

PLATE II

Temporary nest of the driver ant *Dorylus (Anomma) wilverthi* Emery, at Akenge  
October 17, 1913. This nest extended over 3.50 m. and could not be shown entirely  
in the picture.



PLATE III

Army of driver ants, *Dorylus* (*Anomma*) *wilverthi* Emery, on the march near  
Avakubi, October 22, 1909.

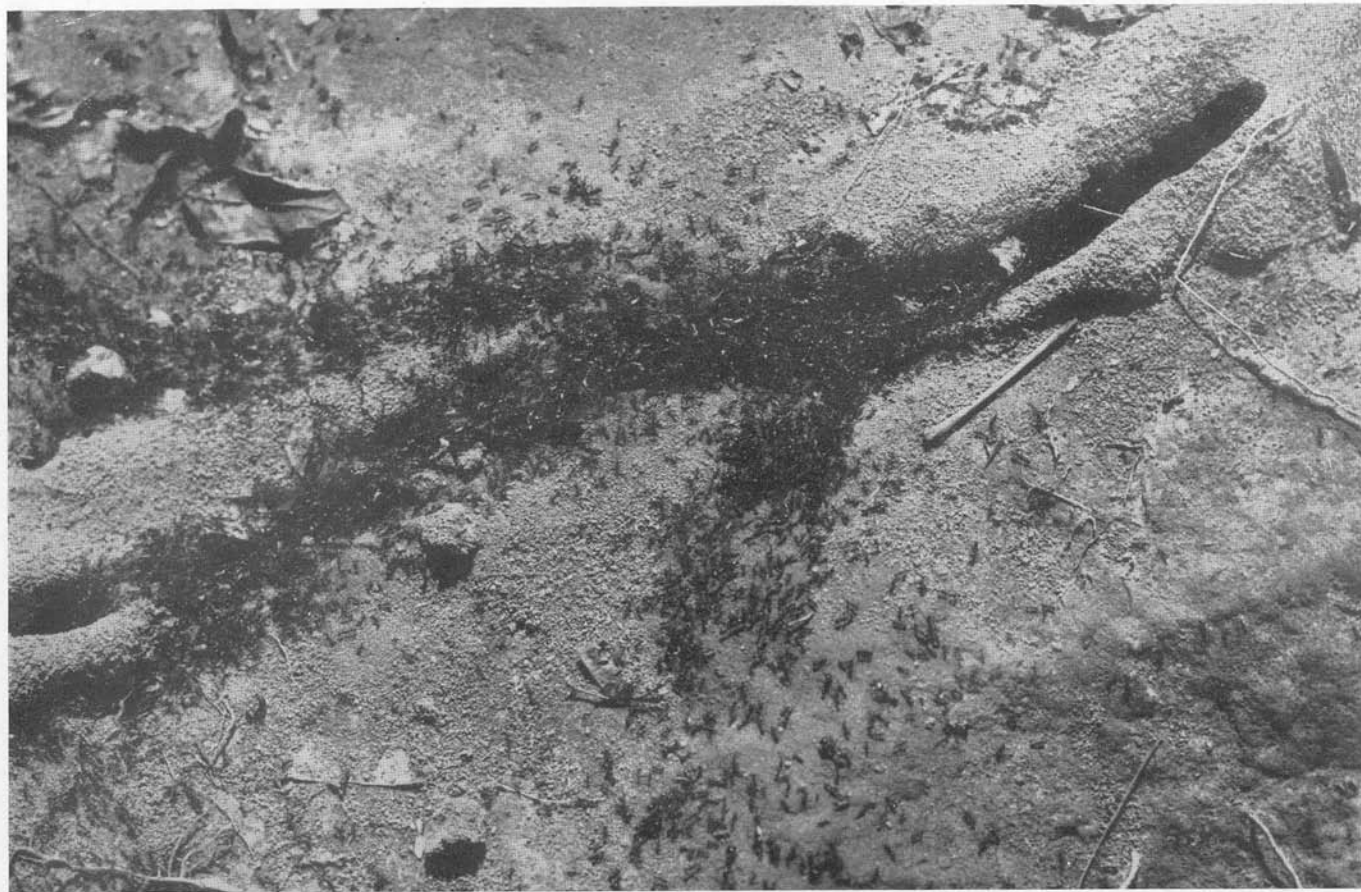


PLATE IV

*Dorylus (Anomma) wilverthi* Emery, at Avakubi, October 30, 1909.

Fig. 1. Worker ants covering in dense masses the larvæ and pupæ among leaves of pineapple and grass, on a temporary halt of the column.

Fig. 2. Part of an army with workers swarming over the low vegetation. The mounds cover a portion of the temporary nest and consist of particles of earth dug out by the ants and loosely connected. There are a great number of openings to such a nest.



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PLATE V

*Dorylus (Anomma) nigricans* Illiger, at Amani, Usambara, East Africa.

Fig. 1. Army of driver ants crossing a ditch.

Fig. 2. Army overwhelming a white rabbit.

Photographs by Dr. J. Vosseler



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PLATE VI

Fig. 1. *Dorylus (Anomma) nigricans* Illiger, at Amani, Usambara, East Africa. Army crossing a path. The workers carrying the brood pass between solid walls of soldiers which, with their mandibles lifted and wide open, protect the main body of the army.

Photograph by Dr. J. Vosseler

Fig. 2. *Megaponera jätens* (Fabricius), at Avakubi, October 22, 1909. Entrance to a nest, surrounded by a small mound of excavated earth, situated in a deserted plantation. When dug up, five galleries were found to open into the single aperture. On two occasions Mr. Lang observed from 30 to 40 pupa cases lying outside in the sun, near the entrance, with a few ants in steady attendance. There are no true chambers in the nest, but the galleries for the pupæ and larvæ are rather wide. When touched, these insects sting before using the mandibles, which can even pierce the thick skin of the hand. The columns of these ants contain relatively few individuals and, when closely approached, break up at once, the members scurrying nervously in all directions and making a stridulating noise. After a minute or so they reform the ranks and continue their march. They are great termite robbers, and Mr. Lang counted as many as eight such insects held between the mandibles of a single ant. They never opened the jaws to drop their prey, even when taken up with the forceps.



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#### PLATE VII

*Pheidole saxicola* Wheeler, at Zambi, June 1915. This seed-storing ant works chiefly during the night and early morning, forming columns in various directions to forage. Near the entrances to the nests heaps of refuse are shown, consisting of seeds and chaff, and often also of dead ants and other insects.



## PLATE VIII

*Myrmicaria eumenoides* subspecies *opaciventris* (Emery).

Fig. 1. Crescent-shaped craters of excavated earth at the entrances to nests in level, hardened soil at Rungu, July 7, 1913. The ants usually burrow their galleries after a heavy rain, either by day or night. The workers then busily carry out particles of soil which they drop near the edge of the crater. Often the moist earth does not roll down but sticks to the upper margin which thus becomes an overhanging crest. The mounds in the photograph are of typical form, but some of the best are often twice as high (5 to 6 cm.). It is said that these craters suggested the shape of the famous hairdresses of the Mangbetu tribe.

Fig. 2. Crescent-shaped crater at the entrance to a nest at Avakubi, October 22, 1909. In this case it was not as true to form as those shown in Fig. 1 because the entrances were placed near the base of a bush. The galleries showed many ramifications and extended 17 inches below the surface; but the whole nest, when exposed, did not cover an area more than two feet in diameter. Most of the pupæ were found about the roots of the bush. These harmless and common ants also build subterranean tunnels in various directions from their nest and make themselves noticeable by their immediate appearance in great numbers around a piece of meat or dead insect.



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PLATE IX

*Myrmicaria salambo* Wheeler. Low tree of the genus *Protea* from the Savannah at Garamba, September 1912, on the buds of which this ant attends scale insects.

Fig. 1. A flowering branch of the tree.

Fig. 2. The entire tree in its typical surroundings. This plant is a characteristic element of the extreme northeastern Congo Savannah, on the divide between the Congo and the Nile. It does not extend southwest of Faradje.





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PLATE X

*Crematogaster (Atopogyne) depressa* variety *fuscipennis* Emery, at Ambelokudi, October 20, 1910. Nest built of rather solid, brownish carton against the trunk of a tree in the forest, a short distance above the ground.

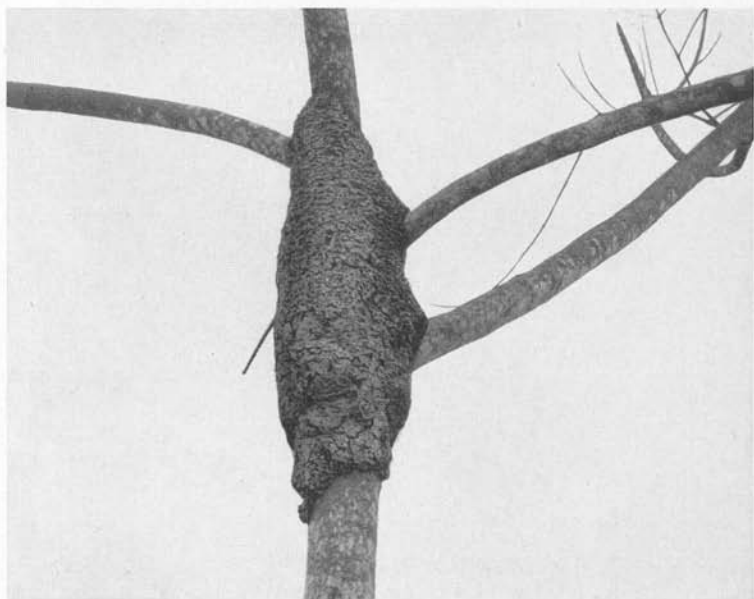


PLATE XI

*Crematogaster (Atopogyne) theta* (Forel).

Fig. 1. Carton nest at Stanleyville, August 10, 1909, built on the trunk of a tree, about 5 feet from the ground.

Fig. 2. Another nest of this species in the same locality, but of different shape.



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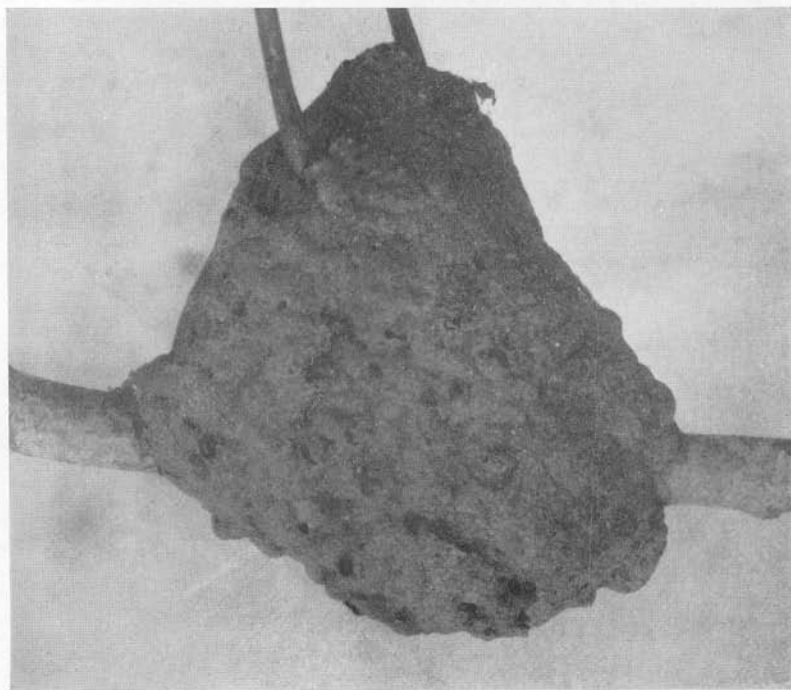
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PLATE XII

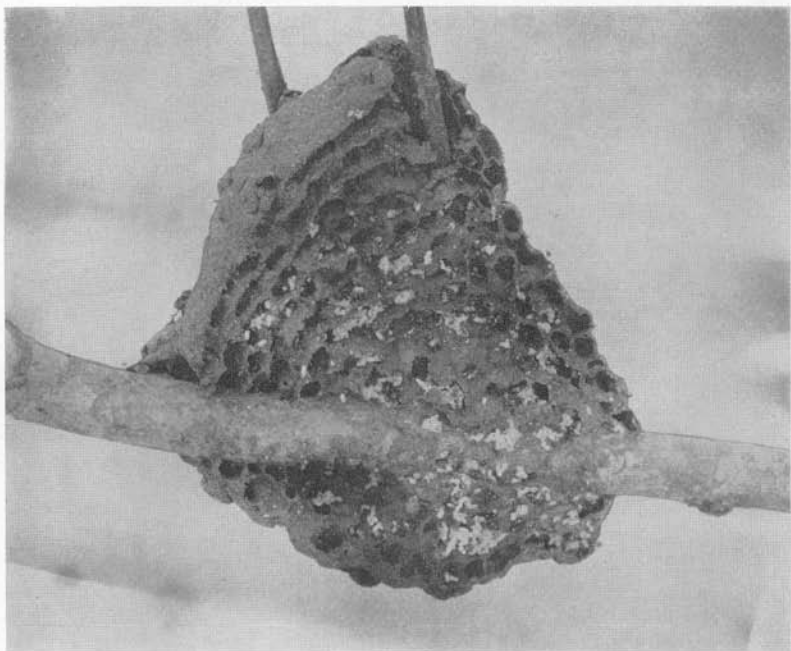
*Crematogaster (Atopogyne) theta* (Forel), at Medje, June 15, 1914.

