

1942 - 1943 Catalogue

# Improved Swanberg, No. 5, No. 6, No. 7, No. 8 & No. 9 Silver, Adjustable, Utero-Vaginal, Radium Applicators

Designed by

**HAROLD SWANBERG, B.S., M.D., F.A.C.P.**

Editor, Mississippi Valley Medical Journal and Radiologic Review,

Past President, Illinois Radiological Society, Etc.,

(First Described in J.A.M.A., 90:1289, April 21, 1928)

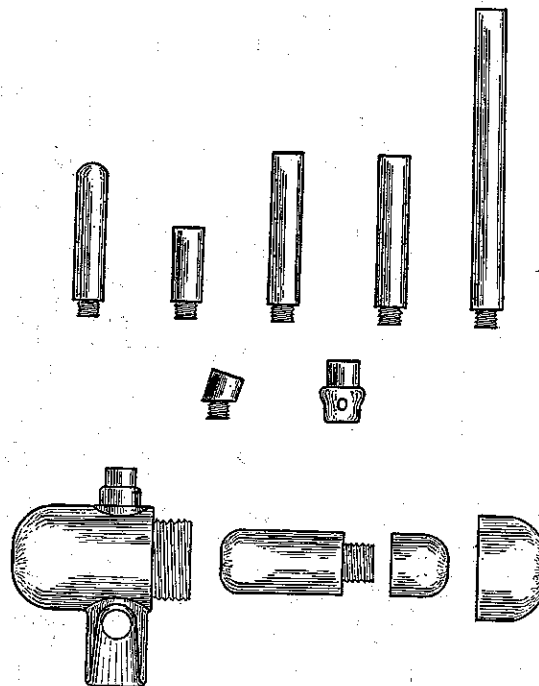


Fig. 1. Individual parts of the SWANBERG No. 8 Silver, Utero-Vaginal Radium Applicator with single capsule, cross-arm vaginal end (including silver capsule enclosed therein). A 15 degree uterine angle wedge and a screw cap for uterine stem (for use without a vaginal end) is also illustrated. No rubber covering is shown. Actual size.

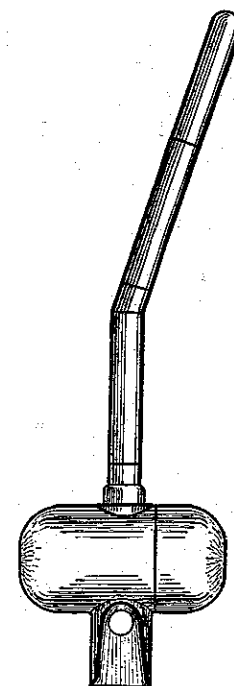


Fig. 2. SWANBERG No. 8 Applicator assembled with single capsule, cross-arm vaginal end and with uterine angle wedge, for use in an averaged length uterine canal. The applicator thus assembled provides uterine radiation, in addition to one center of radiation in the vaginal vault. Actual size.

The improved Swanberg No. 5, No. 6, No. 7, No. 8 and No. 9 Silver, Utero-Vaginal, Radium Applicators are especially adapted for carrying out the recent change in the Paris Technic (Regaud and Lacassagne) of Radium Therapy as used at The Radium Institute of the University of Paris or the modified Stockholm (Heyman)

Technic as used at the Marie Curie Hospital (Hurdon and Gilmour) in London, in the treatment of uterine cancer. These two institutions are among Europe's most important cancer clinics and their five year reports, of the radiologic treatment of uterine cervical cancer, are the most favorable to be reported by the leading cancer clinics of the world. (Annual Report on Results of Radiotherapy in Cancer of the Uterine Cervix. Edited by J. Heyman. Volume 1, 2, 3 and 4, League of Nations Publications. Geneva 1937-1938-1939-1941)

The results of the 1933 series (latest reported; published in 1941) of patients treated at 18 leading cancer clinics in 8 countries reveal a five year curability of 47.2% of ALL patients treated at the University of Paris (125 treated patients) and 35.6% at the Marie Curie Hospital (101 treated patients). These excellent results have special significance in view of the fact that 51% of the patients at the University of Paris had advanced lesions, (Stage 3 and 4 growths) when the treatment was begun; at the Marie Curie Hospital this percentage of advanced growths was 60% (See Swanberg, Harold: Results of Radiation Therapy in Uterine Cervical Cancer. A Statistical Study of the Five Year End-Results of 1796 Treated Patients in 18 Radiotherapeutic Centers in 8 Countries During 1933. Mississippi Valley Medical Journal, Incorporating the Radiologic Review, March 1942.)

The Radium technic pursued at Paris\* to secure these excellent results consists of multiple centers (usually six) of heavily filtered Radium distributed throughout the entire length of the uterine canal and the width of the vaginal vault, (an average of 67 milligrams of Radium in 6 centers is used, distributed equally between the uterus and vagina). The essential filtration is 1 MM of platinum in the uterus; 1.5 MM in the vagina and the treatment is given slowly, being 8,000 milligram hours in 5 to 8 days in a typical case. The diameter of the rubber-covered, intrauterine applicator is 7 MM and the size of the three cork, barrel-shaped, vaginal applicators usually used are 20 x 30-32 MM each.

The Radium technic used at London\* also consists of multiple centers, (two or three in the uterus and twelve, 5 mgs. each, in the vagina), of heavily filtered Radium distributed throughout the entire length of the uterine canal and the width of the vaginal vault. (An average of 110-118 milligrams is used; distributed nearly equally between uterus and vagina.) The essential filtration is 1 MM of platinum in the uterus, the equivalent of 1.25 to 1.3 MM of platinum in the vagina and three treatments of 22 hours are given during a period of three weeks, or a total of 7260 to 7788 milligram hours. The diameter of the intrauterine, rubber-covered, applicator is 7 MM, and the size of the three rubber covered, plaque-like, vaginal applicators usually used in approximately 8 x 23 x 28 MM each.

The Improved Swanberg No. 5, No. 6, No. 7, No. 8 and No. 9 Uterine, Radium Applicators facilitate the adoption of the Paris, Stockholm, or Marie Curie Hospital Technics. They each consist of two parts— a Uterine Stem and a Vaginal End Part.

The Uterine Stem is a slender, tubular stem of silver, (insuring a minimum amount of cervical dilatation in connection with its use), consisting of a number of graduated sections which permit assembling the applicator to individual uterine canal measurements (2.5 to 11 cm. long). This part of the applicator is no longer covered with aluminum (Regaud and Lacassagne have abandoned aluminum as a secondary filter using only rubber or cork) but is readily covered with one or more layers of Non-Metallic Rubber (See "Non Metallic Rubber" P. 15).

Included with the applicator is a 15 degree angle wedge, which can be used at any distance along the length of the uterine stem, thus providing an angulated applicator which conforms more closely to the normal curve of the uterine canal. Since the uterine stem does not fit tight in the vaginal portion of the applicator, the stem can be angulated (when angle wedge is used) in any direction in relation to the vaginal part. There is also included a screw-cap end for the uterine stem so that the applicator can be used without a vaginal portion. This is threaded for an introducing handle.

The Vaginal End part of the Applicators is available in three different types:

- (a) Single Capsule, Cross-Arm Type for the Paris Technic. (Most popular type and the one supplied unless otherwise specified)
- (b) Double Capsule Type for the Paris Technic.
- (c) Plaque-Like Type for the Marie Curie Hospital Technic.

\*For more complete details of the Paris and London technics see Swanberg, Harold: What Radiation Technic Gives the Best Clinical Results in Uterine Cervical Cancer? Mississippi Valley Medical Journal, Incorporating the Radiologic Review, 61: 57-65 (March) 1939.

