

ON THE BIOGENIC STIMULATORS OF ALOE ARBORESCENS

By M. Russiyan and A. Khlopushina, Tashkent Pharmaceutical Institute, Russia.

"Investigations have established that the removal of resins from the leaves of Aloe arborescens reduces the latter's stimulating activity. Therefore these resin components were subjected to a thorough study. According to the literature, resin contained in the leaves of various Aloe species are compound ethers of resintannola, paracoumaric and cinnamic acids. The resins of some Aloe species contain also salicylic acid....

"The following test was conducted to study the effect of the acids in combination with extracts from fresh and preserved Aloe arborescens leaves. If during the preservation of Aloe arborescens leaves the amount of cinnamic and salicylic acids, serving as stimulators, increases, artificially raising the content of these acids in the extracts to concentrations inhibiting yeast cell division should cause a negative effect, especially when adding them to extracts from preserved leaves....

"Thus, the assumption that artificially increasing the salicylic and cinnamic acid content in Aloe arborescens leaf extracts above certain level should render an inhibiting effect on the division of yeast cells, was confirmed....

"The action of cinnamic and salicylic acids as biogenic stimulators was also checked with anise discheniums (seeds) as test objects.... Counting the germinated discheniums showed that cinnamic and salicylic acids in 1:1,000 mol/l concentration markedly inhibited the process of germination while the extract from preserved Aloe arborescens leaves somewhat stimulated it, as compared with the controls....

"Summing up the test results of pre-sowing treatment of anise acheoes with cinnamic and salicylic acids, we may note that the test results correspond to the data obtained in the yeast method....

"In the mango bean sprout tests the roots of 20 plants were measured during 5 days and the average length in millimetres was calculated, with the rate of root growth during the 5 days calculated as well.... In these measurements a regularity was observed, which was also marked in all the previous tests, namely: a higher stimulating effect of the acids at greater dilution; higher stimulating effect of salicylic acid as compared to cinnamic acid at equal concentrations....

"Cinnamic and salicylic acids are well distilled with steam. The presence of these acids in the leaves of Aloe arborescens called for verifying the stimulating action of steam fractions from the leaves of this plant and the comparison of the fraction activity with the activity of an extract from leaves after they were freed from volatile fractions, supposing that it is these acids that are the volatile substance....

"...in 24 hrs the length of the sprout roots in the test dishes was considerably greater than the control ones. Finally, the 5-day roots of the sprouts treated with undiluted distillate reached the greatest length. An extract of the leaves from which volatile fractions were removed also stimulated mango bean root growth as compared with the controls but to a lesser degree than distillates....

CONCLUSION

"Cinnamic and salicylic acids have been detected in the leaves of *Aloe arborescens*. At a concentration of 1:4,000 mol/l and lower they, similar to biogenic stimulators, activate the division of yeast cells, the growth and growth rate of mango bean and omum plant roots, while in higher concentrations they render an inhibiting effect.

"Salicylic acid is a stronger stimulator than cinnamic acid in the same concentrations.

"Confirmed is the complex natures of the biogenic stimulators contained in the leaves of *Aloe arborescens*, consisting of both volatile and non-volatile fractions, and cinnamic and salicylic acid may be considered to be components of the latter fraction."

Published in "Extract of Aloe, Supplement to Clinical Data" by Medexport, USSR, Moscow.

COMPARISON OF THE EFFECTIVENESS OF THE JUICE OF ALOE ARBORESCENS WITH THE JUICE OF ALOE STRIATULA FOR THE PROHYLAYSIS OF RADIATION INJURIES (Both work like Aloe barbadensis, Aloe Vera.)

By N. Nordvinov and B. Rostotsky of the Radiological Department of the State Research Roentgen-Radiological Institute of the RSFSR Ministry of Health and the Chemical Department of the All-Union Research Institute of Medicinal and Aromatic Plants.