Fig. 1. Outside view of a carton nest made of vegetable matter of very light gray or brownish color. The caterpillar shown on Plate XIII, fig. 1 was crawling over the surface of this nest.

Fig. 2. Inside, cross-section view of the same nest. The white masses are the brood (eggs, larvæ, and pupæ). The structure was 10.4 cm. broad and 9.8 cm. long and attached to a small tree in the forest, about 8 feet from the ground. When disturbed, the ants stream outside and let themselves drop upon the intruder. Their sting is painful and can be felt for many minutes afterwards.



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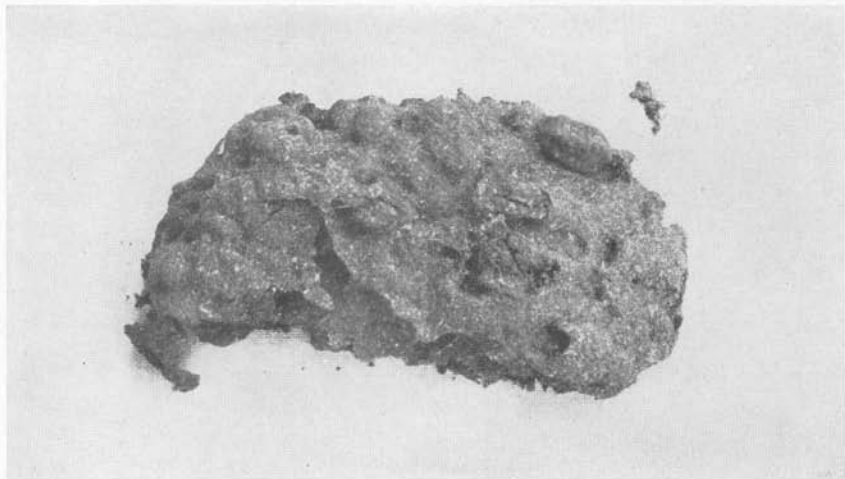
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### PLATE XIII

Fig. 1. Portion of the outer surface of the nest of *Crematogaster* (*Atopogyne*) *theta* (Forel) shown on Plate XII. In the upper right corner is seen a caterpillar that was found crawling over the surface, its segmentation being visible at the time; but when the creature stops and tightly adheres to the nest, its body becomes quite unnoticeable as it then resembles one of the numerous protuberances of the formicary.

Fig. 2. Nest of *Crematogaster* (*Nematocrema*) *stadelmanni* variety *dolichocephala* (Santschi), at Kwamouth, July 14, 1914. This cone-shaped carton nest was hanging in a tree, about nine feet from the ground. It was fastened to several small branches in such a way that it moved about when the boughs were tapped with a stick. The outside surface was quite rough and simulated crumpled up leaves that cover one another like the shingles of a roof. The cellular structure inside was irregular, with very thin walls, and a great many exits; larvæ were especially abundant in the lower portion. It measured about 18 inches in length and 11 inches in width at the top.





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PLATE XIV

*Crematogaster* (*Nematocrema*) *stadelmanni* variety *dolichocephala* (Santschi), at Bengamisa, September 27, 1914. Pensile nest of very hard, woody carton, resembling that of certain termites in shape as well as in material, a fact usually making it impossible to tell from the outside appearance which insect inhabits it. The example photographed was so fixed to several creepers that it swayed in the wind about twenty-five feet from the ground. It was approximately two feet long. The shape and size of these carton nests vary greatly according to the location. Their inner structure is irregular, the galleries and cells seemingly arranged without plan: larvæ and pupæ may be found anywhere throughout the formicary.



PLATE XV

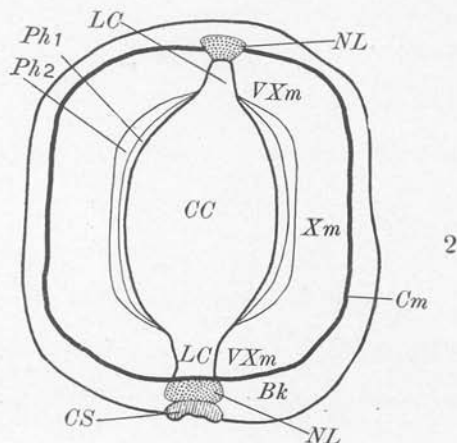
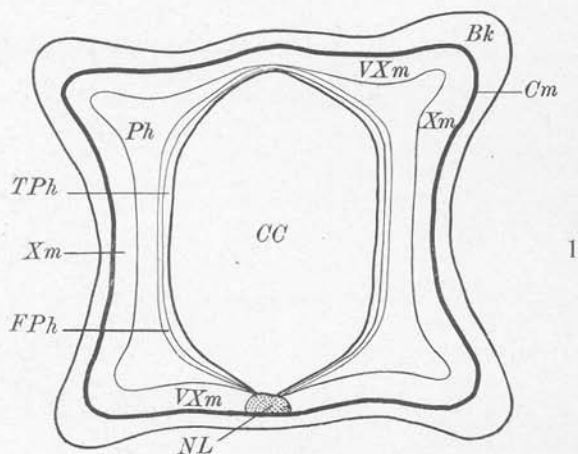
Landscape in the Savannah near Niangara, May 10, 1913, showing numerous hillocks of *Termes natalensis* Haviland scattered over an almost treeless grass plain. The ant *Carebara osborni* Wheeler lives in cleptobiosis with these termites.



PLATE XVI

Mushroom garden of *Acanthotermes militaris* (Hagen) from a nest at Malela, July 6, 1915. The minute ant, *Pædalgus termitolestes* Wheeler, had established its nest close to the surface in the upper part of the termitarium (upper right hand corner).





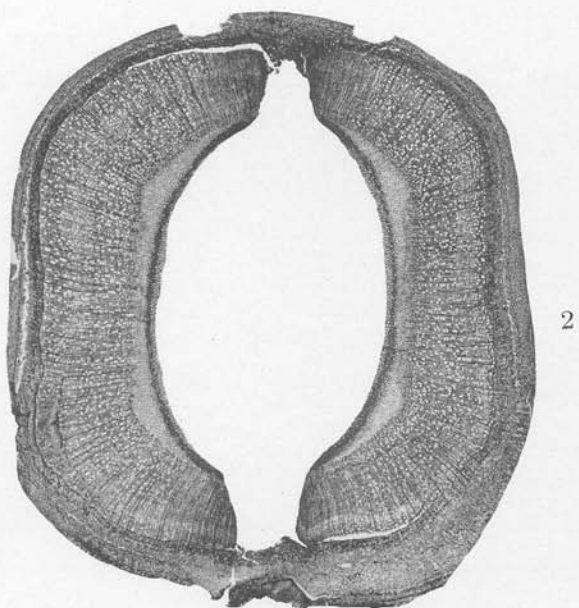
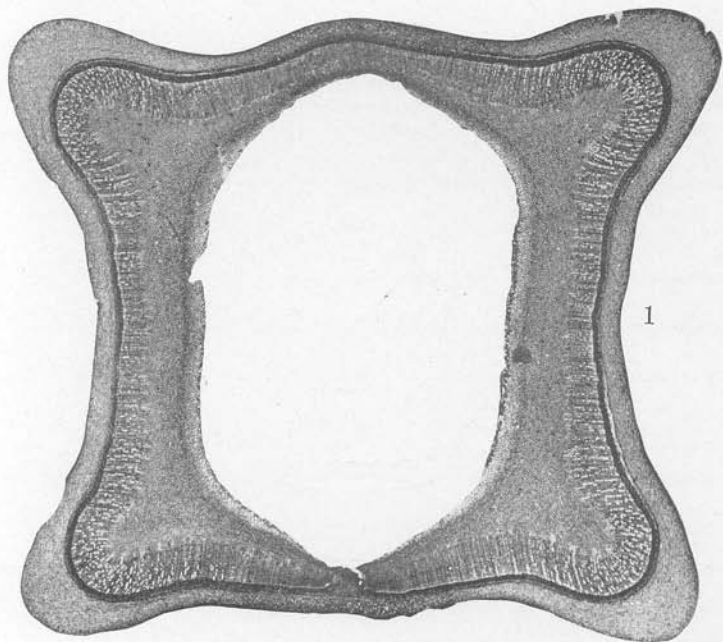
# PLATE XLI

## *Plectronia Laurentii* De Wildeman

Fig. 1. Transverse section of quadrangular, hypertrophied branch: CC, central cavity; NL, nutritive layer or callus; Ph, pith; FPh, layer of medullary tissue which consists of flattened, thick-walled cells; TPh, remains of thin-walled pith tissue; VXm, vesselless xylem; Xm, xylem containing numerous vessels; Cm, cambium; Bk, bark.  $\times 6$ .

Fig. 2. Transverse section of less swollen myrmecodomatium: CC, central cavity; LC, lateral cavity; CS, cap of sclerenchyma; NL, nutritive layer; Ph1, layer of thin-walled medullary tissue; Ph2, layer of medullary tissue having thick-walled, flattened cells; Xm, xylem containing numerous vessels; VXm, vesselless xylem; Cm, cambium; Bk, bark.  $\times 7$ .





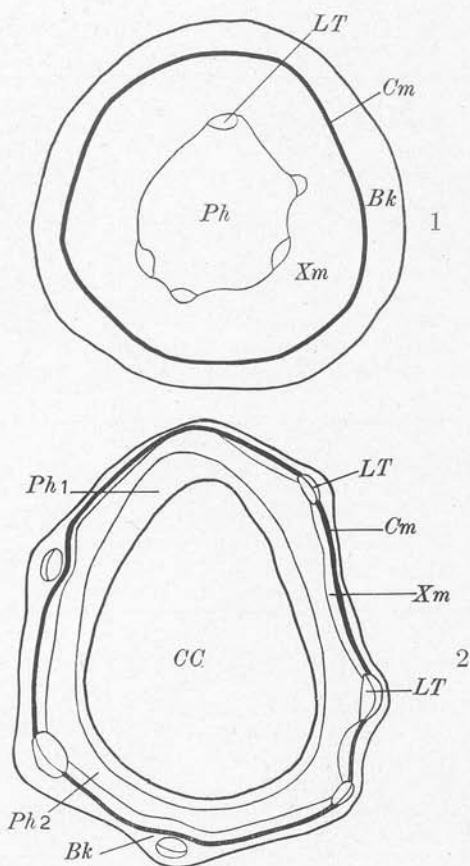
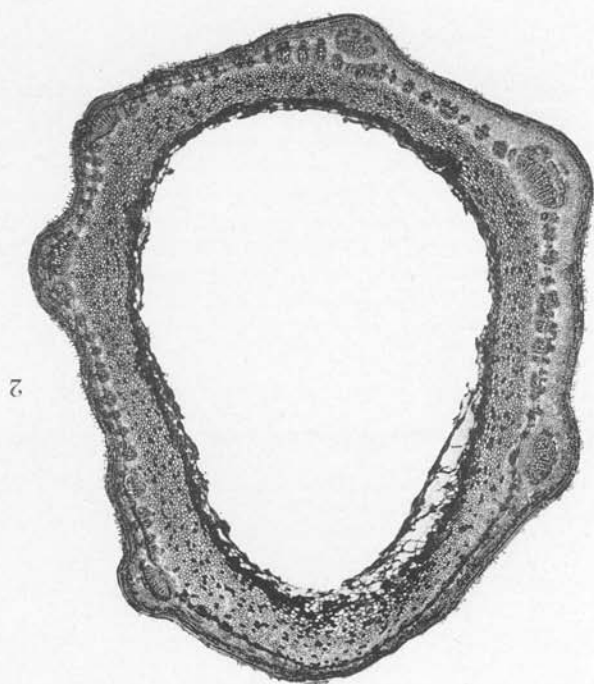


PLATE XLII

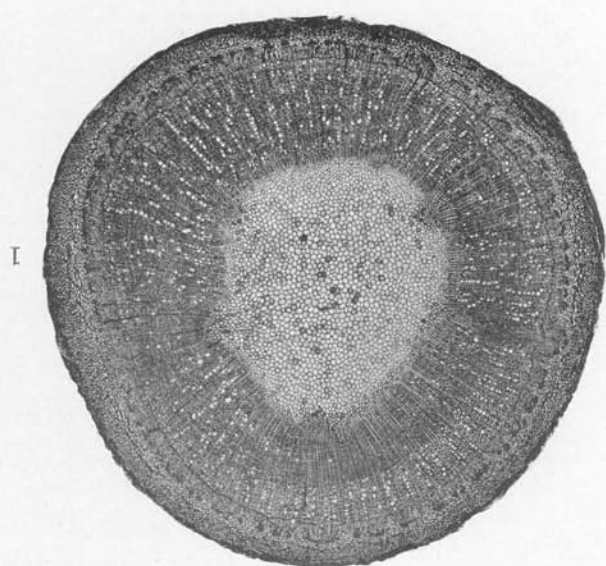
*Barleria fistulosa* Masters

Fig. 1. Transverse section of normal stem: *Ph*, pith; *Xm*, cylinder of xylem; *LT*, leaf trace bundles; *Cm*, cambium; *Bk*, bark.  $\times 11$ .

