

DRAWINGS BY RICHARD MUIR

illustrating

"SOME PROBLEMS IN RELATION TO THE HEALING OF WOUNDS"

Thesis presented for the Syme Surgical Fellowship

by

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PLATE I.

Cells of Granulation Tissue (isolated)

Fig.1. From Granulation Tissue in Wound (5 days).
(Methyl-Green-Pyronin and Resorcin:
x 1000).

- a. Polymorpho-nuclear Leucocytes.
- b. Small Lymphocytes.
- c. Mononucleated cells.
- d. Phagocytic cells in the exudate.
- e. Cells in Mitosis.
- f. Different forms of Fibroblasts.

Fig.2. Pigment-containing cells from wound
(7 days).

(Haematin and Eosin x 1000.)

- a. Lymphocytes.
- b. Phagocytic cells containing
Haemosiderin granules.

Fig. I.

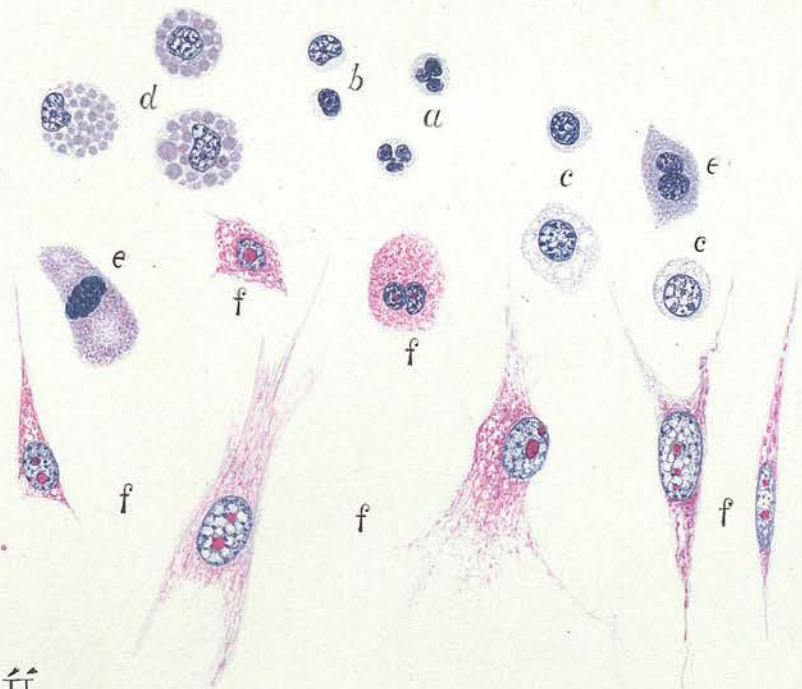


Fig. II.

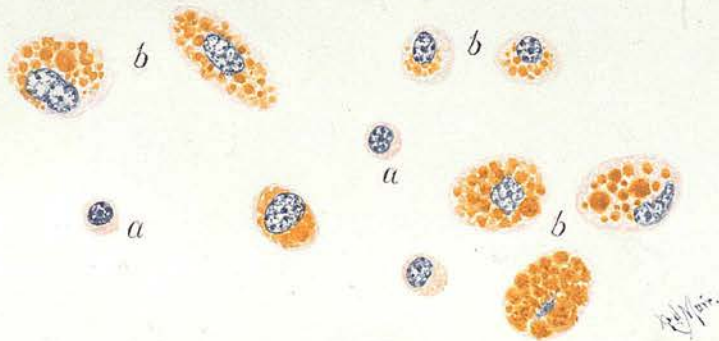


PLATE II.

Phagocytic Cells in Granulation Tissue.

(Eosin and Methylene Blue; x 1000).

- a. Fibrin filaments.
- b. Red blood corpuscles.
- c. Polymorpho-nuclear Leucocytes.
- d. Mononucleated cells.
- e. Phagocytic cells showing all stages of digestion of Leucocytes and red blood corpuscles.

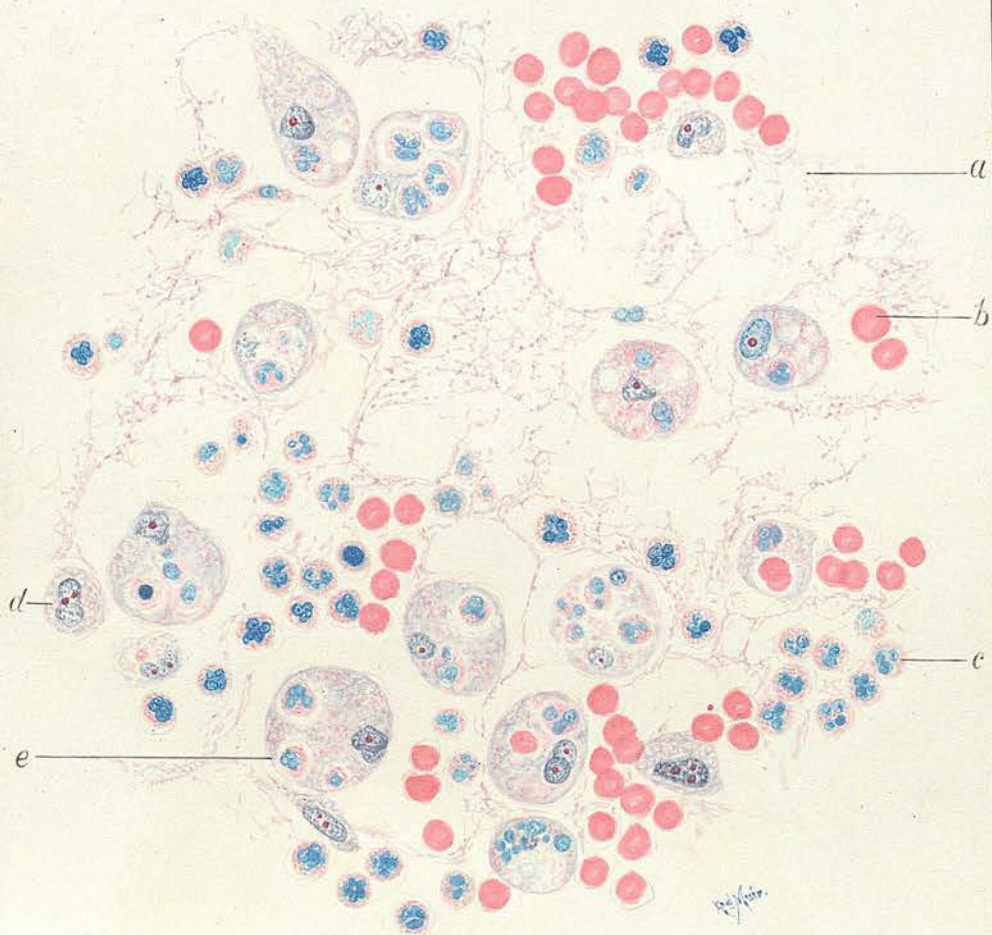


PLATE III.

Part of a "small-celled Infiltration" with
Lymphocytes and Plasma-cells.

(Methyl-Green-Pyronin and Resorcin- x 1000)

- a. Typical Plasma-Cells.
- b. Smaller cells: showing transitions between lymphocytes and Plasma-cells.
- c. Plasma-cell in Mitosis.
- d. " " with two nuclei.
- f. Mononucleated Phagocytes.
- g. Fibroblast.
- h. Phagocytic Fibroblast.
- i. Blood-vessels.

