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October 29, 1946

Dr. Eugene M. K. Geiling
Department of Pharmacology
University of Chicago
Abbott Memorial Hall
951 East 58th Street
Chicago, Illinois

REPOSITORY Argonne/CHR
COLLECTION Austin Brues Subseries
BOX No. 267
FOLDER Radium Project 1950-1952
Sources of Exposure

Dear Dr. Geiling:

Thank you very much for referring to us the question of the clinical use of radon ointment.

We have examined your statement on Alphatron Radon Ointment, and we are in agreement with the points mentioned in your general summary at the end of this statement. In particular, we believe (a) that the potential hazard involved in using this radioactive material makes it unsuitable to recommend it for general use at this time; (b) that the claims for clinical indications noted in your report go far beyond any clinical or experimental evidence which we have seen; and (c) that the apparent variation in radon content of the samples which have been analyzed is beyond reasonable limits.

We should, however, like to add that the clinical evidence which has been presented by substantial and experienced radiologists leads us to believe that it may be a useful method of treatment of radiation ulcers and that pari passu it may prove to be valuable in other conditions. Nevertheless, the points raised in your summary would appear to us to validate your conclusion that the Council is wise in not recommending inclusion of this preparation in "Apparatus Accepted" and "New and Nonofficial Remedies."

It might be pointed out here that indiscriminate distribution of radioactive materials to any individual without regard for his experience in handling radioactive substances, or for his ability to protect the patient or himself from the harmful effects of over-exposure, is a general problem which is, or should be, of concern to the medical profession. The Manhattan District, for example, requires that recipients of radioactive isotopes present evidence of their ability properly to safeguard the persons who may be exposed to the radiations from these materials.

Sincerely yours,

Austin M. Brues, M.D.

James J. Nickson, M.D.

John E. Rose

B/N/bm

cc: Dr. Brues
Dr. Nickson
File
Mr. Rose (10-30-46)

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ALPHATRON RADON OINTMENT

Manufacturer: The Canadian Radium and Uranium Corp.
630 Fifth Avenue
New York, New York

Radium-Emanation (Radon) emits alpha, beta and gamma rays. Radon incorporated into a vehicle of neutral anhydrous lanolin, U.S.P., emits the same radiation.

According to the firm, "Alphatron" Radon Ointment is prepared in two (2) concentrations:

Weak	containing	100 E.S.U.*	(40 microcuries) per cc.
Normal	containing	200 E.S.U.	(80 microcuries) per cc.

For identification each tube of "Alphatron" Radon Ointment is marked to indicate the potency for the day of use. The radioactivity of "Alphatron" Radon Ointment decreases 16.5% every twenty-four (24) hours. In addition, colored tags designate the contents of the tubes in the following manner:

for the Weak	Yellow
for the Normal	White

The ointment is packaged in collapsible tin tubes of 10 cc. per tube and larger 50 cc. tubes for hospital use.

Claims for the clinical indications include:

SURGERY

X-Ray burns
Radium burns
Burns
- Heat 2nd and 3rd degree
- Diathermy
- Electric currents

Frozen extremities
Ulcers
- Arteriosclerotic
- Diabetic
- Wound
- Gangrene
- Fistulas

GYNECOLOGY

Erosion of the Portio
Rhagades
Pruritus of the Vulva
Pruritus anus

GENERAL MEDICINE

Arthritis
Arthrosis
Spondylitis
Epicondylitis
Occipital Neuralgia
Intercostal Neuralgia

* E.S.U. or e.s.u. means electrostatic unit

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Post-operative scars
Thrombophlebitis
Tendinitis
Tenositis

DERMATOLOGY

Chronic eczema
Ear eczema
Varicose eczema
Ano-Genital eczema
Pruritus
Psoriasis
Lichen Ruber Planus
Neurodermatitis
Dermatitis
Scleroderma

Technic of Application: (1) Distribute ointment evenly over area in thickness of about one millimeter, with a wooden spatula (2) Apply gauze (2 to 3 strata) over the ointment covering this area with oil silk, cellophane or rubber dam, taking precaution that the oil silk, etc., overlaps the gauze by 1½" (3) Fasten the edges of the oil silk, etc., to the skin with adhesive tape (1" to 1½" wide). For affected joints use elastic tape, and (4) Apply adhesive tape over the previously prepared dressing in a criss-cross manner in order to protect the dressing and maintain utmost airtightness. On limbs and joints, use elastic bandage to protect the dressing. ATTENTION: Upon arrival of the Radon Ointment "ARI", check immediately for date of use indicated on the label attached to the tube. The ointment may be used also the next day by increasing the time of application by 16%; e.g., instead of 24 hours for 30 hours.

