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VOLUME IV

COLLECTED STUDIES OF
SKIN DISEASES

By the
DERMATOLOGICAL DEPARTMENTS
of the
BARNARD FREE SKIN AND CANCER HOSPITAL
and the
SCHOOL OF MEDICINE, WASHINGTON UNIVERSITY
ST. LOUIS



Edited by
RICHARD S. WEISS, M.D.
and
MORRIS MOORE, PH.D.

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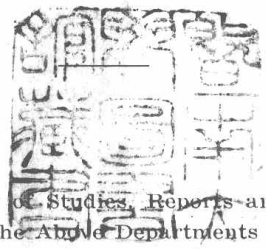
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The Fourth Volume of Studies, Reports and Observations
of the Above Departments

Edited by
RICHARD S. WEISS, M.D.
and
MORRIS MOORE, Ph.D.

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*To one who has achieved pre-eminence
in his chosen life's work
MARTIN FEENEY ENGMAN, SR., M.D.
we, his grateful students,
dedicate this volume.*

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COLLECTED STUDIES OF SKIN DISEASES

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XC.—MICROSPOROSIS OF THE SCALP CAUSED BY MICROSPORUM FULVUM

REPORT OF A CASE AND DESCRIPTION OF THE FUNGUS

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and the Washington University School of Medicine

AND

ADOLPH H. CONRAD JR., M.D.

Resident in Dermatology

ST. LOUIS

The infrequency of microporosis due to *Microsporum fulvum* in the United States, and particularly in the midwest, warrants the report of the following case.

REPORT OF CASE

N. R., a boy aged 4 years, entered the dermatologic clinic of the Barnard Free Skin and Cancer Hospital on Dec. 19, 1939, with a "sore on the scalp," which, the child's mother stated, had been present for a week and showed a gradual increase in size.

Examination showed a circular patch of dermatitis with some alopecia and short, broken-off hairs (fig. 1). The involved area was mildly hyperemic, slightly raised above the surface of the surrounding skin and approximately 3.5 cm. in diameter. The lesion consisted of discrete and confluent papules, which were covered with grayish scales.

Scrapings from the lesion and some of the short, broken-off hairs were examined microscopically. They showed filaments and chains of spores, particularly the freshly infected hairs and scrapings from the periphery of the lesion (fig. 2). Hairs from the central area of the lesion showed a sheath of spores which was analogous to that produced by the microsporum. Cultures on Sabouraud's maltose and dextrose agars confirmed the presence of a microsporum, *M. fulvum*.

The source of infection could not be determined in this case, since there were no pet animals in the house, although there were many in the neighborhood. Two other children in the family, one younger and one older, were free from the infection.

The patient was given an ointment of salicylic acid (5 per cent) and precipitated sulfur (10 per cent) in petrolatum to apply three times daily. He failed to return to the clinic. An investigation four months later revealed that because of financial reasons the boy, on December 30, had been taken to the St. Louis City Hospital, which was in the vicinity of his home. At that institution he was given a similar ointment. On Jan. 2, 1940 the lesion was described as an "inflammatory dermatitis of the scalp," and wet packs of mercury bichloride (1:5,000) and

Studies, observations and reports from the Departments of Dermatology and Mycology of the Barnard Free Skin and Cancer Hospital, service of Dr. M. F. Engman Sr.

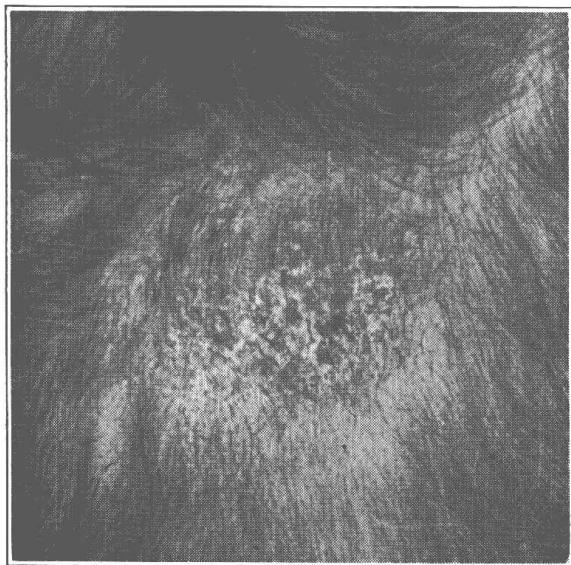


Fig. 1.—Lesion of microsporosis of the scalp caused by *M. fulvum*.