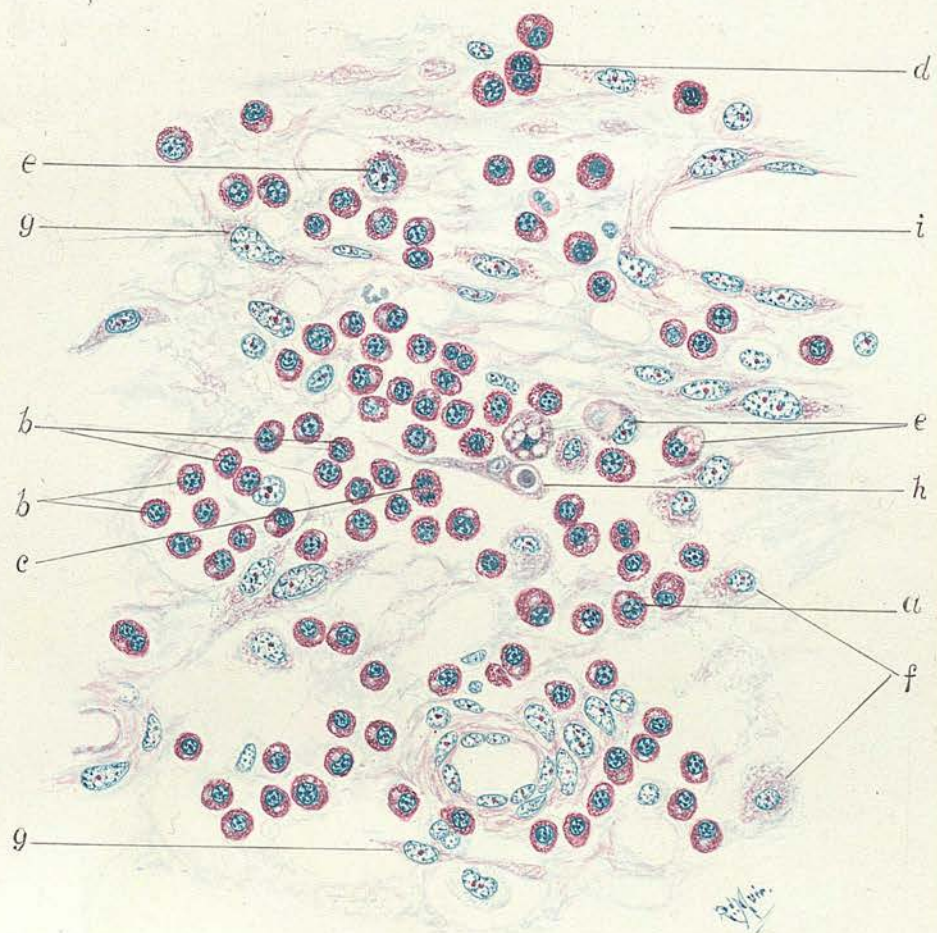


PLATE IV.

Foreign-Body Giant-Cells.

Fig.1. Giant-cell formation from Mononucleated cells: in Wound (10 Days.)

(Haematin and Eosin x 500).

- a. Foreign-body: isolated pieces of catgut.
- b. Single Mononucleated cells.
- c. Giant Cells.
- d. Blood-vessels.
- e. Larger giant-cells.

Fig.2. Giant-cell formation in Granulation Tissue Open Wound (7 days).

(Eosin and Methylene Blue: x 500)

- a. Foreign body.
- b. Single Mononucleated cells.
- c. Giant-cells: one also phagocytic.

Fig. I.



Fig. II.

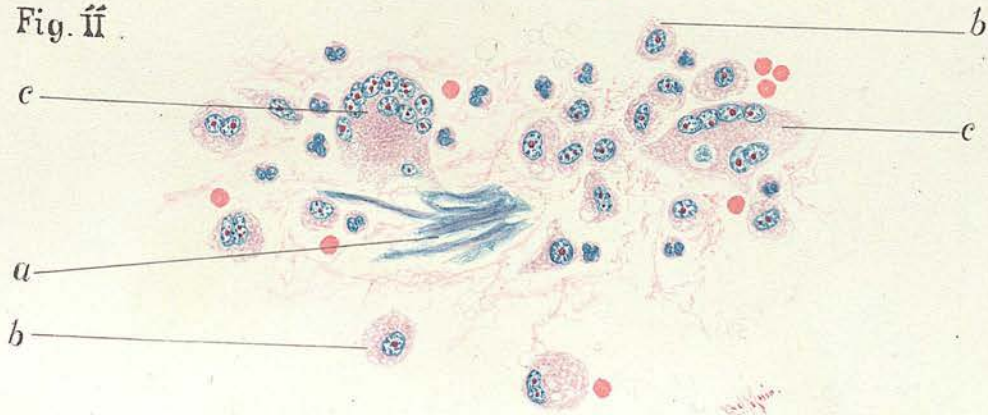


PLATE V.

New Fibril Formation: Wound (5 Days.)

(Van Giesen: x 1000).

- a. Cells showing commencing fibrillation: unravelling of the processes and fibrils running irregularly in the outer portions of the protoplasm and passing into the processes.

