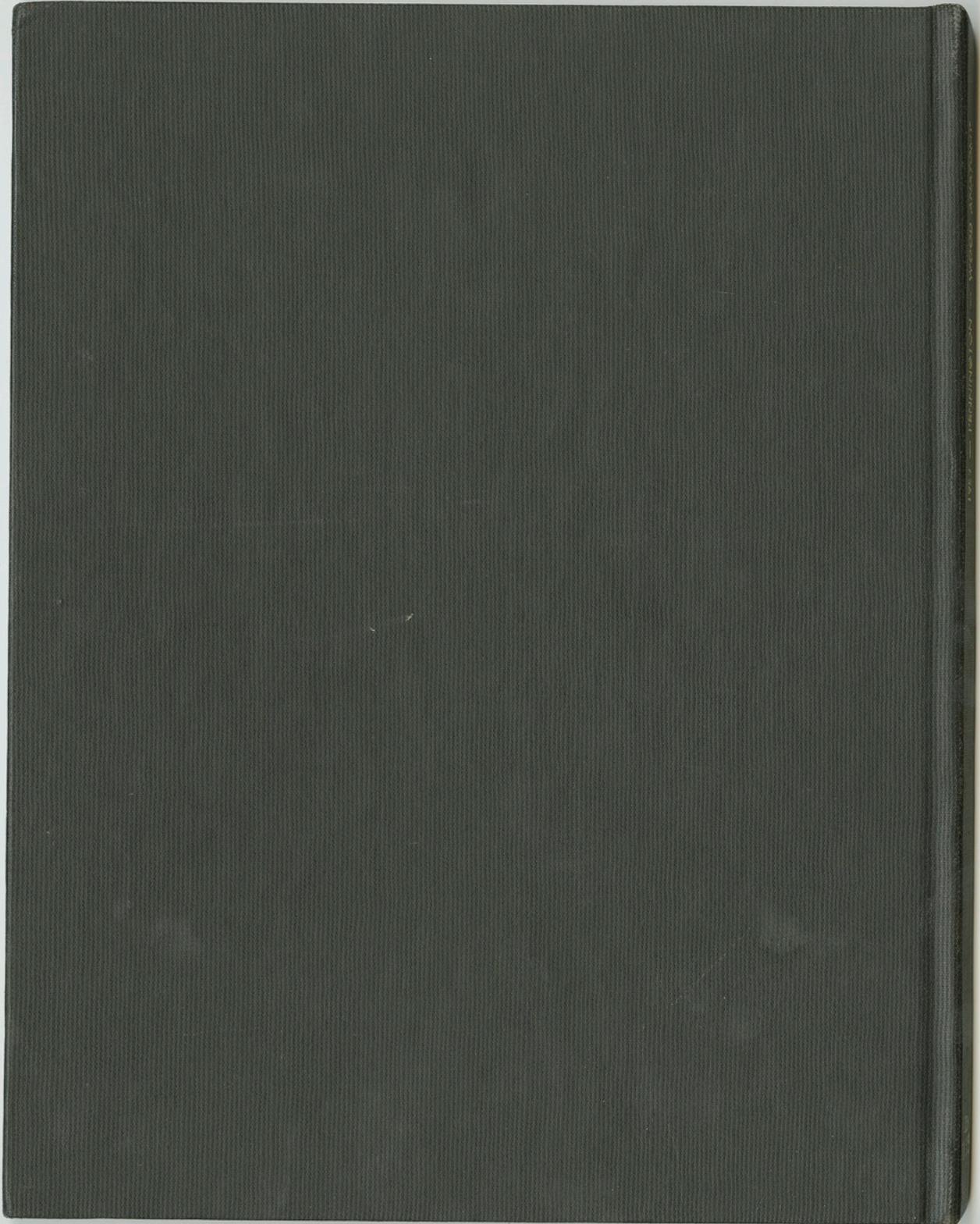


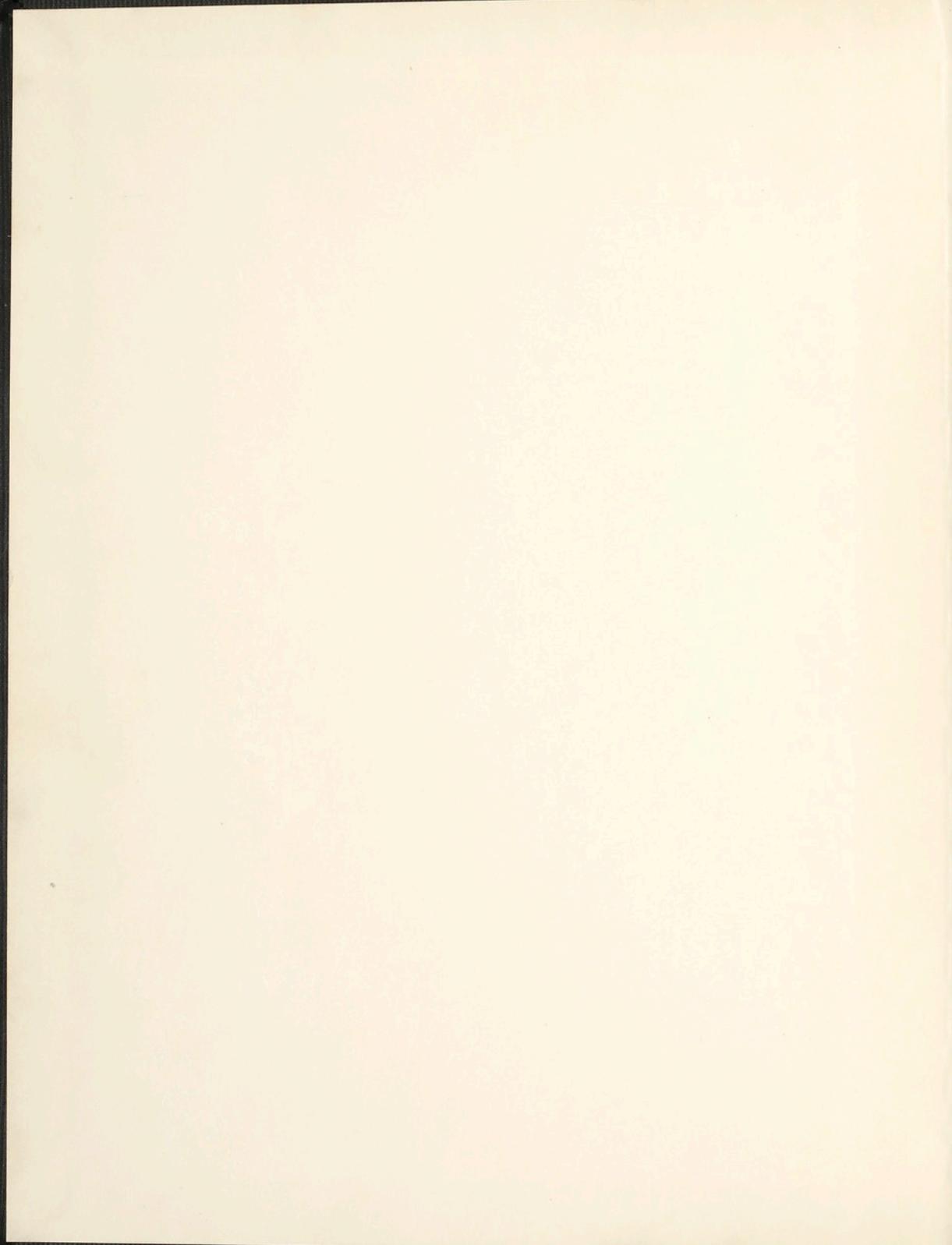
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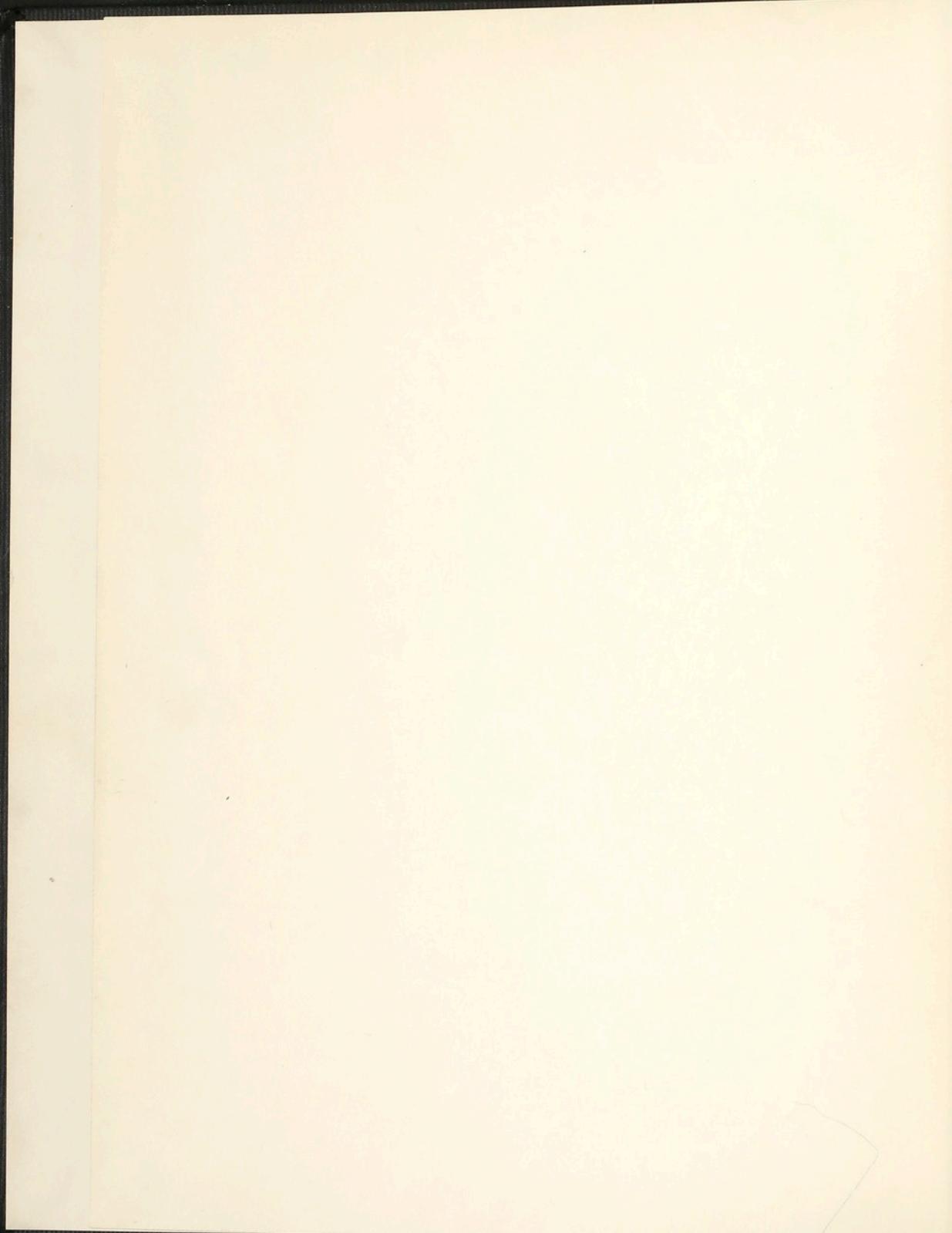