It often happens that in radiation therapy of patients with malignant neoplasms, low skin tolerance to ionizing radiation prevents administering the necessary dose to a tumor situated deep in the patient's body. In such cases drugs increasing skin tolerance make it possible to increase the dose for each irradiated field and thus assist in achieving better results of treatment. Research for new medicinal preparations with the property of reducing skin reaction to irradiation has been conducted for many years. Many of such preparations were put to trial at the Radiological Department of State Research Roentgen-Radiological Institute of the RSFSR Ministry of Health: Aloe emulsion, thesane, linol, hexerol and others. One of the most effective preparations turned out to be the emulsion of Aloe arborescens tested in 1956-57 during radiation therapy of 200 patients with various localizations of malignant tumors.

The application of Aloe emulsion was considerably extended after the first clinical trials. The emulsion is recommended for preventing the development of local reactions in radiation therapy, in the treatment of dry and moist epidermitis and treating radiation burns of the 2nd and 3rd degrees, in gynecology - in the treatment of kraurosis vulvae in cases of subacute and acute inflammatory processes of the skin (dermatitis, eczema, psoriasis, neurodermitis, lichen ruber planus and other skin diseases.) Aloe emulsion was successfully administered also in a number of other disorders, particularly for heat burns, frostbite, for treating cuts, blisters, etc.

The extensive range of Aloe emulsion application is due to its marked stimulating effect in the process of granulation formation and epithelization.

Aloe arborescens is cultivated in the humid subtropical regions along the Black Sea Coast of the Trans-Caucasus, in Abkhazia. But even in that climatic zone it cannot stand the winter, demanding glass-covered ground for the winter period. Difficulties in cultivating Aloe arborescens in large quantities for the manufacture of aloe preparations have led to the search of other species of aloe. As a result of the investigations carried out, an emulsion was prepared from the juice of Aloe striatula.

This species is distinguished by a lesser yield of juice (about 49% from clean leaves prepared for processing; while Aloe arborescens give 65%), but it possesses greater frost resistance, and, according to data from the Trans-Caucasus Experimental Station of the All-Union Institute of Medicinal and

Aromatic Plants, can winter in open ground in Trans-Caucasian climatic conditions.

When carrying out comparative clinical evaluation of the new species, it was only natural to keep strictly to the production technology and also to the co-relation of ingredients, comprised in the preparation....

The emulsion contains 78 parts of bio-stimulated preserved aloe juice, 11 parts of emulsifier, 11 parts of castor oil and 0.1 part of eucalyptus oil....

The authors have carried out comparative clinical tests of emulsions from the juice of *Aloe arborescens* (aloe exulsion No. 1) and *Aloe striatula* (aloe emulsion No. 2). The effect of aloe emulsion No. 2 was checked on 60 patients who were given telegammatherapy for malignant tumors under the same conditions as another 200 patients undergoing treatment in 1956-57. For testing the effect of aloe emulsion No. 2 a group of patients was selected with symmetrically situated irradiation fields on the right and left sides of the body. This circumstance made it possible to compare the degree of reaction on skin areas treated by aloe emulsion No. 2 and other remedies....

The obtained data show that aloe emulsion No. 2 reduces the sensitivity of the skin to ionizing irradiation, and this may facilitate the exposure of the affected focus to a larger dose....

As seen from Table 9 the average irradiation dose to an area and the degree of skin reaction occurring on areas treated with aloe emulsion No. 2 does not materially differ from those obtained in the symmetrically situated areas treated with emulsion No. 1. In this group of patients the reaction of moist epidermitis, which always compels the physician to discontinue radiation therapy, irrespective of the focal exposure dose, took place only occasionally and usually started by the end of irradiation....