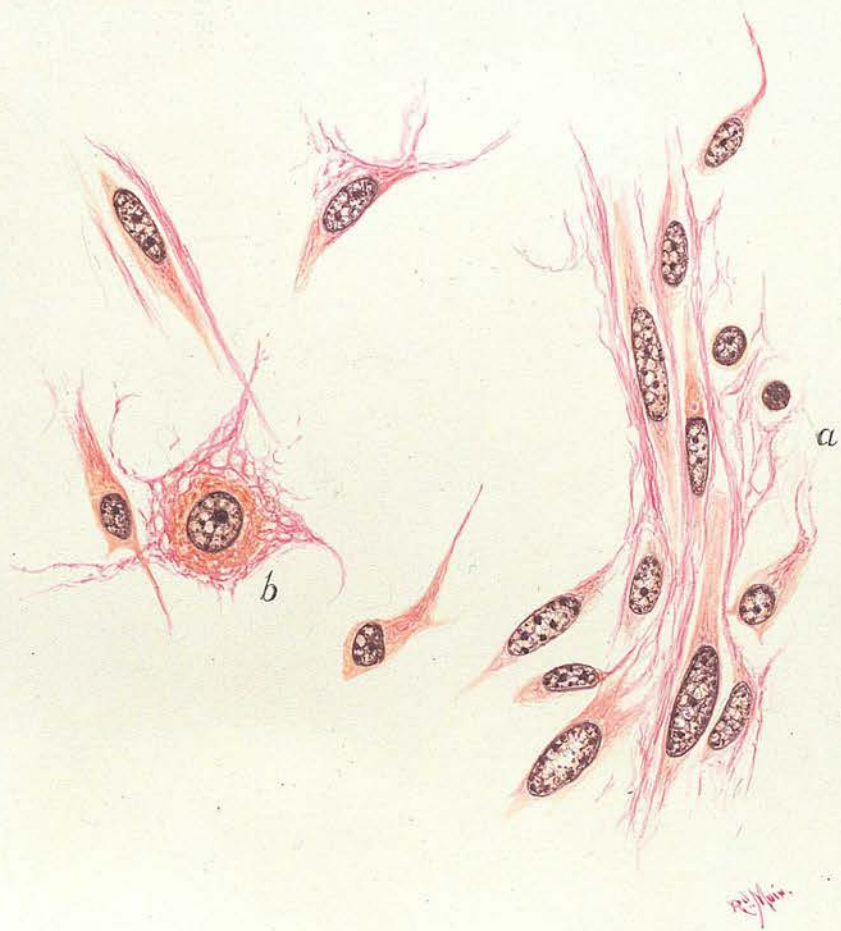
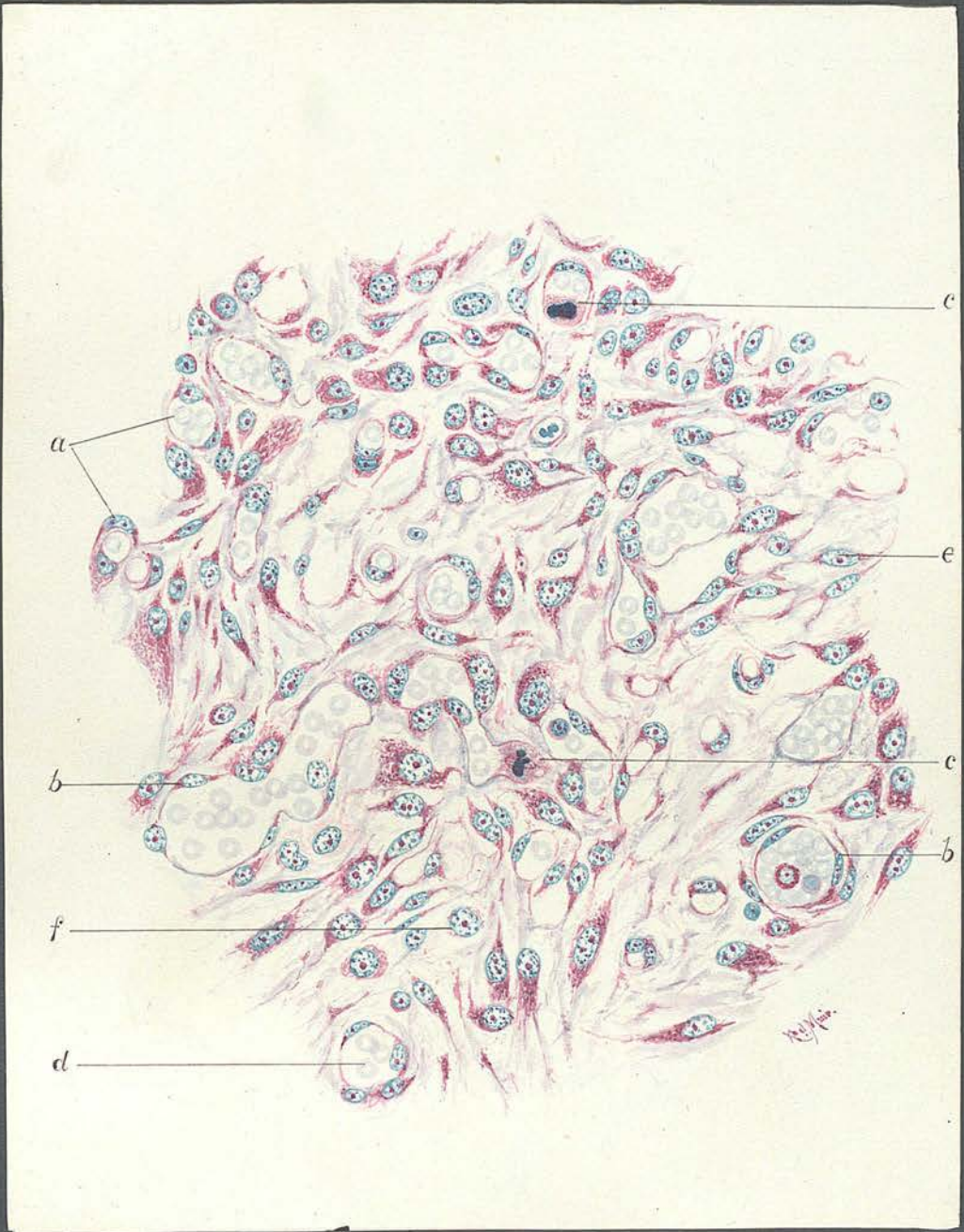


PLATE VI.

Granulation Tissue showing New Capillary Formation.

(Methyl-Green-Pyronin and Resorcin: x 600).

- a. Young vessels.
- b. Endothelium.
- c. Endothelial cells in Mitosis.
- d. Blood corpuscles in the young vessels.
- e. Fibroblasts.
- f. Mononucleated cells.



a

b

f

d

c

e

c

b

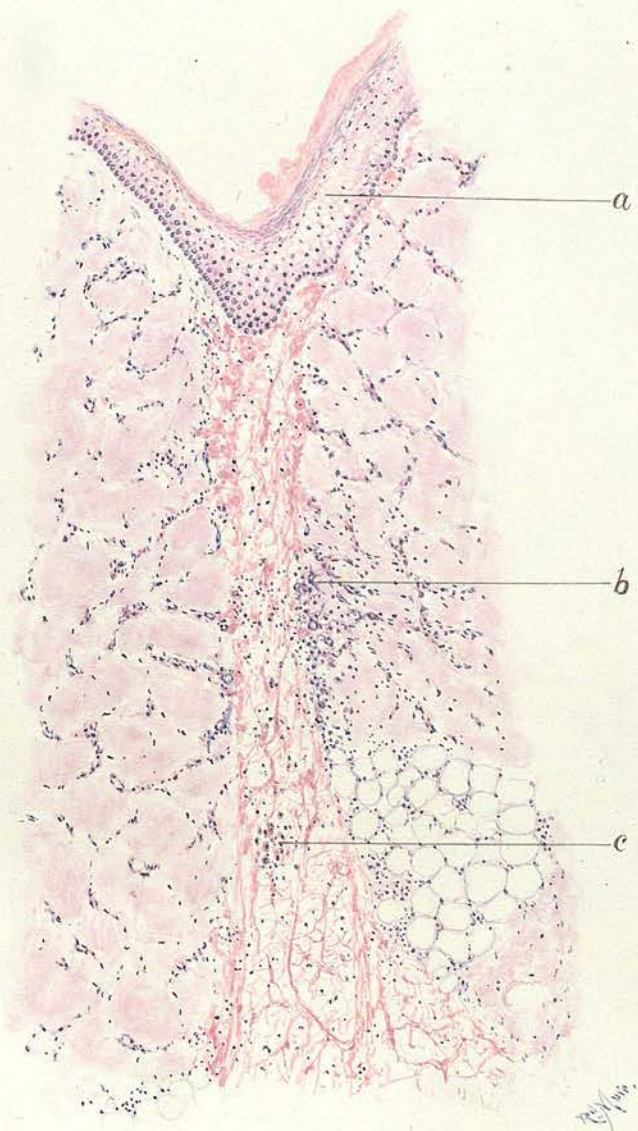
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PLATE VII.

Incised Wound: (4 Days).

(Van Gieson: x 50).

- a. Epithelium covering Wound.
- b. Dilated vessels and new cells penetrating fibrin.
- c. Phagocytic cells in the fibrin meshes.



Handwritten signature or initials

PLATE VIII.

Incised Wound - Rabbit: (6½ Days).

(Van Gieson: x 50).

- a. Narrow strip of cellular fibrous tissue, filling former gap.
- b. Changed Muscle Bundles.