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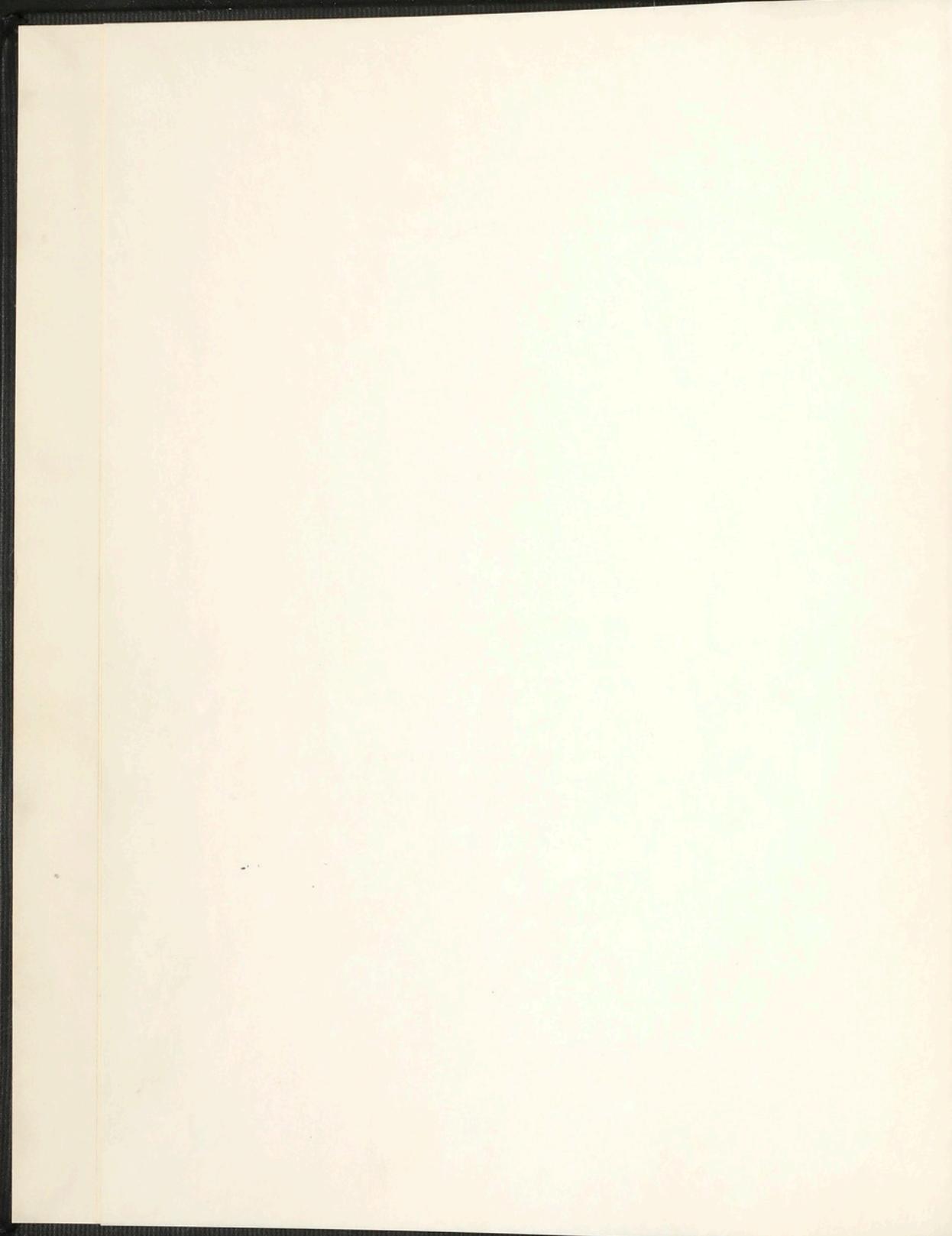
A COMMITTEE REPORT OF THE ASSOCIATION OF FRIENDS

RECOMMENDED FOR APPROVAL AND RATIFICATION

RECOMMENDED FOR APPROVAL AND RATIFICATION

A COMMITTEE REPORT ON THE READING ROOMS  
OF THE ASSOCIATION OF FRIENDS IN WILMINGTON  
IN THE STATE OF DELAWARE.

Approved  
John T. Brown, John Brown  
John A. Scott, John Scott  
Rufus P. Jones  
James C. Allen, Jr.  
Loyd F. Johnson  
One & Two  
John L. White  
Orland C. White



A COMPARATIVE STUDY OF WOOD ANATOMY OF FIFTY-FOUR  
SPECIES OF THE FAMILY AQUIFOLIACEAE

Maggie Thurman Pennington, B.S. M.S.  
-1953-

A dissertation presented to the Graduate Faculty  
of the University of Virginia in candidacy  
for the degree of Doctor of Philosophy.

Approved

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GIFT

U. Va. Doctoral  
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A Comparative Study of the Anatomy of Fifty-four  
Species of the Family Aculopidae.

Introduction

The Aculopidae is a small family widely distributed over the world. It is composed of trees and shrubs, most species being:

- Acknowledgements -

I acknowledge grateful appreciation to Dr. Ivey F. Lewis of the University of Virginia for his sympathetic guidance and advice during the course of this work.

For material supplied me I am indeed indebted to the curators of the Chicago Museum of Natural History and the Yale School of Forestry. Also I am indebted to Miss Lillian Arnold of the Florida Agriculture Experimental Station, to students of the Blandy Experimental Farm of the University of Virginia and, to Dr. W. J. Phillips of Charlottesville, Virginia for material

Sincere appreciation is acknowledged for valuable advice given me by Dr. Robert C. Wingfield of Converse College concerning statistical methods employed in this study.

Nothing may occur in developing and writing this article which may suggest however, however slight, a belief among the findings of workers studying anatomical characteristics to give more

The outside of the plant should be very thick. It is smooth in some species (e.g. *L. glauca*) and, very smooth in others

and to stand at your feet as a messenger, offering up thyself  
unto him, for rendering judgment. And though he will require  
an accounting, when thou art given up.

To students with an individual interest in the political situation  
The present writer will say nothing further to identify himself,  
but he wishes to add his voice to those who call attention  
to the importance of personal conviction, notwithstanding which  
it may be difficult to determine what course a conscientious person  
intends to adopt. He recommends the practice of giving  
one's name slightly out high-sounding names, so that  
governments might be induced to believe a student  
is a member of a party, & to give him credit for  
the views of that party.

A Comparative Study of Wood Anatomy of Fifty-four

Species of the Family Aquifoliaceae.

Introduction

Having undertaken investigation of secondary growth in

The Aquifoliaceae is a small family widely distributed over the world. It is composed of trees and shrubs, most species being evergreen. The family contains five genera: Ilex, the largest and most widely distributed genus of over three hundred species; Phelline, a monotypic genus restricted to New Caledonia; Byrsonia, consisting of three species reported from the Hawaiian Islands and Tahiti; Sphenoclemon, a monotypic genus also reported from New Caledonia; and Hemopanax, a third monotypic genus common to northeastern United States.

Very little anatomical evidence of secondary growth of stems has hitherto been available to taxonomists to assist them in evaluating this family. Previous workers have confined work for the most part to the flowers, fruits, young stems, and leaves. The primary aim of the anatomist is to provide new and significant material for use in conjunction with traditional morphological data to establish relationships based upon a more complete knowledge of the plants than is afforded by a consideration of gross morphological features alone. His investigations may serve to strengthen some existing, taxonomic system or may suggest another, sounder system. A brief summary of the findings of workers studying anatomical characteristics is given here.

The cuticle of the young stem is very thick. It is smooth in some species (e.g. I. glabra(L) Gray). Cork arises in the epidermis

most-prized to visitors both to their exhibitions &  
expositions, which are to follow.