In those rare cases when moist epidermitis developed on the skin, aloe emulsion No. 2 was used in order to speed up epithelization, for which the affected parts of the skin were covered with a dressing with the emulsion, changed every 2-3 days. It has been noted that both the emulsion of *Aloe striatula* and that of *Aloe arborescens* possess the property of speeding up epithelization (reduce term of treatment to 15-16 days instead of the usual 30-45 days). 10 patients, besides those enumerated above, were given aloe emulsion No. 2 for the treatment of ray lesions of the skin. Observations have shown that in this case also the medicinal properties of emulsion from the juice of *Aloe striatula* are not inferior to that prepared from the juice of *Aloe arborescens*.

Published in "Extract of Aloe, Supplement to Clinical Data," Medexport, USSR, Moscow.

FRESH ALOE VERA USED FOR X-RAY DERMATITIS

By Dr. E. E. Collins, D.D.S., M.D., and Dr. Creston Collins, M.S.

Published in the American Journal of Roetgenology, March 1935, pages 396-7.

(Comment: This article by Dr. Creston Collins and his father was the landmark report, creating waves of interest throughout the world among medical science. Since the new wonder treatment of roentgen rays had some tragic side effects, the ancient and often scoffed at "Medicine Plant" provided the only workable solution for many cases. Dr. Collins went on to pioneer many additional uses and preparations, founding one of the most respected lines of Aloe Vera products in the country.)

REPORTS of a dermatitis peculiar to and incident to excessive exposure to roentgen rays began to appear a few years after the discovery of the roentgen rays was announced to the medical profession.

In many cases it has been shown that where there was reason to suspect only a short exposure to roentgen radiation in excess of the "tolerance" dosage, then the prompt application of ultraviolet appeared to counteract a percentage of the roentgen radiation. Pigmentation would, of course, result but morbid skin changes might be prevented.

By far the more numerous, however, have been those cases of workers in roentgenology, and patients who, because of improperly measured dosage, unanticipated hypersensitivity, or other reasons, have suffered from varying degrees of roentgen dermatitis, usually with a delayed reaction; and in a few instances from a permanent and possibly progressive destruction to underlying tissues.

It is because complete cures have been reported in so few of these severely burned cases that we think it worth while to record an evident cure in the following typical but not selected case:

REPORT OF CASE

A white woman, aged thirty-one was, on March 2, 1934, seen to be suffering with a severe roentgen dermatitis. There was desquamation over an area 4 by 8 cm. on the left side of the forehead, extending 2 cm. above the hair line. The history showed that in May, 1932, she had received (in another city) what she had been told was a depilatory roentgen treatment. Fourteen months later, she said, the skin of the forehead and scalp became rough and scabby and itched continuously (dermatitis exfoliativa). Between July, 1933, and March,

1934, she had successively consulted three physicians, all of whom had agreed as to the diagnosis, and who had prescribed (variously) boric acid, phenol in olive oil, ichthyol, a 5 per cent mercurial ointment, and zinc oxide. The condition had become progressively worse until there was (as has been stated) extensive desquamation with oozing of serous fluid. The patient stated that the itching and burning sensations were so severe and constant that she was compelled to wear cotton gloves at night in order to prevent scratching the damaged area and inducing bleeding.

After a review of this history and an examination of the condition it was felt that a skin graft was indicated and the patient was so advised. At the time of examination the patient was furnished with a quantity of aloe vera (fresh whole leaf) for local application, with the hope that this material might serve as a palliative (i.e., act to allay the itching). Twenty-four hours later she reported that the sensation of itching and burning had entirely subsided. She was instructed to continue the use of the plant material, and when seen from time to time during the next five weeks the condition was found to be progressively improved.

At the end of this time (i.e., on April 7, 1934), there was complete regeneration of the skin of the forehead and scalp, new hair growth, complete restoration of sensation, and absence of scar. There was at this time a slight blanching of the affected area. When last seen on July 23, 1934, the healed area appeared to be completely cured, with no indication whatever of a relapse. On exposure to the summer sunlight the skin of the forehead was seen to be pigmenting normally along with other exposed skin surfaces of the body.