# SWANBERG SILVER, UTERO-VAGINAL, APPLICATORS MADE IN FIVE FORMS

These are made of special silver alloy (density 10.3), which corresponds to approximately half the density of platinum (21.4). In ascertaining the form of applicator desired, three things must be considered; (a) the filtration desired with the Radium technic to be used (best expressed in millimeters of platinum or equivalent); (b) the size (length and diameter) of the Radium forms to be placed in the applicator; and (c) the filtration provided by the Radium forms to be used (which must be added to the filtration provided by the applicator itself). The vaginal cross-arm portion of the applicator is so arranged that silver capsules, providing a variety of filtration can be used. (See Silver Screw-Cap Capsule, P. 6). The entire applicator, when assembled for use, should be covered with at least one layer of Non-Metallic Rubber, which will add a minimum of 1.6 MM to the total diameter of the instrument when ready for use. The uterine stem is designed to provide filtration equivalent to the density of 1 or 1.5 MM of platinum (allowing for the filtration provided by the Radium forms enclosed therein). If the filtrations listed below will not provide the density you wish, or accommodate your Radium forms, we can supply a uterine stem to your specific requirements for \$10.00 extra,—total cost of complete applicator, \$48.00. (Let us know the length, diameter, wall thickness, and type of metal in the Radium forms to be used; also number to be enclosed in the instrument).

**No. 5**—Provides filtration, in the uterine stem, equivalent to the density of 0.7 MM of platinum, and is especially recommended for use with 0.3 MM wall platinum Radium forms. Dimensions:

Uterine Portion	{	Central Bore 2.8 MM
		Wall thickness 1.5 MM
		Outside diameter 5.8 MM

The Vaginal Portion consists of a single cross-arm 2 MM. aluminum shell, in which is placed a silver capsule (of appropriate dimensions depending upon the filtration desired. See Silver Screw-Cap Capsules. P. 6). Dimensions:

Outside diameter 13.5 MM; Outside length 27 MM (or 34 MM) (Can also be supplied with a Double-Capsule Vaginal End or Plaque-Like Vaginal End—See P. 4).

**No. 6**—Provides lighter filtration than No. 5, in the uterine stem, equivalent to the density of 0.5 MM of platinum, and is especially recommended for use with 0.5 MM or 1 MM wall platinum Radium forms. Dimensions:

Uterine Portion	{	Central bore 3.8 MM
		Wall thickness 1 MM
		Outside diameter 5.8 MM

The Vaginal Portion consists of a single cross-arm 2 MM aluminum shell, in which is placed a silver capsule (of appropriate dimensions depending upon the filtration desired. See Silver Screw-Cap Capsules. P. 6). Dimensions:

Outside diameter 13.5 MM; Outside length 27 MM (or 34 MM) (Can also be supplied with a Double-Capsule Vaginal End or Plaque-Like Vaginal End—See P. 4).

**No. 7**—Provides heavy filtration, in the uterine stem, equivalent to the density of 1.2 MM of platinum and is especially recommended for use with 0.3 MM wall platinum Radium forms for those desiring extra heavy filtration. Dimensions:

Uterine Portion	{	Central bore 1.5 MM
		Wall thickness 2.5 MM
		Outside diameter 6.5 MM

The Vaginal Portion consists of a single cross-arm 2 MM aluminum shell, in which is placed a silver capsule (of appropriate dimensions depending upon the filtration desired. See Silver Screw-Cap Capsules. P. 6). Dimensions:

Outside diameter 13.5 MM; Outside length 27 MM (or 34 MM) (Can also be supplied with a Double-Capsule Vaginal End or Plaque-Like Vaginal End—See P. 4).

**No. 8**—Provides filtration, in the uterine stem, equivalent to the density of 0.8 MM of platinum and can only be used with 0.2 MM wall platinum Radium cells, providing an unusually slender uterine stem. Dimensions:

Uterine Portion	{	Central bore 1.2 MM
		Wall thickness 1.7 MM
		Outside diameter 4.6 MM

The Vaginal Portion consists of a single cross-arm 2 MM aluminum shell, in which is placed a silver capsule (of appropriate dimensions depending upon the filtration desired. See Silver Screw-Cap Capsules. P. 6).

Outside diameter 13.5 MM; Outside length 27 MM (or 34 MM) (Can also be supplied with a Double-Capsule Vaginal End or Plaque-Like Vaginal End—See P. 4).

**No. 9**—Provides filtration, in the uterine stem, equivalent to the density of 0.8 MM of platinum and is especially recommended for use with 0.2 or 0.3 MM wall platinum forms. Dimensions:

Uterine Portion { Central bore 2.4 MM  
Wall thickness 1.7 MM  
Outside diameter 5.8 MM

The Vaginal Portion consists of a single cross-arm 2 MM aluminum shell, in which is placed a silver capsule (of appropriate dimensions depending upon the filtration sired. See Silver Screw-Cap Capsules. P. 6). Dimensions:

Outside diameter 13.5 MM; Outside length 27 MM (or 34 MM). (Can also be supplied with a Double-Capsule Vaginal End or Plaque-Like Vaginal End—See P. 4).

In ordering the Swanberg Utero-Vaginal Applicator, the smaller length, (27 MM) single cross-arm vaginal end is supplied, unless otherwise specified. It is important, however, that the size of the Silver Screw Cap Capsule (3W, 3X, or 3Y) to be enclosed in the vaginal end, be specified; the 3W capsule is supplied unless otherwise instructed.

#### SPECIAL VAGINAL ENDS FOR SWANBERG APPLICATOR

In addition to the popular cross-arm aluminum shell, containing a single silver capsule, two other vaginal ends are available for the Swanberg Utero-Vaginal Applicator—(a) a Double-Capsule Vaginal End and (b) a Plaque-Like Type Vaginal End.

#### DOUBLE-CAPSULE VAGINAL END

This consists of a 2 MM aluminum shell in which are placed two silver capsules of appropriate dimensions, depending upon the filtration desired. Any of the capsules described on Page 6 will fit in the special double capsule vaginal end for the Swanberg Utero-Vaginal Applicator. With this applicator, two Radium centers are placed in the vagina instead of one. This is desirable when the vaginal vault is very spacious and the Swanberg Utero-Vaginal Applicator is used with a colpostat or several London Capsules. It is also convenient when the vaginal vault is small and it is impossible to use a colpostat or London capsules in addition to the Swanberg Applicators. Dimensions:

Width 28.5 MM Thickness 13.5 MM Length 28.5 MM (or 35.5 MM)

In ordering the Double-Capsule Vaginal End the smaller length size will be supplied unless otherwise stated.

#### PLAQUE-LIKE TYPE VAGINAL END

This consists of a special silver alloy (density 10.3) vaginal applicator, plaque-like in size, containing 4 compartments for Radium centers, (usually 5 mgs. each), parallel to one another. It is especially designed to carry out the modified Stockholm (Heyman) technic as used at the Marie Curie Hospital in London (Hurdon and Gilmour). This vaginal applicator may be attached to the Uterine stem of the Swanberg Applicator or used as an individual vaginal applicator, and is, therefore, available in two forms; an end that is to be screwed on the Swanberg Applicator and has a grooved part for insertion with a uterine dressing forceps; or an end that is to be used as a separate vaginal applicator and which does not have the screwed portion for the Swanberg Applicator. It is threaded for an introducing handle. If Plaque-Like Type Applicators are desired as individual vaginal applicators be sure to state when ordering. It provides filtration equivalent to the density of 1 MM of platinum, should preferably be used with 0.3 MM wall platinum forms, and be covered with 2 layers of Non-Metallic Rubber. Dimensions:

Central bore for Radium centers 1.9 MM  
Inside length for Radium 21.5 MM  
External width 20 MM  
External length 25 MM  
Total Thickness 6.1 MM

If the filtration, listed above, will not provide the density you wish with the Radium forms to be enclosed therein, the applicator can be supplied to your specific requirements for \$5.00 extra. (Let us know the length, diameter, wall thickness, and