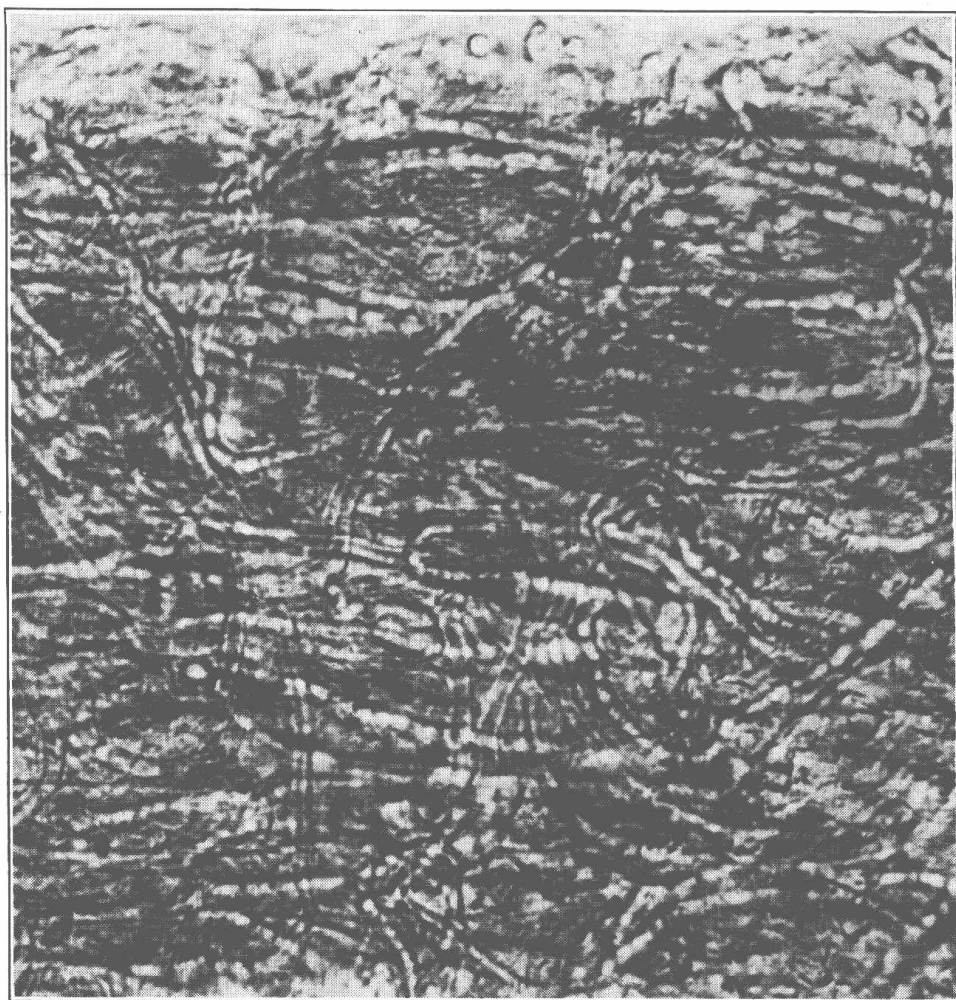


Fig. 2.—Hair infected with *M. fulvum*. Note filaments and chains of spores.