COMMENT

The aloe vera leaf contains a large quantity of a light yellowish-green material having about the color and consistency of lemon jello; it is this intestine material which is used for local application. The

leaf may be split lengthwise or cut into thick cross-sections and the intestine material macerated. While this is still fresh, liberal quantities are applied to the area to be treated, covering it with a neutral, non-porous substance (such as waxed paper). Bandage or adhesive may then be used to secure the mass in place. An hour or two is the life of an application; it will then be found to be dark and gummy. It is simply washed off carefully with warm water, using no soap or medication. The applications may be renewed as often as may be desirable and convenient.

USE OF ALOE VERA ON RADIATION BURNS

By Dr. James Barrett Brown, M.D., F.A.C.S. of Washington University School of Medicine and Barnes Hospital, St. Louis, Mo..

Published CA--A Cancer Journal for Clinicians, Vol 14, pages 14-15 in 1963.

"The use of aloe vera on radiation burns has been advocated for many years. We formerly obtained the thick leaf with its natural soothing gel from the Missouri Botanical Garden (Shaw's Garden) here in St. Louis, split it open and applied the fresh gel of the leaf directly to the area.

"This use of the aloe vera has been replaced by use of Alo Ointment as supplied by the Aloe Creme Laboratories, Inc., Fort Lauderdale, Florida, in the past few years. It provides a constant supply, is easily handled and applied, and is productive of relief from pain and itching. It tends to keep down keratosis and ulceration; these effects may tend to slow up, and possibly prevent, changes toward malignancy. We have many patients who have obtained marked relief from pain, cracking, and keratosis of such radiation burns. These include cases of physicians' hands burned in their own work, and burns from treatments given over the face and elsewhere."....

ANIMAL RESEARCH ON ACUTE RADIATION DAMAGE

By Dr. C. C. Lushbaugh, M. D. and Dr. D. B. Hale, B. S., From the Health Division, Los Alamos, Scientific Laboratory, University of California, Los Alamos, New Mexico, under the auspices of the United States Atomic Energy Commission.

Published in Cancer, Vol. 6, July 1953, pages 690 to 698.

"Continued emphasis of both the peacetime and military application of atomic energy has greatly increased the number of potential victims of radiation damage to the skin. . . . In this connection the relatively recent discovery that the juices of the leaf of the Aloe vera plant are efficacious in the treatment of acute and chronic radiodermatitis is of considerable interest. . . .

"Histological Experiment: Ten rabbits were used in the experiment. The shaved back was divided into four quadrants and the central area of each quadrant received 14,000 rep of beta radiation from the strontium source. Two of the four areas were treated daily with the A. vera ointment. The other two areas were left unprotected and untreated. . . .

"These experiments show objectively that A. vera has a remarkably curative effect upon radiodermatitis in the rabbit. It was found to increase greatly the development of the lesion by apparently doing away with the so-called latent period. . . . As a result of the enhancement of the healing processes, the damage to the original connective tissue seemed to be restricted and usually did not proceed so extensively as in the untreated lesions. . . .

Summary and Conclusions

"Rabbits irradiated locally on the back with 14,000 and 28,000 rep of beta radiation from Sr^{90} were treated with fresh whole leaf of Aloe vera and a commercially available ointment made from these leaves. The gross and microscopic morphological changes in the skin resulting from the radiation alone were compared with those in the irradiated skin treated with Aloe. Treatment was found to hasten both the degenerative and reparative phases of the lesion so that complete healing of an ulcer caused by 28,000 rep of beta radiation was accomplished within two months of treatment, while the untreated ulcerations were still not completely healed more than four months after irradiation. It was concluded that A. vera contains substances that are stimulatory both to the delayed development and delayed healing of ulcerative radiodermatitis and that because of the growing modern importance of this injury further investigation of the action of A. vera should be pursued."