### ADVANTAGES OF THE IMPROVED SWANBERG, SILVER, UTERO-VAGINAL RADIUM APPLICATOR

1. Provides a single instrument for irradiating the entire uterine canal as well as the vaginal portion of the cervix, with filtration of your choice (being especially adapted for carrying out technics of heavily filtered Radium from multiple centers such as used at the University of Paris, Marie Curie Hospital of London, Radiumhemmet of Stockholm, etc.).
2. Being readily adjustable, uterine canals of various lengths may be adequately irradiated.
3. Offers heavy filtration which permits only the penetrating radiation from the hard gamma rays of short wave length, thus avoiding caustic radiation with its attending necrosis and subsequent sloughing, reducing the possibility of fistula formation.
4. Provides an angulated uterine stem, which may be placed anywhere along the stem, and which may be readily adjusted in its relation to the vaginal portion of the applicator.
5. Provides a variety of vaginal parts for the applicator and a choice of filtration (applicator may be also used without a vaginal part).
6. The entire applicator can be readily sterilized by boiling without fear of damaging the instrument.
7. Caustic secondary radiation from the applicator can be readily absorbed by covering it with one or more layers of Non-Metallic Rubber as desired.
8. By the use of separate screw caps, it is possible to convert the uterine extension parts into separate capsules, thus converting the applicator into one of universal applicability.
9. Can be procured at a much lower cost than an applicator of platinum or gold filtration.

### MODIFIED LONDON VAGINAL RADIUM APPLICATOR

This type of vaginal Radium applicator, originally used at the Radium Institute of London, is especially designed to administer heavily filtered Radium from multiple centers in the treatment of malignant conditions of the vagina, uterine cervix, or parametria. It has been recently improved and consists of a nearly unbreakable cylindrical, moulded, bakelite (density 1.38), screw-cap capsule with rounded ends in which is placed a heavily filtered capsule containing the Radium. The applicator is introduced by means of an introducing handle about eight inches long, which screws in the side of the bakelite capsule into a brass lug (which also contains an eyelet for thread). In treating uterine cervical cancer, 2 to 4 of these vaginal applicators are generally used, in addition to an intra-uterine applicator. The applicators are placed in proper position by means of the introducing handles. The vagina is then packed with gauze and the handles are not unscrewed and removed until the packing of the vagina is complete.

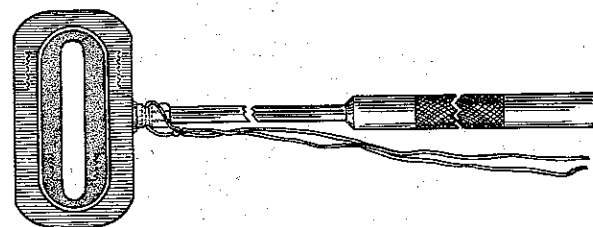


Fig. 3. Modified LONDON Bakelite Vaginal Applicator, showing silver capsule contained therein, together with introducing handle. Actual size of No. 6 London Applicator and 3W silver capsule.

### ADVANTAGES OF MODIFIED LONDON VAGINAL RADIUM APPLICATOR

This applicator is especially designed to replace the use of a vaginal colpostat in treating uterine cancer. The advantages are:

1. The ends are so rounded that the applicators can be comfortably placed and the pressure on the vaginal mucous membrane is evenly distributed.
2. The wall thickness of the bakelite is sufficient to form a secondary screen which permits of a large Radium dose within the limits of tissue tolerance.

3. By using molded bakelite (as supplied in the popular No. 6 applicator) the applicator is almost unbreakable and will not crack when sterilized by boiling.

4. As many applicators can be used as the anatomical size of the part will permit.

5. The applicators can be inserted with ease and correctly placed by means of the introducing handles.

6. By holding the applicators in accurate position by means of the handles while the vagina is packed with gauze, the applicators will remain in correct position during the treatment period.

7. The applicators are ideal in carrying out the Paris (Regaud and Lacassagne) Technic or the Stockholm (Heyman) Technic in treating uterine cancer, especially when used in connection with the SWANBERG Utero-Vaginal Applicator, either with or without its vaginal part.

#### MODIFIED LONDON VAGINAL RADIUM APPLICATOR MADE IN TWO SIZES

No. 5. Made of laminated bakelite. Designed to enclose the 3W, 3X, or 3Y Silver capsules and is of the same external dimensions as the vaginal applicators used at the University of Paris.

Central bore 9.4 MM		Outside diameter 20 MM
Inside length 24.5 MM	Wall thickness 5.3 MM	Outside length 30 MM
(or 31.5 MM)		(or 37 MM)

No. 6. Made of molded bakelite. Designed to enclose the 3W, 3X, or 3Y Silver capsule being practically of the same dimensions as the No. 5 except of smaller external diameter. The external diameter may be increased, when desired, by the addition of one or more layers of Non-Metallic Rubber.

Central bore 9.4 MM		Outside diameter 15.6 MM
Inside length 24.5 MM	Wall thickness 3.1 MM	Outside length 28 MM
(or 31.5 MM)		(or 35 MM)

In ordering the Modified London Vaginal Bakelite Capsules, the smaller length size, in each form, will be supplied unless otherwise specified.

#### SILVER SCREW-CAP CAPSULES

In order to provide heavily filtered Radium for the colpostat or the Modified London Bakelite Vaginal Capsules (which should be used in conjunction with the SWANBERG Utero-Vaginal Applicator) to secure the best results in uterine malignancy, several screw-cap capsules, made of special silver alloy (density 10.3) are provided. Any of these capsules will fit in the aluminum shell of the single cross-arm portion of the SWANBERG Utero-Vaginal Applicator or the double-capsule vaginal end. The capsules are designed to provide filtration, equivalent to the density of 1, 1.5, or 2 MM of platinum (allowing for the filtration provided by the Radium forms enclosed therein). If the capsules listed below will not provide the density you wish or accommodate your Radium forms we can supply capsules to your specific requirements for only \$1.50 extra per capsule, total cost \$6.50. (Let us know the length, diameter, wall thickness and type of metal in the Radium forms to be used; also number to be enclosed in the capsule).

No. 3W SILVER SCREW-CAP CAPSULE. Provides heavy filtration which has the density of 1.3 MM of platinum. It can be inserted in the aluminum shell of the vaginal portion of any of the SWANBERG Utero-Vaginal Applicators; (also in the double-capsule vaginal end), in a colpostat, or in a No. 5 or 6 Modified London Bakelite Capsule to provide the principal applicators to irradiate the vaginal vault in carrying out the Paris Technic. Dimensions:

Central bore 3.5 MM		Outside diameter 8.9 MM
Inside length 21.5 MM	Wall thickness 2.7 MM	Outside length 24 MM
(or 28.5 MM)	Silver	(or 31 MM)

No. 3X SILVER SCREW-CAP CAPSULE. Provides heavy filtration which has the density of 1 MM of platinum. It can be inserted in the aluminum shell of the vaginal portion of any of the SWANBERG Utero-Vaginal Applicators (also in the double capsule vaginal end), in a colpostat, or in a No. 5 or No. 6 Modified London Bakelite Capsule. Dimensions:

Central bore 4.7 MM		Outside diameter 8.9 MM
Inside length 21.5 MM	Wall thickness 2.1 MM	Outside length 24 MM

**No. 3Y SILVER SCREW-CAP CAPSULE.** Provides extra heavy filtration which has the density of 1.8 MM of platinum. It can be inserted in the aluminum shell of the vaginal portion of any of the SWANBERG Utero-Vaginal Applicators (also the double capsule vaginal end), in a colpostat, or in a No. 5 or No. 6 Modified London Bakelite Capsule. Dimensions:

Central bore 1.5 MM		Outside diameter 8.9 MM
Inside length 21.5 MM	Wall thickness 3.7 MM	Outside length 24 MM
(or 28.5 MM)		(or 31 MM)

In ordering Silver Screw-Cap Capsules, the smaller length size, in each form, will be supplied unless otherwise specified.