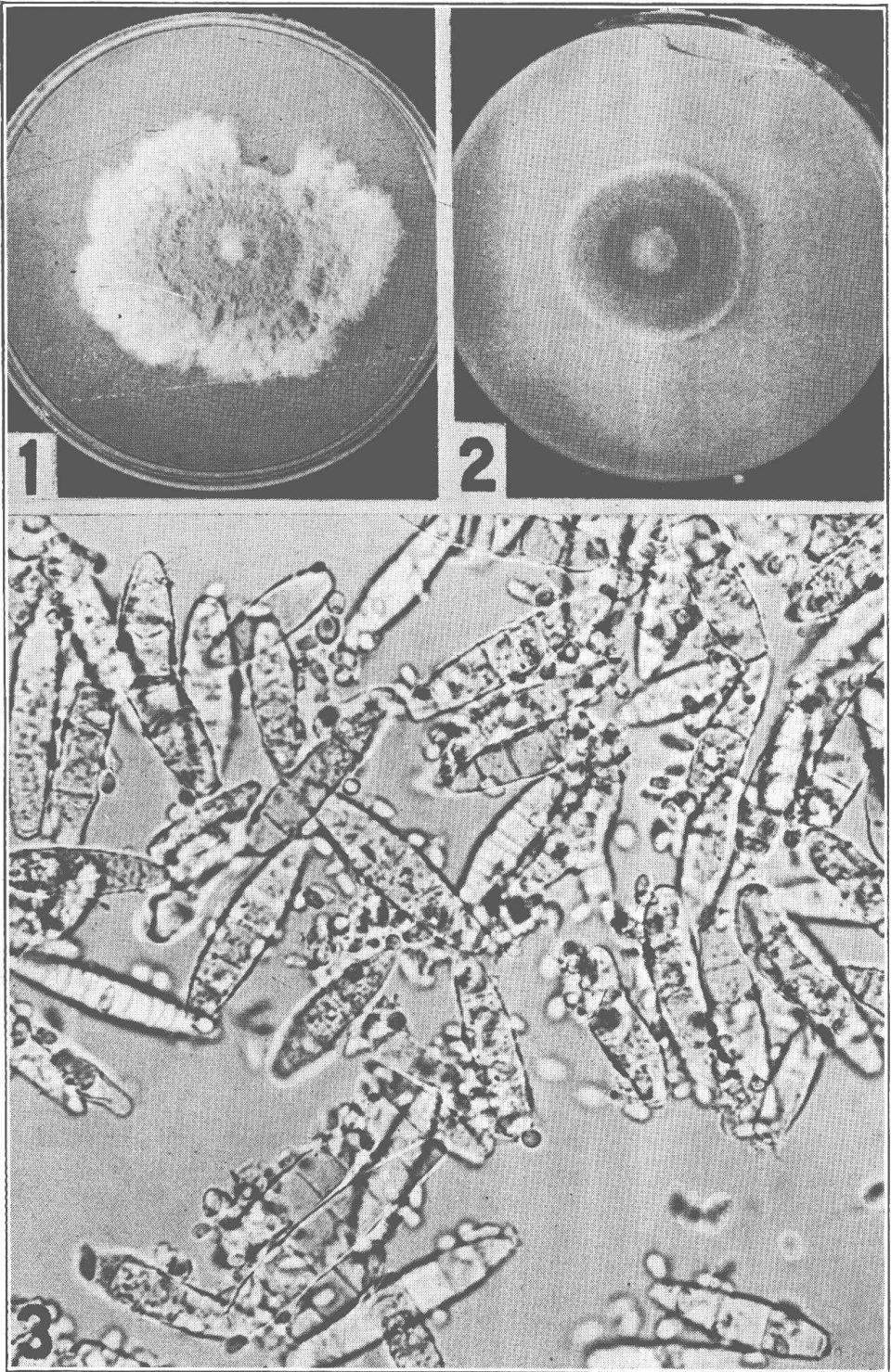


Fig. 3.—1, sixteen day old growth of *M. fulvum* on Sabouraud's glucose agar. 2, sixteen day old growth of *M. fulvum* on Sabouraud's maltose agar. 3, fuseaux and microconidia or aleurospores of *M. fulvum* grown on Sabouraud's maltose agar ($\times 560$).

the subsequent application of ammoniated mercury ointment (5 per cent) were prescribed. The mother was advised to epilate all remaining broken-off hairs. The wet packs were discontinued on January 4. The patient was last seen on January 13, at which time the dermatitis was rapidly clearing. By April 4, the lesion had completely disappeared, and the area was covered with apparently healthy hair.