Covering Power of Radon Ointment: 1 cc. of the ointment will cover approximately an area of 1½" x 1½" of a lesion, applied one millimeter thick, or approximately 4 cc. will cover the surface of the palm of the hand.

On September 24, 1945, the Council on Physical Medicine and the Council on Pharmacy and Chemistry adopted the report "Alphatron Radon Ointment Not Acceptable" for inclusion in "Apparatus Accepted" and "New and Nonofficial Remedies." The summary and recommendation of the Councils in their unpublished report of September 24, 1945, follows:

Summary: In summarizing, it is apparent that:

1. Alphatron contains alpha, beta and gamma rays in such intensity as to be dangerous unless handled by an expert. Therapy with radon ointment is not alpha therapy but therapy with radium emanation and therefore all precautions necessary in handling radium apply to radon ointment.

2. The letters written by those physicians whose names were suggested by the firm and who are using radon ointment are not conclusive and do not prove the safety or the value of radon ointment.

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3. The articles submitted by the firm were strong statements of claims without scientific proof. The illustrations in many instances were labeled in such a way as to impart a meaning not justified. The captions were certainly misleading. Cases of radionecrosis were reported as cured when in fact they had gone on to cancer formation necessitating amputations and major surgical intervention. All cases of radionecrosis were not cured. Other ulcerations were not cured. There was no evidence that electric burns, postoperative scars, scleroderma, thrombophlebitis, frozen extremities, arthritis and other diseases mentioned were cured with Alphatron. An after treatment photograph of a hand with a prosthesis was used to illustrate what excellent results could be obtained with Radon ointment.

Recommendation: The Council on Physical Medicine and the Council on Pharmacy and Chemistry declared "Alphatron" Radon Ointment unacceptable for inclusion in "Apparatus Accepted" and "New and Nonofficial Remedies" because:

1. The evidence submitted does not support the therapeutic claims made for it.

2. It is too dangerous for use by those without special training.

3. Study of a sample of the ointment by a physicist showed it to be 200 times stronger in alpha rays than that labeled. Impartial clinicians and impartial physicists think it is a dangerous remedy which should not be made available indiscriminately to those who do not understand its dangers.

A reply from the Canadian Radium and Uranium Corporation on December 22, 1945, in answer to the unpublished declaration of the Councils, stated that it believed the claims made for "Alphatron" Radon Ointment are based on scientific evidence and that the statements on the labels of their product and in their prospectus are accurate. The Councils had previously submitted samples of the ointment to a qualified physicist for investigation and testing. It was this consultant's report that contained several statements to which the firm took issue. One controversy arose over the stated and measured contents of the tubes of "Alphatron" Radon Ointment.

In advertising the firm uses the E.S.U. of radioactivity but recently has equilibrated the E.S.U. in terms of the more commonly accepted microcurie. The firm states that 1 E.S.U. = .000364 μc. On this basis a tube of 200 E.S.U. per cc. should be expected to represent 72 μc. instead of 80 μc. as stated on the label, a fact that may be confusing to the physician at large.