### KAPLAN VAGINAL COLPOSTAT

(As used in Bellevue Hospital and the New York City Cancer Institute)

Designed by Ira I. Kaplan, B.S., M.D., Prof. of Clinical Surgery, New York University Medical College, the KAPLAN Vaginal Colpostat is a modification of the Curie Colpostat. It consists of two rubber barrels (in which heavily filtered Radium capsules are placed) held together by a clock spring covered with rubber. The applicator is inserted in the vagina and manipulated so that a barrel is placed in each lateral vaginal fornix, thus radiating the cervix and parametria. Used in conjunction with the SWANBERG Utero-Vaginal Applicator, it is the principal vaginal applicator for carrying out the Paris technic for treating uterine malignancy. The barrels are 18 x 30 MM with 5 MM walls. Any of the silver screw-cap capsules, described in this leaflet, can be placed in the barrels.

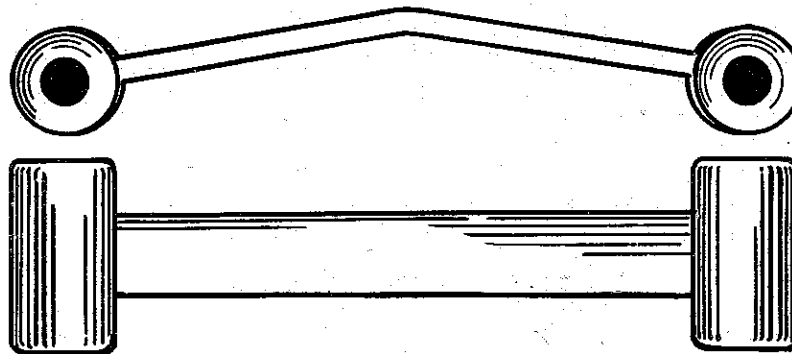


Fig. 5. Upper, End View: Fig. 10—Lower, Side View of the KAPLAN Vaginal Colpostat. (Three-Quarters Actual Size).

### X-RAY THERAPY OF CHRONIC ARTHRITIS

(Including the X-Ray Diagnosis of the Disease)

by KARL GOLDHAMER, M.D.

Formerly Roentgenologist, University of Vienna.

With Foreword by

HAROLD SWANBERG, B.S., M.D., F.A.C.P.

Editor, Mississippi Valley Medical Journal and Radiological Review.

This, the first exhaustive treatise on the X-ray treatment of chronic arthritis, is based on the author's extensive experience of nearly 20 years in the treatment of this common disorder in both Vienna and this country. The monograph covers the clinical aspects and pathology of chronic arthritis, its roentgen diagnosis and differential diagnosis, the history of X-ray therapy and how X-rays act in chronic arthritis, what cases should be treated by X-rays, technic of treatment, report of cases, and results. A monograph of 131 pages with numerous illustrations by the author. Postpaid \$2.00.

RADIOLOGIC REVIEW PUBLISHING CO.

P. O. Drawer 110

Quincy, Illinois

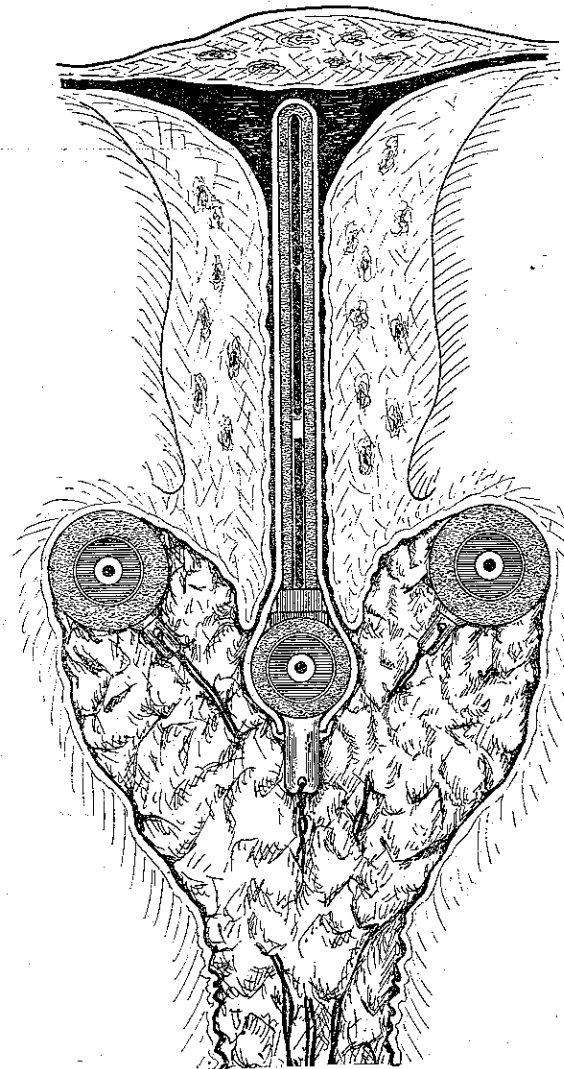


Fig. 4. Illustrating the SWANBERG Radium Technic (a modification of the Paris Technic) in the Treatment of Uterine Cervical Cancer. The SWANBERG No. 8 Utero-Vaginal Applicator is covered with one thickness of Non-Metallic Rubber; two No. 6 Modified LONDON Applicators, containing 3W silver capsules, are in the lateral vaginal fornices. SWANBERG, long active-centered, 10 milligram Radium cells are shown in the applicators—three in the uterine canal, three in the vaginal wall. (Total 60 milligrams). The applicators are maintained in correct position by means of a voluminous gauze vaginal pack. In a typical case 7200 milligram hours of radiation are administered. (Actual Size).



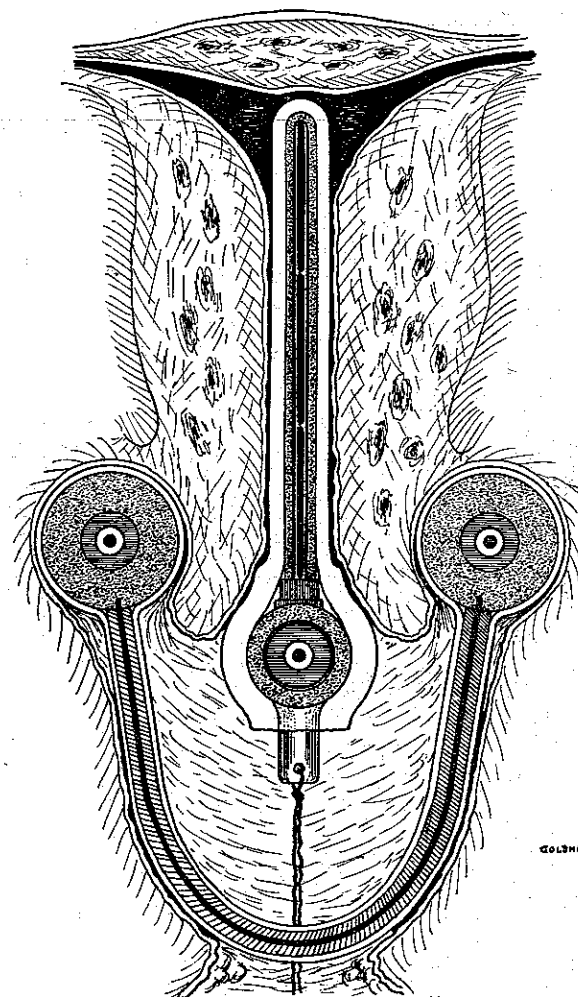


Fig. 6. Illustrating the SWANBERG No. 8 Silver Utero-Vaginal Applicator, the uterine stem of which is covered with two layers and the vaginal end with four layers of Non-Metallic Rubber; the KAPLAN Vaginal Colpostat is also shown, covered with one layer of Non-Metallic Rubber. The SWANBERG special long active centered, 10 milligram Radium cells are shown in the applicators. This arrangement provides applicators that are identical in size and filtration with those used at the University of Paris in treating uterine cervical cancer—three Radium centers in the uterine canal and three in the vaginal vault. Gauze packing to hold the applicators in correct situ is not shown. Actual size.