Microsporiasis due to *M. fulvum* was first described by Uriburu¹ in 1909 in Argentina, where it was reported as being fairly common. The organism has also been described in reports from Uruguay, Brazil, Germany, Hungary and Canada and in a few from New York. Clinically, microsporiasis due to *M. fulvum* may resemble closely an early patch of favus. Microscopically the fungus on the infected hair may simulate microsporums of animal origin or at times *Achorion schoenleini*. Although no direct evidence is available, *M. fulvum* is generally considered to be transmitted by dogs or cats.

In culture *M. fulvum* grows rapidly, producing a characteristic growth in sixteen days. A white central umbo is formed, surrounded by a powdery, ochraceous buff, pinkish buff to light cinnamon-colored velvet, which in turn may be surrounded by an irregular, white, cottony growth, as on Sabouraud's dextrose agar (fig. 3, 1). On Sabouraud's maltose agar after sixteen days a growth of concentric rings is formed (fig. 3, 2). The cultural growth may become rapidly pleomorphic, as evidenced by the formation of white, cottony tufts.

Microscopically the cultural growth shows a large number of multi-septate fuseaux (macroconidia or closterospores), which are usually four to six celled, measuring approximately 30 to 55 by 10 to 15 microns, ellipsoid and thin walled, with warty excrescences on the surface. The fuseaux may be found in groups of twelve to fifteen on branched conidiophores (fig. 3, 3). Microconidia or aleurospores are also evident. These measure approximately 2 to 4 by 3 to 5 microns and are spherical or ovoid, sessile or on short sterigmata. On Sabouraud's sugar mediums there also may be seen chlamydospores, arthrospores, nodular bodies, pectinate hyphae and spirals.

This organism at times may be confused with the common microsporums of animal origin, particularly *Microsporum canis* and *Microsporum felineum*, and should be differentiated in order to demonstrate that this organism is not as rare as is supposed.

1. Uriburu, J. V.: Contribución al estudio de las tinias en Buenos Aires, Argent. méd., 1909, no. 42, p. 241; no. 43, p. 258; no. 44, p. 260; cited by Dodge, C. W.: Medical Mycology, St. Louis, C. V. Mosby Company, 1935, p. 541, and Sabouraud, R.: Les teignes, Paris, Masson & Cie, 1910.

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XCI. TATTOO TYPE BLEMISHES FOLLOWING USE OF IRON SALTS IN TREATMENT OF RHUS DERMATITIS

RICHARD S. WEISS, M.D.

ADOLPH H. CONRAD, M.D.

AND

ADOLPH H. CONRAD JR., M.D.

ST. LOUIS

McNair¹ in 1917 recommended the use of iron salts in the treatment and prevention of poison ivy dermatitis. He found a rational explanation of its apparent good effect in that the toxic principle of rhus is precipitated and perhaps denatured when it comes in contact with iron. This method of treatment was first used by White in 1873;² therefore, it seems to have been in use for many years previous to McNair's report.

Pusey³ in 1930 was the first to report a case of brown stains in the skin from wet dressings of a solution of ferrous sulfate. The stains on his patient's skin remained for years. Traub and Tenner⁴ reported 2 cases of this type of metallic pigmentation following the use of solutions of ferrous sulfate and ferric chloride and referred to 4 additional cases occurring in the service of Dr. George M. MacKee. Sutton⁵ reported a case of this condition following the use of strong solutions of ferrous sulfate and lead acetate. He stated the belief that the iron was precipitated in the skin as the acetate. Foerster⁶ stated that he had observed several cases of "tattoo marks" following the use of ferric

Studies, observations and reports from the Department of Dermatology of the Barnard Free Skin and Cancer Hospital and from the Department of Dermatology, Washington University School of Medicine, service of Dr. M. F. Engman Sr.