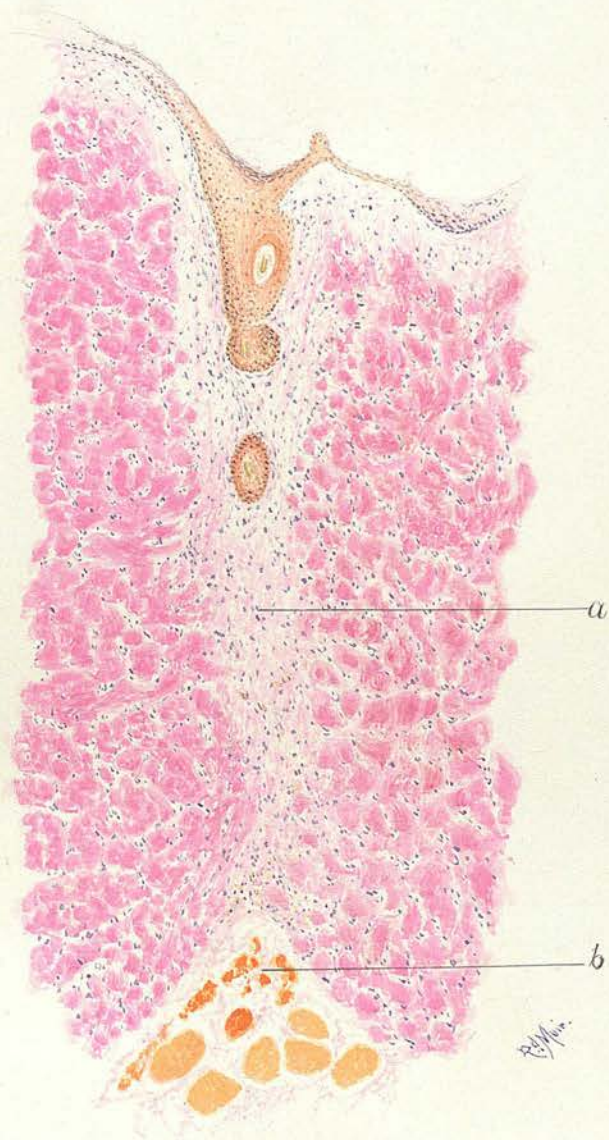


PLATE IX.

Incised Wound: Mouse: (1 Day).

Healing under a Scab.

(Haematin and Eosin: x 70)

- a. Crust formed of fibrin and leucocytes
and effused lymph.
- b. Leococytes.

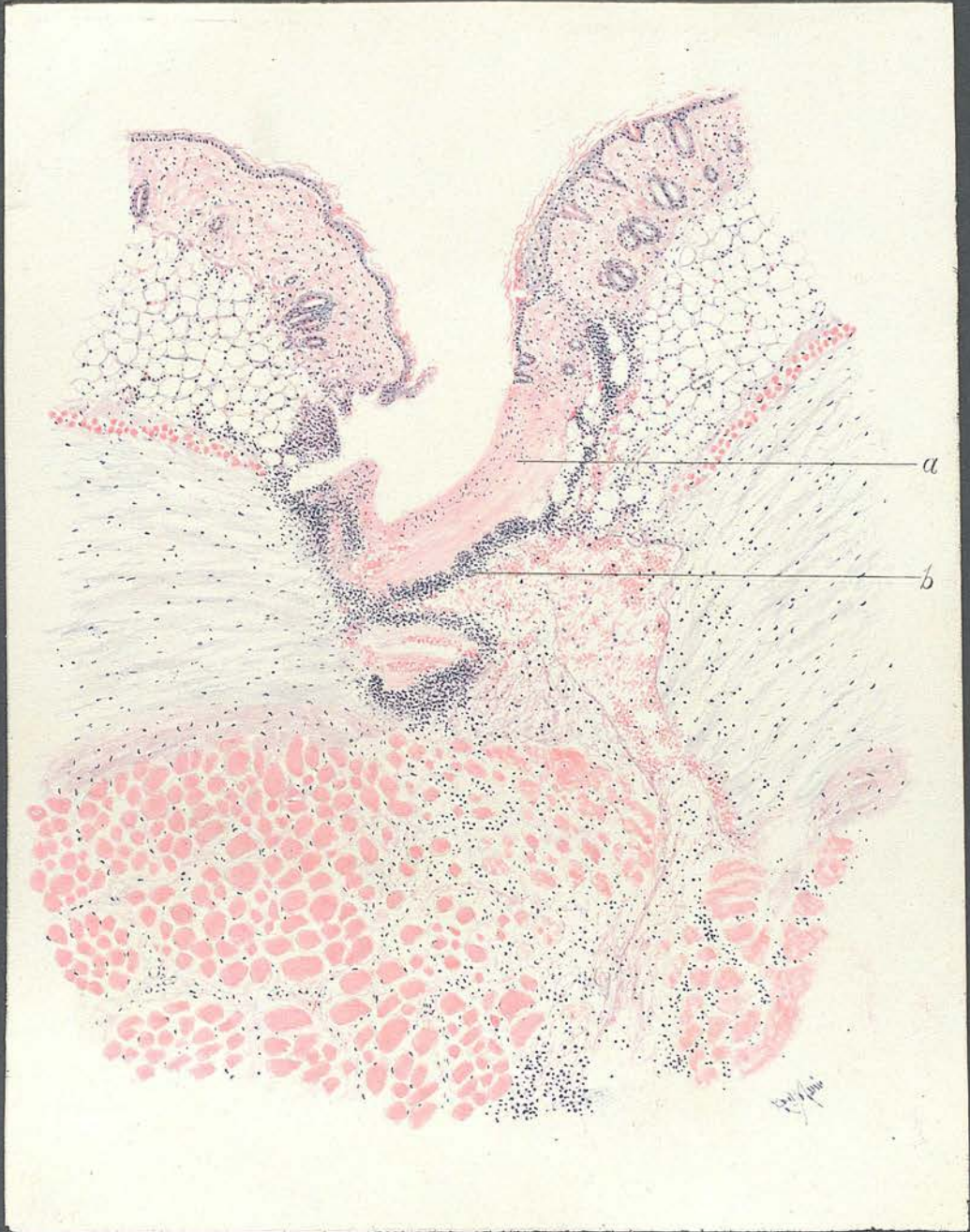


PLATE X.

Incised Wound: Mouse: 2 Days.

Healing under a Scab.

(Haematin and Eosin: x 70)

- a. Crust formed of lymph-fibrin, and leucocytes.
- b. Dense accumulation of leucocytes.
- c. Dilated vessels in neighbourhood.
- d. Changed muscle bundles.
- e. Normal. " "