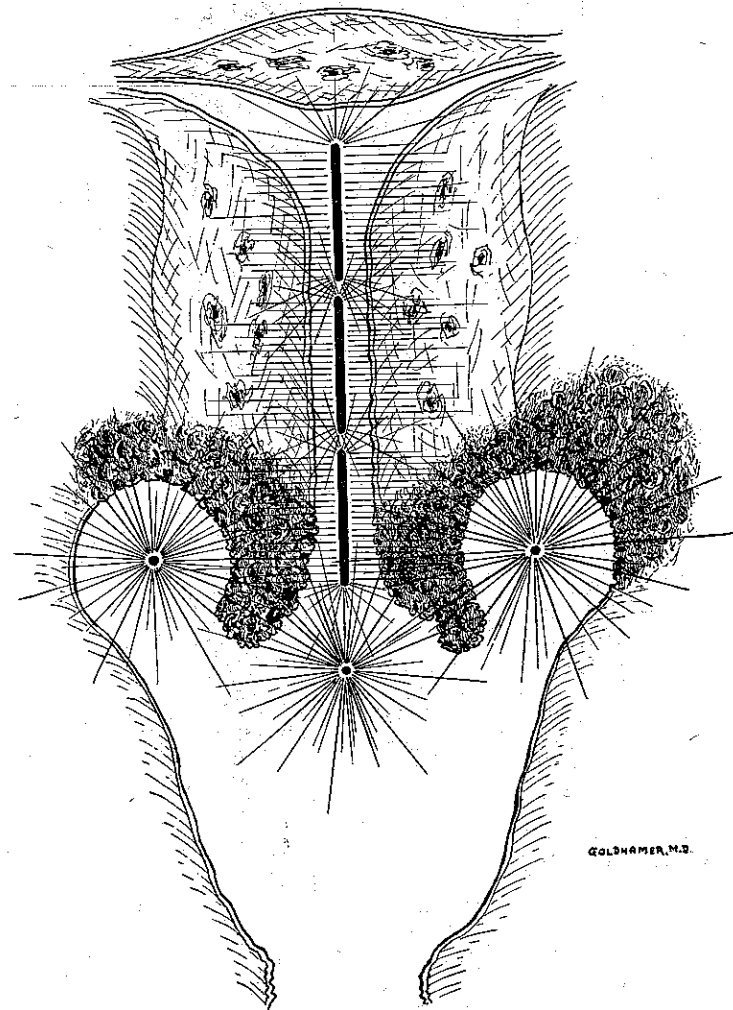


Fig. 7. A schematic drawing showing an advanced Stage 2 uterine cervical cancer in a patient with normal sized anatomic parts. The position of the Radium centers, in accordance with the Paris Technic, are shown in the uterine canal (3) and vaginal vault (3), thus radiating the entire uterus, the vaginal vault, cross-firing on the cervix and sending radiation into the parametria. This technic is readily carried out by using the SWANBERG Utero-Vaginal Applicator, with the addition of London Vaginal Applicators or some type of Vaginal Colpostat.

## USERS OF THE SWANBERG UTERO-VAGINAL APPLICATOR

During the past 14 years hundreds of these applicators have been sold to radiologists and hospitals in many countries of the world. The following is a PARTIAL list of some of the purchasers:

Alameda County Hospital, Oakland, California.  
 Arnett-Crockett Clinic, Lafayette, Indiana.  
 Bethany Methodist Hospital, Kansas City, Missouri.  
 Beth Israel Hospital, Boston, Massachusetts.  
 Boulder-Colorado Sanitarium, Boulder, Colorado.  
 Duke University, Durham, North Carolina.  
 Duluth Clinic, Duluth, Minnesota. (Dr. Russell J. Moe)  
 Employees' Hospital, (Tenn. Coal, Iron & R. R. Co.), Fairfield, Alabama.  
 Fargo Clinic, Fargo, North Dakota.  
 Gallinger Municipal Hospital, Washington, D. C.  
 Hackley Hospital, Grand Rapids, Michigan.  
 Hamilton General Hospital, Hamilton, Canada. (Dr. A. E. Walkey)  
 Harris Clinic, Fort Worth, Texas.  
 Henry Ford Hospital, Detroit, Michigan.  
 Jeanes Hospital, Fox Chase, Philadelphia, Pennsylvania.  
 Jefferson Davis Hospital, Houston, Texas.  
 Jewish Hospital, Cincinnati, Ohio. (Dr. Archibald Fine)  
 Los Angeles Medical Group and Clinic, Los Angeles, California. (Dr. Hiram Weaver)  
 Lovelace Clinic, Albuquerque, New Mexico.  
 McGill University (Royal Victoria Hospital), Montreal, Canada.  
 Medical and Surgical Clinic, San Antonio, Texas.  
 Medical & Surgical Clinic, Sherman, Texas.  
 Mercy Hospital, Canton, Ohio. (Dr. Chester M. Peters)  
 Methodist Episcopal Hospital, Philadelphia, Pennsylvania.  
 Monmouth Memorial Hospital, Long Branch, New York.  
 Mountinside Hospital, Montclair, New Jersey.  
 Oklahoma Skin and Cancer Clinic, Oklahoma City, Oklahoma. (Drs. Lain & Roland)  
 Peabody Hospital and Clinic, Webster, South Dakota.  
 Philadelphia General Hospital, Philadelphia, Pa. (Drs. B. P. Widmann and J. L. Weatherwax)  
 Radium Institute of New Orleans, New Orleans, Louisiana.  
 Roper Hospital, Charleston, South Carolina. (Dr. Hillyer Rudisell, Jr.)  
 Royal Jubilee Hospital, Victoria, Canada. (Dr. W. M. Carr)  
 Sacred Heart Hospital, Manchester, New Hampshire.  
 Santa Monica Hospital, Santa Monica, California.  
 St. Bernard Hospital, Chicago, Illinois. (Dr. L. B. Donkle)  
 St. Louis City Hospital, St. Louis, Missouri. (Dr. Leroy R. Sante)  
 St. Luke's Hospital, Duluth, Minnesota.  
 St. Mary's Hospital, Decatur, Illinois. (Dr. F. Flinn)  
 St. Mary's Hospital, Grand Rapids, Michigan.  
 St. Paul's Hospital, Vancouver, Canada.  
 Shreveport Charity Hospital, Shreveport, Louisiana. (Dr. H. G. F. Edwards)  
 Sutter Hospital, Sacramento, California.  
 Tuomey Hospital, Sumter, South Carolina. (Dr. W. G. Benjamin)  
 University of Alberta, Edmonton, Canada. (University Hospital).  
 University of Kansas, Kansas City, Kansas. (Bell Memorial Hospital).  
 University of Oregon, Portland, Oregon.  
 University of Toronto, Toronto, Canada. (Toronto General Hospital, Dr. G. E. Richards).  
 Victoria Hospital Association, Victoria, Texas.  
 West Texas Hospital, Lubbock, Texas.  
 Woman's Hospital, Detroit, Michigan.