1. McNair, J. B.: A Contribution to the Chemotherapy of Rhus Dermatitis, *Arch. Dermat. & Syph.* **3**:802-808 (June) 1921; Rhus Dermatitis, Chicago, University of Chicago Press, 1923, p. 179.

2. White, J. C.: On the Action of Rhus Venenata and Rhus Toxicodendron upon the Human Skin, *New York M. J.* **17**:225-249, 1873.

3. Pusey, W. A.: Brown Stains in Skin from Wet Dressings of a Solution of Copperas, *J. A. M. A.* **94**:207 (Jan. 18) 1930.

4. Traub, E. F., and Tenner, J. S.: Permanent Pigmentation Following Application of Iron Salts, *J. A. M. A.* **106**:1711-1712 (May 16) 1936.

5. Sutton, R. L., Jr.: Pigmentation of the Skin Due to Iron (Copperas) Applied Locally, *J. A. M. A.* **108**:112-113 (Jan. 9) 1937.

6. Foerster, H. A.: The Treatment of Poison Ivy, *J. Oklahoma M. A.* **31**: 245-247 (July) 1938.

chloride solution and stated the opinion that it should not be used for local treatment. Reyner ⁷ reported another case of pigmentation following the use of ferrous sulfate. He stated that the pigmentation could be removed with ultraviolet irradiation. His patient had applied buttermilk after using ferrous sulfate.

The use of iron salts has been popularized for the layman in other than academic medical publications. For instance, in *Hygeia* ⁸ it was stated that a 5 per cent solution of iron chloride is an effective remedy for the treatment of ivy poisoning in its early stages. In a botany leaflet of the Field Museum of Natural History McNair ⁹ recommended the use of 5 per cent ferric chloride in 50 per cent alcohol as a preventive and as an effective treatment.

In supplement 161 of the *United States Public Health Reports* ¹⁰ the use of iron salts was recommended, but it was mentioned that several cases of persistent discoloration had been reported. Practitioners have become acquainted with this method of treatment through textbooks and in the section "Queries and Minor Notes" in *The Journal of the American Medical Association*.¹¹ Canadian physicians were acquainted with the treatment by Byram,¹² who did not mention the disfigurement which may follow. Without mentioning its disadvantages, McNair ¹³ recommended the use of iron salts to biology teachers. Manlove ¹⁴ has recommended it to Navy medical officers.

REPORT OF A CASE

A 23 year old white woman was first seen at the dermatologic clinic of the Barnard Free Skin and Cancer Hospital on July 8, 1940. She complained of brownish black discoloration on the left side of her face and neck and on both forearms.

On May 28, 1940 the patient had been exposed to poison ivy, and two days later a profuse eruption appeared on her face and arms. She treated the eruption

7. Reyner, C. E.: Pigmentation Following the Use of Iron Salts, *Arch. Dermat. & Syph.* **40**:380-381 (Sept) 1939.

8. Iron Chloride Solution Is Good Treatment for Poison Ivy, *Hygeia* **10**:767 (Aug.) 1932.

9. McNair, J. B.: Poison Ivy, Leaflet 12, Botany, Field Museum of Natural History, Chicago, 1926.

10. Ivy and Sumac Poisoning, *Pub. Health Rep.*, 1940, supp. 161.

11. Ivy Poisoning and Lobinol, *Queries and Minor Notes*, *J. A. M. A.* **97**: 341 (Aug. 1) 1931. *Dermatitis Venenata*, *Queries and Minor Notes*, *ibid.* **102**: 1517 (May 5) 1934.