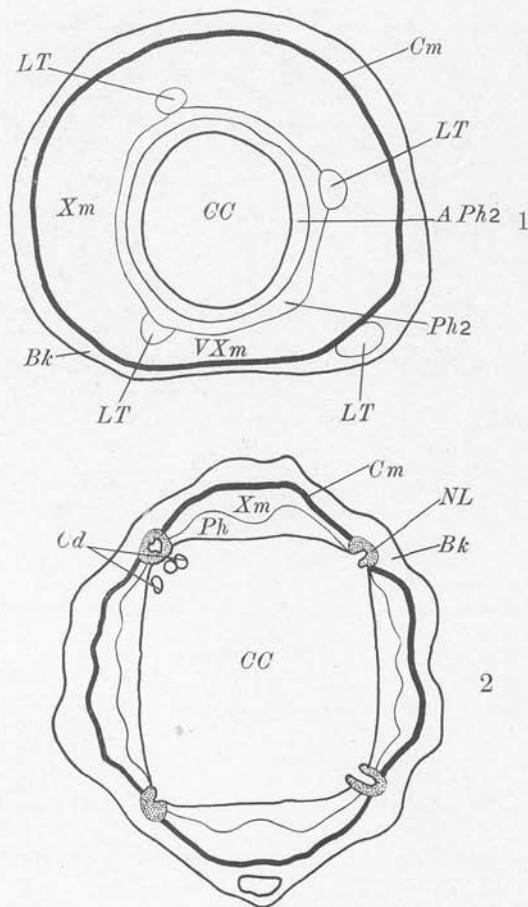
Fig. 2. Transverse section of swollen stem, showing central cavity formed by the collapse and drying up of the thin-walled cells of the pith: *CC*, central cavity; *Ph1*, remains of thin-walled cells of pith; *Ph2*, thick-walled cells of pith; *Xm*, xylem; *LT*, leaf trace bundles; *Cm*, cambium; *Bk*, bark.  $\times 10$ .



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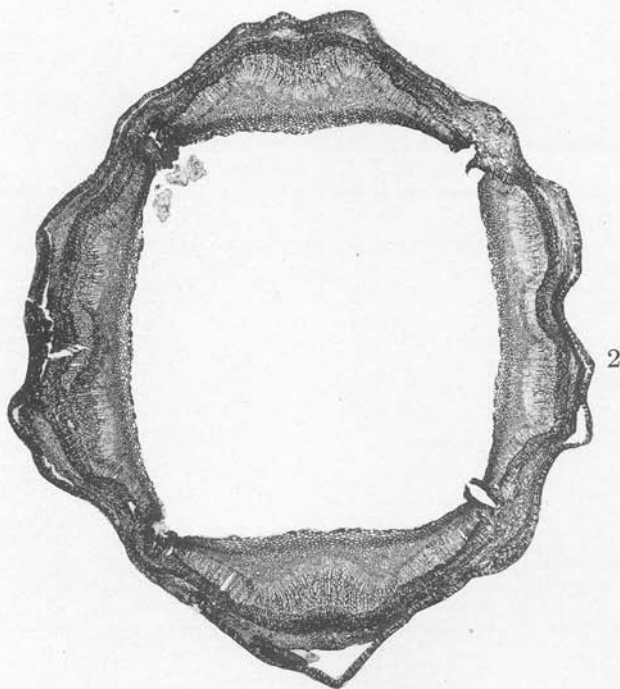
# PLATE XLIII

Fig. 1. *Barteria Deweyrei* De Wildeman and Durand. Transverse section of stout stem, showing heterogeneous pith, central cavity, and thin side of myrmecodomatium: CC, central cavity; APh2, layer of thick-walled, flattened pith cells that are filled with amber-colored, hyaline substance; Ph2, peripheral layer of medullary tissue; LT, leaf trace bundles; VXm, vesselless xylem; Xm, xylem containing numerous vessels; Cm, cambium; Bk, bark.  $\times 10$ .

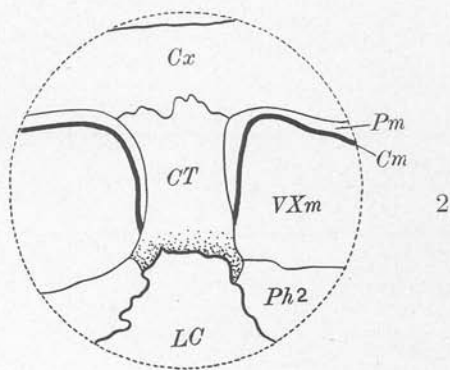
Fig. 2. *Sarcocephalus* species. Transverse section of dried myrmecodomatium, showing central cavity, heterogeneous medulla, and four nutritive layers: CC, central cavity; Ph, peripheral layer of medullary tissue; Cd, sections of coccids; NL, nutritive layer or callus; Xm, xylem; Cm, cambium; Bk, bark.  $\times 8$ .



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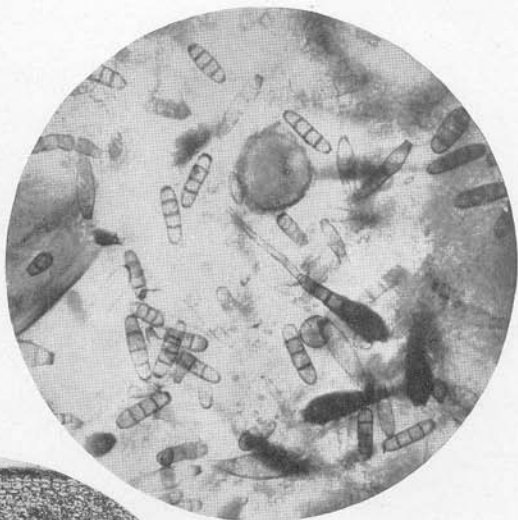
#### PLATE XLIV

Fig. 1. Portion of a pellet from the infrabuccal pocket of *Pachysima æthiops* (F. Smith), showing numerous spores and other plant material.  $\times 180$ .

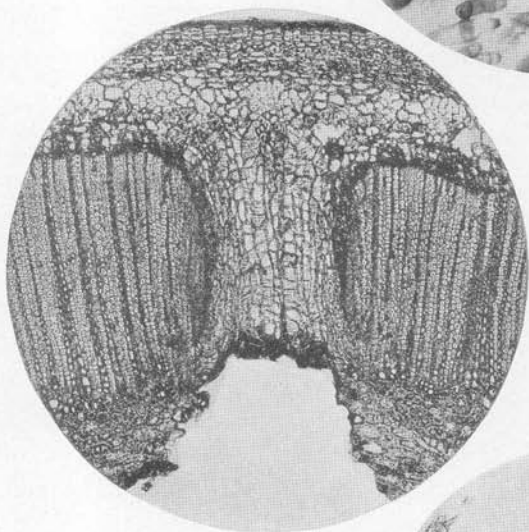
Fig. 2. *Barteria Deweyrei* De Wildeman and Durand. Transverse section of myrmecodomatium, showing lateral pit and hyperplasia: *LC*, lateral cavity; *Ph2*, thick-walled medullary tissue; *CT*, callus containing amber-colored, hyaline substance; *VXm*, vesselless xylem; *Cm*, cambium; *Pm*, phloem; *Cx*, cortex.  $\times 60$ .

Fig. 3. Portion of a coccid (*Stictococcus formicarius* Newstead) taken from larval pellet of *Pachysima æthiops* (F. Smith).  $\times 100$ .

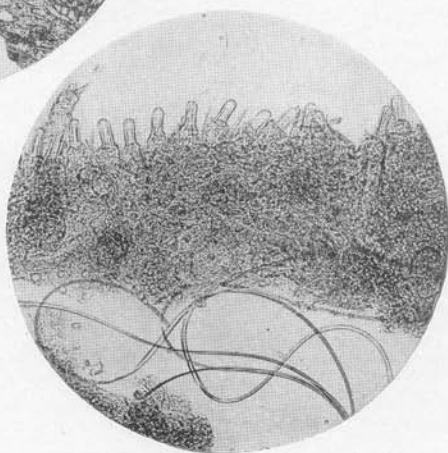
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#### PLATE XLV

Fig. 1. Fragments of nutritive layer of heteroplasia in larval pellet of *Vitivicola tessmanni* (Stitz).  $\times 90$ .

Fig. 2. Coccid larva (*Stictococcus formicarius* Newstead) from larval pellet of *Pachysima æthiops* (F. Smith).  $\times 58$ .

Fig. 3. Fragment of ant larva from larval pellet of *Vitivicola tessmanni* (Stitz).  $\times 58$ .

Fig. 4. Portion of pellet of *Pseudomyrma gracilis* variety *mexicana*, showing numerous spores of different kinds.  $\times 330$ .

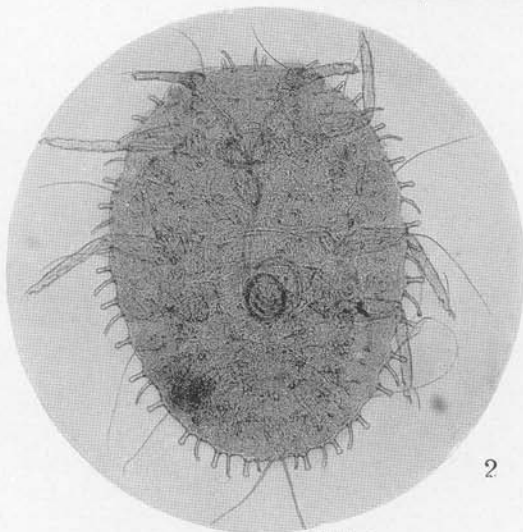
Fig. 5. Portion of pellet of *Pachysima æthiops* (F. Smith), showing fragments of aerial hyphæ, spores, and other detritus.  $\times 330$ .

Fig. 6. Portion of pellet of *Pachysima æthiops* (F. Smith), showing fragments of medullary tissue containing amber-colored substance.  $\times 96$ .

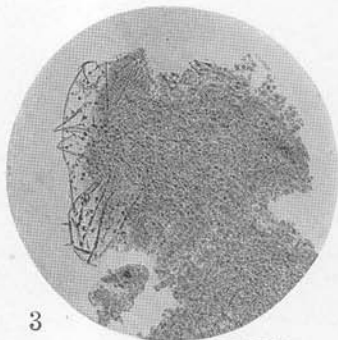




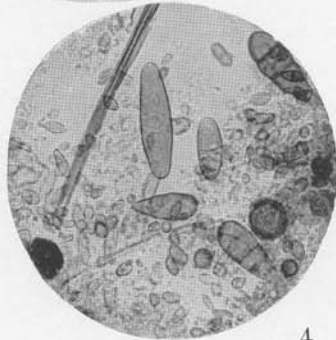
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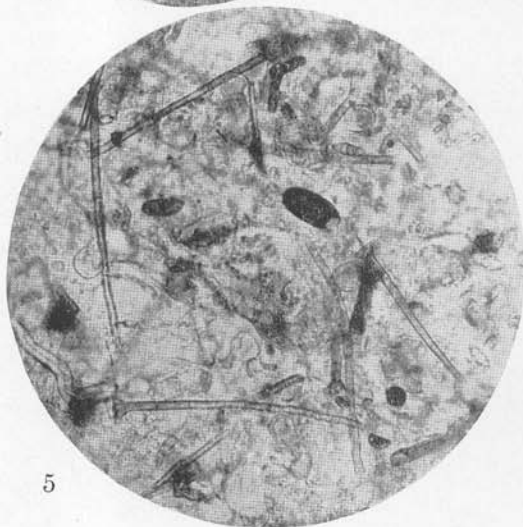
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PLATE XVII

Fig. 1. *Macromischoides aculeatus* (Mayr), at Medje, May 1914. Two nests of these small ants, built with loosely connected vegetable fibres between leaves.

Fig. 2. *Tetramorium sericeiventris* subspecies *continentis* (Forel), at Zambi, June 30, 1915. Craters of white sand at the entrances to the nest of these ants.



