



DECLARATION OF ACCURACY AND PRECISION

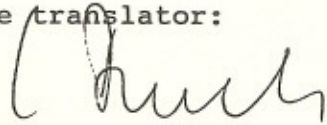
Re: Translation from Portuguese

Article by A.G. Sobrinho, "A Cellulose film in the  
treatment of second- and third-degree burns"

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This declaration certifies the accuracy and precision of the translation from  
Portuguese into English of the above material and is an accurate  
reflection of the text as it appeared in Portuguese.

for the translator:



Translator

11/11/96

Date

DRUSTS ASSOCIATES

**A cellulose film in the treatment  
of second- and third-degree burns**

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**SUMMARY**

Description of two cases of second- and third-degree burns in upper and lower limbs, treated with a cellulose film named BIOFILL. Very satisfactory results were obtained, since the area in the first case should have received a laminar-type skin graft and was treated only and exclusively with the use of the cellulose film. The hyperbaric chamber was used as the only parallel treatment, in order to reduce secretions and accelerate drying of the film.

**KEYWORDS:** biologic dressing; temporary skin substitute; cellulose film

The objective of local treatment of an extensive and deep burn is to restore the integrity of the injured skin as rapidly as possible, without any functional loss, avoiding scarring retractions and/or hypertrophies. When the patient is pediatric, the treatment is surrounded by special concerns, since this type of patient is very susceptible to situations that generate anxiety and stress, principally by the separation from the bosom of the family (in this case, the necessity of hospitalization) and not very resistant to pain. Survival is not a problem and emphasis should be given to the protection of the wound, to the comfort of the patient and to rapid rehabilitation.<sup>1</sup>

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The dry occlusive dressing returned to use during the Second World War, where the importance of sterile and aseptic techniques in the cleaning and dressing of the burn was emphasized in this era by Harvey Allen and Summer Koch.<sup>2</sup> They summarized their experience and affirmed that the surgical principles involved in the treatment of burns were frequently forgotten and sometimes ignored in the constant effort to find new and better treatment methods.<sup>3</sup> They indicated that these fundamental principles are very simple and established the objectives of its treatment<sup>4</sup>:

- 1) convert an open and contaminated wound into a clean wound;
- 2) cover an open wound with the most simple dressing possible that:
  - a - would protect it against the constant risk of reinfection;
  - b - would not stick to or destroy any part of the skin or subcutaneous tissue that is still viable when the patient is seen for the first time;
  - c - would permit drainage of serosity that oozes from the burned surface until it may be controlled by pressure or by the normal coagulation process;
  - d - would exert uniform moderate pressure over the burned area;
  - e - could be easily removed if infection develops under the dressing or if the burn compromises the entire thickness of the skin.
- 3) keep the injured surface at rest;
- 4) ensure healing in the minimum period of time with the minimum loss of function.

Local care should be initiated at the time the patient is admitted, however it will always be considered at a lower level than that dedicated to the general condition of the patient. In the final analysis, local treatment of the burned area seeks:

- a - to attenuate or prevent pain, loss of fluids, destruction of tissues and infection;

b - to isolate the lesion from the rest of the body until it completes its repair;

c - to not increase aggravating factors.<sup>5</sup>

Since 1972, more than 800 burn victims were treated at the Burn Center of the Sherman Oaks Community Hospital of Los Angeles. The hyperbaric oxygen (HBO) chamber is used only as support for standard treatment procedures, and is not used to replace currently accepted treatments. The results of the first program of 3-year studies show definitive modifications in the application of dressings to burns. There was a definite decrease in mortality in comparison to our predictions and statistics and with those of the NBIE.<sup>6</sup>

The results of in vivo studies by Ketchum and coworkers indicate that hyperbaric oxygen may improve the mortality rate of thermic burns by reducing the shock from the burn, infection and by accelerating the healing of the wounds. Graft procedures are benefitted by exposures to hyperbaric oxygen, subject to controlled time.<sup>7</sup>

The combination of the cellulose film<sup>7</sup> with HBO was shown to be of excellent importance because one complements the other; the cellulose film protecting the patient from new infections and the HBO drying the secretions and accelerating epithelization.

#### Report of cases

Case 1 - Female patient, white, nine years of age, not presenting with other associated pathologies, sought our service on 12/31/87, with a [clinical] picture of extensive burn of the right lower limb, compromising inner, outer, and posterior surfaces of the leg, caused by alcohol, on the preceding day.