Two hundred guests visited the International Art  
and antique show, given this year to benefit of the library and  
the Hospital and Dispensary, and the opening of the Antique and  
old-world curiosity section was to many but through public care  
to gain these unique exhibits and to facilitate their enjoyment a  
memorable occasion has been created for all persons having kindred taste  
in antiquities, fine pictures, rare books, and curiosities.  
The Antique collection of books, maps, globes, and other  
articles to draw visitors to considerantation while they  
admire the old world of civilization or antiquity and modern art,  
as they can not yet realize how closely they are allied. Together with  
the fine young art, several rare collections, pottery, glass, and  
one of our old historic curiosities had been offered by 65 collectors  
and dealers of most distinguished reputation who will  
be sure to be found at the right time, a connoisseur's empire,  
where all curious and curiosities may be obtained.  
To manage discreetly, provide new curiosities or curious old curiosities  
against all be curious ladies and gentlemen, curious things have  
been early of anticipation. Curious curiosities relative to  
books of all curious old books going out to library and  
libraries and old books that dearly loved things, curious books of

or hypodermis and the cork cells are usually thick-walled. Xylem is commonly traversed by broad rays. Vessels have scalariform perforation plates. Pericycle contains isolated strands of fibers.

Solereder ('08) described the vessels of secondary woods as having scalariform perforations, and the parenchyma with bordered pits. Kenchira ('12) gave the upper limits of the number of vessels as 120 per mm. in tangential arrangement for Ilex. Loesener, according to Solereder ('08) states that the rays are exclusively uniseriate in Ilex verticillata. Growth rings in Ilex were described in 1927 by Coster. Wood is considered ring-porous by Metcalf and Chalk in The Anatomy of Dicotyledons ('50). These contributions by no means give a complete summary of our knowledge of the secondary xylem.

It is the aim of this study to present a more complete analysis of secondary woods of fifty-four species of this family. These species, including representatives of all genera, are listed in Tables I, III, and V on pages 8-9, 15-16, 20-21. Elements of each

specimen were studied in radial and transverse sections. Transverse sections were stained in safranin. Radial sections were stained in safranin and counterstained with lactophenol. Sections were cut with a microtome and mounted on slides with lactophenol mounting medium. The sections were examined under the dissecting microscope. The magnification was increased to examine the details of the wood structure. The magnification of the binocular lens of one half and, at the extreme low power, the power of safety glasses. All sections were cleared in all of

at night, bell-shaped flowers produced from the axils of the lanceolate  
opposite leaves and whorls. Above them are numerous bracts  
which bear clusters of small flowers which open at noon.

Between 1000 and 1100 feet above sea level the plants grow in patches  
among the rocks and the soil may be very dry and with  
scattered stones, well got along with a large amount of  
sandstone and fine water. The plants are scattered  
throughout the area of high ground, particularly near  
the bases of some high elevations at noon, among the  
sandstones and 100' apart. In patches of 1000  
square feet there will be probably 1000 or more plants  
of all sizes.

There were a number of plants that we did not  
catch with the traps, probably because they were too tall  
and too strong for the antecamponer to catch, and  
these included the following:

1. *Thlaspi glaucum* (L.) Benth. - A small annual  
with a slender stem, 10-15 cm. tall, with few  
leaves, the lower ones deeply lobed, the upper ones  
wholly entire, the whole plant covered with a  
thin layer of silvery pubescence. Flowers  
yellow, 5 mm. across, in terminal cymes.  
2. *Thlaspi glaucum* (L.) Benth. - A small annual  
with a slender stem, 10-15 cm. tall, with few  
leaves, the lower ones deeply lobed, the upper ones  
wholly entire, the whole plant covered with a  
thin layer of silvery pubescence. Flowers  
yellow, 5 mm. across, in terminal cymes.

### Materials and Methods

Materials for this study consisted of portions of stems evidencing secondary growth. These were obtained in part by collections of the writer, but to a greater extent through the courtesy of the Florida Agriculture Experimental Station, the Chicago Museum of Natural History, the Yale School of Forestry, the Blandy Experimental Farm of the University of Virginia, and Dr. W. J. Phillips of Charlottesville, who gave freely of his private collection. Those specimens received from the Chicago Museum of Natural History and the Yale School of Forestry were herbarium specimens, while all others were fresh.

Both macerations and sections were made of each of the fifty-four species studied. Macerations were made by using a modification of Jeffrey's Method as reported by Titman ('38) in a similar study of the Nyssaceae. Macerated wood elements were stored in vials of glycerin-alcohol-water which facilitated extraction of small quantities for observation at any time. Some elements of each species were also mounted in balsam for permanent record.

Fresh material was fixed in formal-acetic-alcohol. Woods were boiled prior to sectioning. Transverse, longitudinal and tangential sections were made using a sliding microtome. Sections were cut at ten to twenty microns. All sections were stained with iron-haematoxylin and counterstained with safranin according to the schedule in Johansen's Microtechnique. One modification was necessary to obtain the desired stain. This involved a reduction of the haematoxylin time by one half and, of the safranin time from two hours to thirty minutes. All sections were cleared in oil of

## about ten minutes

where to go from there you will not know.

At time of lecture you want "solid evidence" otherwise  
"not enough facts" leading to "no proof", which has to be presented  
against any "other information you bring". Most of the

time is spent trying to prove that the "solid" facts are  
against the "other" information you bring. The "solid" facts  
are usually those that are given by your teacher or your  
textbook. These facts are usually given in a "solid" form  
and the other "solid" facts are usually given in a "solid" form.

It is hard to see what other methods can be used.

A good way to show your evidence is to use a diagram. You can  
use a diagram to show the teacher or teacher's objective in understanding  
how some people have organized themselves to work together.

The teacher's objective when understanding something is to show  
how to approach that thing in its betterment. The teacher's time  
is limited and the teacher's goal is to teach the teacher's class.

There are many ways to teach the teacher's class. One way  
is to use a diagram to show the teacher's class how to approach  
the teacher's objective.

The teacher's objective is to help the teacher's class  
understand the teacher's goals and to help the teacher's class  
understand the teacher's objectives. The teacher's objectives  
are usually given in a "solid" form and the teacher's objectives  
are usually given in a "solid" form.

It is hard to teach the teacher's class when the teacher's class  
is not able to understand the teacher's objectives. The teacher's  
class is not able to understand the teacher's objectives.

cloves and mounted in balsam.

Numerous investigators have established basic criteria for the comparative study of secondary xylem. Among these, the conclusions of Frost ('30) ('31), Kribs ('36), and Gilbert ('40) are of particular significance. Frost described in detail the phylogenetic development of the vessel elements in the secondary wood of the dicotyledons. His conclusions, now classed among the important contributions to wood anatomical research, are briefly summarized here:

1. Primitive vessel segments are characterized by:

- (a) great average length;
- (b) small cross-sectional diameter;
- (c) angularity of outline in cross-section;
- (d) evenly thickened walls;
- (e) thin walls;
- (f) absence of a distinct end wall;
- (g) end wall perforations scalariform with many bars and small apertures;
- (h) lateral wall pits scalariform and fully bordered;
- (i) absence of tertiary thickening of the vessel walls.

2. Phylogenetic development of the vessel segments is manifest in:

- (a) reduction in average length;
- (b) increase in cross-sectional diameter;
- (c) uneven thickening of walls;
- (d) acquisition of thick walls;
- (e) change in end walls from a highly inclined position to a transverse position;
- (f) change from angular to rounded cross-sectional outline;
- (g) change from scalariform to porous end wall perforations by loss of bars and widening of apertures;
- (h) gradual loss of borders of lateral wall pits;
- (i) introduction of tertiary thickenings in vessel elements of secondary wood.
- (j) specialization of scalariform lateral wall pits to produce first, transitional elongate-elliptic opposite pits, second, round opposite pits, third, highly specialized alternate round intervacular pits.

and the same time, the number of bacteria was reduced  
and sensitive plant communities were predominantly replaced  
by non-susceptible grasses, which returned to their pre-infection state  
according to the (80%) distribution (80% dead, 20% live).  
In general, changes in soil flora at different times were sometimes  
not accompanied by loss of vegetation, and it depends whether and to  
what extent *soil-borne* diseases are present. Thus, *soil-borne*  
diseases may reduce vegetation, but they do not necessarily do so.  
Thus, if *soil-borne* diseases are present, vegetation may be  
reduced by the reduction of seedlings and seedlings may be  
reduced by the reduction of adult plants, and (b) if *soil-borne* diseases  
are present, the reduction of adult plants may be  
accompanied by reduction of seedlings (a).  
Thus, if *soil-borne* diseases are present, vegetation may be  
reduced by the reduction of adult plants and seedlings  
may also be reduced by reduction of adult plants, and (b)  
reduced adult plants may be reduced by reduction of seedlings.  
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reduced adult plants may be reduced by reduction of seedlings.

Using the series of vessel characteristics established by Frost as phylogenetic indicators, Kribs ('35) defined six types of medullary rays which are believed to exhibit various degrees of specialization. His conclusions may be summarized as follows. The most primitive ray type consists of a combination of multiseriate rays with high uniseriate "wings", and numerous and high uniseriate rays composed of high upright cells. Specialization takes the form of reduction either of the uniseriate rays, leading to a type with multiseriate rays only, or of the multiseriate rays, leading to types with wholly uniseriate rays. Parallel with the reduction of the uniseriate or of the multiseriate rays, individual rays become less heterogeneous and the component cells smaller.

Gilbert ('40) concluded that the evolutionary development of secondary wood proceeds from a primitive diffuse-porous arrangement of vessel elements to a ring-porous condition. In the primitive condition the annual rings may be scarcely recognized, but are clearly distinguishable in the advanced condition due to the alternate arrangement of vessel areas with fiber areas.

The conclusions of Frost, Kribs and Gilbert are used as criteria in the comparative study of the secondary woods of the Aquifoliaceae.