ALOES IN THE TREATMENT OF BURNS AND SCALDS

By Dr. J. E. Crewe, M. D., practicing physician in Rochester, Minnesota, read before the Olmsted-Houston-Fillmore-Dodge County Medical Society, January 6, 1938.

Published in Minnesota Medicine, August 1939 pages 538-9.

RECENT medical literature contains many excellent articles on the treatment of burns. While numerous methods have been mentioned, in those most generally accepted, tannic acid is employed. In Bettman's treatment, tannic acid is applied in a spray, and this is followed by application of 10 per cent silver nitrate. Apparently, this sequence has distinct advantages over the use of tannic acid alone. Good as these methods are, I have experienced annoyance from infection, and from the long period required for separation and removal of the coagulum in some cases in which I have used tannic acid. It has been a relief to me, therefore, to find a treatment which has eliminated these disadvantages. This method has proved so simple and the results have been so satisfactory, that I have not used any other treatment for burns since the spring of 1935.

Author's Method

I employ an ointment of which the active ingredient is Socotrine or Barbados aloes. The ointment is made by mixing 2 drams of the powdered aloes and about 2 drams of mineral oil in an ounce of white vaseline. If mineral oil is not used the ointment is a little too stiff.

The usual precautions in regard to contamination and infection are taken. The affected area is cleaned as thoroughly as possible and, in some instances when the area is badly soiled, a preliminary application consists of warm moist dressings. These dressings are saturated in a solution composed of a teaspoonful each of borax and sodium chloride dissolved in a quart of water. If the burned area is fairly clean and a greasy substance has been used in first aid treatment, it is not necessary to remove all the grease as it will mix with the ointment that is to be applied.

Blisters are carefully protected and the serum is evacuated with a hypodermic needle, after which a small amount of mercurochrome is injected into each collapsed vesicle. Mercurochrome is used because of its color, and only

enough is injected to cover the floor of the emptied vesicle. If the blisters are torn or the burn is deep, mercurochrome is applied with a cotton swab. Mercurochrome has been omitted in treatment of small burns, and they have remained as free of infection as those in which it has been employed. Perhaps the added precaution of its use is unnecessary.

When this preliminary treatment has been completed, sterile gauze is folded in about four thicknesses, to make an area large enough to cover the burn. If the burn is too large to be covered by one piece of gauze, or if it is in an area where a single piece would not fit snugly, more than one piece can be applied. The gauze is laid on a smooth, sterile towel and is covered with a layer of ointment at least $\frac{1}{8}$ inch thick. This dressing is laid, ointment side down, on the burned area. More gauze may be placed on this dressing and the whole held in place with bandages or other material. No attempt should be made to spread the ointment on the burn, because it will not adhere readily to the raw surface.

Ordinarily, this dressing is not removed for two days. At the end of that time, the entire dressing can be removed as easily as a piece of wet writing paper is lifted from the top of a table. There is no sticking from dried serum or dried blood. The surface of the wound does not bleed but has a clean, glazed appearance, as if the area were covered with a thin, transparent film. Unless new blisters have formed, another dressing, prepared as before, is applied and each dressing is left in place for two days. Usually, only from four to six dressings of aloes ointment will be required. Then zinc stearate or some other bland dressing may be applied.

Illustrative Cases

It must be stated that, in the period that has elapsed since I have been using the treatment that has been described, I have not encountered any burns of sufficient severity to endanger life. There is no reason to believe, however, that good results might not be obtained by this method in treatment of more extensive burns.

*Read before the Olmsted-Houston-Fillmore-Dodge County Medical Society, January 6, 1938.

Case 1.—A man stepped into a pit containing boiling water which had just been released from a pressure cooker in a canning factory. The leg, as high as the knee, was immersed in the water. Few blisters were encountered because most of the epidermis adhered to the patient's underclothing and stockings when they were removed. In areas the size of a silver dollar, over the maleoli, the burn completely penetrated the integument. Treatment such as has been described was applied and the patient returned to work on the nineteenth day after the injury.