Ball Memorial Hospital, Muncie, Indiana.  
 Dr. H. W. Ackerman, Rockford, Illinois.  
 Dr. O. D. Baxter, Sumpter, South Carolina.  
 Dr. G. D. Bliss, Altoona, Pennsylvania.  
 Dr. R. H. Crockett, San Antonio, Texas.  
 Dr. Alfredo G. Dominguez, Havana, Cuba.  
 Dr. F. H. Domnissee, Cape Town, South Africa.  
 Dr. Edwin C. Ernst, St. Louis, Missouri.  
 Dr. L. F. Fisher, South Bend, Indiana.  
 Drs. Grover, Christie & Merritt, Washington, D. C.  
 Dr. A. E. Hatcher, Wellington, Kansas.  
 Drs. Ivey & Howard, Goldsboro, North Carolina.  
 Dr. Peter J. Kapo, Mahoney City, Pennsylvania.  
 Dr. James Kelly, Omaha, Nebraska.  
 Dr. Sidney Lange, Cincinnati, Ohio.  
 Dr. H. I. L. Loverud, Manchester, N. H.  
 Dr. Gonzalez Martinez, San Juan, Porto Rico.  
 Dr. H. G. Maul, Denver, Colorado.  
 Dr. W. H. McGuffin, Calgary, Alberta, Canada.  
 Drs. Menville & Ane, New Orleans, Louisiana.  
 Dr. O. L. Norrworthy, San Antonio, Texas.

Dr. R. K. Paterson, Ottawa, Ontario, Canada.  
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 Dr. Robert A. Powers, Palo Alto, California.  
 Dr. Edward Reinert, Columbus, Ohio.  
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 Dr. Harry C. Saltzstein, Detroit, Michigan.  
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 Dr. Robert W. Shipp, Austin, Texas.  
 Dr. F. W. Smythe, Memphis, Tennessee.  
 Dr. F. C. Swearingen, Pomona, California.  
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 Dr. M. A. Thomas, Cleveland, Ohio.  
 Dr. M. Truehart, Sterling, Kansas.  
 Dr. A. F. Tyler, Omaha, Nebraska.  
 Dr. W. Warner Watkins, Phoenix, Arizona.  
 Drs. Watt & Watt, Austin, Texas.  
 Dr. L. S. Weaver, York, Pennsylvania.  
 Dr. John Wehrly, Santa Ana, California.  
 Dr. H. H. Woods, Topeka, Kansas.  
 Dr. Harold Zimmerman, Sacramento, California.



Fig. 9. SWANBERG Special 1 MM. Brass Applicator with flexible wire screw cap. (Other cap types are available.) The flexible wire provides a semi-rigid handle which facilitates ready insertion.

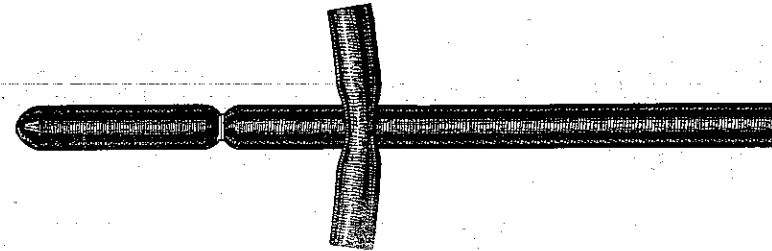


Fig. 10. SWANBERG Special 1 MM. Brass Applicator enclosed in a blind-end rubber tube with adjustable rubber cross-arm piece.

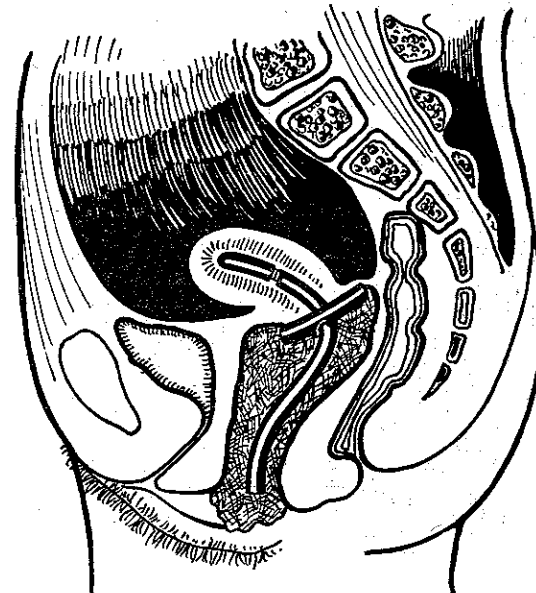


Fig. 11. Illustrating the SWANBERG Special 1 MM. Brass Applicator, covered with a blind-end rubber tube and adjustable rubber cross-arm piece, as it appears when placed in the body of the uterus. It can be assembled in any desired length (depending upon length of the uterine canal) and the flexible wire screw cap facilitates ready insertion but the applicator handle to be bent to conform to the direction of the uterine canal. It is maintained in correct position by a voluminous gauze vaginal packing.

#### SWANBERG SPECIAL 1 MM. BRASS APPLICATOR

The SWANBERG Special 1 MM. Brass Applicator is designed for lightly filtered intra-uterine application and is especially adapted for treating non-malignant conditions, although it is of universal applicability. It is a simple tubular applicator consisting of a number of graduated sections which permit assembling the applicator to any desired length. The filtration is 1 MM. of brass (density 8.5). It is made with a central bore of 4 sizes—2.8 MM., 3.5 M.M., 4 MM., and 4.5 MM., with individual sections, 1 CM., 2 CM., and 3 CM. in length, and is provided with four different types of screw cap ends. It can be readily covered with one or more layers of non-metallic rubber or enclosed in a blind-end rubber tube.

Reprints describing in detail the use of this applicator in treating benign uterine hemorrhage and uterine fibroids will be gladly sent upon request.

## SWANBERG RADIUM TECHNIC FOR UTERINE CERVICAL CANCER

Over twenty years' experience with the radiation treatment of carcinoma of the uterine cervix, during which time approximately 2,000 patients with uterine cancer have been treated, has resulted in the adoption of a modified Paris Radium Technic as the simplest to apply and the most effective in this disease. This has become known as the SWANBERG Radium Technic or more correctly the SWANBERG modification of the Paris Radium Technic (see Figure 4) in uterine cancer and has for its basis the SWANBERG Utero-Vaginal Applicator. A reprint describing the technic will be gladly furnished on request (Swanberg, Harold: A Modification of the Paris Technic for Uterine Cervical Cancer With Use of an Improved Radium Applicator. Mississippi Valley M. J., 63:54-64, March, 1941). The SWANBERG Radium Technic is most effective when used in connection with the SWANBERG Radium Cells.

Swanberg has also devised a 10 milligram Radium cell that is especially recommended for the SWANBERG No. 8 Applicator. It is 1 x 20 mm. with an 0.2 mm. platinum wall and the Radium itself is distributed 18 mm. in length in the cell, thus providing an almost uninterrupted source of Radium when the cells are placed in tandem arrangement in the uterine stem. (5 milligram cells, exactly one-half the length of the 10 milligram cells, are also available.) A reprint giving complete description of the cells will be gladly sent on request. (Swanberg, Harold: Uterine Cancer—An Advance in Radium Technic. Radiol. Rev. & Mississippi Valley M. J., 60:141-142, July, 1938, and Gynecologic Radium Therapy. Illinois M. J., 74:344-350, Oct., 1938).



A.



B.

Fig. 12. A. Old Style Radium needle containing 10 milligrams, size 1.75 x 27.5 mm. with wall thickness of 0.4 mm. of non-corrosive steel or monel metal (density 8.7); Radium occupies about one-third of the length of the needle—10 mm. (Twice actual size).

B. The SWANBERG designed, long active centered, Radium cell containing 10 milligrams, size 1 x 20 mm. with a wall thickness of 0.2 mm. of platinum (density 21.4); Radium occupies 90 percent of the length of the cell—18 mm. (Twice actual size.)