In order to liquidate the disputation, the firm and the Council then agreed to submit samples to the National Bureau of Standards for testing. At various dates from February 18, 1946, to June 11, 1946, the samples were submitted. The Councils obtained their samples on the open market. The reports of the National Bureau

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of Standards follow:

(SUBMITTED BY THE FIRM)

Description: The samples tested were five shipments, each containing two collapsible metal tubes approximately 10 cc. in volume with labels stating contents to be "Alphatron Radon Ointment". The samples were received from the Canadian Radium and Uranium Corporation New York office as follows:

Tube	Received	Stated date of use
1 and 2	2-18-46	2-19-46
3 and 4	2-28-46	3- 1-46
7 and 8	3-11-46	3-11-46
11 and 12	3-18-46	3-18-46
15 and 16	3-22-46	3-25-46

Measurement: The gamma radiation from the tubes was compared with that from the Radium Standard of this Bureau and the average of three determinations for each tube was found equivalent to the following radon content on the stated date of use:

Tube	Stated Contents	Measured Contents
1	approx. 40 µcuries/cc	38.3 microcuries/cc
2	" 80 " "	88.3 " "
3	" 40 " "	42.2 " "
4	" 80 " "	89.5 " "
7	" 40 " "	44.3 " "
8	" 80 " "	87.0 " "
11	" 40 " "	40.9 " "
12	" 80 " "	89.7 " "
15	" 40 " "	40.1 " "
16	" 80 " "	72.0 " "

All tubes, except Nos. 19 and 20, were tested over a period of two weeks and the decrease in activity with time was found to follow the decay curve for radon.

The volume of the tube used in calculating the radon content per cc. was that stated on the tube. The volumes of four tubes were measured by melting out the ointment and measuring it in a volumetric graduate. These volumes agreed with the stated volumes within two percent.

Description: The samples tested were five shipments, each containing two collapsible metal tubes approximately 10 cc. in volume with labels stating contents to be "Alphatron Radon Ointment". The samples were received from the Canadian Radium and Uranium Corporation Chicago office as follows:

Tube	Received	Stated date of use
5 and 6	3-4-46	3-4-46
9 and 10	3-11-46	3-11-46
13 and 14	3-18-46	3-18-46
17 and 18	3-25-46	3-25-46
19 and 20	4-15-46	4-15-46

Measurement: The gamma radiation from the tubes was compared with that from the Radium Standard of this Bureau and the average of three determinations for each tube was found equivalent to the following radon content on the stated date of use:

Tube	Stated Contents	Measured Contents
5	approx. 40 µcuries/cc	49.8 microcuries/cc
6	" 80 " "	93.7 " "
9	" 40 " "	40.8 " "
10	" 80 " "	75.3 " "
13	" 40 " "	49.0 " "
14	" 80 " "	72.5 " "
17	" 40 " "	48.4 " "
18	" 80 " "	106.3 " "
19	" 40 " "	53.3 " "
20	" 80 " "	97.9 " "

All tubes, except Nos. 19 and 20, were tested over a period of two weeks and the decrease in activity with time was found to follow the decay curve for radon.

(SUBMITTED BY THE COUNCIL)

Description: The samples tested were two shipments, each containing a collapsible metal tube with labels stating contents to be "Alphatron Radon Ointment". The samples were received from the American Medical Association, Chicago, Illinois, as follows:

Tube	Received	Stated date of use
22	5-2-46	4-29-46
24	5-8-46	5- 7-46

Measurement: The gamma radiation from the tubes was compared with that from the Radium Standard of this Bureau and the average of six determinations for each tube was found equivalent to the following radon content on the stated date of use:

Tube	Stated Contents	Measured Contents
22	10 cc of approx. 80 µcuries/cc	103.3 µcuries/cc
24	10 " " " " " "	83.7 " "

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The tubes were tested over a period from four to eight days and the decrease in activity with time was found to follow the decay curve for radon.

Description: The samples tested were six shipments, each containing a collapsible metal tube with labels stating contents to be "Alphatron Radon Ointment". The samples were received from New York, N. Y., as follows:

Tube	Received	Stated date of use
21	4-25-46	4-27-46
23	5- 6-46	5- 4-46
25	5-13-46	5-11-46
26	5-22-46	5-20-46
27	5-27-46	5-25-46
28	6-11-46	6-10-46

Measurement: The gamma radiation from the tubes was compared with that from the Radium Standard of this Bureau and the average of six determinations for each tube was found equivalent to the following radon content on the stated date of use:

Tube	Stated Contents	Measured Contents
21	5 cc of approx. 120 µcuries/cc	215.6 µcuries/cc
23	5 " " " " " "	119.2 " "
25	5 " " " " " "	129.8 " "
26	10 " " " 80 " "	103.5 " "
27	10 " " " 120 " "	150.7 " "
28	10 " " " " " "	63.5 " "

The tubes were tested over a period from five to sixteen days and the decrease in activity with time was found to follow the decay curve for radon.