Treatment was begun with occlusive dressing with furazonated gauze (Nitrofurazone Jefforos, 1957),<sup>5</sup> with outpatient care and daily changes of the dressing being done until the lesion was without necrosis and ready for grafting. On the 13th day



(01/13/88), the area was showing excellent granulation tissue (Fig. 1).

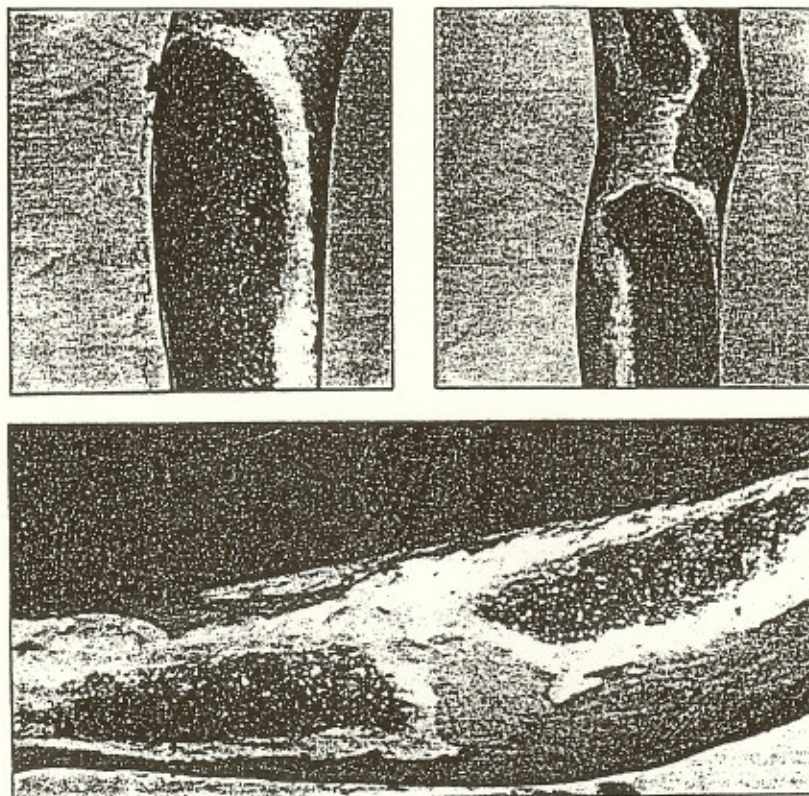


Fig. 1 - After debridement of the lesion

Surgical debridement of the rest of the devitalized tissues was done on 01/18/88, under general anesthesia and rigorous asepsis, with the first cellulose films being placed. These were removed from the packages and immediately placed on the lesions, according to the manufacturer's guidelines, being left without occlusion for better drying of them and subsequent formation of scab.

Twenty-four hours after the placement of the cellulose film (Fig. 2), it showed good adherence, little serous secretion and some hemorrhagic points. The patient felt well, did not have pain, could walk normally. Daily care was done and, on the 8th day, after placement of the film, thicker secretion of a yellowish color

was noted, without characteristic odor. Drainage was done with small incisions on the film, using sterile water. Material was collected for culture and antibiotic testing. From the beginning of the burn, topical antibiotic therapy was not used,<sup>8</sup> which made, according to the results of the culture, *Staphylococcus aureus* appear. Concomitantly, coverage was initiated with antibiotic by systemic route.

On 02/01/88, the 14th day after placement of the cellulose film, it was removed for the first time, with rigorous asepsis being done (Fig. 3).

An epithelization in the borders of the wound could be noted.

Observations made 24 hours after the changing of the film showed that it was completely dried and with small hemorrhagic black points.

On 02/09/88, a second change was done, only on the outer surface of the leg (Fig. 4), since the inner surface had good epithelization (Fig. 5), with loosening of the scab formed with the cellulose film. From this date, the patient was guided into the hyperbaric chamber in the attempt to achieve an improvement in the area with secretion and posterior healing (Fig. 6). After 45 days from the beginning of treatment and 15 sessions in the hyperbaric chamber, the burns were completely epithelized, with some scabs (Fig. 7).