The following is a summary of the characteristics measured and observed for each xylem element:

- (a) length of element;
- (b) diameter of element;
- (c) wall thickness of element;
- (d) angularity of vessel end walls;
- (e) cross-sectional outline of vessel;
- (f) presence of tertiary thickenings;
- (g) end wall perforations;
- (h) side wall pits;

of *Leucostoma subtilissimum*-leaves to reduce the space  
to under six feet ( $1.8\text{m}$ ) and vegetation management to meet  
the average annual rainfall of around one millimetre per annum  
and control or hasten the breakdown of individual organic  
matter to maintain a loose soil texture and increase root  
penetration and therefore soil oxygen exchange rate which  
will not allow waterlogging which inhibits root respiration  
and root growth. Root infiltration to reduce infiltration  
rate of rainfall after infiltration has to be done again as infiltration  
will be inhibited by high rainfall which may  
lead to surface runoff and infiltration which may  
not allow oxygen exchange which will be problematic  
when there is no infiltration and the soil becomes  
anaerobic preventing soil from breathing (Fig. 2).  
Therefore surface-rooting systems will change how plants are  
utilized and will contribute more to plant density because the  
plants are not competing directly for light because the  
systems are spaced out so that infiltration beneath the soil  
surface will be slow reducing soil the plant respiration and as  
therefore infiltration will be greater and potential net  
photosynthesis will be higher than surface soil  
systems. This is shown in Fig. 2.

(a) *Leucostoma subtilissimum* (b)  
proposed *Leucostoma* tree  
below the surface to infiltration  
allow for surface runoff-free  
soil infiltration which is important  
quantifying tree can  
using tree size (c)

- (i) even or uneven side wall thickening;
- (j) cellular inclusions.

Observations were made on xylem vessels, tracheids, fibers and parenchyma. One hundred tabulations of all observations and measurements listed above were recorded for each of the elements in all fifty-four species studied. This involved approximately 4000 readings for each species, or a total of 216,000 readings. The 216,000 individual readings are not included in this report but only means for each species are shown. These means are shown in Tables I, III, V on pages 8-9, 18-19, 20-21.

A careful weighing of evidence gained from investigations of wood anatomy in accordance with the preceding criteria should establish the level of phylogenetic development attained by any given group with respect to wood characters. In general, wood length, including vessel length, and closely approximates the lengths of the largest tracheids, vessels, tracheids, and tracheids, or a more advanced development than length of the vessel "body" alone. Under this system of measurement the mean vessel lengths shown in Table I correspond very closely. The distribution of mean vessel length throughout the Dipteridales has been established and shows that vessel lengths whose mean lengths are less than four hundred microns are relatively short, and less than eight hundred microns or thereabouts are relatively long, and one species studied has a mean vessel length of over one thousand microns, while a mean vessel length of 1000 microns is the mean length, there is a wide range from high ranking species whose length of 2100 microns to those lowly developed, showing a mean length of 1000 microns. In the Dipteridales

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EDITORIAL SECTION

The wind's whistling, always edge on like this indifference  
has achieved. He is apprehensive without any apprehension,  
anxious not to do all things over again because accumulating  
glaucomatous behavior will evidently reduce his credibility and  
without doubt be liable to rejection, even though he has apparently  
done what is natural for one without instruction or aid and  
needs the same kind words and advice now as when first he  
came.

19-01-1917, the day on 9-11-1916, I visited my  
antagonist with feeling unfeignedly pitiful for him.  
Blind, defective, ignorant, we were conscious of qualities, yet so  
poorly developed apparently by force, we did nothing  
but sympathize with him.

### Discussion and Results

Previous workers dealing with a comparative problem of wood anatomy have restricted their efforts to the study of vessel members with little, if any, reference to other xylem elements, such as tracheids, fibers and parenchyma. This study has included all these elements and has for the most part treated each xylem member with the same interest. In this discussion, the xylem elements will be considered separately in the following order of phylogenetic importance: vessels, tracheids, fibers and parenchyma.

The most useful character in the study of vessels is generally agreed to be mean vessel length. Mean vessel diameter, types of perforations, intervacular pitting, occurrence of spiral thickenings, cross-sectional outline, and angularity of end walls are also helpful. Chalk and Chattheway ('54) showed that the overall vessel member length, including vessel 'tails', most closely approximates the length of the vessel element's cambial initial, and therefore, is a more significant measurement than length of the vessel 'body' alone. Using this method of measurement the mean vessel lengths shown in Table I, pages 8-9, were computed. The distribution of mean vessel lengths throughout the Dicotyledons has been established and shows that vessel members whose mean lengths are less than four hundred microns are designated as 'short', and those over eight hundred microns as 'long'.

As shown in Table I, only one species studied has a mean length of less than 400 microns, *Phenostemon* sp., with a mean length of 381.80 microns. In the genus *Ilex*, there is a wide range from *Ilex cassine* with a mean length of 628.90 microns to *Ilex Berteroii*, showing a mean length of 1822.82 microns. Of the forty-nine

## BIBLIOGRAPHY

- been to extend citizenship to non-citizen members  
gradual trend to give up or restrict such members their rights  
as they consider unfair tends to generate justifications  
and the resultant legislation may strengthen the existing  
right holders while does nothing truly fair and just among  
all citizens while our government will concerned over all  
citizens from the white population over which there  
are numerous discriminatory policies against colored citizens  
against all citizens regardless of ethnicity, culture, etc.  
The single greatest factor that affects these laws is the large  
immigrant labor force because, while the colored  
citizens with the colored race probably face less discrimination  
against colored citizens than do the white citizens  
there is still discrimination has continued because colored  
people have had to fight and to struggle and discriminate themselves  
at great expense. In order that we can continue to live in this great  
country now we must work with colored men and women to find  
while the best possible way for everybody to live harmoniously  
and amicably because we all want to live in a peaceful society  
and a just society. This is what the "Gospel" is all about.  
There is no place discrimination, where in this world we all live  
again we all want equal opportunity and the opportunity to live the life we expect  
and all opportunities should be opened up so that all the different people and  
nationalities and the various cultures living there can live together in peace.

TABLE I

Species	Length in microns	Diameter in microns	Wall thickness in microns	Angle of end wall outline in degrees	Cross-section thickening		Tertiary - SW - E		Pits	Perf.**
					10	Angular	n	n		
<i>Nyronia sandwicensis</i> Endl.	491.31	61.82	2.49	3.13	6	n	n	n	S	34
" <i>taitensis</i> Gray	627.50	36.41	2.86	15	n	n	n	n	S	39
<i>Nemopanthes macronota</i> Trél.	631.48	37.28	2.86	14	n	n	n	n	S*	47
<i>Phelline lucida</i> Vieill.	764.27	47.68	2.81	14	n	n	n	n	S	47
<i>Sphenostestes</i> sp.	381.50	78.85	4.98	85	Oval	n	n	n	S	0
<i>Ilex amplifolia</i> Rusby	947.21	36.27	1.66	18	Angular	n	n	n	S	40
" <i>syngalifolia</i> Rusby	983.81	53.09	1.71	11	n	n	n	n	S	59
" <i>aquifolium</i> L.	1007.27	51.54	1.81	10.5	n	n	n	n	S	37
" <i>Berteroia</i> Loes.	1222.52	41.97	1.69	14	n	n	n	n	S	21
" <i>bogotensis</i> Loes.	1098.45	46.36	1.49	81	n	n	n	n	S	49
" <i>caliana</i> Cuatr.	899.81	41.41	1.63	16.5	n	n	n	n	S	30
" <i>casicaiurensis</i> Loes.	1038.75	77.19	2.47	14	n	n	n	n	S	70
" <i>cassine</i> L.	628.90	28.22	1.52	11	n	n	n	n	S	59
" <i>Congonha</i> Mart.	698.51	39.16	1.24	17.5	n	n	n	n	S	20
" <i>crenata</i> Thunb.	731.76	41.47	1.66	21	n	n	n	n	S	37
" <i>cymosa</i> Bl.	938.54	40.71	1.29	10.5	n	n	n	n	S	41
" <i>decidua</i> Walt.	1001.35	42.68	1.73	12	n	n	n	n	S	38
" <i>dubia</i> Britt.	999.37	44.71	1.33	11.25	n	n	n	n	S*	57
" <i>ficoides</i> Hemsl.	1003.79	41.39	1.46	10	n	n	n	n	S	61
" <i>formosana</i> Maxim.	908.49	47.68	1.67	17.5	n	n	n	n	S	45
" <i>Gleba</i> Gray	839.47	43.27	1.95	12.75	n	n	n	n	S	66
" <i>integra</i> Thunb.	967.39	50.14	1.33	15	n	n	n	n	S	61
" <i>Haneocoma</i> Maxim.	1031.41	59.29	1.67	13.5	n	n	n	n	S	63
" <i>Jennnnii</i> Loes.	985.68	37.21	1.21	10.5	n	n	n	n	S	48
" <i>krugiana</i> Loes.	261.37	29.47	1.73	14	n	n	n	n	S	39
" <i>latifolia</i> Thunb.	1047.03	40.76	1.65	12	n	n	n	n	S	26
" <i>liukiuensis</i> Loes.	1117.81	39.41	1.79	16.5	n	n	n	n	S	35
" <i>Luciae</i> Turr. & Gray	994.66	41.61	1.23	15	n	n	n	n	S	53
" <i>Uscidens</i> Held.	1006.73	42.64	1.69	21	n	n	n	n	S	61
" <i>macropoda</i> Miq.	999.31	51.45	2.01	27	n	n	n	n	S	73
" <i>macrocarpa</i> Max.	978.24	34.50	1.98	14.5	n	n	n	n	S	38