The volume of the tubes used in calculating the radon content per cc was that stated on the label with the tube. The volume of the tubes were measured by melting out the ointment and measuring it in a volumetric graduate. These volumes agreed with the stated volume within 0.5 cc.

The average error of radioactivity in the tubes sent by the firm from New York is approximately 7% when the stated contents are 40 and 80 µc/cc. If values of 36 and 72 µc/cc are used on the

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basis of the firm's equivalent for E.S.U., the error present is approximately 16%. The values obtained from the samples obtained in New York, and submitted by the Council err approximately 32% and 53% respectively as above.

Samples sent from Chicago by the firm showed discrepancies of approximately 17% for 40 and 80 µc/cc and approximately 28% on the basis of 36 and 72 µc/cc, while samples submitted by the American Medical Association showed approximately 17% and 29% error respectively

It can be concluded (1) a greater discrepancy exists between radioactive contents of the samples supplied by the American Medical Association than those furnished by the firm, and (2) the radon ointment produced in Chicago and New York varies considerably in radioactive content. Since the Bureau's report was submitted, the firm has discontinued advertising "Alphatron" in 120 µc/cc strength.

Strasburger[1] in 1921 first introduced radon (radium-emanation) ointment into medical therapy. Since then Lomholtz[2] and especially Uhlmann [3,4,5] have been largely responsible for the furtherance of alpha ray therapy in dermatological conditions. More recently this treatment has been adapted to other medical and surgical conditions.

1. Strasburger, J.: Neuere klinische Erfahrungen bei der Anwendung von Radiumemanation in grosseren Dosen, Allg. Med. Central Ztg. 90:289 (Dec. 3) 1921.

2. Lomholtz,S.: "Alpha and Beta Ray Therapy in Dermatology" B. J. of Derm., 48:567 (Nov.) 1936.

3. Uhlmann, E. and Schambaye, G: "Uber erfolgreiche Behandlung von Strahlenschaden der Hant" Strahlentherapie, 52:282 1935.

4. Uhlmann, E.: "The Treatment of Injuries Produced by Roentgen Rays and Radioactive Substances" Am. J. of Roentgenol. 41:80 (Jan.) 1939.

5. Uhlmann, E.: "Alpha Rays in the Treatment of Wounds" S. G. and O., 79:412 (Oct.) 1944.

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The medicament now conventionally used is radon in anhydrous lanolin supplemented with applications of boric-beryllium ointment between treatments.[4] Radon ointment is generally produced by one of two processes.[6] Vacuum absorption of radon from radium salts with direct transmission of the gas to a fatty carrier into which it is evenly dispersed is the essential process involved in both methods.

Notable reports of the physical properties of radon gas and alpha rays have been contributed by Lomholtz,[2] Klinghoffer,[7] Larkin[8] and Evans[9]. The latter's work is by far the most comprehensive to date.

Insufficient research has been done to elucidate the pharmacologic action of alpha rays. It is generally believed that post-radiation necrosis and ulceration is the end result of local capillary and lymphatic destruction. Griffith et al[10] have attempted to show that alpha rays exert a stimulating action on the vascular bed and aid in the formation of new lymphatic channels in the ulcerative area. No definite conclusions can be reached because of the insignificant amount of work heretofore presented.

Dosage is left to the discretion of the physician and is determined only by clinical experience.[4] Since alpha rays are radioactive emissions, they are not without their side effects. Pigmentation, erythema, and burns are the most common disadvantages encountered from overdosage with alpha rays.[11] Failure to run large series of control cases has left doubt as to the efficacy of this medicament in itself.