In Fig. 8, aspects of the burned area 60 days after the placement of the cellulose film are seen, showing tissue with a pink and brilliant appearance.

Five months after the beginning of treatment, the treated area shows good elasticity, pink coloring, hyperchromic in the center of the lesion and hypochromic in the outer part, not showing hypertrophic or keloidal scars.



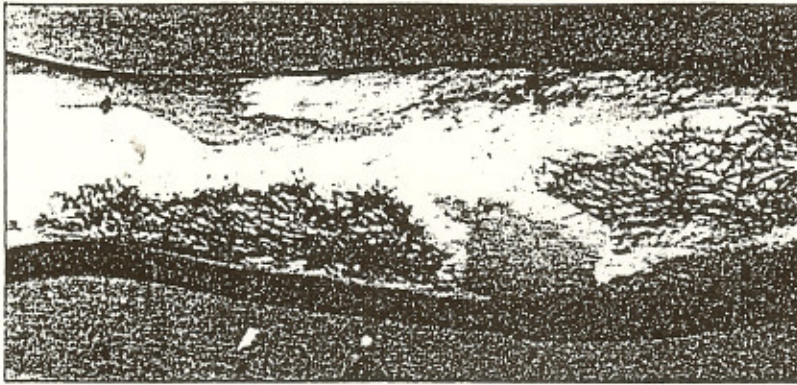


Fig. 2 - Note the dried film, 24 hours after its application.

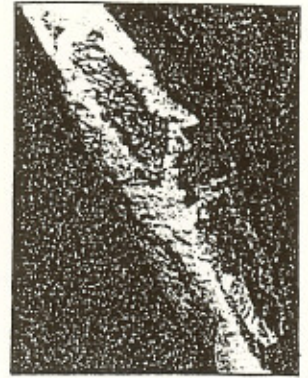
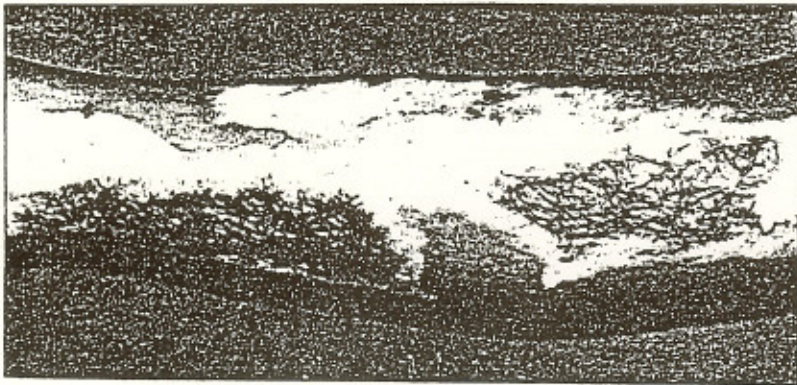


Fig. 4 - Aspects 24 hours after the 2nd change of the cellulose film.



Fig. 3 - Removal of the 1st film and application of the 2nd.



Fig. 5 - Third change of the cellulose film, in one area.



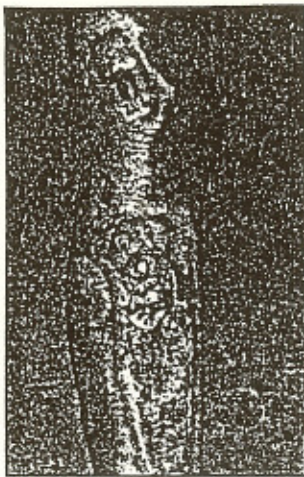


Fig. 6 - Aspects of the 3rd change, where some secretion can be noted.

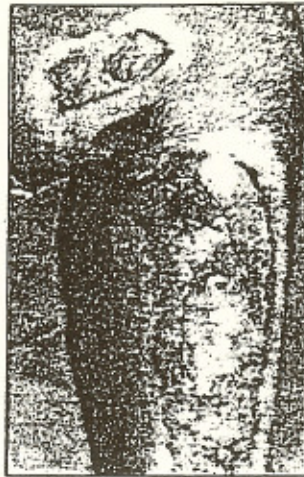


Fig. 7 - With 45 days, completely epithelized area, noting small scabs in the deeper areas.