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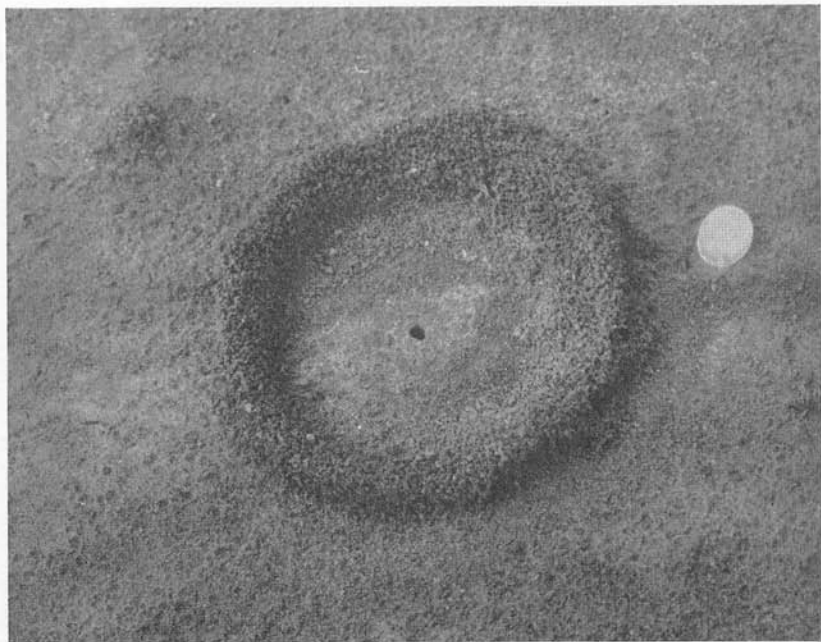
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PLATE XVIII

*Tetramorium setigerum* subspecies *quærens* Forel, at Niapu.

Fig. 1. Regular ring-shaped craters of loose particles of soil constructed about the entrance of the nest during the rainy season. These ants are very common in open places.

Fig. 2. Aspect of the entrance to the nest of the same ant during the dry season. At that time the insects merely carry out débris and particles of soil without attempting to construct a crater.



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PLATE XIX

*Plagiolepis (Anoplolepis) custodiens* (F. Smith).

Fig. 1. Shore of the Atlantic Ocean a short distance north of Banana, showing the narrow beach of white sand in the upper part of which the nests of *P. custodiens* are excavated.

Photograph by J. Bequaert

Fig. 2. Nest of *P. custodiens* in the sandy beach of the Atlantic near Banana, August 1915.



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PLATE XX

*Ecophylla longinoda* (Latreille), at Malela, July 5, 1915. The nests of this ant consist of leaflets closely woven together with white silk. These were found in a thorny bush about three feet from the ground. In order to photograph them the compound leaves of the plant were cut off and laid on the ground.

Fig. 1. Six leaflets have been united into one nest.

Fig. 2. A closer view of another formicary of the same species.





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PLATE XXI

Fig. 1. Carton nest of a termite about five feet from the ground; deserted by its builder and now occupied by a colony of *Camponotus (Orthonotomyrmex) vividus* (F. Smith); near Malela, July 7, 1915. The structure was established around the stem of a sapling in swampy woods.

Fig. 2. Interior of the same nest, showing the chambers excavated by the ants in the termitarium.



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## PLATE XXII

Fig. 1. Craters of white sand at the entrances to the subterranean nest of *Camponotus* (*Myrmosericus*) *rufoglaucus* subspecies *syphax* Wheeler, at Zambi, June 30, 1915.

Fig. 2. Nest of *Polyrhachis* (*Myrma*) *laboriosa* F. Smith, at Niangara, November 1910. It was built in a fork of a bush in a cluster of fine twigs, and consisted of old vegetable fibres and leaves fastened together. It was extremely light since no soil entered into its construction; dark gray outside, brown inside. Though the nest was somewhat damaged there were apparently many exits. When disturbed, the ants made a rattling noise by striking the nest with their gaster; at the same time they emitted considerable quantities of formic acid, bending their gaster forward between the legs.



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PLATE XXIII

Nests of *Polyrhachis (Myrma) gagates* F. Smith, excavated in sandy soil at Zambi, June 30, 1915.

Fig. 1. Craters of white sand surrounding the entrances from which the grass-stalks have been cut away.

Fig. 2. As the nest appeared before the vegetation was removed.



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PLATE XXIV

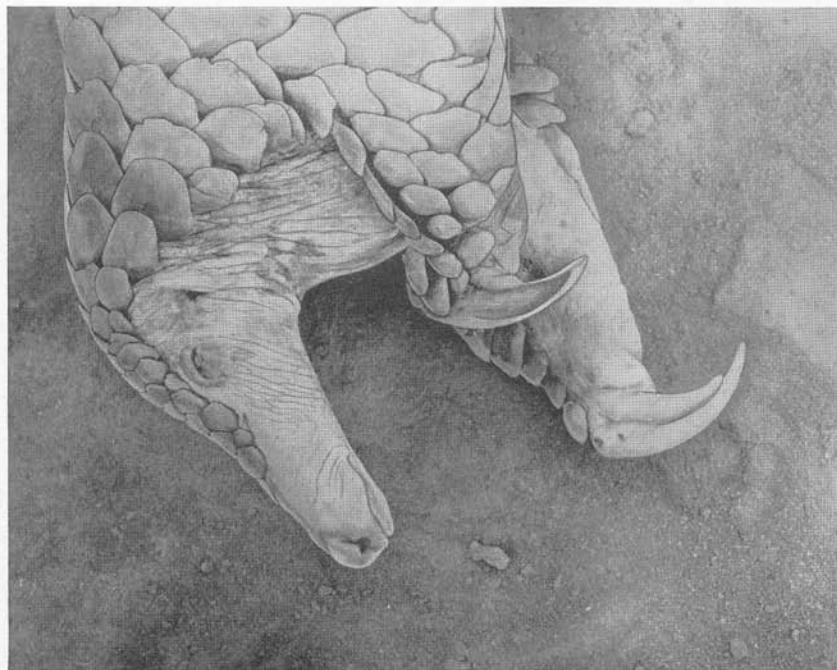
Fig. 1. *Orycteropus afer* (Pallas). Freshly killed female, at Faradje, March 6, 1911. Anterior portion of the body, showing the elongated snout and the heavily built fore limbs with their powerful digging claws.

Fig. 2. *Manis gigantea* Illiger. Freshly killed female, at Niangara, April 26, 1913. Anterior view, showing the elongate snout and lengthened, heavy claws of the fore limbs.





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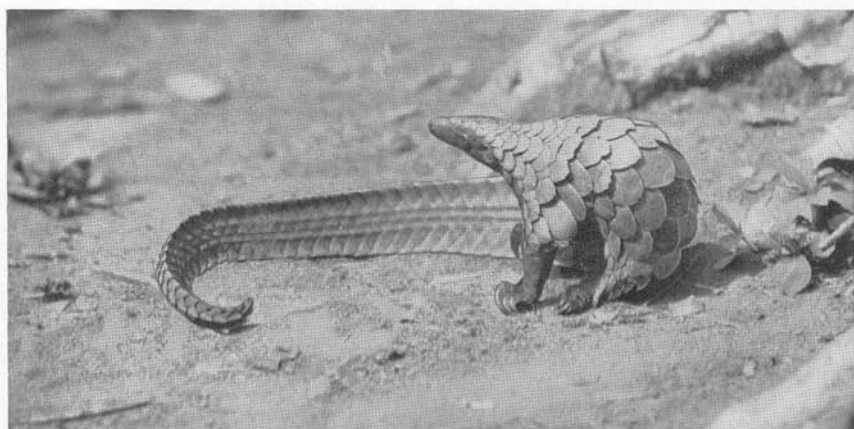
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PLATE XXV

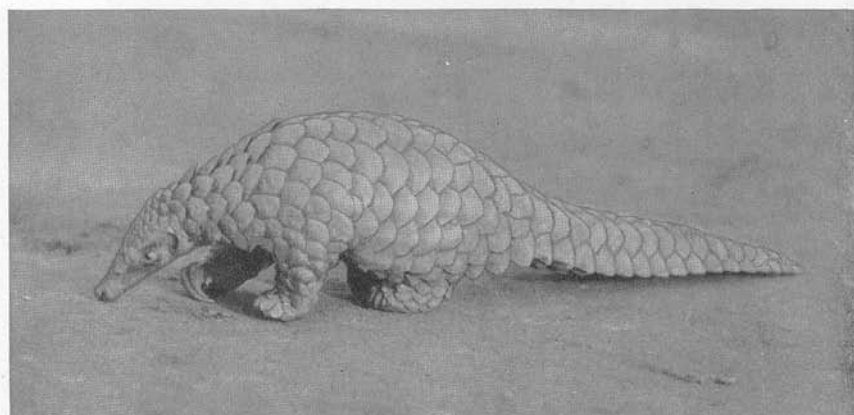
Fig. 1. *Manis tetradactyla* Linnæus. Living male, at Niapu, December 16, 1913.  
An arboreal species.

Fig. 2. *Manis gigantea* Illiger. Live young female, at Poko, August, 1913.  
Typical pose of the animal while in search of its food.

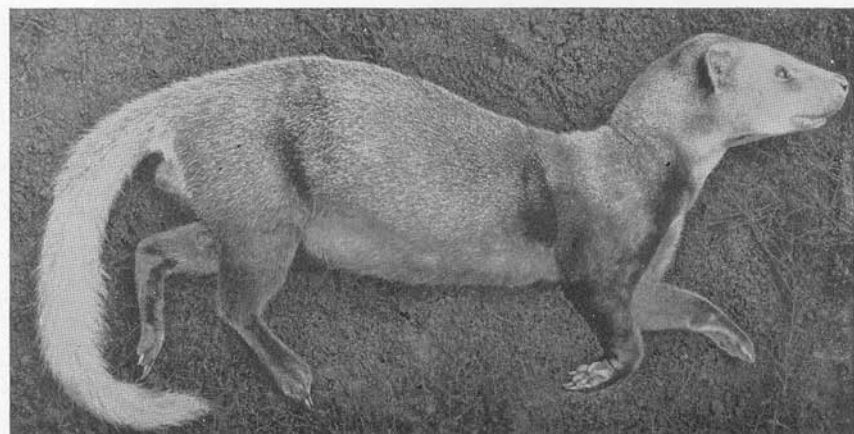
Fig. 3. *Bdeogale nigripes* Pucheran. Freshly killed male, at Akenge, October 8, 1913.



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PLATE XXVI

Fig. 1. Nest of a harvesting ant (*Messor* species) in the Athi Plains, British East Africa, July, 1906.

Fig. 2. Bushes of a species of *Acacia* with galls on the swollen thorns, often inhabited by ants. Athi Plains, British East Africa, July, 1906.

Fig. 3. Species of *Acacia* with galls on the thorns inhabited by ants. Near the Tana River, 25 miles below Fort Hall, British East Africa, September, 1910.

Photograph by Mr. Carl E. Akeley



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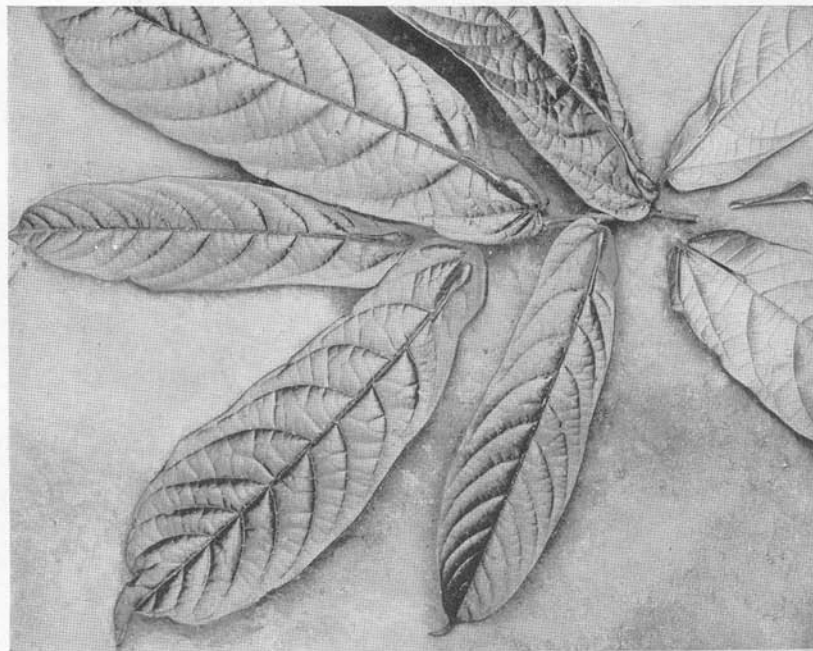


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PLATE XXVII

Fig. 1. *Scaphopetalum Thonneri* De Wildeman and Durand. Niapu, January 1, 1914. Extremity of a branch with ant inhabited pouches at the base of the leaf-blade. The five leaves still attached are seen from above; the two detached (lower part of photograph) show the under side with slit leading into the pouch; between them is a longitudinal section of one of the ascidia.

Fig. 2. *Cola Laurentii* De Wildeman. Stanleyville, March, 1915. Extremity of a branch with flowers and fruit. Many of the leaves show the pair of characteristic ant-pouches at the base of the blade.