6. Uhlmann, E.: "Significance and Management of Radiation Injuries" Radiology, 38:445 (April) 1942.

7. Klinghoffer, S.: "Radon Treatment" Am. J. of Roentgenol., 49:240 (Feb) 1943.

8. Larkin, J. C.: "An Erythmatous Skin Reaction by an Alpha-Particle Beam" Am. J. Roentgenol., 45:109 (Jan.) 1941.

9. Evans, R. D.: "Physical Constants of Radon Ointment" In process of publication.

10. Griffith, J. Q., Pendergrass, E. P., Perryman, C. R., and Hooker, J.: "Effect of Radon-Containing Ointment on Cutaneous Lymph Flow and Minute Vessels of Skin" Proceed. Society for Experimental Biology and Medicine, 61:70, 1946.

11. Jordon, H. H.: "Alphatron (Radon Ointment) in Orthopaedic and Traumatic Surgery" Proc. R. Virchow Soc. Vol. IV 1945.

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Considerable discussion has arisen over the penetration of radon gas and hence the alpha rays into the tissues. Alpha rays penetrate tissue only to a depth of several millimeters. Hence, the question arises how do the alpha rays exert their effect on the less superficial tissues. Many attempts have been made to determine the penetrating power of ointment vehicles. MacKee et al[12,13] have shown that even with inunction lanolin penetrations of the dermis is practically nihil. Evans[8] demonstrated that radon gas is given off by the lungs in minute quantities so that some absorption apparently must take place.

Radon ointment was first used extensively in the treatment of post-radiation necrosis and ulceration. Uhlmann[4] presented 70 cases of post-radiation injuries which he treated while in Europe. Only two of his series failed to respond to treatment. Later Uhlmann[5] presented another series of 70 cases with similar results. Some of the photographs illustrating his articles are sufficiently indistinct as to leave doubt in the reader's mind as to the amount of healing that had taken place.

Cooper and Robertson[14] in Australia using Uhlmann's method of treatment obtained satisfactory results in 69 cases of radio-necrotic ulcers. Only two cases have been reported from the Mayo Clinic.[15,16] Low-Beer and Stone[17] found in their 28 cases that pain was alleviated and ulcers healed in instances where bone and tendon involvement did not exist.

12. MacKee, G. M., Sulzberger, M. B., Herrmann, F., and Baer, B. L.: "Histologic Studies on Percutaneous Penetration With Special References to the Effect of Vehicles" J. Invest. Derm., 6:43 (Feb.) 1945.

13. MacKee, G. M., Herrmann, F., Baer, R. H., and Sulzberger, M. B.: "A Histochemical Method for Demonstrating the Presence of Sulfonamides in the Tissues" J. of Lab. & Clin. Med., 28:1642. (Oct.) 1943

14. Cooper, A. G. S., and Robertson, D. F.: "The Treatment of Post-Irradiation Ulcers by Radon Ointment" Med. J. of Australia, 1:297 (Mar. 24) 1945.

15. Fricke, R. E., and Williams, M. M. D.: "Radon Ointment for Irradiation Injuries; Report of Case" Proceed. Staff Meeting of the Mayo Clinic, 19:283 (May 31) 1944.

16. Fricke, R. E., and Williams, M. M. D.: "Radon Ointment Treatment of Irradiation Ulcers" Radiology, 45:156 (Aug.) 1945.

17. Low-Beer, B. V. A., and Stone, R. S.: "The Treatment of Late Post-Irradiation Ulcers with Radon Ointment" Radiology, 46: 149 (Feb.) 1946.

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Since radionecrotic ulcers appear to respond to radon ointment, it seemed logical to Uhlmann and Grossman[18] that this ointment could be used as an adjunct to facilitate differentiation between radionecrosis and malignant degenerations. This hypothesis is interesting; however, sufficient clinical verification is wanting.

It should be appreciated that alpha ray therapy (radon ointment) may constitute a useful method of treatment for radiation ulcers and possibly for other types of ulcers.

Many chronic orthopedic conditions fail to respond to known modalities of treatment. Jordan[10,19,20] believed that 75% of his series of 147 patients with various orthopedic conditions showed better response with radon ointment. Lustig[21] noted that Jordan's dosage was too high and found in 35 cases that radon ointment is effective in many orthopedic conditions.