## 5 YEAR END-RESULTS RADIATION TREATMENT OF CERVICAL CANCER

The following is the five year statistical study of the 1933 series (latest to be reported) of patients treated at The Radium Institute (Regaud and Lacassagne) of the University of Paris. It comprises all the patients suffering from cervical cancer treated at the Institute during that year. Irradiation therapy was used exclusively, —all patients had microscopic proof of the disease, and all patients lost track of or who died from intercurrent disease during the 5 year interval were considered cancer deaths. Of 125 patients treated, representing all stages of uterine cervical cancer, 59 were alive without evidence of cancer five years later, representing a five year curability of 47.2 per cent—the highest per cent of cures reported for this disease of any institution reporting to the League of Nations. Considering the method of compiling the statistical data, and the fact that 51% of the patients had advanced cancers (Stage 3 and 4 growths) when the treatment was begun, these results are truly remarkable. Had these statistics been compiled on the basis more commonly used, that is: (1) patients dying from intercurrent disease not considered cancer deaths; and (2) patients alive but suffering from recurrent cancer not considered as cancer deaths, the 5 year salvage for the series would be 52.8 per cent.

Stage of Disease*	Patients Treated	% Each Stage	Cured End 5 Years	% 5 Yr. Cures
Stage 1	16	12.8	13	86.7
Stage 2	45	36	23	51.1
Stage 3	50	40	20	40
Stage 4	14	11.2	3	21.4
Total	125	100%	59 Aver.	47.2%

\*The stages of the disease outlined by the Radiological Subcommittee of the League of Nations.

(Annual Report on the Results of Radiotherapy in Cancer of the Uterine Cervix. Fourth Volume. Edited by Prof. J. Heyman. League of Nations Publications, Geneva and Stockholm 1941).

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15. Swanberg, Harold: An Improved Uterine Applicator, Am. J. Roentgenol. 40:932-934 (Dec.) 1938.
16. Swanberg, Harold: A Modification of the Paris Radium Technic for Uterine Cervical Cancer With Use of an Improved Radium Applicator. Mississippi Valley M. J., 63:54-64 (March) 1941.

#### RADIATION VERSUS SURGERY UTERINE CERVICAL CANCER

If two groups, each comprising 100 unselected patients suffering from the various stages of uterine cervical cancer, (presuming the stage percentages found in 1796 treated patients in 18 League of Nations' reporting radiotherapeutic centers; viz. 42% early cases, Stage 1 and 2, and 58% advanced cases, Stage 3 and 4) would apply to the large clinics reporting the most favorable five-year surgical and radiation end-results (presuming 100 patients in each group) a careful statistical study would show: 17 alive and free from cancer at the end of 5 years who elected the surgical treatment (Weibel Clinic of Vienna); 46 survivors from those taking the radiation treatment (the Radium Institute of the University of Paris). The results, therefore, from the radiation treatment would be approximately 173% better than from the surgical treatment.

(Swanberg, Harold: Results of Radiation Therapy in Uterine Cervical Cancer (1933). Medical Journal Incorporating the Radiologic Review, March 1942).



## IMPORTANCE OF NON-METALLIC RUBBER

The proper primary filtration of Radium applicators is of great consideration. The emergent soft secondary radiation emitted at the surface of the metal filter of the Radium applicators should preferably be absorbed by a soft substance containing no element of high density or high atomic weight; Non-Metallic Rubber is ideal for this purpose. This material is a pure gum rubber, free from metallic substances, and does not emit caustic secondary radiations. It should not be confused with Commercial Rubber. The use of Commercial Rubber, or other substances containing elements of high atomic number, places in direct contact with the tissues an element which acts as a source of caustic secondary radiation. The importance of eliminating caustic secondary radiation increases in proportion to the time of application. Where the treatment extends over a number of days it is especially desirable that Radium applicators be covered with Non-Metallic Rubber, otherwise there may be danger of secondary radiation reactions.

Our product is manufactured in the United States especially for use as a secondary filter for Radium applicators and replaces the use of aluminum. It is practically odorless and tasteless (very desirable for mouth applicators) and readily adheres to itself. It is 0.8 MM thick, has a density 0.93, and is supplied in 10 cm. (4 inch) spools, 1¼ to 1½ lbs. each, price per spool \$4.00.



Fig. 8. Illustrating one of our Blind-End Rubber Tubes . Actual size of Tube 1 A.

## BLIND-END RUBBER TUBES

We have manufactured, especially for radium work, a number of different size Blind-End Rubber Tubes to enclose Radium applicators. These are especially desirable in carrying out certain Radium technics, and can be sterilized and reused. These tubes are available in Non-Metallic Rubber, or rubber which has a slight amount of metallic substance; the latter product is somewhat more durable and will be supplied on orders unless the Non-Metallic Tubes are specifically requested. The price is the same for both products. These tubes are available in the following sizes:

- 1A—2 MM wall thickness, 3 MM central bore, 150 MM long (7 MM external diameter)
- 1B—1.5 MM wall thickness, 4 MM central bore, 150 MM long (7 MM external diameter)
- 1C—2 MM wall thickness, 5 MM central bore, 150 MM long (9 MM external diameter)
- 1D—2 MM wall thickness, 7 MM central bore, 150 MM long (11 MM external diameter)

Price 75c each or \$7.50 per dozen (assorted sizes permitted).

## RADIUM PROTECTION

There has been a tendency among owners and leasers of Radium to not give sufficient consideration to the protection necessary to store and transport Radium. Overexposure to the radiations emitted by Radium may result in serious injuries. Since the injuries do not become apparent immediately, workers may frequently be tempted to neglect routine precautions. The National Bureau of Standards has furnished definite regulations for protection from Radium and these regulations should be read in the original (National Bureau of Standards Handbook H-23; Supt. of Documents, Washington, D. C., Price 10 cents). Two measures that every owner or leaser of Radium should provide is (1) an adequate lead container to store Radium, and (2) a special lead container to be used when transporting Radium. The containers described below have been constructed to meet the National Bureau of Standards recommendations for Radium protection.

## SWANBERG RADIUM CARRYING CONTAINER

This consists of a lead cylinder with a ½ inch wall, and inside dimensions of 2 x 6 inches. It is placed in a substantial, hinged carrying case. The lead cylinder fits securely in position. The case is equipped with a handle, also a special canvas strap so it can be carried close to the ground. (This places Radium in the lead container, about 22 inches distance from the canvas handle). A convenient lock is provided. A stamped metal plate marked "Radium—Keep Away" is placed on the top of the lid. The case has reinforced corners. It meets the National Bureau of Standards specifications to afford adequate protection if 100 milligrams are placed therein and the container is

strap attached, is used to transport Radium within an institution. (Used as outlined above, the body dose resulting from carrying 100 milligrams 7 hours a day is approximately 1 "R" unit of radiation per day). The container will afford adequate protection, from local Radium injury, to a messenger, even should 200 milligrams be placed therein, provided the container is maintained at a distance of 4 or more inches away.

Weight of box and lead container approximately 15 lbs.

We have also designed a de-luxe lead Radium Carrying Container, of the same size and capacity as the lead cylinder described above, which is chromium plated. This de-luxe container is equipped with a canvas carrying handle, has stamped metal plate marked "Radium—Keep Away" and need not be placed in a carrying case.

Weight of Swanberg De-Luxe, Chromium Plated, Radium Carrying Container approximately 18 lbs.

### SWANBERG LEAD RADIUM STORAGE CONTAINER

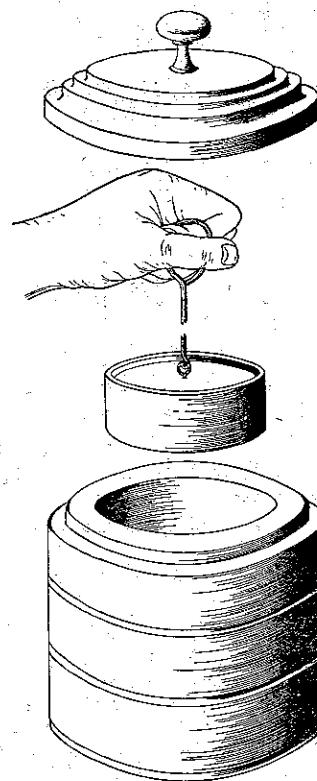


Fig. 13. SWANBERG Lead Radium Storage Container with removable lead disc. One-fourth actual size.

