted to superficial growths, when they are small, that is, in the early stage. It is also suitable for cavities and has the advantage over the x-rays in this respect as it can be used in places inaccessible to them. Within these limitations, which cover only a part of the field suitable for x-rays, radium has, I believe, an undoubted advantage, and this advantage is not based on theoretical grounds alone, but is confirmed by clinical experience. I have compared, for instance, the value of x-rays and radium by treating one half of a superficial new growth and one half of a tract affected by lupus with one remedy and the other half with the other, and clinically radium was the better. It is safer because the dosage can easily be exact, and, as a rule, it is more prompt in its action than the x-rays.

The cases of malignant disease best suited for treatment by radium are more especially early epitheliomas. In the majority of such cases *improvement* takes place very soon; it may begin within three weeks and sometimes within one. This improvement is manifested by relief from pain or irritation, by the checking of the growth if it is in an active stage, or its stimulation if it is indolent, or in other ways. Radium is also of great value in keloids.

Some superficial growths of about one centimeter in diameter heal after a few, say, half a dozen, treatments by radium; now and then after less than this number. On the other hand, in cases of long duration a long course of treatment may be required, but the average duration of treatment is much less than with the x-rays, another important advantage for radium.

It is hardly necessary to emphasize the desirability of early treatment when employing this remedy. It should be used first in nearly all of these cases. If for any reason improvement does not take place promptly, operation can follow without harmful delay. The best opportunity for radium is when the growth is small, as already mentioned, and before operation or x-rays have been used.

But the use of radium is not limited to early cases; it may also be of value in those of long standing. The following is illustrative: C. D. had an epithelioma of seventeen years' duration which had been operated on several times and had also been treated by the x-rays when he came to me. At this time the new growth covered the temple and a considerable part of the left cheek, but it yielded to treatment by radium. Warts that have been irritated and ulcerate, a small patch that looks like chronic or subacute eczema, but does not heal, or a small sore that persists, particularly on the lip, may take on a malignant character, especially in persons of mature years. These and similar affections of the skin yield as a rule to radium even when they resist other treatment.

Recurrences take place after treatment by radium as well as after other forms of treatment or operation, but thus far have yielded to further treatment by this remedy.

The table of 69 cases of epithelioma that I prepared last June is, I think, sufficiently instructive to give again.[1]

	Total.	Healed.	Not healed.	Under treatment.	Discontinued treatment.
Lower lip,	14	11*	–	1	2
Lid,	9	6	–	1	2
Face	24	20	1	1	2
Auditory canal,	1	1	–	–	–
Ear,	1	–	–	–	1
Hand,	1	1	–	–	–
Nose,	19	17	–	1	1†
	69	56	1	4	8

I quote from the paper read at that time in regard to these cases: "The average duration of the disease before treatment was begun was four and one-half years; 56 healed, 1 did not heal, 4 are under treatment and 8 discontinued treatment, but these last, with one exception, were all doing well at that time.

"As the length of time that has elapsed after healing is a very important consideration in estimating the value of a remedy, I should state that of the 56 healed cases, 23 have been well for two years or more, 9 of these 23 for more than three years and 2 for more than four years. Recurrence took place in two of the 23 cases, in one a year and in the other two and one-half years after healing, but yielded to further treatment."

It should be clearly understood that these results have been obtained by using an efficient amount, 50 mgm. of the pure radium salt.

To carry out treatment by radium properly:

1. Fifty milligrams of pure radium bromide are desirable, but this is difficult to obtain and is very expensive. I was most fortunate in getting, over five years ago, 120 mgm. of pure radium. About a year ago I wrote to a firm which has been interested in selling this salt and asked the price of pure radium bromide. The reply was that they had none of the pure salt and did not believe it existed, but they had some one

[1] Med. Communications, Mass. Med. Soc., 1908, xxi, 267.

* In one of these eleven lip cases, a gland just under the angle of the jaw became somewhat enlarged four months after the lip had healed and has been removed. Prof. F. B. Mallory reported it to be cancerous. There has been no recurrence on the lip. This case shows that the action of radium was local, and indicates the importance of its early use. When desirable, radium may be supplemented by suitable treatment of the neighboring glands.

† A feeble man, seventy-six years old, who died suddenly after being out on a very cold day. All the others except one were doing well when they discontinued treatment.

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sixth as strong. A number of physicians are attempting to treat patients with radium too weak in quality and too small in quantity to be efficient, and this will doubtless tend to discredit this new therapeutic agent.

2. The radium should be placed in a capsule, covered with lead except on one side, which is at the end of a long handle, as a protection to the physician. The capsule, over which a clean rubber cot, for each patient has been drawn for purposes of cleanliness, should then be passed slowly over the area to be treated or held over the special place for one half to three and sometimes four minutes. The exposure should be made from one to three times a week; less often after healing has begun.