Kestler[22] in concentrating his treatment on cases of arthritis used dosages much higher than suggested by Uhlmann. Of the 65 cases, 32 became symptom free, 31 improved while 2 remained unchanged.

A short follow-up period was noted.

Isaak[23] using a variation of the ointment method of applying alpha rays used a pad impregnated with radium salts. By approxi-

18. Uhlmann, E., and Grossman, A.: "The Use of Radon Ointment as a Means of Differentiation between Radionecrosis and Recurrent Carcinoma" Am. J. of Roentgenol. 47:620 (April) 1942.

19. Jordon, H. H.: "Alphatron Radon Ointment in Industrial Practice" Indust. Med. 14:964 (Dec.) 1945.

20. Jordon, H. H.: "Radon Treatment in Chronic Arthritis" Pan-Am. Rheumatism Bull., A44:1 (Jan.) 1944.

21. Lustig, F.: "Radon and Physical Therapy" Med. Record, 158:225 (April) 1945.

22. Kestler, O. C.: "A New Method of Local Treatment of Rheumatoid and Traumatic Affections of the Joints" Geriatrics, 1:159 (Mar.-Apr.) 1946.

23. Isaak, L.: "Treatment of Cutaneous Diseases with Radon Ointment and Radium Pads" Archives of Derm. and Syph., 45:560 (Mar.) 1942.

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mating the pad closely to the skin Isaak claims to accomplish the same results as with radon ointment. After treating 85 cases of dermatological conditions he concluded that radon ointment and radium pads are valuable assets in the treatment of diseases of the skin but that it is perhaps too early to draw any conclusions.

Realizing that radon was being used indiscriminately by the medical profession the Council on Physical Medicine authorized the publication of an editorial.[24] In this article Dr. Cipollaro writes in part "the proper administration of radium, radon, or x-rays in the treatment of cutaneous diseases requires specialized training in both dermatology and radiology."

From a comprehensive review of the literature it is apparent that (radon ointment) alpha ray therapy is too new to recommend its dissemination to the medical profession. This fact is revealed by the lack of basic medical research done with alpha rays. Considerable dispute exists over the epidermal penetration of the radon ointment or radon gas into the deeper tissues. Moreover, it is extremely difficult to explain how this medicament could be of use in arthritic conditions of the large joints. The circulation around the large joints tends to pass from the superficial to the deeper vessels over a gradient diverging away from the cutaneous areas over the joint. How then can the very short penetrating alpha ray benefit the deeper tissues? Beneficial effects that have been reported following its use in arthritis may be largely attributable to a transient counter-irritant action that at best is palliative.

In all the literature there are but a few articles wherein control medication has been applied. This fails to give a scientific foundation upon which clinical results may be justly evaluated. Another, as yet unsettled, matter is the dosage. Standards have been set forth, but in view of the lack of controlled clinical case evaluation and variations in dosage, distribution of such drug is unsound until further basic research is accomplished.

Many physicians prescribing this ointment do not consult a dermatologist or roentgenologist. Yet it has been emphasized that only those well trained in the field of radioactive physical medicine should be allowed to handle radon ointment. This raises the question as to whether or not such a product should be employed by physicians not specifically trained in this branch of medicine.

The pliable tin tubes which contain the ointment do not stop the passage of gamma rays. This in itself is not noteworthy; however, if a physician or attendant routinely handled great

24. Cipollaro, A. C.: (Authorized publication by the Council on Physical Therapy (now Medicine) of the A.M.A.) "Dangers Incident to the Indiscriminate Use of Radium Compounds and Radon" JAMA 115:1996 (Dec. 7) 1940.

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quantities over a period of time, they obviously may be subjected to radiation injury.

THE CLAIMS SET FORTH BY THE COMPANY FOR RADON OINTMENT ARE NUMEROUS AND MOST OF THEM SUPPORTED BY LITTLE OR NO CLINICAL VERIFICATION. As one physician stated, "_____Radon Ointment is extremely useful in the treatment of radiation ulcers, and I regret that the Canadian Radium and Uranium Corporation makes what seems to me rather unreasonable claims for it."