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PLATE XXVIII

*Barteria fistulosa* Masters

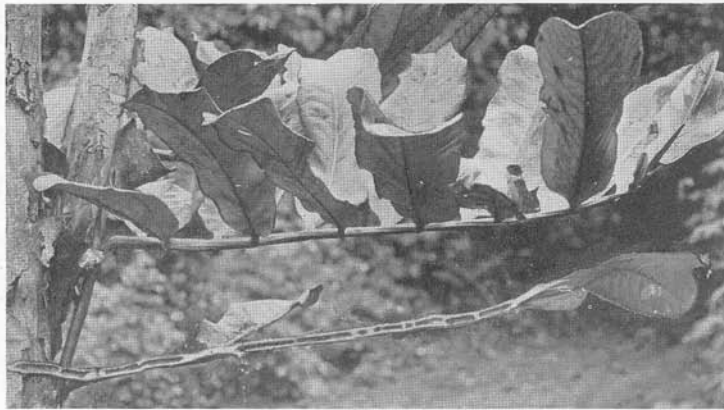
Fig. 1. Tree growing in secondary forest near the Tshopo River, Stanleyville, April, 1915. The horizontal branches and the spreading leaves are well illustrated.

Fig. 2. Two lateral branches inhabited by *Pachysima æthiops* (F. Smith). The upper one demonstrates the spreading leaves and the sudden swelling at the base of the branch; the lower one, sectioned longitudinally, shows the cavity occupied by the ants. Medje, October, 1910.





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PLATE XXIX

*Barteria fistulosa* Masters. Tree left standing in a forest path near Medje, October, 1910. Characteristic are the horizontal branches, some of which in the upper part of the tree have lost their leaves. The branches represented in Pl. XXVIII, fig. 2 were from this specimen.



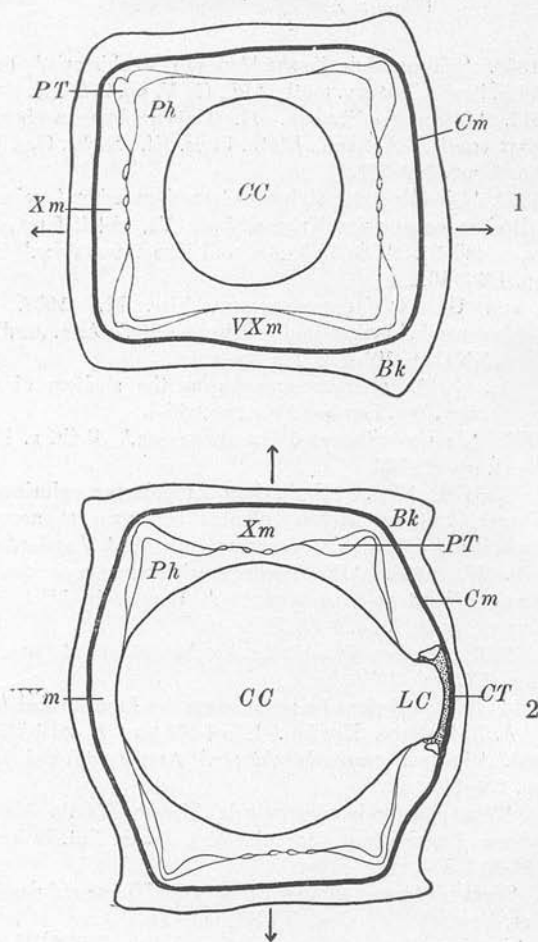


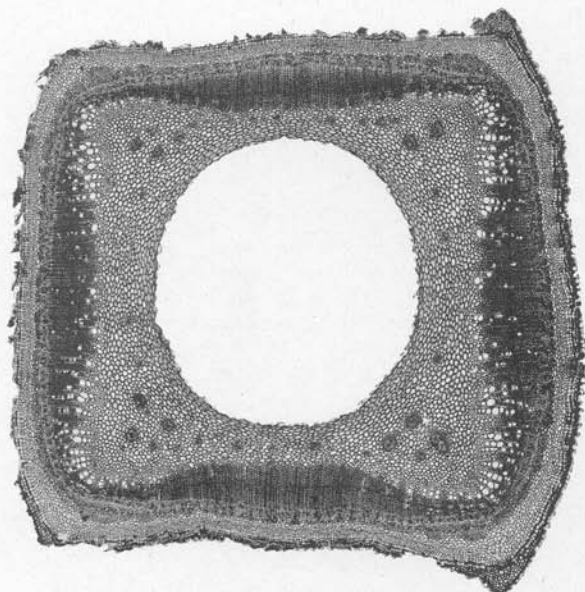
PLATE XXX

*Vitex Staudtii* Guerke

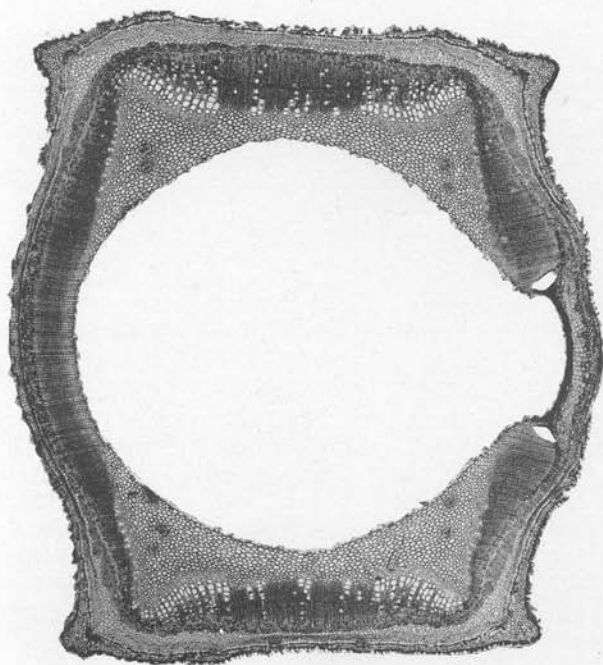
Fig. 1. Transverse section of a young stem, cut just above a node (at the level A-A shown in Text Figure 88, p. 449): CC, central cavity; Ph, peripheral layer of pith; PT, primary tracheæ; Xm, secondary xylem containing vessels; Vxm, secondary xylem devoid of vessels; Cm, cambium; Bk, bark.  $\times 19$ .

Fig. 2. Transverse section of a young stem, cut just below the node (at the level B-B in Text Figure 88, p. 449): CC, central cavity; LC, lateral cavity; CT, shriveled callus; Ph, remains of peripheral layer of medullary tissue; PT, primary tracheæ; Xm, secondary xylem containing vessels; Vxm, vesselless secondary xylem; Cm, cambium; Bk, bark.  $\times 19$ .

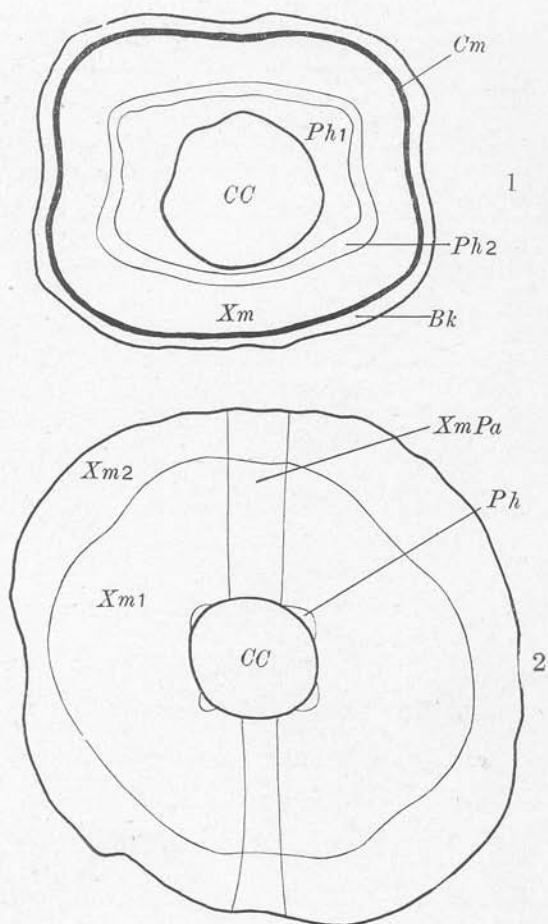
The arrows indicate the sides of the stele which pass out into the leaves at the next (higher) node.



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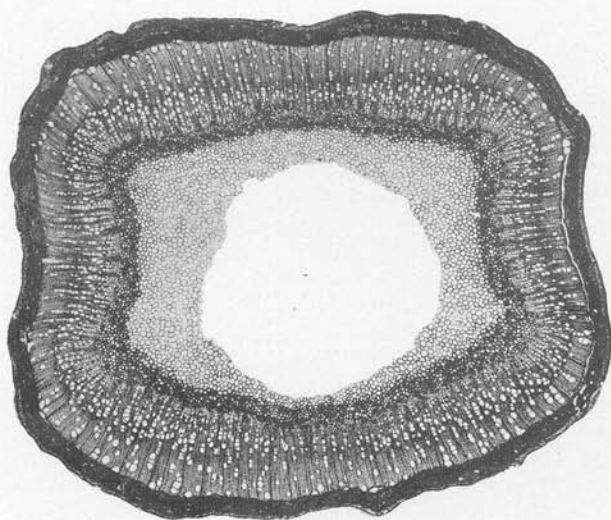
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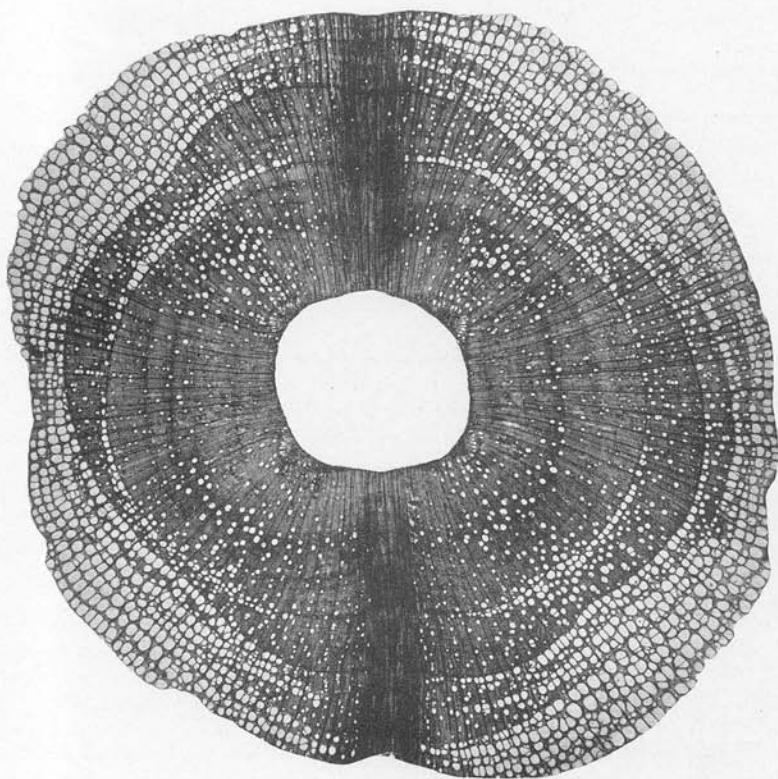
# PLATE XXXI

Fig. 1. *Vitex littoralis* Deene. Transverse section of a young stem, showing a central cavity in a species which is not inhabited by ants: *CC*, central cavity; *Ph1*, thin-walled pith; *Ph2*, thick-walled pith; *Xm*, xylem; *Cm*, cambium; *Bk*, bark.  $\times 12$ .

Fig. 2. *Vitex Staudtii* Guerke. Transverse section of a decorticated stem 18 mm. in diameter, showing six growth layers: *CC*, central cavity; *Ph*, remains of pith; *Xm1*, growth layers containing few vessels; *Xm2*, growth layers containing numerous large vessels; *XmPa*, radii of stem devoid of vessels, in which the formation of xylem parenchyma has been greatly accentuated by traumatic stimuli.  $\times 7$ .