12. Byram, A. T.: Poison Ivy Control, *Canad. Pub. Health J.* **22**:291-292 (June) 1931.

13. McNair, J. B.: A Dependable Remedy for the Poison Ivy Group, *Am. Biol. Teacher* **2**:100-101, 1940.

14. Manlove, W. R., Jr.: Ivy Poisoning, *U. S. Nav. M. Bull.* **33**:183-187 (April) 1935.

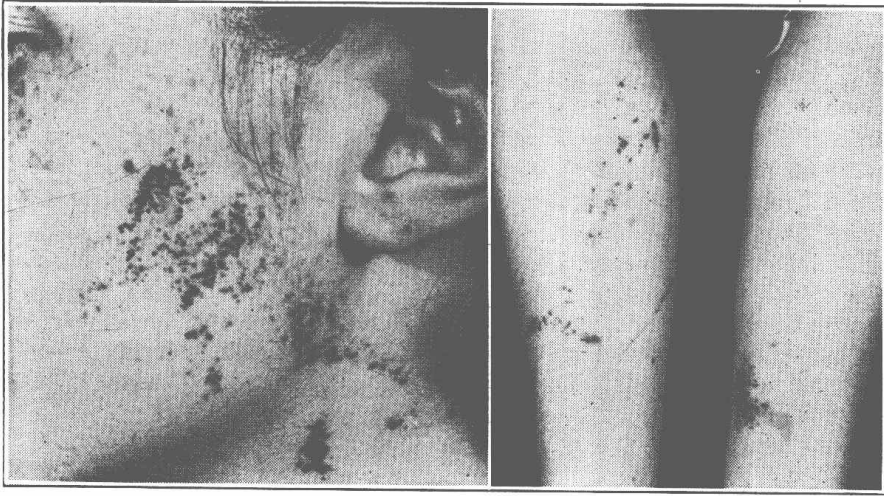


Fig. 1.—Distribution of tattoo type blemishes on the face and neck and on the forearms.

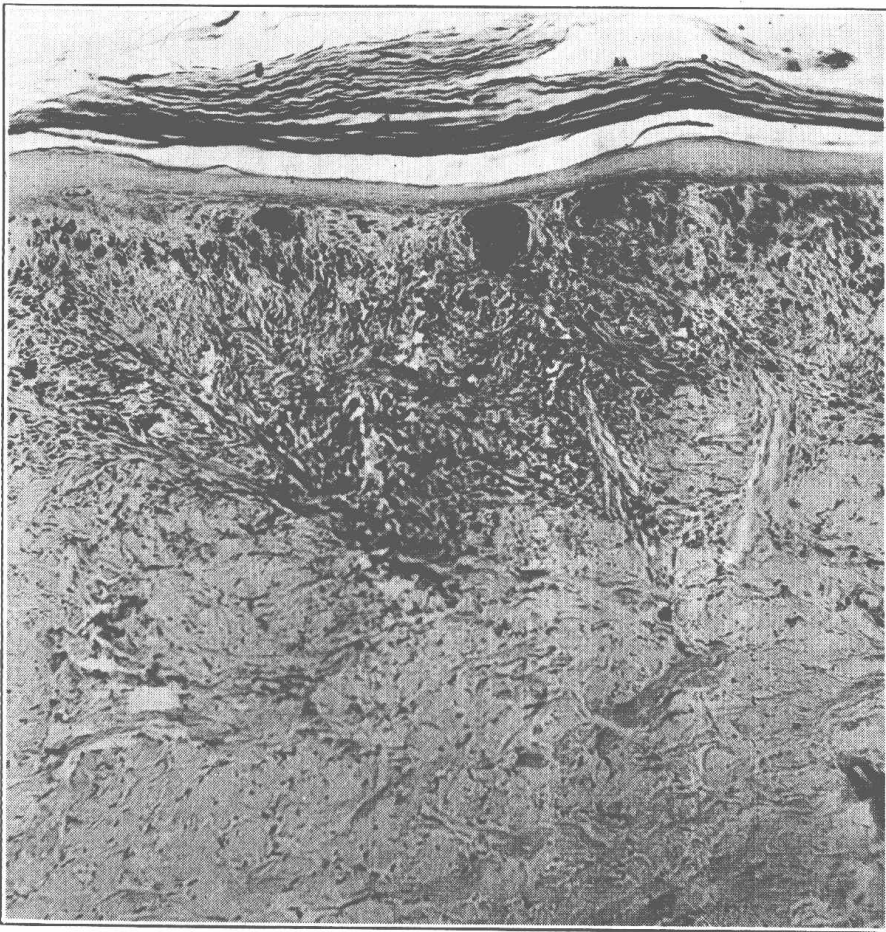


Fig. 2.—Photomicrograph showing deposits of iron in the upper portion of the corium and decided fibroblastic reaction about them ($\times 105$).