Case 2.—A girl, sixteen years of age, spilled boiling water over her feet. The very severe scald involved most of the surface, except the soles, of both feet to above the ankles. This patient lived in the country and came to the office for treatment only four times, on alternate days. The feet were coated with lard when she first was seen. Results from the treatment which has been outlined were satisfactory.

Other cases.—Two infants suffered smaller burns on the face, arms and chest, by falling against heating stoves. Dressings were easily applied because their application and removal were painless.

Two patients, with severe sunburn involving the shoulders and most of the back above the waist, both complained bitterly of pain when they came for treatment but they suffered practically no pain after the first dressing was applied. Only two dressings with the ointment were required. Then zinc stearate was applied.

Comment

My interest in aloes for the treatment of cutaneous conditions began some years ago. I have reported some experiences with this substance.³ Originally, I treated chronic ulcers and some skin diseases with the fresh leaf of *Aloe vera*, obtained from Florida and the island of Aruba in the Dutch West Indies. However, it was difficult to obtain and preserve the fresh leaves and, after trial of ointments made in various ways, the two ointments that have been described were adopted. That made from Socotrine aloes is dark brown, and that made from Barbados aloes, nearly black. The dark color of aloes ointment is a disadvantage because it soils the dressings and unbroken skin, but not more so than the various dyes and other colored substances which are used in treatment. Surfaces where the ointment has been applied can be cleaned with benzine and the residue can be removed with rubbing alcohol.

Aloes, used either as the leaf or ointment, possesses distinct analgesic qualities. Removal of ointment dressings, as has been said, is painless. Dense, white scar tissue is not seen after healing of burns but the burned areas are reddish at first and remain smooth and pliable. Healing is rapid. Aloes possesses some enzymotic action; pus is apparently digested for purulent surfaces become clean. The drug is astringent, possibly because of the tannin it contains. It has styptic properties in fresh cuts, when applied as a powder. Antiseptic properties are indicated by the rapid clearing up of infected surfaces. When burns are treated by the method that has been outlined, infection is negligible.

It might be feared that absorption would give rise to unpleasant effects but I have noted no evidence of absorption. Stools have not been loose in any case. No undesirable effect was seen when powdered aloes was dusted in full strength, daily for a number of days, over the entire surface of large, chronic ulcers. Aloes is reputed to have abortifacient action but in treatment of one woman, eight months pregnant, the ointment was used for severe and extensive dermatitis caused by poison ivy and there was no evident effect on the uterus. Another woman four months pregnant, was treated with aloes ointment for severe pruritus vulvæ, without any untoward effect.

That this is not one of those measures which seems effective only in the hands of the one who advocates it is evident in the results which Collins⁴ and Wright⁶ have obtained with aloes in the treatment of roentgenologic injuries.

References

1. Bettman, A. C.: The tannic acid-silver nitrate treatment of burns: A method of minimizing shock and toxemia and shortening convalescence. *Northwest Med.*, 34:46-51, (Feb.) 1935.
2. Bettman, A. G.: The rationale of the tannic acid-silver nitrate treatment of burns. *Jour. A.M.A.*, 108:1490-1494, (May 1) 1937.
3. Collins, C. E.: Alvagel as a therapeutic agent in the treatment of roentgen and radium burns. *Radiol. Rev. and Chicago Med. Rec.*, 57:137-138, (June) 1935.
4. Collins, C. E., and Collins, Creston: Roentgen dermatitis treated with fresh whole leaf of *aloe vera*. *Am. Jour. Roentgenol.*, 33:396-397, (Mar.) 1935.
5. Crewe, J. E.: The external use of aloes. *Minn. Med.*, 20:670-673, (Oct.) 1937.
6. Wright, Carroll S.: *Aloe vera* in the treatment of roentgen ulcers and telangiectasis. *Jour. A.M.A.*, 106:1363-1364, (Apr. 18) 1936.