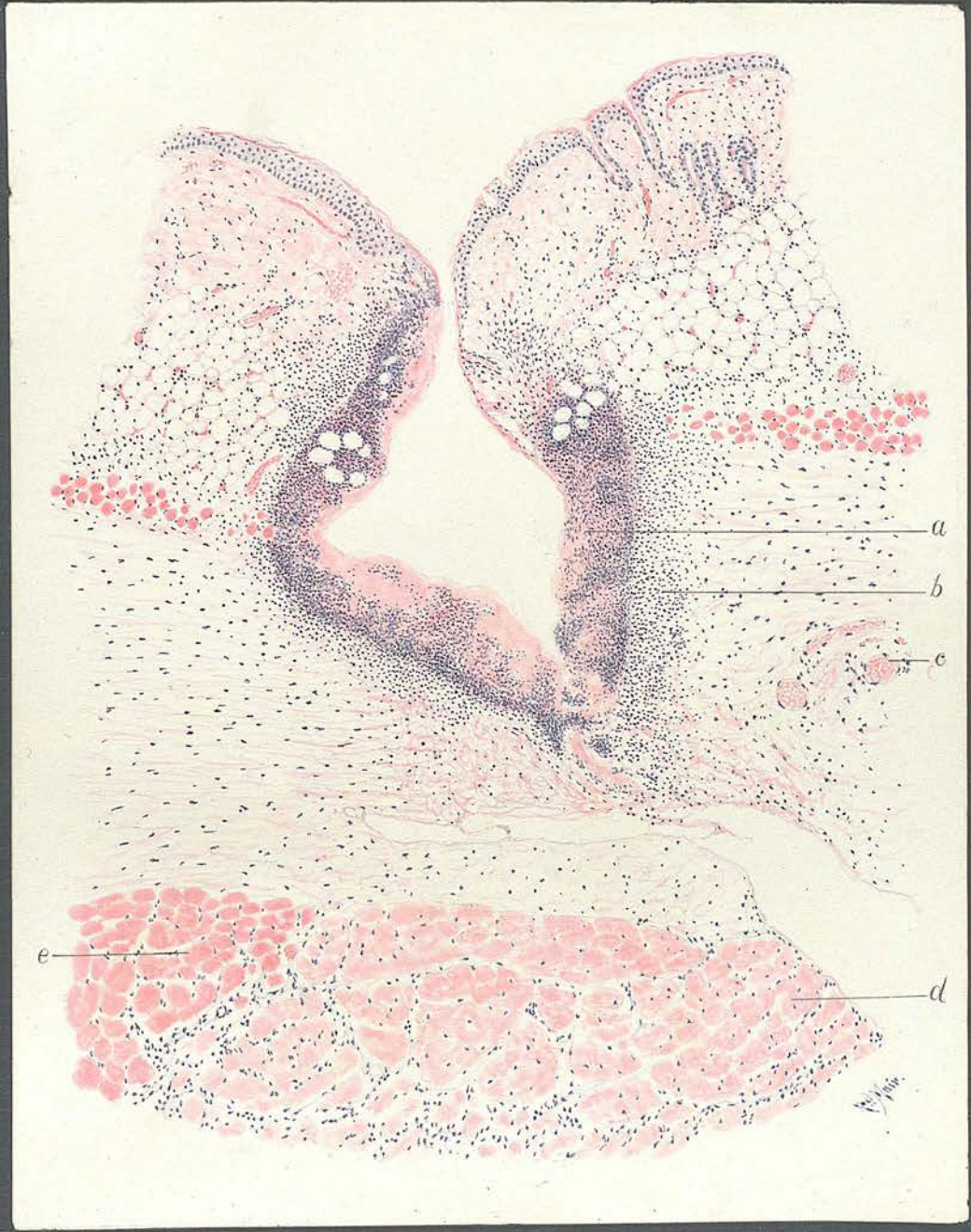


PLATE XI.

Wound (12 Days): Healing under a Scab:
under which the granulation takes place.

(Haematin and Eosin: x 70)

- a. Coagulable exudate.
- b. Growing margin of epithelium.
- c. Dilated vessels in the granulation tissue.
- d. Separation and Destruction of Muscle fibres, embedded in fibrous tissue.



PLATE XII.

Sterile Catgut in Muscle: (15 Days)

(Haematin and Eosin: x 50)

- a. Penetrating lines of cells.
- b. Blood-vessels entering projections of granulation tissue.
- c. Remains of Catgut.
- d. Muscle.

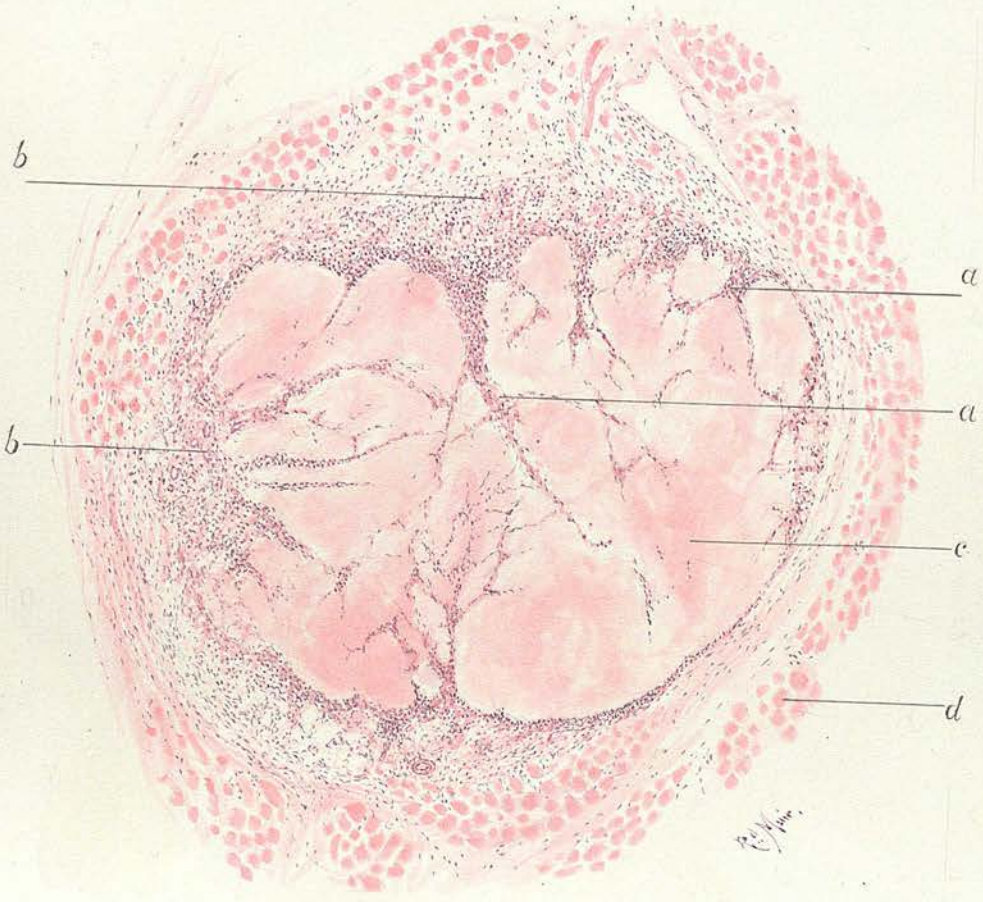


PLATE XIII.

Abscess Membrane: (18 Days)

(Haematin and Eosin: x 70)

- a. Mother-tissue.
- b. Outer Layer of Membrane: formed of Laminated fibrous tissue.
- c. Inner Layer of Membrane: in which occur the processes leading to absorption of pus.
- d. Abscess contents.

At junction of c. and d. numerous vessels entering the pus mass, and several rows of pus phagocytes.



PLATE XIV.

Ulcer (10 Days): with exuberant granulations.

(Van Gieson: x 40)

- a. Margin of growing epithelium.
- b. Fibrinous exudate.
- c. Numerous dilated vessels.

PLATE XV.