3. The remedy must be used with sufficient courage to obtain results, but with care to avoid harm, for a remedy that is of any value is a two-edged sword and requires judgment and experience in its use.

When patients learn to come very early for treatment, the results should, I believe, be even more satisfactory than those obtained during the past five years. During this time cases of long duration and considerable extent have done well, but obviously we may fairly expect that healing will be more prompt and take place in a larger proportion of cases, when the more suitable, especially the early cases, are submitted to this treatment and operation or other treatment advised for those in which radium is unsuitable.

I have compared the therapeutic value of the x-rays and radium and have shown that in its own particular field radium has an advantage over the x-rays; on the other hand, radium has no value in diagnosis; but lest your minds should be diverted by the use of the x-rays in treatment from their wider usefulness in diagnosis, let me say in this connection that not only for surgical but more emphatically for medical diagnosis, particularly in diseases of the thorax, the x-rays are of great value and importance.

AN ACCURATE RAPID METHOD FOR THE QUANTITATIVE DETERMINATION OF CHLORINE IN THE URINE. A CRITICAL STUDY OF THE SHORT METHODS IN VOGUE.

BY HARRY W. GOODALL, M.D., BOSTON.

SEVERAL quantitative tests for chlorine in the urine have been devised, but chemists have only recognized the Volhardt or modification of the Volhardt method as accurate.

For clinical purposes the time consumed in a single determination, fifteen or twenty minutes, is a serious objection to the Volhardt methods. The following determinations were made in order to test the applicability of the short methods that have been devised, control tests being made in each case by Arnold's modification of Volhardt's method.

Normal urines, urines of normal individuals on a salt-free diet and the urines of chronic nephritis, containing only the slightest possible trace of albumen, were selected for the series. The Purdy method of centrifugalization, Sutton's method and Newhawers-Salkowski's method were intentionally omitted; they require as much time for the determination as the Volhardt method.

The rough silver chloride test. — The rough method of adding one drop of $AgNo_3$ (1:8) to a urine acidulated with HNO_3, estimating by the compactness of the precipitated ball of silver chloride whether the chlorine is normal or diminished, cannot be applied quantitatively with any degree of accuracy, and even as a rough method it is to be condemned since the results depend upon the per cent of chlorine present in the urine rather than upon the total chlorine present in twenty-four hours.

Direct titration of diluted urine with standard silver solution. — The direct titration of a known amount of urine, acidulated with HNO_3 and diluted with water, with a standard solution of $AgNO_3$ until no further precipitate formed was found to be impractical as the end point could not be determined with any degree of accuracy.

Mohr's method. — Mohr's method, in which a solution of potassium chromate is used as an indicator, was found to give too high values, due to the fact that other substances which may be present in the urine are precipitated out. The results are still too inaccurate to be of value if, as has been suggested, we subtract 1 ccm. from the total amount of the silver nitrate solution used. The fact that the end point is not a sharp one would make this method undesirable even though this objection did not exist.

For comparison the results by this method are tabulated at the end of the paper, as well as those of the following method.

Rapid determination by Arnold's modification of Volhardt's method. — The direct titration with Arnold's solutions without removing the silver chloride by filtration, the step which consumes most of the time necessary for the determination, can be performed in two or three minutes. The end point is so sharp and the error so small that this method can be recommended as sufficiently accurate for all clinical purposes.

The method is described in full.

Three solutions are necessary:

1. $AgNO_3$ solution. Dissolve 29.075 gm. of pure crystalline $AgNO_3$ in 1 liter of distilled water. One cubic centimeter of this solution precipitates 0.01 gm. NaCl.

2. Ammonium sulphocyanate solution. Dissolve 12.9 gm. of ammonium sulphocyanate in 1 liter of distilled water. One cubic centimeter of this solution equals approximately 1 ccm. of the $AgNO_3$ solution (Solution 1).[1]

[1] The accurate strength of this solution should always be determined by standardizing it with the silver solution in the following manner: To 10 ccm. of Solution 1 in a small beaker add 20 or 30 drops of concentrated HNO_3, 30 to 50 ccm. distilled water and 2 ccm. of the indicator, Solution 3 (cold saturated iron ammonium alum solution). Titrate with the ammonium sulphocyanate solution until a permanent brown color develops, which marks the end point. This should be done at least three times and the average taken, that the error may be as small as possible.

If 12 ccm. of Solution 2 is required to precipitate 10 ccm. of Solution 1, the sulphocyanate solution is weaker than the silver solution, and in actual chlorine determination the solutions must be reduced to terms of equality. This is done by multiplying the number of cubic centimeters of the sulphocyanate solution used by the factor. This factor is determined by dividing 12 by 10 and in this particular example equals 1.200. When these solutions are kept for some length of time they should be occasionally standardized in this manner.

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