with various remedies, among which were solution of boric acid, solution of sodium bicarbonate, alcohol and a solution of lead acetate of the approximate strength of a teaspoonful to a half-cup of water. After the use of the lead acetate solution she procured from her pharmacist some ferrous sulfate, made a solution of about a teaspoonful to a half-cup of water and applied it liberally to the eruption. A few days later many of the lesions turned brownish red.

The patient when examined presented many areas of dark red to brownish black pigmentation on the left side of the face and neck and on both forearms, more profuse on the flexor surfaces. The distribution of the lesions was in lines, angular

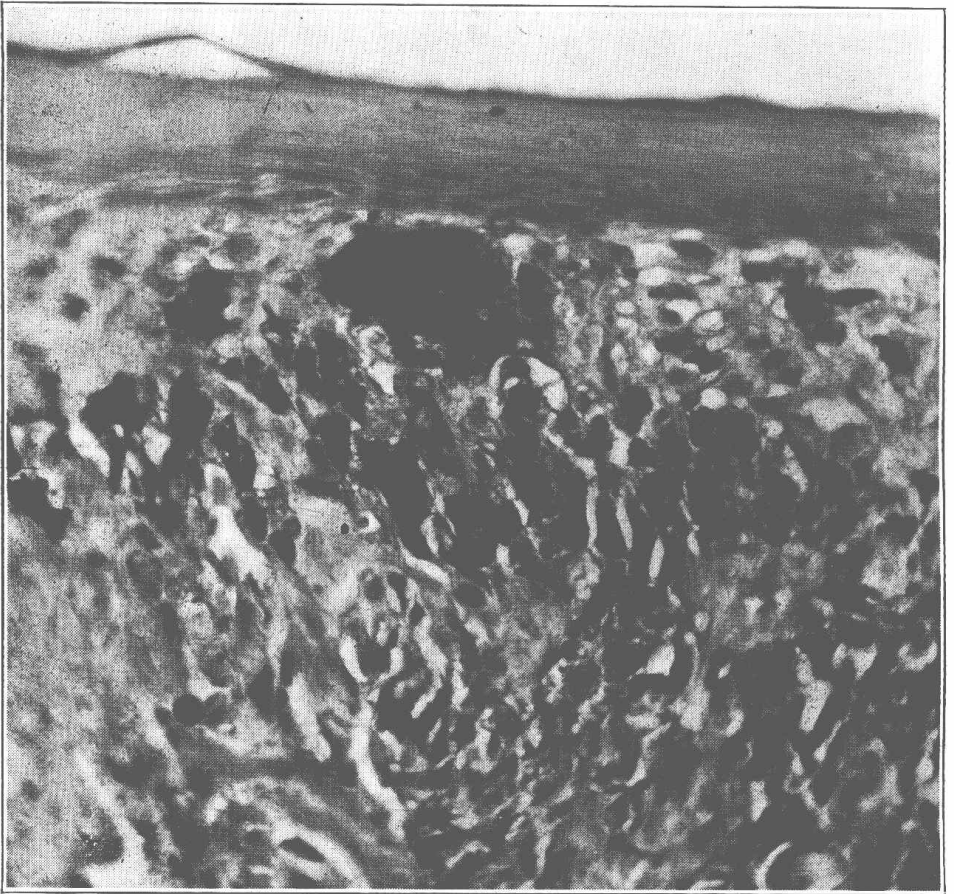


Fig. 3.—Photomicrograph showing macrophages containing iron granules and extracellular deposits of iron ($\times 380$).

figures and irregular groups (fig. 1). Many of them resembled purpura when viewed from a slight distance. The lesions were level with the skin, did not fade on pressure and presented no infiltration appreciable to the touch. The individual lesions were from 1 to 5 mm. in size, mostly circular or oval and decidedly grouped.