ALOE VERA OINTMENT TESTED ON THIRD DEGREE BURNS

By Dr. R. Rovatti, M.D. and Dr. R.J. Brennan, M.D. done at the laboratories of Viamax, Inc., Miami, Florida.

Published in Industrial Medicine and Surgery, August 1959, pages 364-368.

"The purpose of this study was to determine, with serial biopsies, the progressive skin changes in thermal burns from the time of burning to the end of the pathological and healing process. . . . The process of gradual formation of the eschar has been followed in these experiments, examining the gross and microscopic changes step by step after establishing a definite procedure to provide (1) a controlled procedure of burning, (2) a close examination of the initial damage to the skin structures, (3) the timing of subsequent histopathological changes in the early hours and days following burning, (4) an insight into factors to be corrected and possibly prevented by the early treatment of thermal burns and (5) a uniform method to evaluate the efficacy of early therapeutic measures.

"Albino rabbits weighing six to seven pounds were kept on a standard diet to assure a homogeneous group. . . . Preliminary research work done by us on identical burns following the same method and procedure showed that aloe vera gel alone was not well suited for continuous dressing of the thermally injured skin and an ointment consisting of lanolin base alone was not effective. . . . The ointment, consisting of aloe vera gel, preparation S, 30% in a specially prepared bland ointment base with 5% lanolin, used in Groups I and II of the following comparative experiments, was found to be the most effective preventing the formation of the microscopic eschar. . . .

Summary

"Gross and microscopic observations in these experiments showed that in deep dermal burns an eschar forms and separates microscopically in 24 to 48 hours and grossly the eschar separates in 10 to 14 days if the skin is not treated with ointment after burning.

"The study of the burned skin in the untreated group, showing this clear-cut separation and demarcation, suggest that early treatment should be directed toward the prevention of the changes which produce the formation of the eschar within the first 24 hours.

"Group I -- Treated with Alo-Creme Ointment: The skin burned and treated with Alo-Creme Ointment remained pliable and soft during the first week with slight and continuous superficial debridement of the upper dermis and without gross or microscopic separation of an eschar. These lesions healed in two weeks without gross evidence of scarring.

"Group II -- Treated with Alo-Creme Ointment containing cystine: Identical burns treated with Alo-Creme Ointment containing 5% cystine, showed during the second week more superficial debridement than observed in animals of Group I. There was no gross or microscopic separation of an eschar and no gross scarring

occurred. There was little or no difference between this group and Group I.

"Group III -- Treated with trinitrophenol ointment: The appearance of the skin was comparable during the first 24 hours to that observed in Groups I and II. Then these lesions became grossly and microscopically hemorrhagic and the separation of an eschar was evident microscopically at 48 hours. None of the animals survived the tenth day and hemorrhages were found in the skin at the end of the first week.

"Group IV -- Treated with petrolatum and gauze: During the first three days there was a gradual development of congestion, edema and focal hemorrhages of the skin area in these burns. Microscopically an eschar did develop and separate during the first 48 hours. By the end of the first week there were numerous hemorrhages and several small abscesses. At the end of the second week the entire dermis was debriding in large masses and the lesions healed by scarring during the third and fourth week."

BURN RESEARCH AT UNIVERSITY OF CHICAGO BURN CENTER 1979

Dr. Martin Robson, director of the University of Chicago Burn Center reported at the Burn Conference held in New Orleans in the spring of 1979 the positive results of testing burns on guinea pigs.

In an article published in the Los Angeles Times, Friday, June 22, 1979 by staff writer, Paddy Calistro, Dr. Robson explained, "Aloe Vera probably prevents the progressive death of tissues." He also added "...under test conditions on animal subjects, that certain types of pasteurized Aloe Vera may stop the progressive injury due to severe burns."