The firm in their reply of December 22, 1945, to the Council's unpublished declaration of September 24, 1945, listed a group of physicians who have had clinical experience with radon ointment. Of those listed 30 were requested by the Council to supply information relating to their clinical experience with radon ointment. The Council received only seventeen (17) replies.

Three physicians consulted replied that they had treated only one case each. In treating a case of "trauma superimposed on pre-existing varicose veins and phlebitis of the leg" M. Kummel, M. D., of New York states "whether this preparation contributed to the improvement, I am in no position to state since I could not possibly judge by the results of one case." F. S. O'Hara, M. D., of Illinois has under treatment a patient with varicose ulcer of the leg. The ulcer is still in the process of healing. One case of post-radiation necrosis with ulceration was treated with normal restoration of the affected part by H. H. Harpst, M. D. of Chicago. Two other men, L. C. Kinney, M. D. of California and R. T. Wilson, M. D., of Texas, have successfully healed several cases of x-ray injury. R. W. Vance, M. D., of North Dakota, successfully treated two (2) chronic ulcers (type not stated), but treatment failed in one case of lupus erythematosus. L. S. Goin, M. D., of California treated 15 cases of radiation injuries and obtained prompt healing in 9. Six failed to respond. Two cases of dorsal decubitus showed excellent results.

N. K. Covalt, M. D., of the Veteran's Administration has used radon ointment for four years and believes that it has a definite place in the treatment of peripheral vascular diseases. During that time, however, no controls were used. S. Epstein, M. D., of Wisconsin, has used radon and THORIUM X for twenty years in the dosage of 2,000 E.S.U. per gram of ointment for the treatment of lichen simplex chronicus with "satisfactory" results.

General Summary:

1. Insufficient research on the pharmacology and therapeutics of alpha rays (radon ointment) segregates this medicament into the group of therapeutic agents without scientific basis for clinical application.

2. Many of the clinical indications for "Alphatron" listed by the Canadian Radium and Uranium Corporation have little or no scientific basis for their use, much less appraisal. Few investigators have engaged in research with radon ointment.

3. Impartial specialists and physicians emphasize that the remedy should not be made available indiscriminately to those who are not thoroughly acquainted with its use.

4. Radon ointment appears to constitute a useful method of treatment for radiation ulcers. Its value in any other condition is extremely questionable.

5. Confusion still exists over the labeled potency of radon ointment.

6. Reports from the National Bureau of Standards reveal labeled misrepresentation beyond normally accepted ranges.

7. Letters received from physicians familiar with the use of radon ointment therapy are not conclusive and do not offer scientific proof of either the safety or the value of radon ointment.

8. Danger of radiation injury exists to those engaged in handling quantities of radon ointment over periods of time.

Recommendation:

The Council on Physical Medicine and the Council on Pharmacy and Chemistry of the American Medical Association recommend that "Alphatron" Radon Ointment be not accepted for inclusion in "Apparatus Accepted" and "New and Nonofficial Remedies."

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RADIUM, RADON AND RADON PRODUCTS

Consideration by the Council on Physical Medicine of the rental and sale of radium and the sale of radon and radon products has been before the Council for several years, but to date no satisfactory solution has been reached. The problem is presented quite clearly in two reprints of adopted articles by the Council: (1) "Radon Seeds" by Edith Quimby, M. A., and Arthur U. Desjardins, M. D., and (2) "Radium" by Arthur U. Desjardins, M. D. and Marvin M. D. Williams, Ph. D., copies of which are attached.

Briefly, radon seeds and radon products are being offered for sale to the profession at large and in some instances these products are being used by unqualified individuals. Furthermore, radium is being rented to unqualified practitioner and in many instances reports on the use of radium under these conditions are extremely disconcerting.

The immediate problem before the consultants of the Council is the preparation of requirements for acceptance of radon and radon products and rental and sale of radium. On the discussion sheet attached to this communication, a place is provided for the consultants to comment and offer suggestions on the contents of these proposed requirements. The comments and suggestions of the consultants will be referred to Dr. Desjardins and he, or someone suggested by him, will prepare the first draft of the requirements which will be referred back to the consultants for adoption.

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