When a section of a lesion was examined microscopically the epidermis was found to be somewhat atrophic and the horny layer somewhat hyperkeratotic (figs. 2 and 3). Throughout the upper third of the cutis, and particularly immediately adjacent to the basal layer of the epidermis, there was a heavy deposit of reddish

brown granules (in the section stained by the Turnbull blue method for the demonstration of iron pigment the granules were deep blue). The examination under higher power revealed that some of these deposits were free in the tissue spaces but that most of them were contained in large cells which were interpreted as chromatophores or macrophages. The deeper portions of the cutis were apparently free from these deposits in the sections with hematoxylin and eosin and in the sections stained with Turnbull blue. There was a decided fibroblastic reaction about these granular deposits.

The spectrographic analysis¹⁵ showed a large amount of copper and a very large amount of iron present in the specimen. The calcium content was decidedly

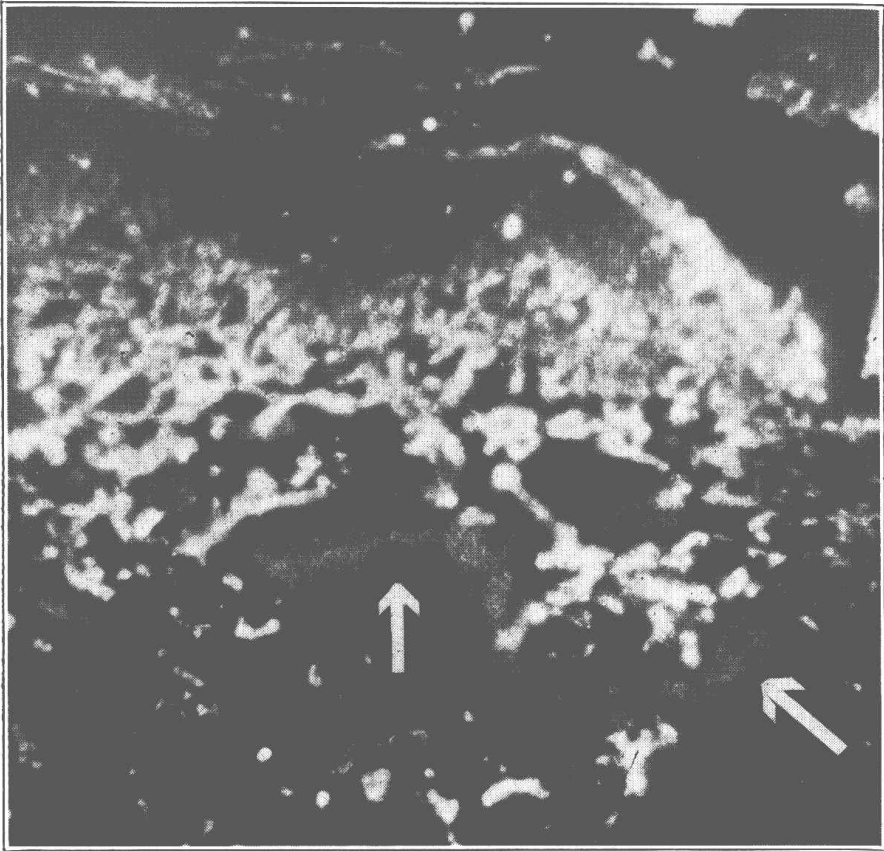


Fig. 4.—Dark field photomicrograph of microincinerated skin showing deposits of iron in the upper portion of the corium (indicated by arrows). The white ash of magnesium and calcium is well demonstrated in the epidermis ($\times 340$).

low, while the magnesium content was high. No arsenic or gold was found. A faint trace of lead was present, although not enough to be considered abnormal in view of the history of the use of lead acetate applications. The silicon lines were not more intense than those found in normal skin. This spectrogram was

15. The significance of this article lies chiefly in the spectrographic and microincineration studies, which were done by Dr. Ross C. MacCardle, research associate to the Dermatologic Department of the Barnard Free Skin and Cancer Hospital.