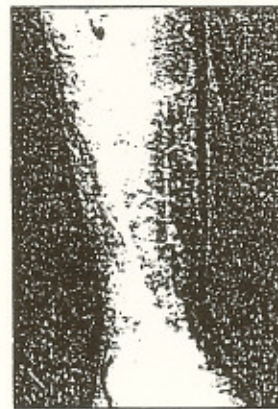
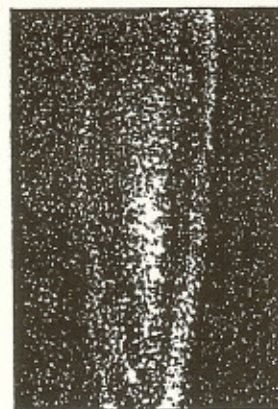
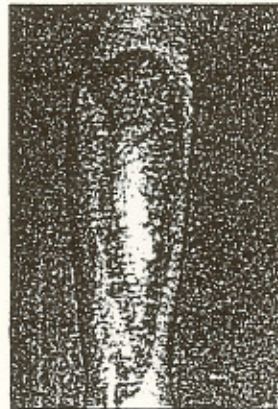
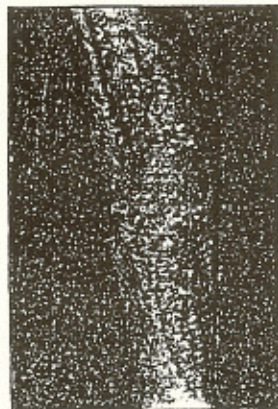
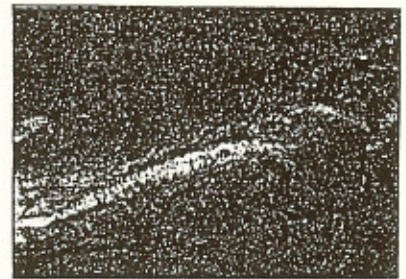


Fig. 8 - After 5 months from the beginning of treatment.



Case 2 - Male patient, white, 31 years of age, without any other associated pathology. He suffered burns of the arm, forearm and back of the left hand, after explosion of chemical material (acid). Fifteen percent of the burns were third degree and 85% were second degree.

On 06/07/88, the patient was helped after suffering the burns, reporting great intensity of pain. Analgesia and occlusive dressing with furazonated gauze were done. However, the patient did not maintain the daily changes of the dressings (due to the pain), seeking in that case our services, where the use of a cellulose film named BIOFILL was indicated. General anesthesia was applied for the removal of these occlusive dressings, besides the evaluation of the lesions, in accordance with Fig. 9. After rigorous antisepsis, removal of the devitalized tissues and placement of cellulose films was done, covering the entire area of the burn, in accordance with the manufacturer's guidelines (Fig. 10). After doing the daily care, there was no formation of secretions, except in the third-degree area, where it was reabsorbed without any drainage. The patient reports that the pain disappeared in less than 24 hours, when he could in that case return to his activities.

Around the 10th day, we could note the film drying and the formation of scabs, since these loosened in the more superficial areas, where an epithelized tissue is noted (Fig. 11). With 18 days, the patient had all the areas epithelized. In Fig. 12 we can note, at the end of one month, a tissue of good quality, without sequelae, and showing hyperchromic areas in the sites where the burns were deeper; in the rest of the areas, a pink tissue with good elasticity.

#### COMMENTARIES AND CONCLUSIONS

If we analyze the trauma that would be caused to obtain a large amount of graft, the hospitalization of the patient with days of occupying a bed and the dressings that would be necessary, for the donor as well as the recipient area, we will see that the



cellulose film came to promote innumerable advantages not only of patient comfort, principally in the pain aspect, but also for the hospital, with regard to bed-cost, besides eliminating hours spent with dressings, asepsis and anesthesia at the physician and nursing personnel level.