This lead storage container has walls 1 inch thick with outside dimensions of 5 1/4 inches wide and 7 inches high, including the handle knob on the cover. The storage space, 3 1/2 x 3 3/4 in., is provided with a removable lead disc, drilled (to order) with holes to accommodate your Radium forms. (Considering the fact that the radium forms are stored in holes drilled in the lead disc, the side wall protection is equivalent to 3 or more centimeters of lead). A special handle facilitates the ready removal of the lead disc. It meets the National Bureau of Standards recommendations to adequately protect an individual working, not to exceed 8 hours daily, if kept 4 feet distance away and not more than 100 milligrams of Radium are stored therein (50 mgs. may be safely stored at 3 feet; 200 mgs. at 6 feet). Under such circumstances the individual is exposed to approximately 0.1 "R" unit of radiation per day which is within the range of

## RADIUM BOUGHT, SOLD, AND LEASED

For nearly 20 years we have conducted a RADIUM EXCHANGE buying and selling used Radium forms. We have purchased thousands of milligrams of Radium from the estates of deceased physicians, terminated partnerships, etc., and have resold this at substantial savings. We recover Radium from old forms and construct new Radium forms. We also have Radium detectors for rent to assist in the recovery of lost Radium.

We represent the Canadian Radium and Uranium Corp., the exclusive distributors of Canadian Radium in the United States. New Canadian Radium in new containers is available in any form and in any type of container either for sale or lease. Manufacturers certificates are furnished guaranteeing freedom from mesothorium and all other short-lived radioactive substances. Radium may be purchased on a long-term monthly payment plan distributing the payment over as long a period as 4 years if desired. While there is no question that it is more economical to purchase Radium, the element may be leased if desired. Recently a plan has been worked out whereby the element may be leased and purchased later, allowing all or part of the leasing payments to apply on the purchase price.

We have furnished new and old Radium forms to scores of our leading state universities, municipalities, hospitals, clinics and prominent radiologists and we are confident we can meet your most exacting requirements.

## PRICE LIST

(All Prices Subject to Change Without Notice)

### A. SWANBERG SILVER, UTERO-VAGINAL, RADIUM APPLICATOR

No. 5, No. 6, No. 7, No. 8, or No. 9 SWANBERG Silver Utero-Vaginal Applicator, complete with uterine angle wedge, screw-cap for uterine stem threaded for introducing handle, single cross-arm vaginal end, (unless otherwise specified, the 27 MM outside length will be supplied), with choice of any size Silver capsule	\$38.00
(Replacement costs—Uterine extension parts \$3.00 each; single cross-arm vaginal end with screw cap, \$15.00; separate vaginal end screw cap, \$1.50; 15 degree uterine angle wedge, \$5.00; screw cap for uterine stem, for special curved introducing handle, \$3.00; silver capsule, \$5.00.)	
SWANBERG Silver, Utero-Vaginal, Applicator complete, as outlined above, but of special sized uterine stem	48.00
Uterine stem of No. 5, No. 6, No. 7, No. 8, or No. 9 SWANBERG Silver Applicator (with angle wedge and screw cap end for special curved introducing handle)	21.00

### B. EXTRA PARTS FOR SWANBERG SILVER, UTERO-VAGINAL, RADIUM APPLICATOR

Screw cap for uterine extensions, each (With or without eye)	2.50
Uterine angle wedge (20 degrees), each	8.00
Double-Capsule, Vaginal End (without capsules), each (Unless otherwise specified, the 28.5 MM outside length will be supplied)	20.00
Plaque-Like Type, Vaginal End, each	38.00
Plaque-Like Type, Vaginal End, to be used as an individual vaginal applicator, each	28.00
Introducing Handle (For uterine stem of SWANBERG Applicator, LONDON Applicators, or Plaque-Like Type Vaginal End when used as an individual vaginal applicator), each	1.00
(We can also supply a non-threaded, curved, Introducing Handle, especially desirable when inserted the SWANBERG Applicator without a vaginal end part. Price \$1.00)	

### C. SILVER SCREW-CAP CAPSULES AND MODIFIED LONDON APPLICATORS

3W, 3X, or 3Y Silver Capsules, each (Unless otherwise specified, the 24 MM length will be supplied)	5.00
Silver Capsules, special size other than above, each	6.50

No. 5 or No. 6 Modified LONDON Applicators, each ..... 3.00  
(Unless otherwise specified, the 28-30 MM outside length will be supplied)

#### D. SWANBERG SPECIAL 1 MM BRASS APPLICATOR

End piece, 2 cm. long, any diameter (central bore 2.8, 3.5, 4, or 4.5 MM, each ..... 2.00  
Individual sections (1, 2 or 3 cm. length) any diameter (2.8, 3.5, 4 or 4.5 MM), ..... 2.00  
each  
Screw-cap ends, Type, A, B, C, D, any diameter:  
Type A—With simple eye, each ..... 1.00  
Type B—Grooved end for introducing forceps or handle, each ..... 2.00  
Type C—Threaded for introducing handle, each ..... 1.00  
(Handle \$1.00 extra)  
Type D—With flexible wire, each ..... 2.00  
Complete Applicator consisting of 2 cm. end piece, 1, 2 and 3 cm. extension parts  
with choice of two of the four screw-cap ends listed. (Please state diameter  
of central bore desired) ..... 10.00  
Uterine angle wedge (15 degrees) extra, each ..... 3.00  
1 MM wall brass, screw-cap capsule, not to exceed 35 MM external length, each ..... 2.00  
As above, except wall thickness greater than 1 MM, each ..... 3.00

#### E. ACCESSORY SUPPLIES

Kaplan Vaginal, Double Barreled, Rubber Colpostat with extra Barrel, each ..... 7.50  
(The Silver Capsules described above will fit in this applicator)  
Special Non-Metallic Rubber, odorless and tasteless 4 inch, 1¼ to 1½ lb. spool, ..... 4.00  
each  
Blind-end Rubber Tubes (see sizes on P. 12), each 75c; 1 doz. .... 7.50  
Blind-end Non-Metallic Rubber Tubes (see sizes on P. 12), each 75c; 1 doz. .... 7.50  
Dental modeling compound, 1 lb. box, each ..... 1.20  
0.1 MM lead foil, per lb. .... .75  
0.5 MM sheet lead, per lb. .... .40  
1 MM sheet lead, per lb. .... .40  
Multiple-angle Radium Needle Insertion Forceps ..... 10.00  
Davis 10-inch Handling Forceps, each ..... 3.50  
SWANBERG 1 MM Brass Urethral applicator, each ..... 10.00  
SWANBERG Lead Radium Storage Container (including lifting handle and  
special drilling to accommodate your Radium forms) ..... 20.00  
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of the

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and

MISSISSIPPI VALLEY MEDICAL JOURNAL

Edited by

HAROLD SWANBERG, B.S., M.D., F.A.C.P.

Radiologist, St. Mary's Hospital and Blessing Hospital, Quincy, Ill.

Past President, Illinois Radiological Society, Etc.

Assisted by an Editorial Board of Internationally Known Radiologists.

Each year in March, for the past 15 years, the RADIOLOGIC REVIEW is devoted entirely to RADIUM. This special "Radium Number" has acquired a national reputation and is eagerly awaited by hundreds of physicians interested in Radium Therapy. All the articles are original and are written especially for this number. The authors include some of the foremost Radium Therapists in America. Every effort is made to make this "Radium Number" practical. It is, therefore, essentially clinical, containing articles written by leading clinical users of Radium and written in a manner that will appeal to the busy clinician. Order YOUR copy of this year's March "Radium Number" today and thus keep posted with the latest developments in this special field. Copies for the current year (or past years) 60c a copy.

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