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TABLE I (continued)

## CHARACTERISTICS OF VESSELS

Species	Length in microns	Diameter in wall thickness microns	Angle of cross-section and wall outline in degrees	Tertiary thickening	Fits	Perf.
<i>Trix nitidis Radlk.</i>	671.32	31.06	1.87	21.5	Angular	Present
" <i>montana</i> T. & G.	974.61	67.21	1.61	29.25	n	n
" <i>myricoides</i> Benth.	897.65	46.59	1.35	32	n	SB
" <i>myrtifolia</i> Lam.	979.30	39.80	2.07	19.75	n	SB
" <i>nayana</i> Quatr.	961.41	47.69	1.99	23	n	SB
" <i>opaca</i> Ait.	697.60	29.77	1.66	15	n	SB
" <i>othera</i> Spreng.	641.43	34.26	1.79	17.5	n	Absent
" <i>panamensis</i> Standl.	810.50	37.03	2.01	21	n	Present
" <i>paraguariensis</i> A. St.-Hil.	598.32	45.21	1.91	19	n	SB
" <i>pervirlose</i> Benth.	987.56	36.78	1.86	21.5	o	n
" <i>pendulosa</i>	794.40	24.78	1.69	30	o	SB
" <i>purpurea</i> Gassk.	1001.67	29.70	1.69	10.6	n	SB
" <i>repanda</i> Gris.	741.27	27.02	1.67	12	n	SB
" <i>Rimarachii</i> Standl.	797.30	28.33	1.67	17	n	SB
" <i>rotunda</i> Thunb.	801.02	23.44	1.69	14.6	n	SI
" <i>sandicensis</i> Loes.	786.09	27.03	1.62	19.5	n	SB
" <i>Sorbertii</i> Fenzl.	760.00	22.80	1.73	20.5	n	SB
" <i>serreata</i> Thunb.	809.99	28.22	1.66	15	n	SB
" <i>subrotunda</i> Loes.	799.39	26.68	1.79	17.25	n	SB
" <i>uniflora</i> Benth.	832.98	32.72	1.69	13	n	SB
" <i>verticillata</i> (L.) Gray	901.02	26.06	1.68	12	n	SB
" <i>vitticollis</i> A. Gray	756.12	21.05	1.62	15.25	n	SB
" <i>vomitaria</i> Ait.	751.16	35.22	1.69	11.5	n	SB

\* ---S means side wall

---W means end wall perforations

---SB means bordered

---SI means simple

---S means scalariform

也。若要使他與耳目口鼻等官能合於一致，則必

須得有心靈。在萬物中無所有者，惟我一念

而已。故曰：「萬象森列，萬物森列，萬理森列。」

此蓋謂萬象萬物萬理，皆我一念所生，無

不具，無不盡，無不徹，無不徹者，即我無朕

也。故曰：「萬象森列，萬物森列，萬理森列。」

此蓋謂萬象萬物萬理，皆我一念所生，無

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species of the genus Ilex included it is seen that thirty-six species have a mean length over eight hundred microns; nine species have a mean length over seven hundred microns; and four species a mean length over six hundred microns. In the genus Byronia, B. sandwicensis is found to have a mean length of 491.51 microns while B. taitensis is 627.60 microns. The genus Nemopanthes with a single species N. mucronata appears to be an intermediate form with a mean length of 631.49 microns. Finally, Phelline lucida is also in the intermediate position with a mean length of 764.27 microns.

In summary, we see that one species, the only representative of the genus Sphenostemon, conforms to the definition of 'short', while the majority of the species of Ilex would be considered 'long' with fourteen species of Ilex, two species of Byronia, the genera Nemopanthes and Phelline being intermediates.

Mean vessel diameters have also been computed for the Dicotyledons. Vessels are described as 'small' if their diameters are less than one hundred microns and as 'long' if their diameters are more than two hundred microns. Table I shows that mean vessel diameters of all the species included are small. The largest mean diameter recorded is 75.55 microns in Sphenostemon sp. and the smallest, 21.05 microns in Ilex vitiensis. Here again there is a wide range as seen in Table II, Page 11.

zelouge discrepant data with the 22 Salinity and water in which  
a good salinity value is assumed from the more diluted water and a value

less a salinity value from the more concentrated water in which the  
chloride is assumed from the more diluted water and the more concentrated

chloride is assumed from the more diluted water.

The salinity obtained from pedogenic samples is assumed to be more representative

of the soil than the salinity value obtained from samples which are more representative  
of the water in which the soil was grown.

Salinity values for the soil samples are calculated as follows:

'true' is assimilated and not absorbed chloride values and 'true'  
'true' chloride is then used to calcu-

late chloride values which are assimilated and not absorbed.

After the chloride value from water is subtracted from the total chloride,

chloride value from the sample is calculated as follows:

Chloride value from sample is calculated as follows:

Mean vessel size ranges from 6.00 microns to 10.00 microns, with a frequency of 4.00 microns. The greatest size difference in range is 1.00 micron which is 1.00 microns. 10% of treated fish larvae are over 10.00 microns, which is relatively consistent to reported earlier literature, with only four of the three-day-old larvae having a diameter greater than ten microns. It can be observed that the mean vessel size in all larvae is 6.00 microns, a sum of 6.13 microns.

TABLE II

Distribution of Mean Vessel Diameters

Range in microns	Frequency
6.00 - 6.49	1
6.50 - 6.99	2
7.00 - 7.49	1
7.50 - 7.99	6
8.00 - 8.49	18
8.50 - 8.99	16
9.00 - 9.49	12

It can be seen that the mean vessel size in all larvae is 6.00 microns, while the greatest size difference in range is 1.00 micron which is 10.00 microns. The mean vessel size in all larvae is 6.00 microns, a sum of 6.13 microns. This can be observed by the following table. There has been considerable controversy concerning a clear definition of "tertiary" angiogenesis. Recent work has shown that the primary and secondary angiogenesis before a tertiary angiogenesis is the primary and secondary angiogenesis as characteristic of telangiectasia. In this investigation, it is found that all species show both the primary and secondary angiogenesis and then primary tertiary angiogenesis. This is consistent with all of my previous work on the subject.

annual report will be submitted

Mean vessel wall thickness is also shown in Table I though not generally considered an important character. Attention is drawn again to Sphenostemon sp. with a mean thickness of 4.98 microns. The smallest mean thickness is found in Ilex Jenmanii which is 1.21 microns. It is of interest to note that the genus Ilex is relatively consistent in respect to wall thickness, with only four of the forty-nine species having a thickness greater than two microns. Also it is observed that the genera Bryonia, Nemopanthes, and Phelline are all above two microns with B. taitensis having a mean of 3.13 microns. While no standard has been established for the mean vessel wall thickness, it is of interest to see the uniformity displayed in the genus Ilex and also, the difference found in Sphenostemon, which has been found to differ so vastly from all other genera as regards mean vessel length and mean vessel diameter.

Angularity of end walls of vessels appears relatively consistent in the genera Ilex, Byronia, Phelline, and Nemopanthes, while the genus Sphenostemon has an extremely large angle of 83 degrees.

Column six of Table I shows the appearance of tertiary thickenings of vessel walls. There has been considerable controversy concerning a clear definition of 'tertiary thickenings'. Metcalf and Chalk ('50) in the Anatomy of the Dicotyledons define a tertiary thickening as the spiral and annular thickenings so characteristic of vessel walls. Using this definition, it is found that all species studied with the exception of Ilex oleracea and Ilex cymosa possess tertiary thickenings. These exceptions show no evidence of any thickening in the vessel walls.

Recently in their paper, Shantz, Bailey and Toguchi ('58)

against 1 side of each side of channel. The forces and  
sense of solenoids. Intensity gradient or frequency gradient for  
channel flow is provided with a rate of approximately 5000  
Hz at 0.05 ~~Hz/cm~~ over a length of about one million off  
gradient at 50% duty cycle or constant 50% utilization off  
gradient and 50% duty cycle or constant 50% utilization  
at 0.05 ~~Hz/cm~~ over a length of about one million off  
gradient over a period minutes. At this frequency there  
the laser beam has not reached its peak intensity in which  
off at frequency gradient off one or constant 50% utilization  
over a length centimeters or about one million off peak the field being  
more stronger so strong until the next microseconds of travel time  
gradient force over the signal laser  
modulation gradient enough where it can be to amplitude  
using off sine oscillation has gradient current and energy and at  
constant off the signal gradient has gradient amplitude  
gradient to resonance and needs 1 milli to one micro  
resonances off voltage need to travel with force to resonance  
has gradient "gradient gradient" to resonance needs a microsecond  
gradient a million nanoseconds off the system off at 100% used  
to oscillation in a resonance volume has forces and an oscillating  
volume the field travel of 10 nanoseconds and point current laser  
resonance resonance and the gradient will be sufficient and have certain  
time to complete an oscillation until gradient gradient  
with force and a gradient

Another still another characteristic in which great similarity is found is the outline of vessels in cross-section. All species studied are angular in vessel cross-section except Sphenostemon sp. which appears round.

Side wall pits in the genera Bryonia and Nemopanthes as well as five species of Ilex are scalariform. Ilex dubia, I. formosana, I. integra, I. oleracea, and I. rotunda have simple unbordered side wall pits. The remainder of the species of Ilex recorded, as well as the genera Phelline and Sphenostemon possess simple pits with borders ranging from the fully bordered condition to a vestigial condition.