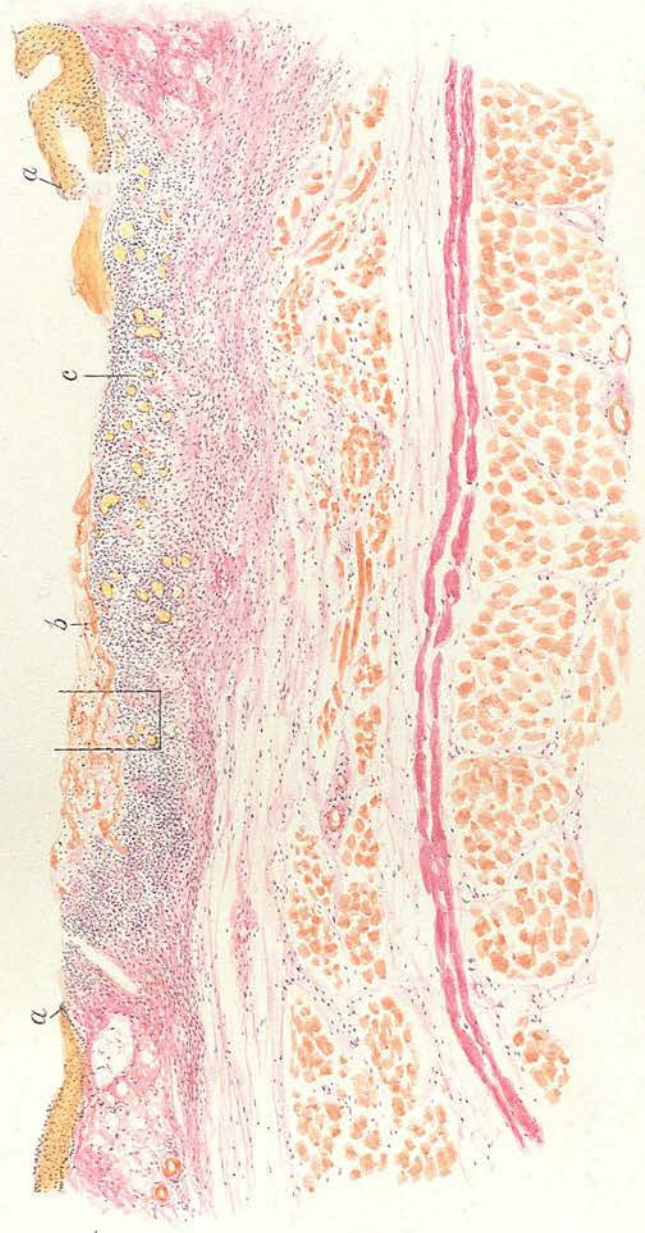


PLATE XV.

Part of Plate XIV. in detail.

(Benda Stain: Saffranin and Licht Grün: x 500)

- a. Fibrin layer.
- b. Polymorpho-nuclear Leucocytes.
- c. Mononucleated cells.
- d. Phagocytic cells.
- e. Fibroblasts.
- f. Capillaries.
- g. Red blood corpuscles.

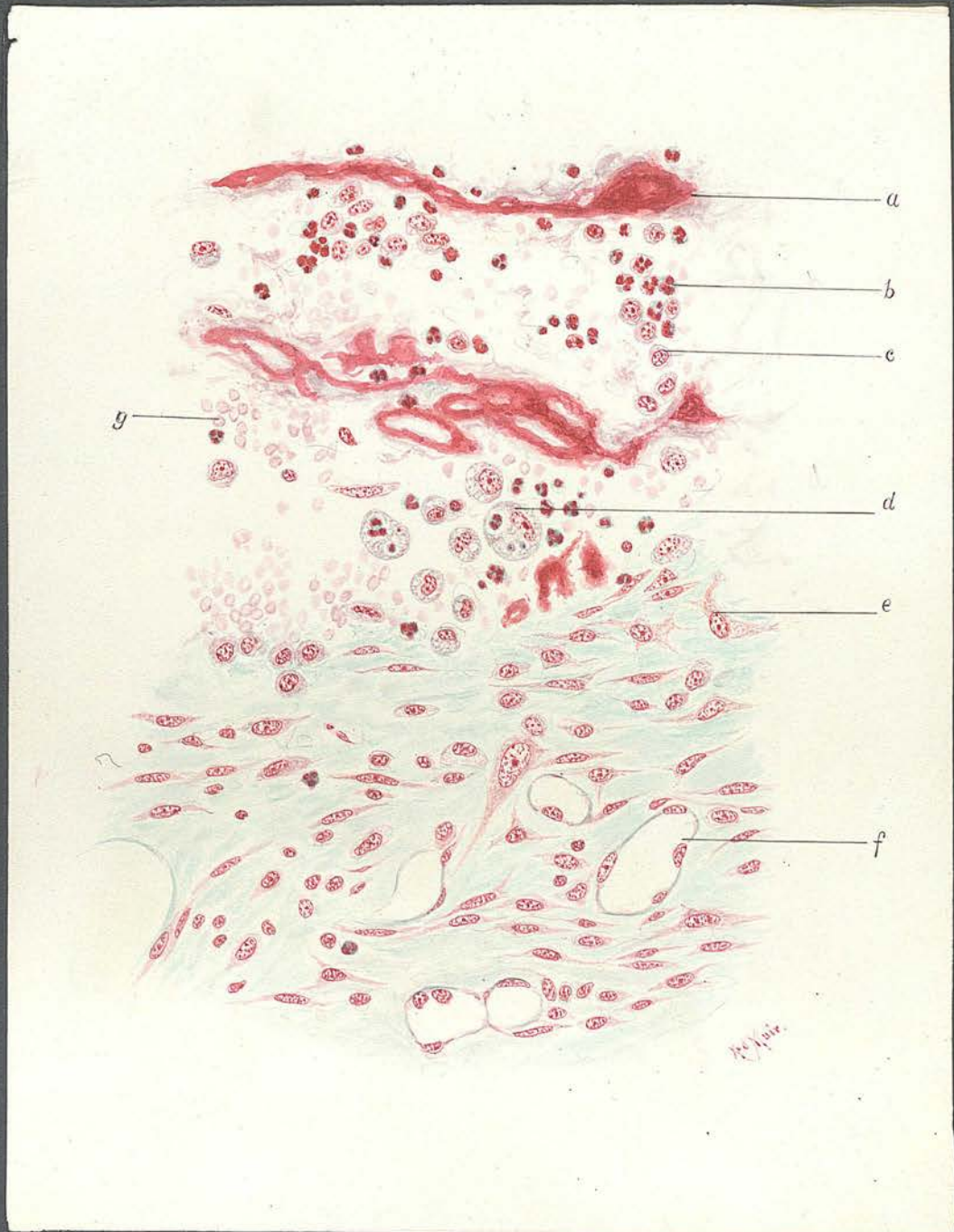
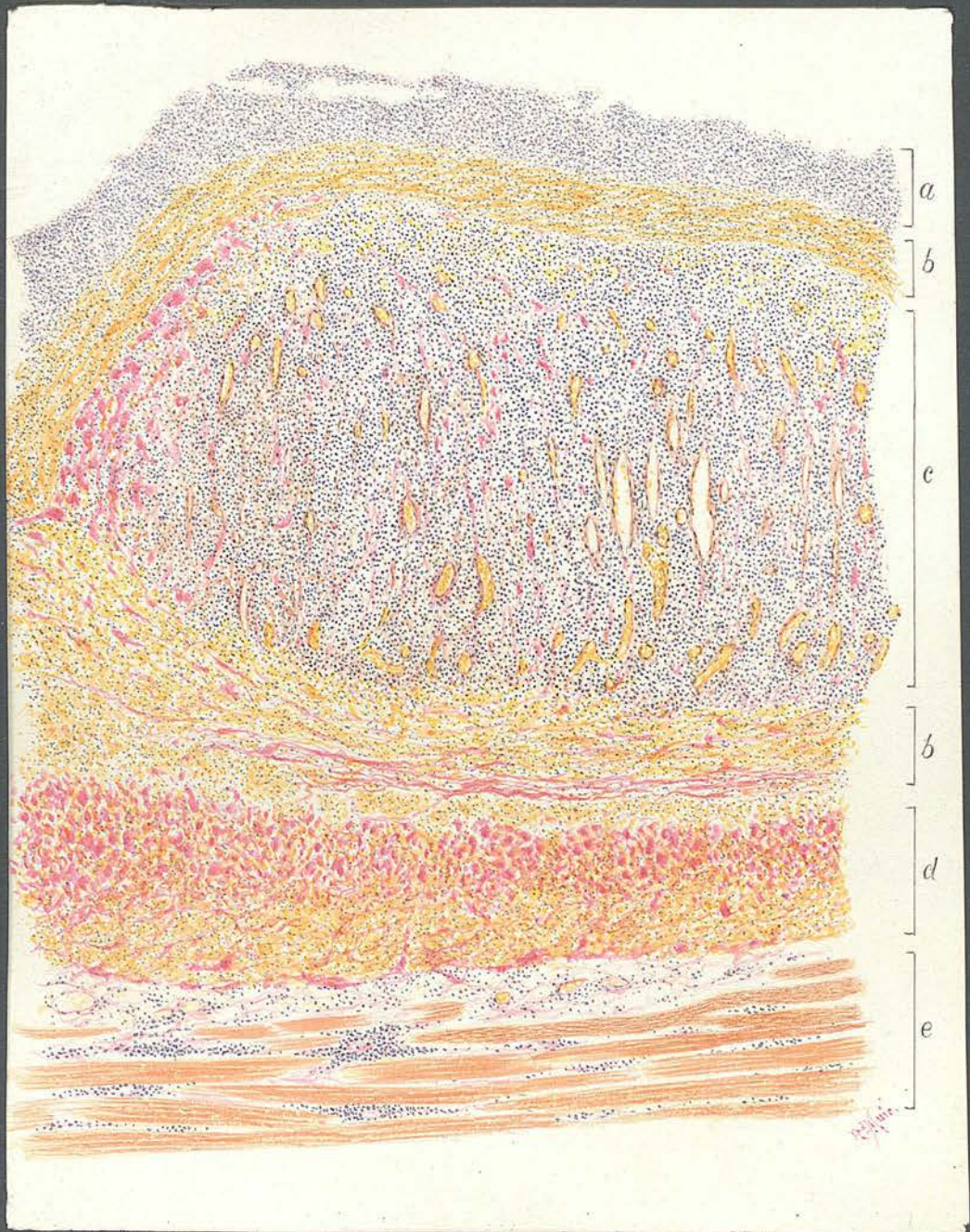