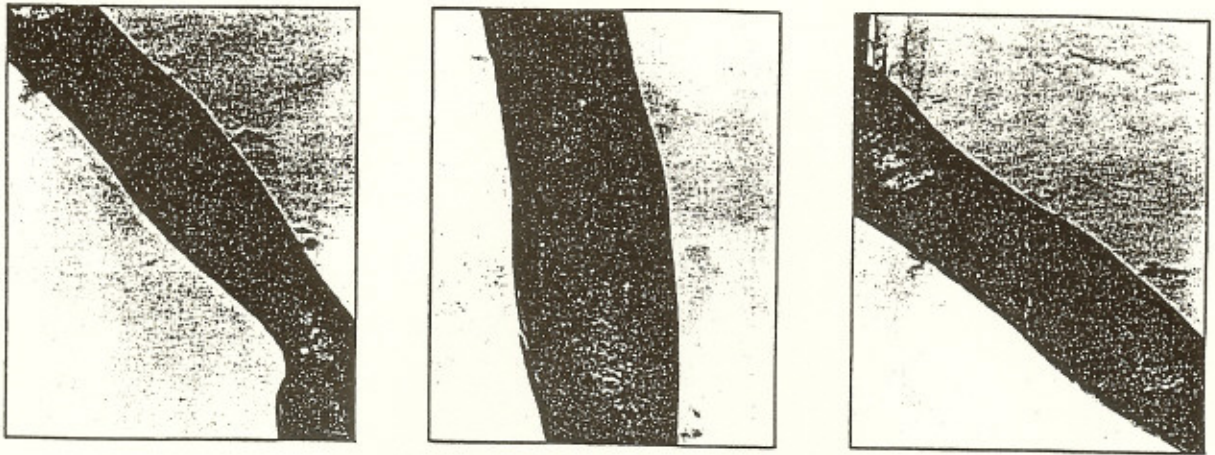


Fig. 9 - After removal of the occlusive dressing, due to the intensity of the pain.

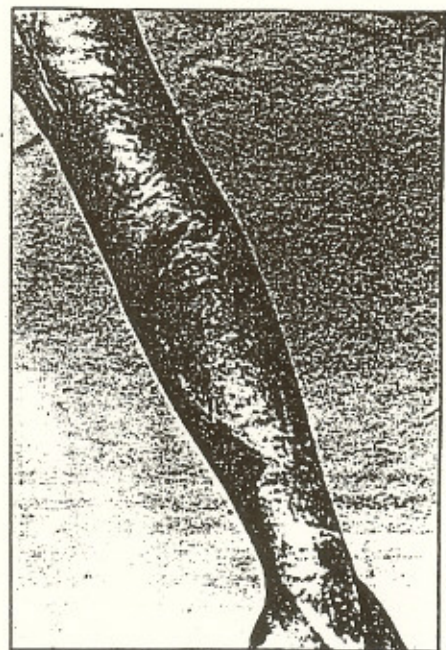
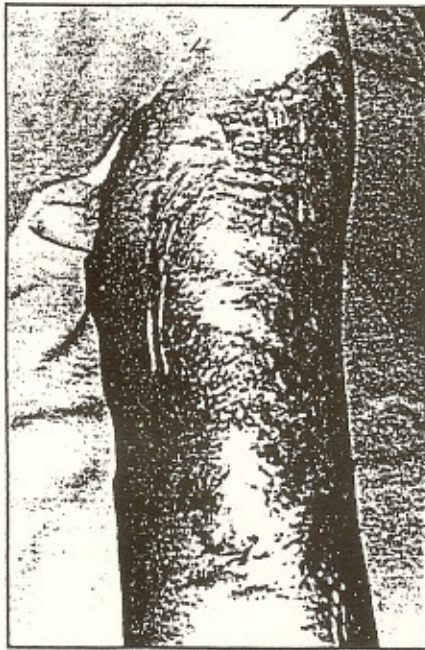
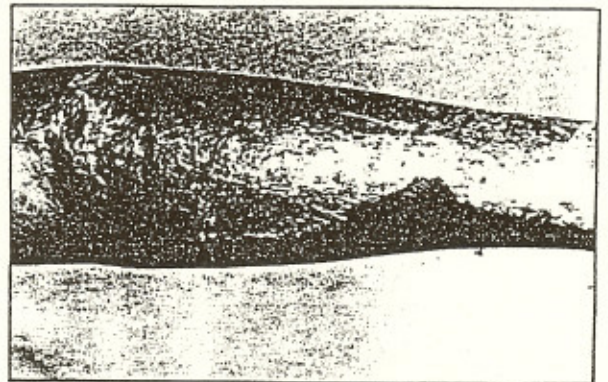
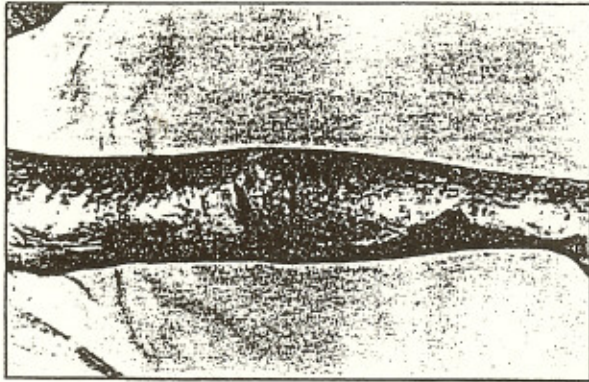