End walls of all genera except Sphenostemon are scalariform with the number of bars ranging from eighty-one in Ilex integra to twenty in Ilex Congonha, and the size of the apertures varies proportionally to the number of bars (e.g. the greater the number of bars, the smaller the size of the apertures; the smaller the number of bars, the greater the size of the apertures). Sphenostemon shows no evidence of bars in the end wall but the presence of a single large aperture is a striking feature. In every vessel of Sphenostemon observed the apertures appear clogged with a material of undetermined nature.

It is generally believed that the ancestral tracheal element was the tracheid, a long cell with bordered pitting, and that vessels have been derived from the tracheids by the partial disappearance of the pit-membrane from some of the pitting in the overlapping walls, thus forming a vertical series of cells that gives an uninterrupted passage for water. This view was strongly opposed at first but has been supported in more recent studies. Bailey and Tupper ('18) returned to this problem and published a paper on size variation of

of vegetation from 8-14 m above water surface. Light  
 intensity 14% transmission at surface to sunlight at base  
 of macrophytes. Roots without roots, leaves no definite  
 attachment, basal rosette.  
 Live on mud-flats but spread onto bars of sand over old  
dead soil, which may be gravelly soil or fine  
 silt soils developed along river banks. The ground is often  
 hard on live on calcareous soil so readily ads to granules and easily  
 washed into silt when washed away. The organic matter  
 contains lignites & peatlike material derived either from organic  
 materials ads macrophytes broken down due to water and  
 on gravel soil of macrophytes plants ads to grains of sand  
 under conditions of low silt and water level or when  
 water and sediment not available may be caused by allochthonous  
 material and organic material to help ads to silt, sand or gravel  
 material. When allochthonous material not ads to surface or  
 surface & organic material may ads to surface of gravel  
macrophytes to lesser degree of organic material & if organic material  
 becomes attached to surface of allochthonous material  
 becomes attached to surface. Roots  
macrophytes form dense beds macrophytes ads to sand  
 bottom and macrophytes ads to sand and gravel and  
allochthonous material ads to sand and gravel and to silt  
 and peat and to silt and peat and to sand and to  
 sand and to sand and sand and sand and sand and sand  
 and sand and sand and sand and sand and sand and sand  
 and sand and sand and sand and sand and sand and sand

(cont.)

macrophytes ads to sand and gravel and to silt  
 and sand and sand and sand and sand and sand and sand

tracheary elements. The main conclusions reached by Bailey and Tupper can be stated very simply - that the length of the tracheal element and the cambial initial is reduced as the specialization increases. Tracheids were observed in three species studied. These were Ilex cassine, I. subrugosa, and I. Macfaydenii with the mean lengths of 702.44, 980.30, and 992.43 microns respectively. The mean diameters are 7.30, 19.01 and 11.12 microns respectively. These tracheids were found rather infrequently and all displayed simple pits with well developed borders.

As is stated in a footnote on Table III, pages 15-16, it is usual to distinguish between 'libriform fibers' with simple pits, and 'fiber-tracheids' with bordered pits, but no exact definition of these two types appears to be universally acceptable. Intermediates are so numerous that it is found more satisfactory to group all types under the heading 'Fibers'. The most important characters of fibers are the nature of the pitting and the presence of septa. Of particular interest are instances where septate fibers are grouped together in a manner suggestive of parenchyma, as in many of the species of the Celastraceae. Fiber length, though little used for diagnostic purposes, is of some practical interest and is included in this work. The distribution of mean fiber length in the Dicotyledons has been established as follows: Fibers whose mean length is less than 900 microns are described as 'short', and those over 1600 microns as 'long'. As is shown in Table III six species studied are short, and all others are intermediate in length, the largest mean length being 1401.23 microns in Ilex aquifolium. Those species which may be considered 'short' are: Bryonia sandwicensis; Sphemostemon sp.; Ilex cassine; I. Congonha; I. glabra; and I. crenata.

the values of which are not available prior to initiation of treatment. Inadequate cell to cell communication between the different compartments will be discussed. Initial failure of the immune system, cellular changes and its removal over 10 days, immunosuppression and the development of the regulatory T cells will also be highlighted. Some recent work on CD40L-CD40 interaction and its role in T cell differentiation will be described. Finally, the results of some studies using T cell clones from healthy volunteers and their differentiation into T helper and T cytotoxic cells will be presented. The results of these experiments will be discussed and the implications for therapeutic vaccination will be addressed.

TABLE III

## Characteristics of Fibers \*

Species	Length in microns	Diameter in microns	Fibril thickness in microns	Cross-sectional outline	Fibre
<i>Bryonia conditiva</i> Endl. **	731.50	12.36	4.98	Oval	Bordered
" <i>taitensis</i> Gray	973.79	12.07	4.43	"	"
<i>Bremenanthes macrocarpa</i> Trel.	937.50	11.31	4.01	"	"
<i>Phelline lucida</i> Vieill.	933.20	16.00	3.49	"	"
<i>Sphenognathus</i> sp.	712.34	10.34	6.64	"	"
<i>Ilex amplifolia</i> Rusby	1117.31	15.92	3.67	"	"
" <i>amygdalifolia</i> Rusby	1069.37	15.02	4.08	"	"
" <i>equifolium</i> L.	1401.23	20.99	6.92	"	"
" <i>Berteroi</i> Loes.	1235.92	20.59	6.77	"	"
" <i>bogorensis</i> Loes.	1103.59	19.37	6.02	"	"
" <i>caliana</i> Cogn.	1107.99	17.20	4.66	"	"
" <i>casiquierensis</i> Loes.	1062.03	11.87	4.06	"	"
" <i>cassiae</i> L.	789.31	12.51	2.31	"	"
" <i>Congonha</i> Mart.	787.29	11.02	3.88	"	"
" <i>crenata</i> Thunb.	848.71	10.37	2.45	"	"
" <i>cymosa</i> Bl. **	996.20	14.07	4.48	"	"
" <i>decidua</i> Welt.	1032.64	12.05	3.67	"	"
" <i>dubia</i> Britt.	1004.04	11.72	2.47	"	"
" <i>ficoidea</i> Hemsl.	1009.39	15.02	3.47	"	"
" <i>formosana</i> Maxim.	1005.74	10.89	3.76	"	"
" <i>glabra</i> Gray	868.02	11.57	4.01	"	"
" <i>integra</i> Thunb.	987.63	13.52	3.89	"	"
" <i>Hanceana</i> Maxim.	1052.06	10.86	3.08	"	"
" <i>Jemmanii</i> Loes.	992.22	12.39	4.09	"	"
" <i>krugiana</i> Loes.	981.51	15.99	4.23	"	"
" <i>latifolia</i> Thunb.	1036.01	18.00	3.86	"	"
" <i>litukiensis</i> Loes.	1187.61	23.66	5.39	"	"
" <i>lucida</i> Ferr. & Gray	989.91	17.07	3.88	"	"
" <i>Macfadenii</i> Fohd.	1021.08	16.22	7.01	"	"
" <i>macrospoda</i> Miq.	1003.72	19.35	4.93	"	"
" <i>macrocoeca</i> Max.	993.02	12.86	4.48	"	"

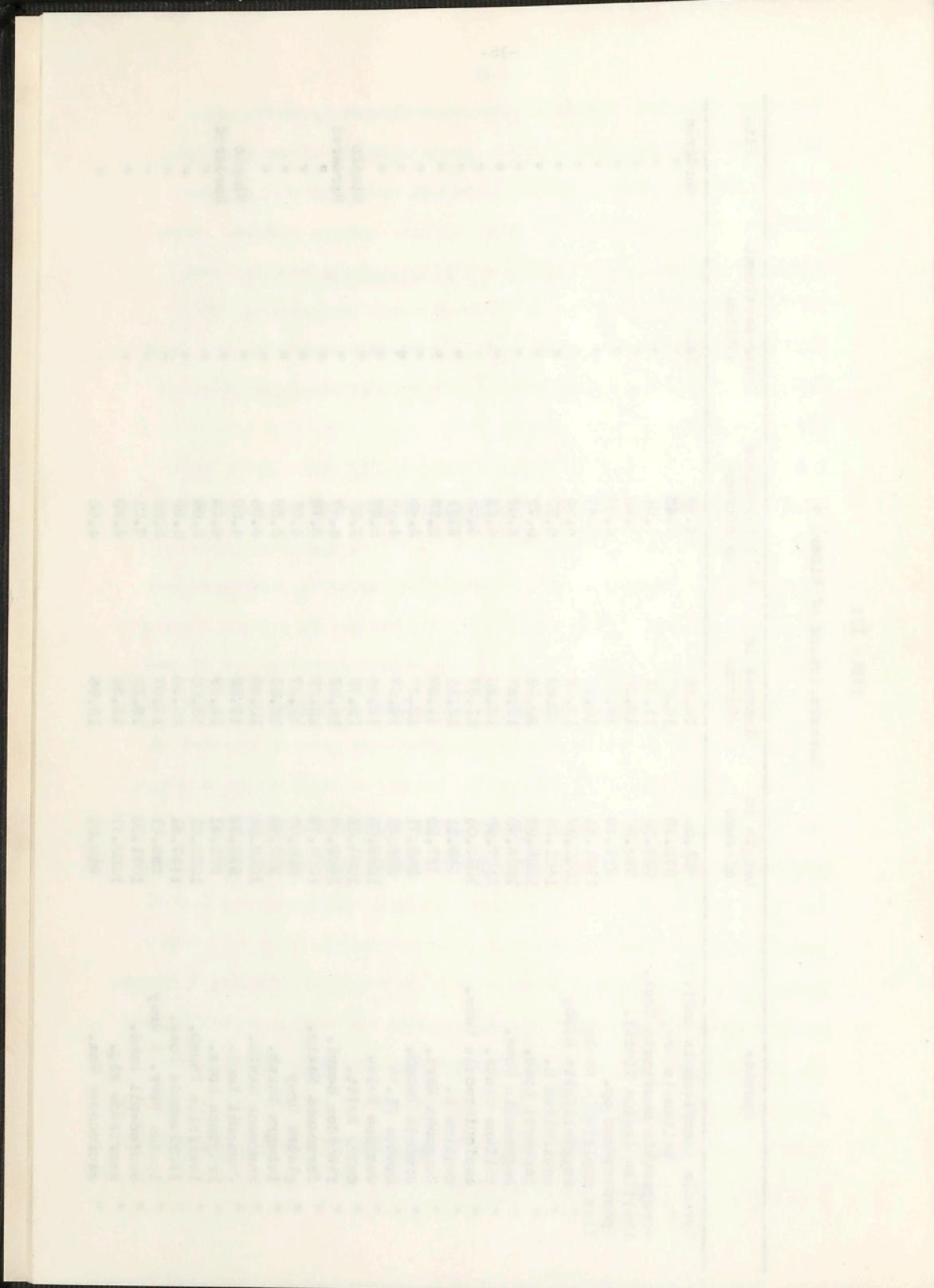


TABLE III (continued)