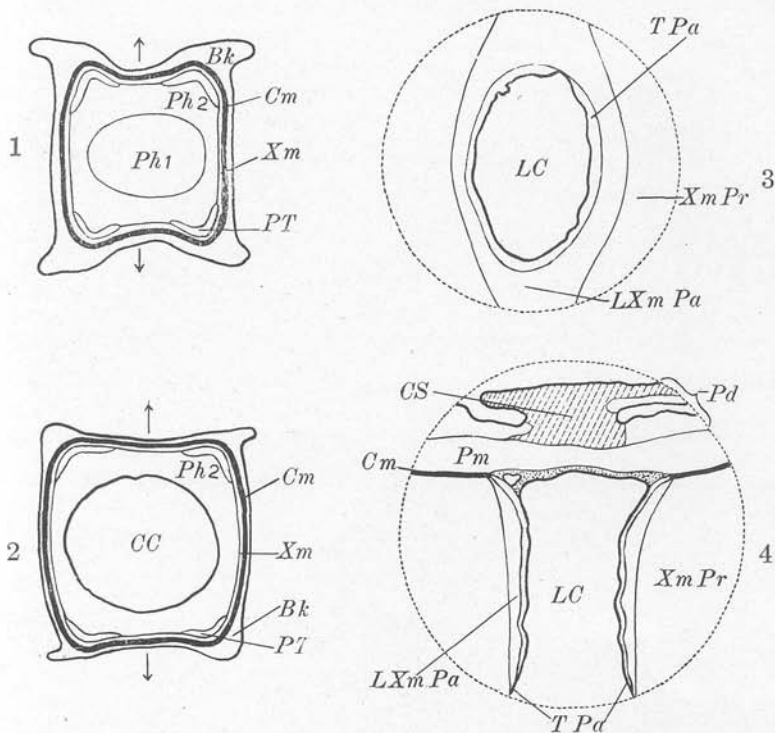


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# PLATE XXXII

*Vilex Staudtii* Guerke

Fig. 1. Transverse section of a very young, tender stem, illustrating heterogeneous medulla and early stage in the differentiation of the "fibrovascular cylinder" or stele: *Ph1*, large-celled, thin-walled medullary tissue; *Ph2*, peripheral layer of medullary tissue composed of small cells; *PT*, primary tracheae; *Xm*, xylem; *Cm*, cambium; *Bk*, bark. The arrows indicate the sides of the stele which pass out into the leaves at the next (higher) node.  $\times 19$ .

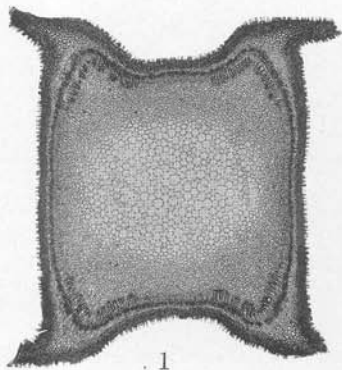
Fig. 2. Transverse section of normal stem cut a short distance below that illustrated in Fig. 1: *CC*, central cavity; *Ph2*, peripheral layer of medullary tissue; *PT*, primary tracheae; *Xm*, xylem; *Cm*, cambium; *Bk*, bark. The arrows indicate the sides of the stele which pass out into the leaves at the next (higher) node.  $\times 19$ .

Fig. 3. Tangential longitudinal section of a stout stem, showing a cross-section of lateral cavity: *LC*, lateral cavity; *TPa*, shriveled remains of thin-walled, unlig-nified parenchyma; *LXmPa*, thick-walled, lignified xylem parenchyma; *XmPr*, prosenchymatous portion of xylem.  $\times 33$ .

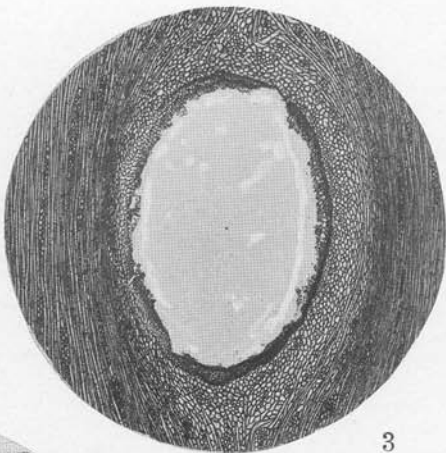
Fig. 4. Radial longitudinal section of stout dry stem, illustrating lateral cavity and outer cap of sclerenchyma: *LC*, lateral cavity; *TPa*, shriveled remains of thin-walled, unlig-nified parenchyma; *LXmPa*, thick-walled, lignified xylem parenchyma; *XmPr*, prosenchymatous portion of xylem; *Cm*, cambium; *Pm*, phloem; *Pd*, periderm; *CS*, sclerenchymatous disk or cap.  $\times 26$ .

Fig. 5. Section of "nutritive" layer stained with Sudan III to differentiate fats.  $\times 90$ .

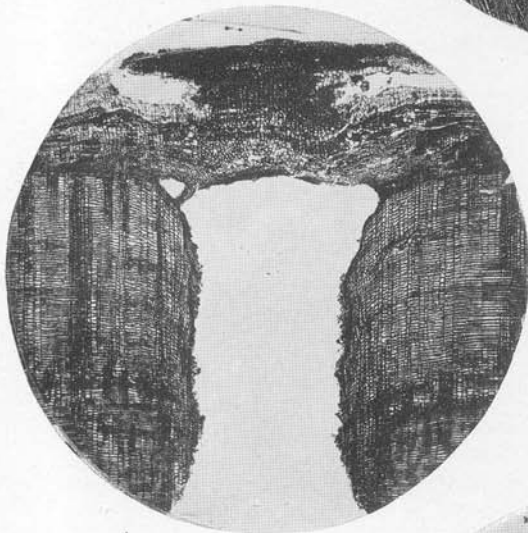




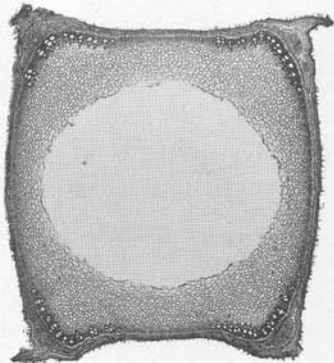
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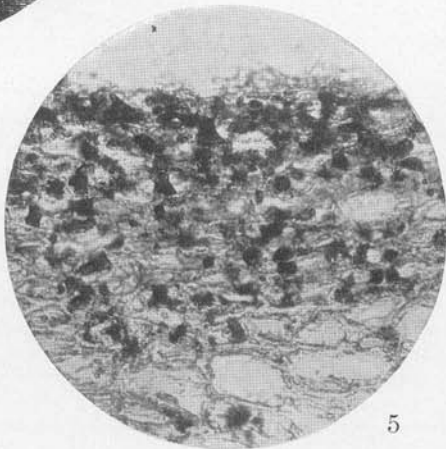
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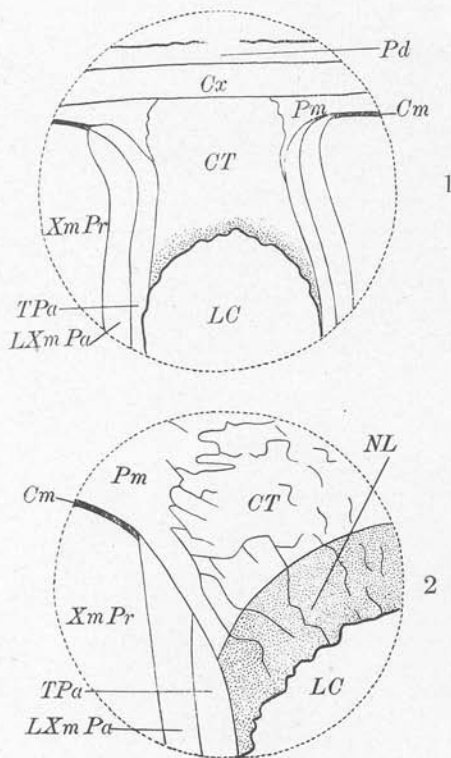


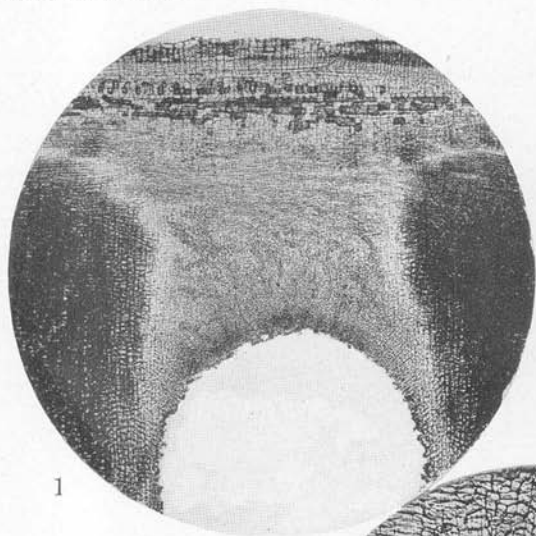
PLATE XXXIII  
*Vitex Staudtii* Guerke

Fig. 1. Radial longitudinal section of stout stem preserved in alcohol, showing convex end of lateral cavity and tissues which surround it: *LC*, lateral cavity; *CT*, unignified callus; *TPa*, thin-walled, unignified parenchyma; *LXmPa*, thick-walled, lignified xylem parenchyma; *XmPr*, prosenchymatous xylem packed with starch; *Cm*, cambium; *Pm*, phloem; *Cx*, cortex; *Pd*, periderm. Stained with chloriodide of zinc.  $\times 35$ .

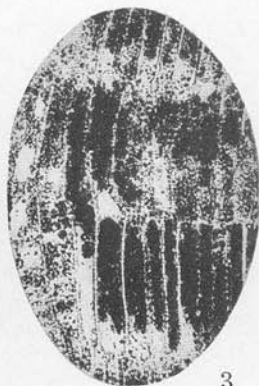
Fig. 2. More highly magnified view of the tissues shown in Fig. 1. *LC*, lateral cavity; *NL*, "nutritive," inner layer of callus; *CT*, outer, larger-celled portion of callus; *TPa*, thin-walled, unignified parenchyma; *LXmPa*, thick-walled, lignified xylem parenchyma; *XmPr*, prosenchymatous xylem; *Cm*, cambium; *Pm*, phloem. Stained with hæmatoxylin-safranin.  $\times 60$ .

Fig. 3. Radial longitudinal section of xylem, showing septate, libriform fibers packed with starch. Section stained with chloriodide of zinc.  $\times 170$ .

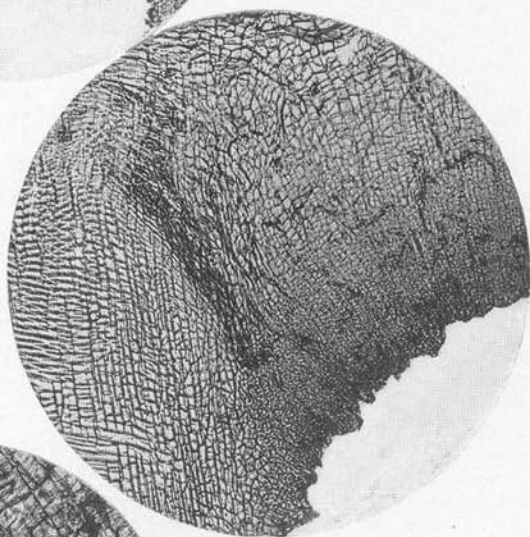
Fig. 4. Section of "nutritive" layer, illustrating ground mass of small, thin-walled cells and dark-colored strands of conducting tissue.  $\times 200$ .



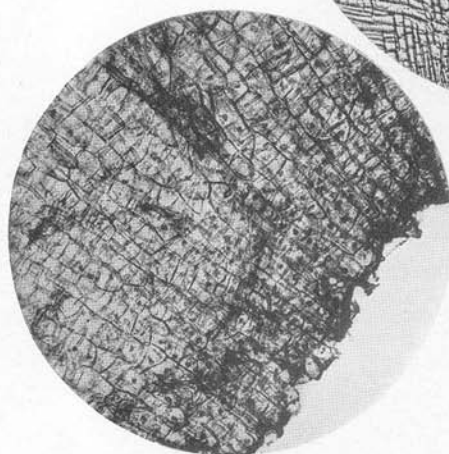
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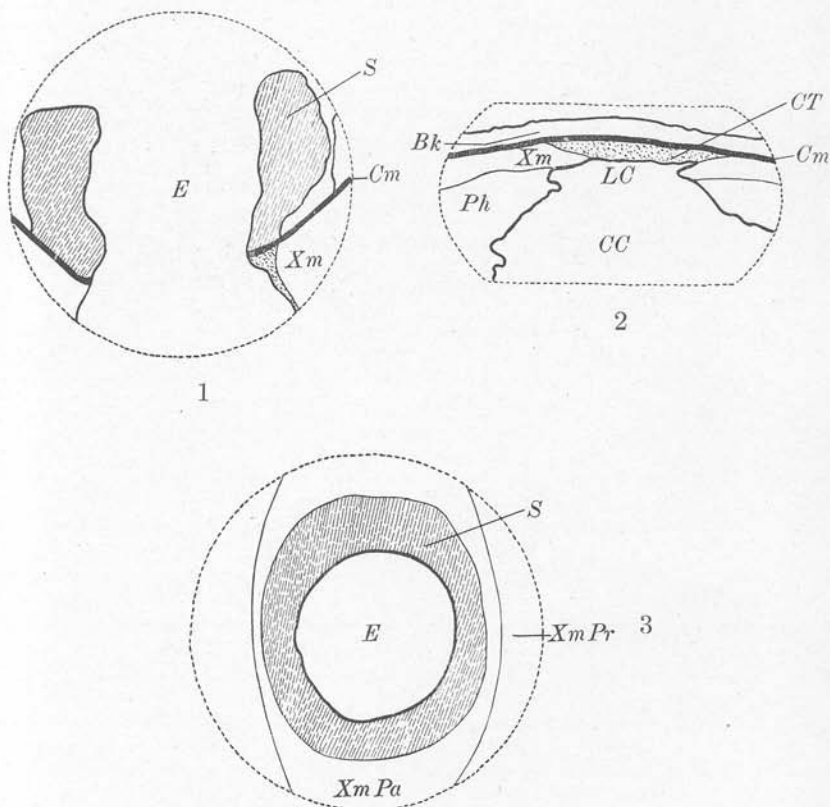
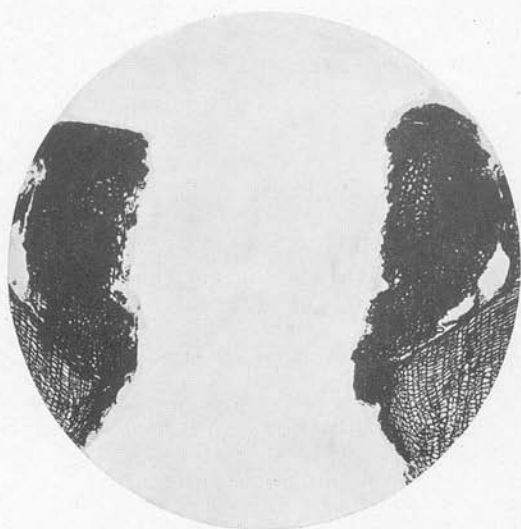