Fig. 10 - After application of the cellulose film.



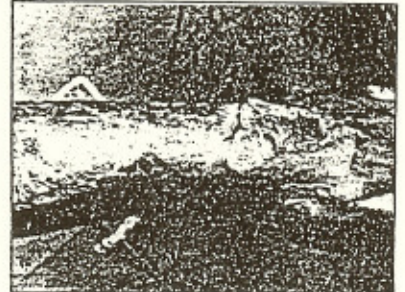
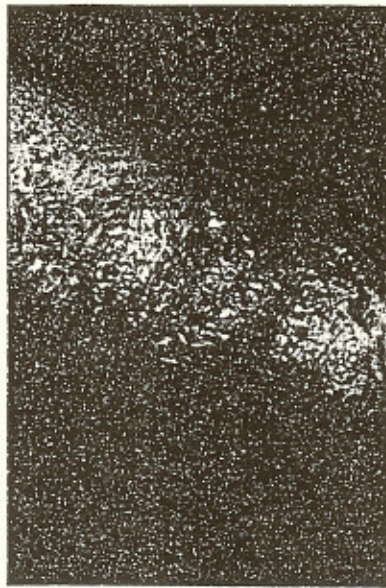
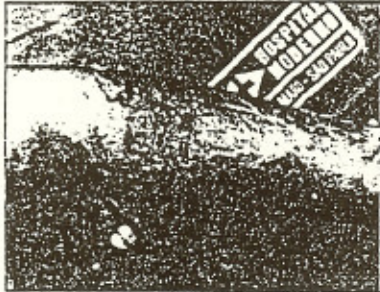


Fig. 11 - Dried film, with scabs, and beginning loosening in the more superficial areas.

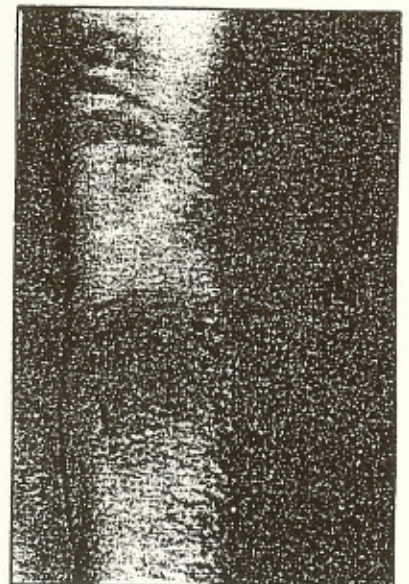
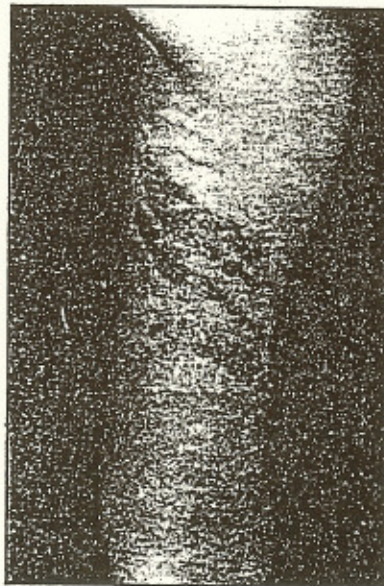
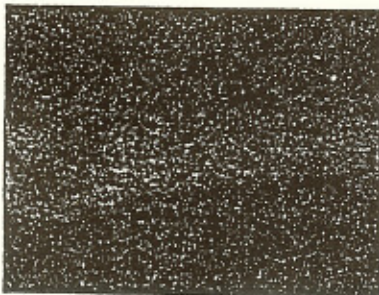


Fig. 12 - One month after single application of the cellulose film.

## References

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