PLATE XVI.

A "Granulation" on an Open Wound Surface:
(4 Days)

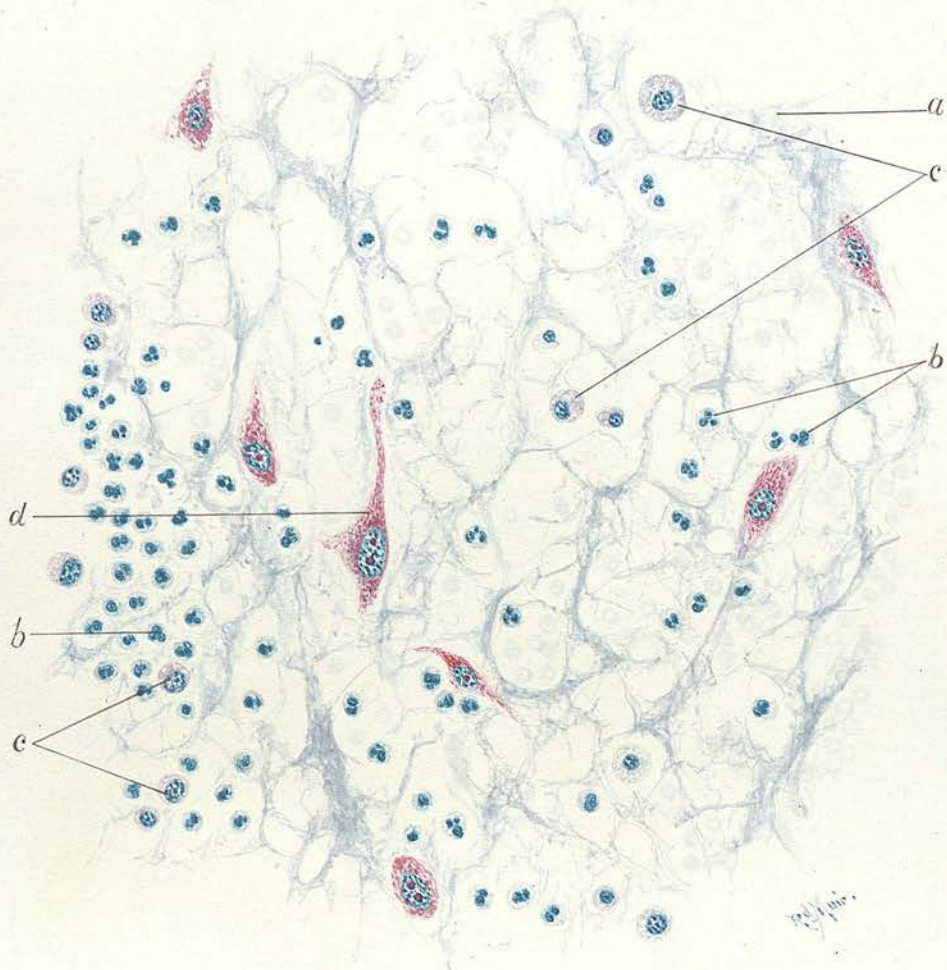
(Van Gieson: x 60)

- a. Layer of Leucocytes.
- b. Layer of Fibrin and Leucocytes.
- c. "Granulation" with numerous vessels
all running vertical to surface.
- d. Fibrinous and Leucocytic infiltration
of deeper tissues.
- e. Muscle layers.



PLATES XVII. XVIII. XIX. XX.

represent the different layers
of Granulation Tissue as described
under Section IX.(5).



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PLATE XVIII.

Intermediate Layer of Granulation Tissue:
(Upper Part) 7 Days.

(Methyl-Green-Pyronin and Resorcin: x 600)

- a. Fibrin filaments.
- b. Leucocytes in meshes.
- c. Mononucleated cells.
- d. Fibroblasts.
- e. Endothelium of young capillaries.
- f. Apparent arrangement of endothelial cells to form capillaries.