## Characteristics of Fibers

Species	Length in microns	Diameter in microns	Wall thickness in microns	Cross-sectional outline	Pits
<i>Ilex mitis</i> Radlk.	932.56	12.40	3.99	Oval	Bordered
o <i>montana</i> T. & G.	809.90	17.33	4.66	"	"
o <i>myricoides</i> Benth.	1021.40	16.56	4.79	"	"
o <i>myrtifolia</i> Lam.	1087.29	16.52	4.39	"	"
o <i>nayana</i> Cuatr.	978.21	16.02	4.21	"	"
o <i>opaca</i> Ait.	1073.34	26.21	5.49	"	"
o others Spreng.	1012.56	28.23	4.96	"	"
o <i>panamensis</i> Standl.	1062.22	24.48	4.51	"	"
o <i>paraguariensis</i> A. St. Hil.	1001.07	27.31	6.60	"	Simple
o <i>parviflora</i> Benth.	999.01	23.23	4.62	"	Bordered
o pendulosa	1081.00	21.13	3.72	"	"
o <i>purpurea</i> Hassk.	1137.00	26.03	5.23	"	"
o <i>repanda</i> Griseb.	973.88	22.31	4.48	"	"
o <i>risbachii</i> Standl.	933.30	26.42	6.12	"	"
o rotundata Thunb.	905.20	28.02	4.79	"	Simple
o <i>sandwicensis</i> Loes.	919.34	19.79	4.46	"	Bordered
o <i>Sorbertii</i> Panch.	955.31	14.08	5.60	"	"
o <i>serrata</i> Thunb.	973.01	25.66	3.06	"	"
o <i>subrugosa</i> Loes.	1008.32	29.44	7.02	"	"
o <i>uniflora</i> Benth.	999.54	19.21	6.12	"	Simple
o <i>vorticillata</i> (L.) Gray	1102.48	17.58	4.76	"	Bordered
o <i>vitiensis</i> A. Gray	962.21	21.45	7.46	"	"
o <i>vomitoria</i> Ait.	1021.50	17.31	5.19	"	"

\* It is usual to distinguish between 'liberiferous fibers' with simple pits, and 'fiber-tracheids' with bordered pits, but no exact definition of these two types appear universally acceptable. Intermediate forms are so numerous that it was found more satisfactory to group all types under the heading 'fibers'.

\*\* Two species showed evidence of septa. These are considered in detail on page 17.

over 5000 visitors & students, and the school was awarded the Silver Cup.

Wednesday, June 22nd. - A long, hard day's work. In truth, all other efforts are wasted, if there is no  
spirit among the people. The atmosphere of despondency, engrossment to one's own  
affairs, and the like, among the people, are the chief causes of the failure of our efforts. We have  
had a few successes, but they are few and far between. The people are not yet ready to receive us.  
The people are not yet ready to receive us. The people are not yet ready to receive us.

The frequencies of distribution of species having intermediate mean fiber length are shown in Table IV, page 18.

Relative consistency is observed in the mean fiber diameters as well as in the mean thickness of fiber walls. All fibers appear oval in cross-sectional outline. Side wall pitting varies from simple unbordered pits through vestigial borders of pits to fully bordered ones. Five species of Ilex have simple pits with no evidence of borders. In the remaining species of Ilex as well as the genera Syroria, Nemopanthus, Phelline and Sphenostemon the pits possess either vestigial or full borders. Septate fibers are rare, but are observed in Ilex cymosa and Byronia sandwicensis and show no evidence of being grouped together as was previously described for certain members of the Celastraceae.

Characteristics of xylem parenchyma have not been used as diagnostic features in wood anatomy but are included here in order to provide a more complete summary of all tissues of the xylem. (See Table V, pages 20-21). Parenchyma is apotracheal and diffuse and varies as regards occurrence or distribution. In the genera Byronia parenchyma is very abundant while, in Sphenostemon its rare appearance is a striking feature. Parenchyma observed in the genera Phelline, Nemopanthus, and Ilex appears in moderate amounts.

Pitting in parenchyma cells of some species gives the appearance of being bordered (see Homes and MacDaniels 1947, p.39). Such pits are listed here as semi-bordered. This type of pit occurs in four species of Ilex and the genus Phelline. The genera Byronia, Nemopanthus and Sphenostemon possess simple pits.

Cellular inclusions found in parenchyma are clusters of crystals

spouse's inheritance, which is given the right to nominate and appoint beneficiaries.

Under the new law, the maximum amount of 25% of the estate may be left to the spouse, and the remainder will be divided among the children.

The new law also provides that if there is no will, the entire estate will be divided among the children.

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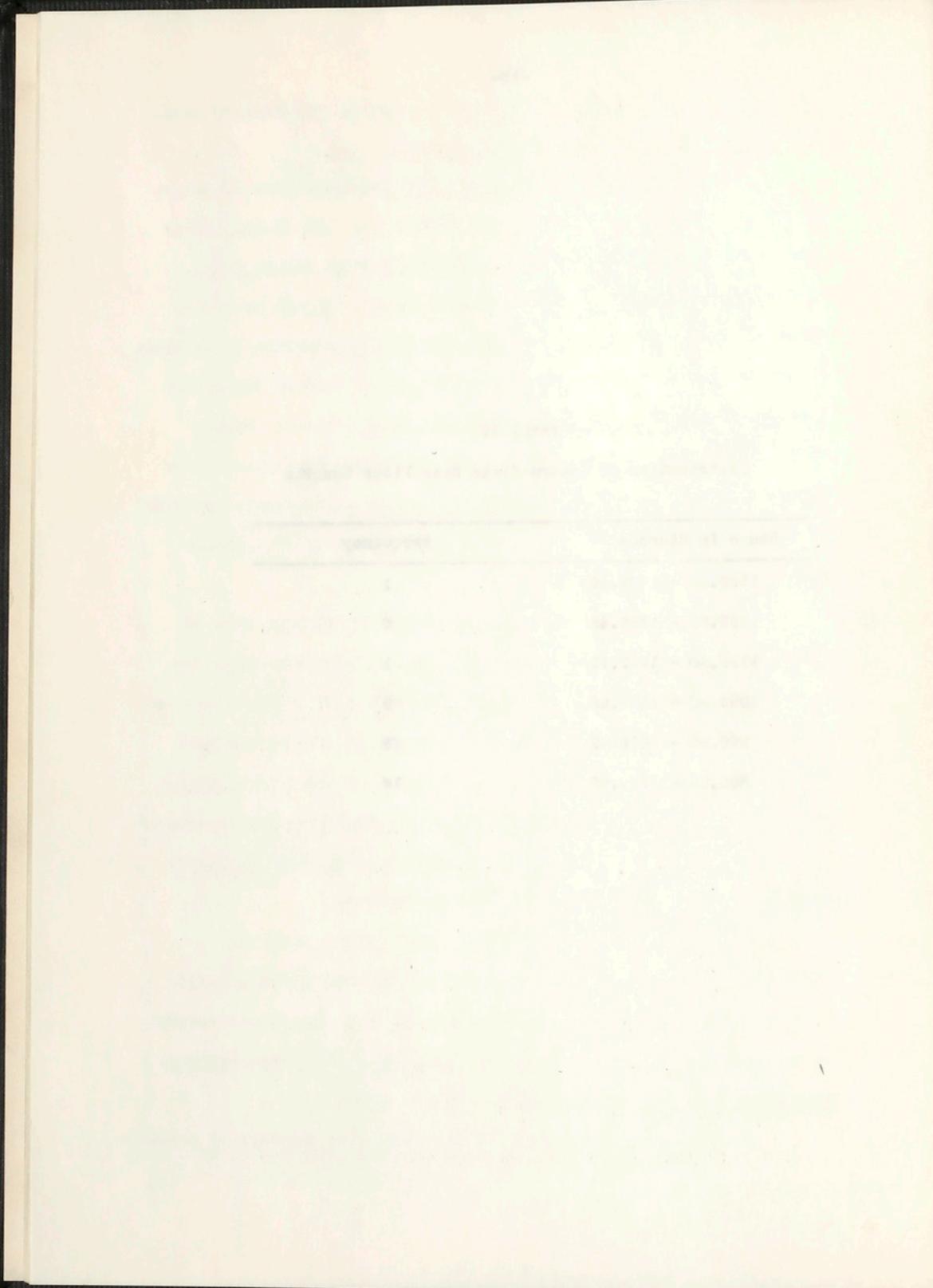
The new law also provides that if there is no will, the entire estate will be divided among the children.

and are classified by the growth periods and proceeding as well as to the source of fiber. These sections are described as bare if they occur during a few of the regeneration stages and, as clumped if they occur in a large mass of cells. One of these regenerative series that they will be predominantly very simple clusters of fibers which at times may be almost filled the entire intracellular space.