PLATE XXXIV  
*Vilex Staudtii* Guerke

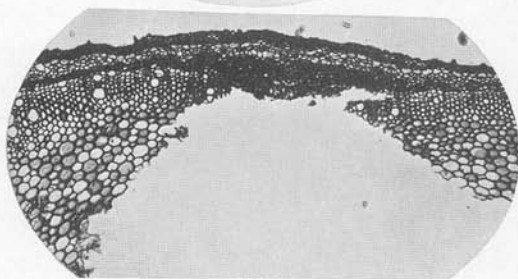
Fig. 1. Radial longitudinal section of stout stem with exit cavity (*E*) surrounded by a ring of sclerenchyma (*S*): *Xm*, xylem; *Cm*, cambium.  $\times 43$ .

Fig. 2. Sector of transverse section cut just above the section illustrated in Pl. XXXII, Fig. 2, showing early stage in the formation of lateral cavity and nutritive layer: *CC*, central cavity; *LC*, lateral cavity; *Ph*, pith tissue; *Xm*, xylem; *CT*, callus; *Cm*, cambium; *Bk*, bark.  $\times 38$ .

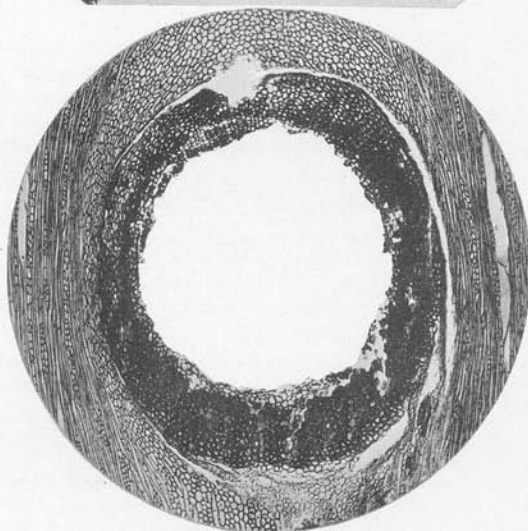
Fig. 3. Tangential longitudinal section of stout stem with exit cavity (*E*): *S*, ring of sclerenchyma; *XmPa*, parenchymatous portion of xylem; *XmPr*, prosenchymatous portion of xylem.  $\times 38$ .



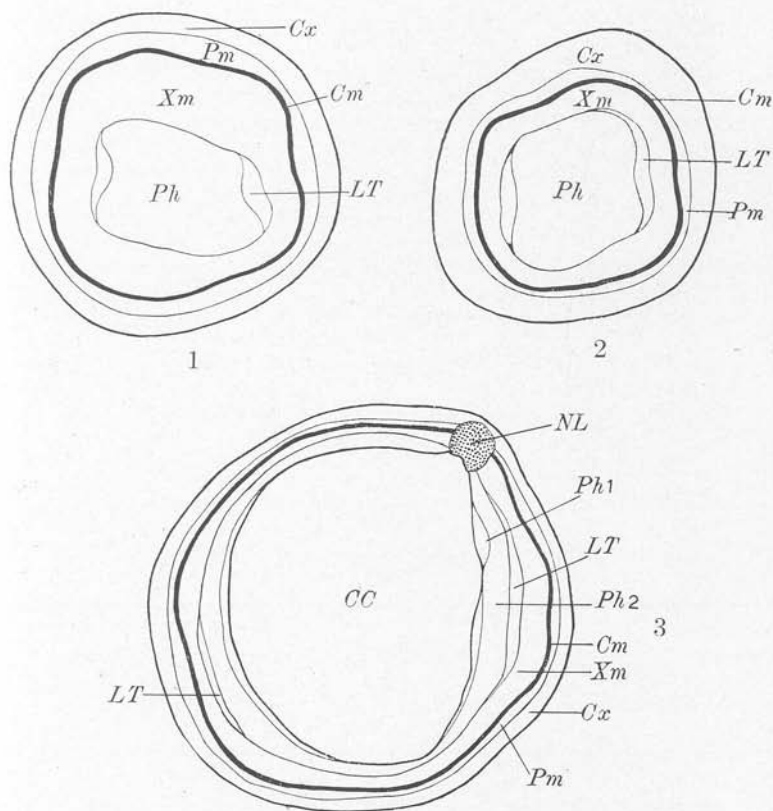
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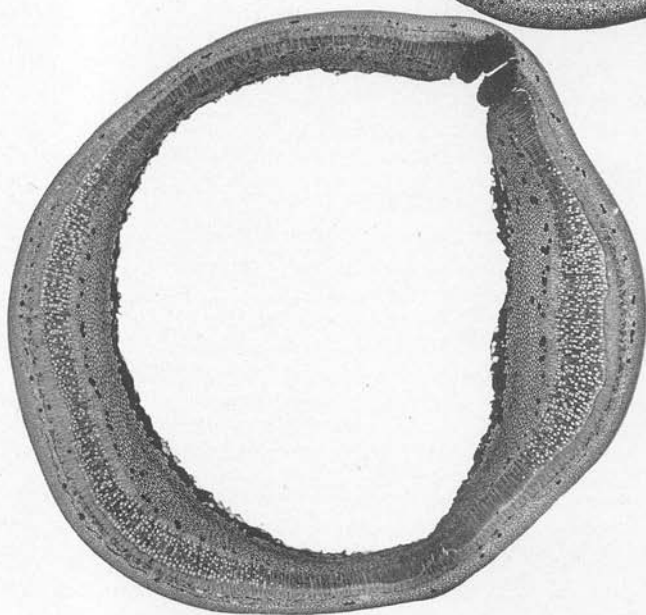
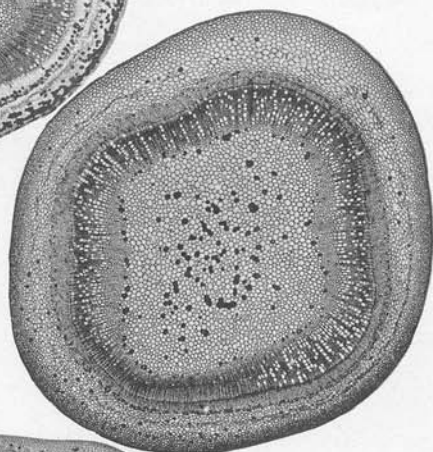
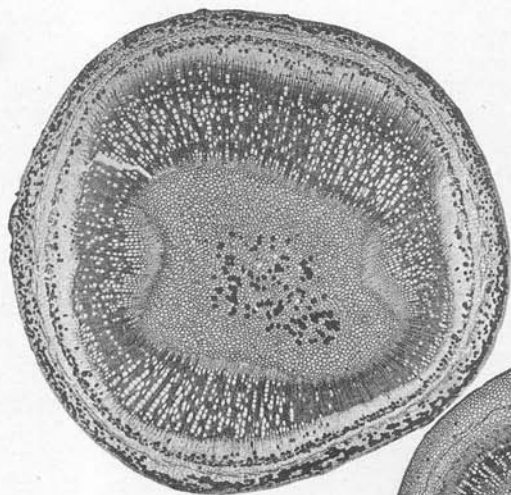


# PLATE XXXV

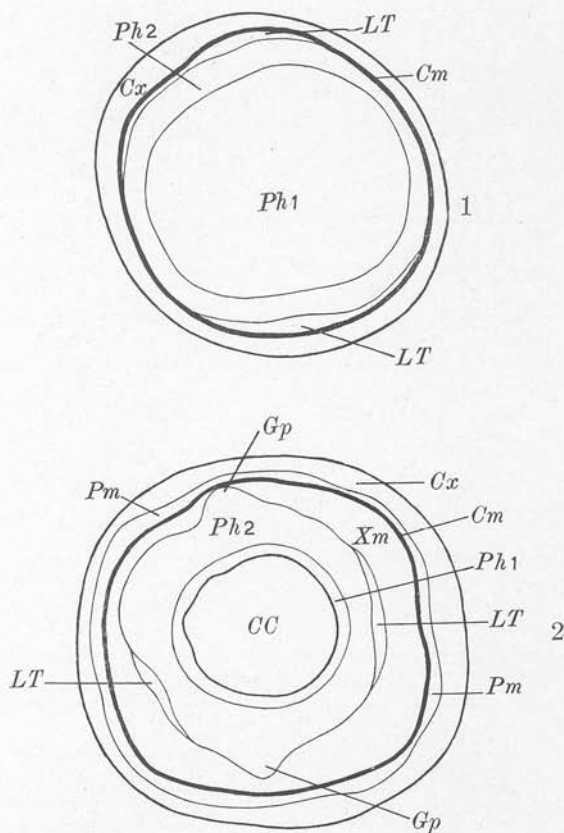
Fig. 1. *Cuviera* species? (collected at Kunga). Transverse section of normal, unswollen portion of internode: *Ph*, pith; *LT*, leaf trace bundles which pass out at the next (higher) node; *Xm*, cylinder of xylem; *Pm*, phloem; *Cm*, cambium; *Cx*, cortex.  $\times 14$ .

Fig. 2. *Cuviera angolensis* Hiern (from the Tshopo River). Transverse section of normal, unswollen portion of internode: *Ph*, pith; *LT*, leaf trace bundles which pass out at the next (higher) node; *Xm*, cylinder of xylem; *Cm*, cambium; *Pm*, phloem; *Cx*, cortex.  $\times 14$ .

Fig. 3. *Cuviera angolensis* Hiern. Transverse section of myrmecodomatium: *Ph1*, remains of thin-walled pith; *Ph2*, thick-walled pith; *LT*, leaf trace bundles which pass out at the next (higher) node; *Xm*, cylinder of xylem; *Pm*, phloem; *Cm*, cambium; *NL*, nutritive layer; *Cx*, cortex; *CC*, central cavity.  $\times 11$ .







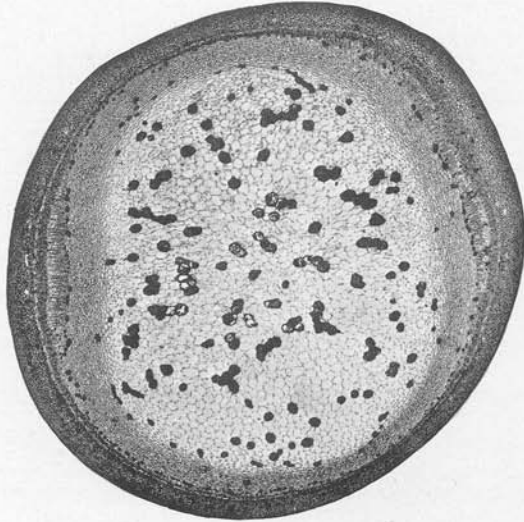
# PLATE XXXVI

*Cuiwiera angolensis* Hiern

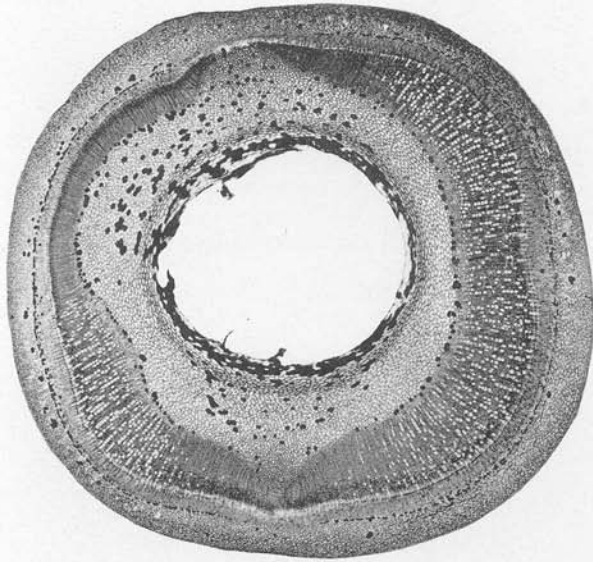
Fig. 1. Transverse section of the swollen portion of a very young stem, showing pulpy pith which later collapses and dries up: *Ph1*, thin-walled pith; *Ph2*, thick-walled pith; *LT*, leaf trace bundles which pass out at the next (higher) node; *Cm*, cambium; *Cx*, cortex.  $\times 14$ .