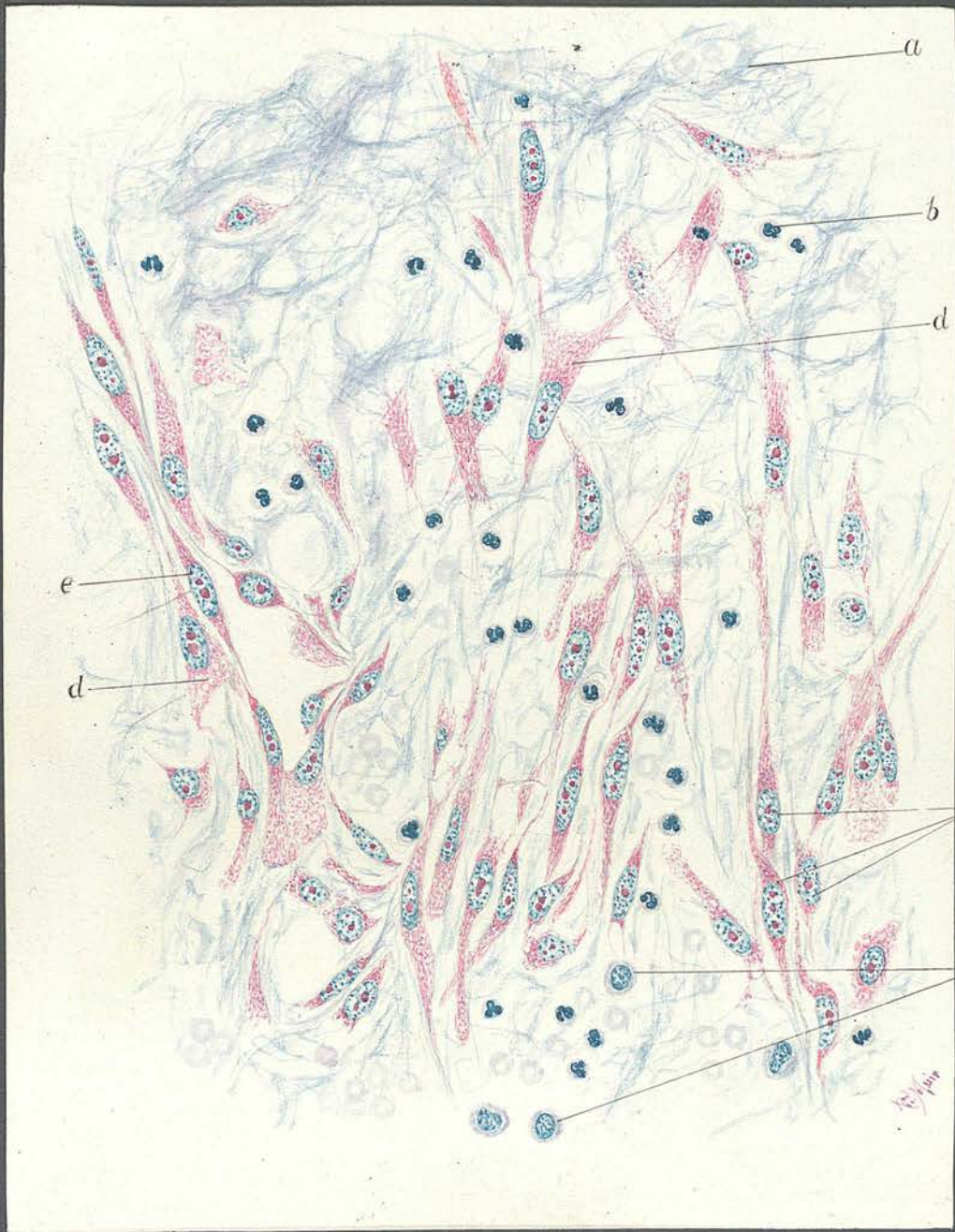


PLATE XIX.

Intermediate Layer of Granulation Tissue: 7 Days.
(Deeper Portion)

(Methyl-Green-Pyronin and Resorcin: x 600)

- a. Fibrin.
- b. Leucocytes.
- c. Mononucleated cells.
- d. Fibroblasts.
- e. Endothelial cells definitely arranged
to form capillaries.
- f. Fibroblasts becoming differentiated
as such.

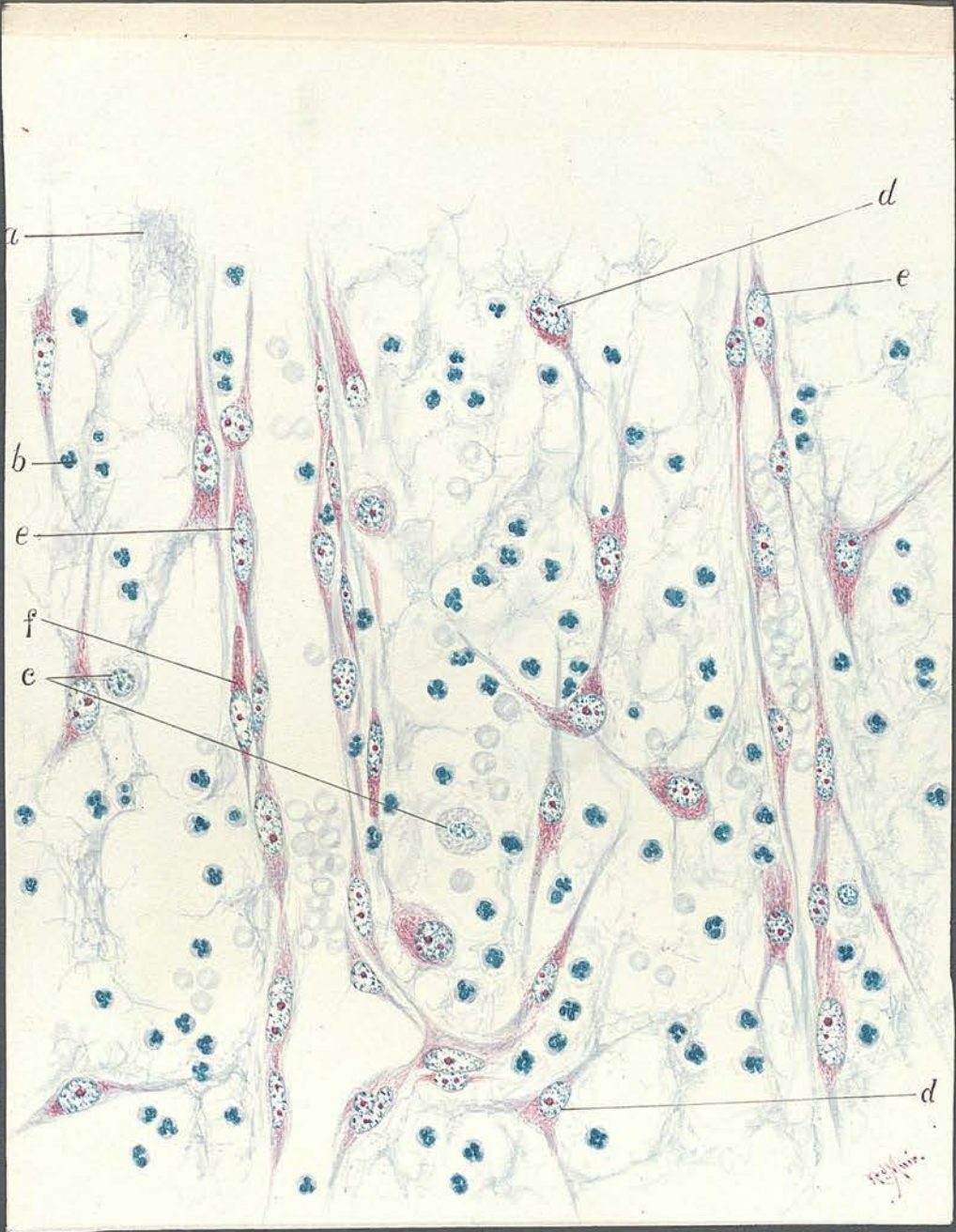


PLATE XX.

Foundation Layer of Granulation Tissue: 7 Days.

(Methyl-Green-Pyronin and Resorcin: x 600)

- a. Leucocytes.
- b. Mononucleated cells.
- c. Fibroblasts arranged at right-angles to blood-vessels.
- d. Endothelium of new vessels.
- e. Fibroblasts arranged outside vessel-wall as an adventitia.