Fig. 2. Transverse section of the base of a swelling on a stout stem, illustrating one phase in the formation of a cavity without the intervention of the ants: *CC*, central cavity; *Ph1*, remains of thin-walled pith; *Ph2*, thick-walled pith; *Xm*, xylem cylinder; *LT*, leaf trace bundles which pass out at the next (higher) node; *Gp*, gaps made by the exit of leaf trace bundles; *Cm*, cambium; *Pm*, phloem; *Cx*, cortex.  $\times 12$ .





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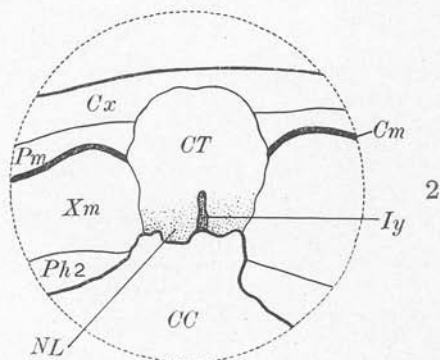


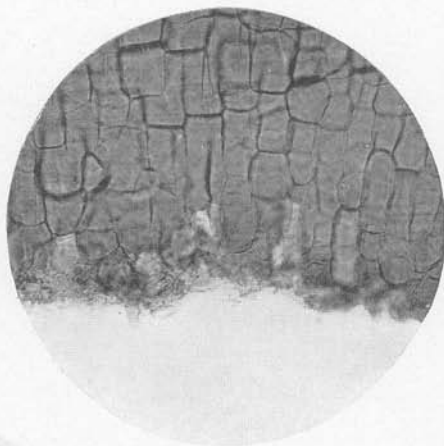
PLATE XXXVII

Fig. 1. *Cuviera* species? (collected at Kunga). Section of nutritive layer, showing chewed inner portion.  $\times 210$ .

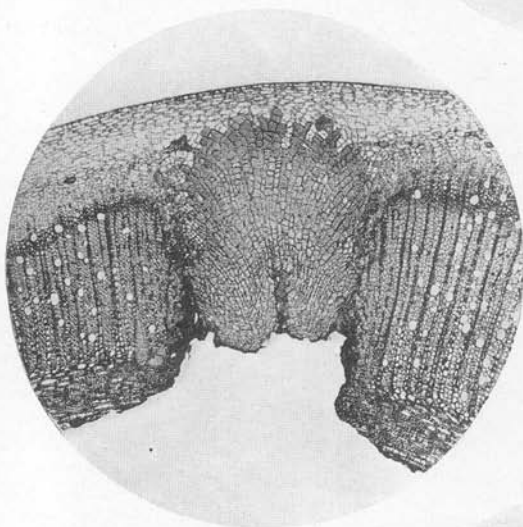
Fig. 2. *Cuviera angolensis* Hiern. Sector of a transverse section of myrmecodomatium, showing nutritive layer: *NL*, nutritive layer; *CT*, callus; *CC*, central cavity; *Ph2*, thick-walled pith; *Xm*, xylem; *Cm*, cambium, *Pm*, phloem; *Cx*, cortex.  $\times 50$ .

Fig. 3. *Cuviera angolensis* Hiern. Section of inner edge of central cavity with thick-walled cells of pith, thin-walled cells of pith containing amber-colored substance, and aerial hyphae of fungus.  $\times 210$ .

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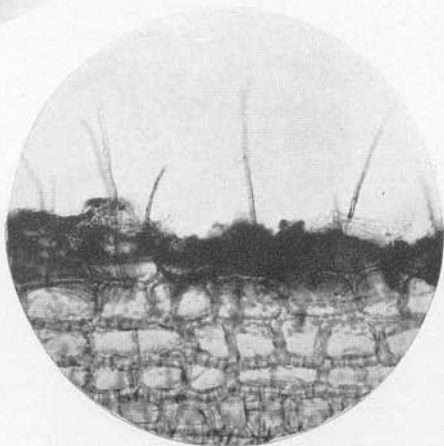


PLATE XXXVIII

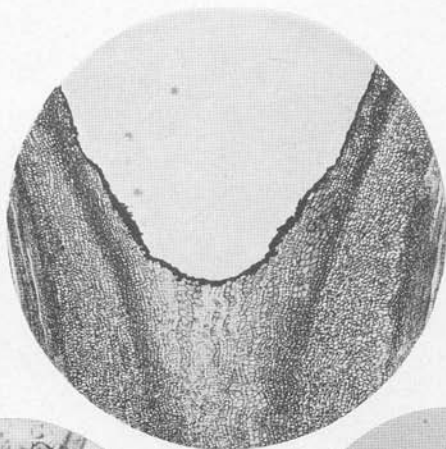
*Cuviera* species? (from Kunga)

Fig. 1. Longitudinal section of stem, showing fungus garden at base of central cavity.  $\times 16$ .

Fig. 2. Portion of ant pellet composed entirely of hyphæ.  $\times 400$ .

Fig. 3. Portion of detritus from base of central cavity showing nematodes.  $\times 390$ .

Fig. 4. "Fungus garden," showing aërial hyphæ, substratum, and thick-walled cells of pith.  $\times 160$ .



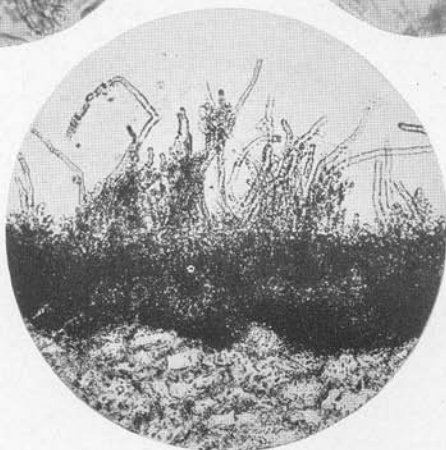
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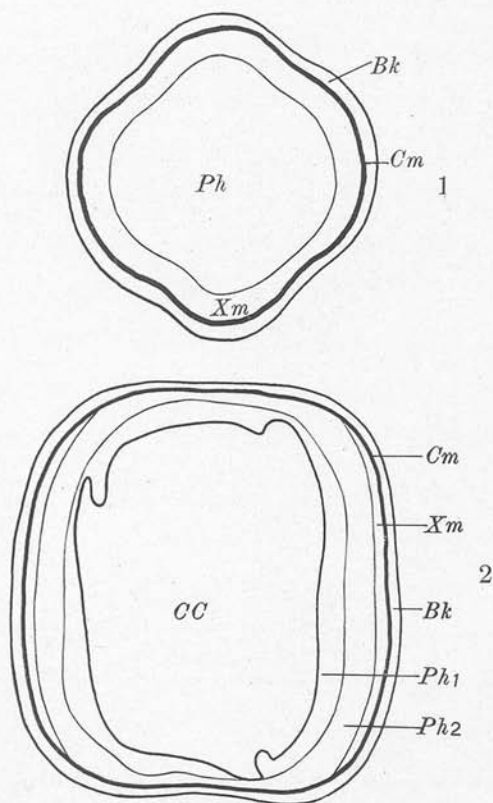
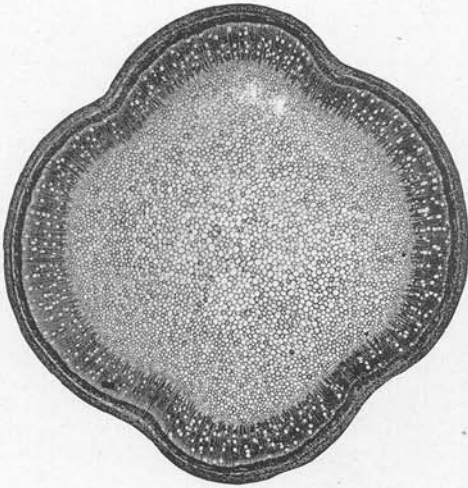


PLATE XXXIX

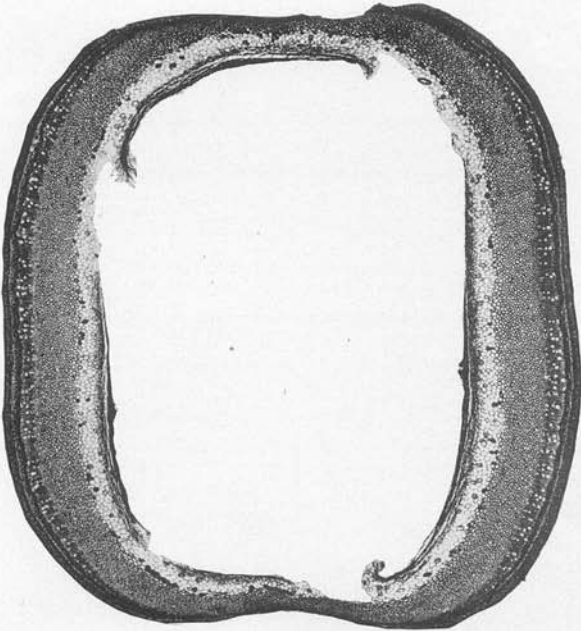
*Plectrnia* species A (from the Tshopo River)

Fig. 1. Transverse section of young, normal internode: *Ph*, pith; *Xm*, xylem cylinder; *Cm*, cambium; *Bk*, bark.  $\times 9$ .

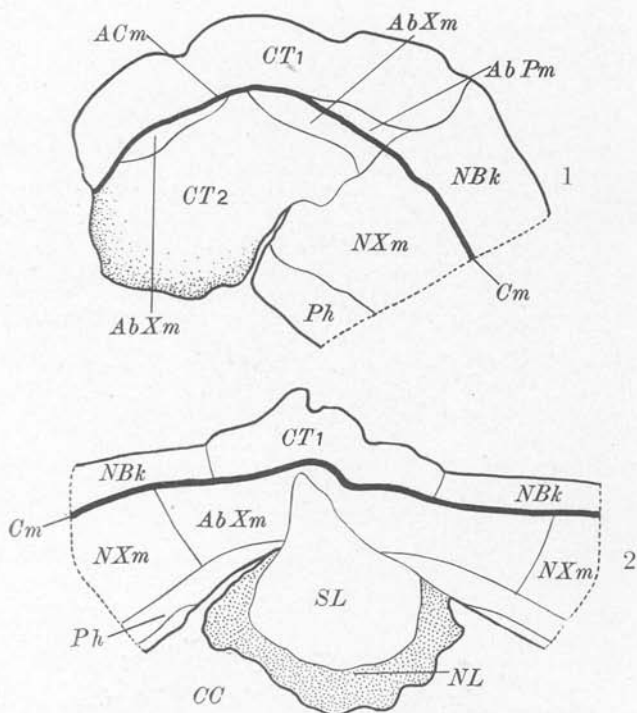
Fig. 2. Transverse section of swollen portion of young stem, showing central cavity formed by the drying up of the thin-walled cells of the pith: *CC*, central cavity; *Ph1*, remains of thin-walled portion of pith; *Ph2*, thick-walled portion of pith; *Xm*, xylem; *Cm*, cambium; *Bk*, bark.  $\times 9$ .



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# PLATE XL

Fig. 1. *Cecropia* species. Sector of a transverse section of a young stem, showing normal structure (right) and callus formation or "stomatome" (left). The latter is differentiated into two distinct portions: a darker outer layer and a light-colored hyperplasia which projects into the cavity of the stem; these two layers are separated by a meristematic layer which is continuous with the cambium: *Ph*, pith; *NXm*, normal xylem; *NBk*, normal bark; *AbXm*, abnormal xylem; *AbPm*, abnormal phloem; *CT1*, dark outer layer of callus formation; *CT2*, light-colored hyperplasia projecting into the cavity of the stem; *Cm*, normal cambium; *ACm*, meristematic layer of callus formation.  $\times 10$ .

Fig. 2. *Plectronia* species A (from the Tshopo River). Sector of a transverse section of a myrmecodomatium, showing hyperplasia projecting into the cavity of the twig: *CC*, central cavity; *NL*, nutritive layer; *SL*, starch containing parenchyma; *Ph*, pith; *NXm*, normal xylem; *AbXm*, abnormal xylem; *NBk*, normal bark; *CT1*, external callus; *Cm*, cambium. The layers *SL* and *NL* together represent the tissue designated as *CT2* in Fig. 1.  $\times 26$ .