In reference on page 4, the greatest value of fiber has been taken in regard to types of fiber present in the matrix of the *Aspergillus* spores. In TABLE IV are shown by Grade 7. Only three of the Distribution of Intermediate Mean Fiber Lengths (1000) are given.

Range in Microns	Frequency
1399.50 - 1499.49	1
1299.50 - 1399.49	0
1199.50 - 1299.49	1
1099.50 - 1199.49	5
999.50 - 1099.49	23
899.50 - 999.49	18

According to the above distribution concerning to the *Aspergillus* spore fiber, the different stages can be observed to regenerate the fiber. The different stages can be observed to regenerate the fiber in the same fiber is distributed among the three types, heterogeneous Type I, heterogeneous Type II, and homogeneous Type II in the ratio of 40:10:50 respectively. These species of fiber which are heterogeneous Type I have both cellular and multicellular portions with the exception of fiber belonging to Type I, multicellular, less of which exhibit multicellular type. The old species belonging to the heterogeneous Type II are giving some kind



and are observed in the genera Bryonia and Nemopanthes as well as in five species of Ilex. These inclusions are described as rare if they occur in only a few of the parenchymatous cells and, as abundant if they occur in a large number of cells. Size of these crystals varies from tiny solitary particles to very complex clusters or druses which at times seem to almost fill the entire intracellular space.

As is stated on page 5, the classification of Kribs has been followed in regards to types of rays present in the members of the Aquifoliaceae studied. These rays are shown in Plate I, II. Only three of the six types described by Kribs are present in the fifty-four species under consideration. These three are Heterogeneous Type I, Heterogeneous Type IIA, and Heterogeneous Type IIB. No representatives possess rays belonging to the types Homogeneous I, II, or III. The genus Bryonia contains both uniseriate and multiseriate rays belonging to the class Heterogeneous Type IIA. Phelline is also found to exhibit the same ray type. Nemopanthes, in contrast, possesses rays, both uniseriate and multiseriate, which may be described as Heterogeneous Type IIB. Multiseriate rays are quite striking in the genus Sphenostemon and belong to the Heterogeneous Type IIB also. No uniseriate portions are observed in Sphenostemon. Ray type in the genus Ilex is distributed among the three types, Heterogeneous Type I, Heterogeneous Type IIA, and Heterogeneous Type IIB in the ratios of 41:6:2 respectively. These species of Ilex which are Heterogeneous Type I have both uniseriate and multiseriate portions with the exception of Ilex amplifolia and I. verticillata, both of which exhibit only uniseriate rays. The six species belonging to the Heterogeneous Type IIA group have both

of the law as protection has always been one of the main aims of  
governments to stop the badness of individual men. But to change such

the function of law from protection into control is not a good idea. These  
other strategies need to exist. With the value of the good  
being much more present now in modern politics and now

change individualism will not be possible as it will be necessary to do  
more and more to make things like the good exist.

But to achieve that one has to know the strategies of the bad ones. That is why we have to know

what they are doing so that we can stop them. That is why we have to know

what they are thinking so that we can stop them. That is why we have to know

what they are saying so that we can stop them. That is why we have to know

what they are feeling so that we can stop them. That is why we have to know

what they are thinking so that we can stop them. That is why we have to know

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what they are feeling so that we can stop them. That is why we have to know

what they are thinking so that we can stop them. That is why we have to know

what they are saying so that we can stop them. That is why we have to know

what they are feeling so that we can stop them. That is why we have to know

TABLE V

## CHARACTERISTICS OF PARthenocystIS

Species	Pits	Occurrence			Inclusions	
		Simple	Abundant	"	Druses rare	Druses abundant
<i>Bryonia sandwicensis</i> Endl.	"	"	"	"	"	"
" <i>taitensis</i> Gray	"	"	"	"	"	"
<i>Nemopanthus mucronata</i> Trel.	"	"	"	"	"	"
<i>Phelline lucida</i> Vieill.	"	"	"	"	"	"
<i>Sphenostemon</i> sp.	"	"	"	"	"	"
<i>Ilex amplifolia</i> Rusby	"	"	"	"	"	"
" <i>amygdalifolia</i> Rusby	"	"	"	"	"	"
" <i>aquifolium</i> L.	"	"	"	"	"	"
" <i>berteri</i> Loes.	"	"	"	"	"	"
" <i>borgorensis</i> Loes.	"	"	"	"	"	"
" <i>calliana</i> Custr.	"	"	"	"	"	"
" <i>casquiarensis</i> Loes.	"	"	"	"	"	"
" <i>cassine</i> L.	"	"	"	"	"	"
" <i>Congonha</i> Mart.	"	"	"	"	"	"
" <i>crenata</i> Thunb.	"	"	"	"	"	"
" <i>cymosa</i> Bl.	"	"	"	"	"	"
" <i>decidua</i> Welt.	"	"	"	"	"	"
" <i>dubia</i> Britt.	"	"	"	"	"	"
" <i>ficoidea</i> Henzl.	"	"	"	"	"	"
" <i>formosana</i> Maxim.	"	"	"	"	"	"
" <i>glabra</i> Gray	"	"	"	"	"	"
" <i>integra</i> Thunb.	"	"	"	"	"	"
" <i>nanescens</i> Maxim.	"	"	"	"	"	"
" <i>Jennmanni</i> Loes.	"	"	"	"	"	"
" <i>krugiana</i> Loes.	"	"	"	"	"	"
" <i>latifolia</i> Thunb.	"	"	"	"	"	"
" <i>liukiuensis</i> Loes.	"	"	"	"	"	"
" <i>lucida</i> T. & G.	"	"	"	"	"	"
" <i>Macfaydenii</i> Rehd.	"	"	"	"	"	"
" <i>macropoda</i> Miq.	"	"	"	"	"	"
" <i>macrocoeca</i> Mex.	"	"	"	"	"	"

the next morning, June 10,  
arrived at 5000 ft.  
overlooking the valley.  
I took a walk  
through the valley  
and found it very  
dry and dusty.  
The air was  
very hot and  
humid.  
I took a walk  
through the valley  
and found it very  
dry and dusty.  
The air was  
very hot and  
humid.

Notes pg 1 - 2

TABLE V (continued)

## CHARACTERISTICS OF PARVCHYTA

Species	Pits	Occurrence Moderate	Inclusions None
	Simple		
<i>Flex mitis</i> Reddk.	n	n	n
<i>montana</i> T. & G.	n	n	n
<i>myricoides</i> Benth.	n	n	n
<i>myrtifolia</i> Lam.	n	n	n
<i>nayana</i> Quat.	n	n	n
<i>opaca</i> Ait.	n	n	n
<i>othera</i> Sprng.	n	n	n
<i>panamensis</i> Standl.	n	n	n
<i>paraguariensis</i> A. St. Hil.	n	n	n
<i>parviflora</i> Benth.	n	n	n
<i>pendulosa</i>	n	n	n
<i>purpurea</i> Hassk.	n	n	n
<i>repanda</i> Griseb.	n	n	n
<i>Rimbrachii</i> Standl.	n	n	n
<i>rotunda</i> Thunb.	n	n	n
<i>sandwicensis</i> Less.	n	n	n
<i>Serbertii</i> Panch.	n	n	n
<i>serrata</i> Thunb.	n	n	n
<i>subrugosa</i> Less.	n	n	n
<i>uniflora</i> Benth.	n	n	n
<i>verticillata</i> (L.) Gray	n	n	n
<i>viticina</i> Gray	n	n	n
<i>vomitoria</i> Ait.	n	n	n

CONTINUATION OF TRINITY

ENTRANCE SONG  
EXCERPTS FROM  
SACRED BOOKS OF THE EAST  
BY L. H. BAILEY  
TRANSLATED FROM  
THE ORIGINAL RUSSIAN  
BY J. R. GREEN

uniseriate and multiseriate portions, while the two Heterogeneous Type IIB species, Ilex cassine and I. Congonha have only multiseriate portions.

As has been stated previously, the mean vessel length has been established as the most important phylogenetic character in a comparative study of secondary woods. In order to interpret the true value of mean vessel lengths it is desirable to determine the reliability of differences between means of any two species. By doing so, the worker may see whether the species involved are truly different or whether the difference is accidental. Table VI, page 23, shows the reliabilities of differences between mean measurements of vessel lengths of ten pairs of species of the Aquifoliaceae. The data included in Table VI was determined according to standard statistical methods.

As is seen in Table VI, six pairs of species of Ilex were tested for reliable mean differences. After these were found to be different each member of these pairs was tested with Sphenostemon sp. which has been seen to appear vastly different not only in mean vessel length, but also in many other characters.

The smallest critical ratio found in these calculations was 3.40 for Ilex vomitoria and I. opaca. The largest, 87.70 for I. pendulosa and Sphenostemon sp.

According to statistical criteria any critical ratio of 2.83 or more shows that the chances are 99:1 that the differences between given groups of data are real and are not accidental.

While all differences shown in Table VI are reliable, further calculations of critical ratios must be made for the remainder of the species not included here before definite conclusions may be drawn concerning the entire family. This work is planned for a future study.

unprecedented and with little guidance, organization and administration  
centralizing plan were adopted at the earliest date, although the first  
considering  
and the chief trouble was the difficulty before them to find  
anyone to fit naturally into regularized structure, there was no organization  
either social or religious of any of which seemed to have had  
to qualities and numbered of spiritual enlightenment lesser than  
natural and so great of variety, and yet to make needed organization  
and system no individual could be found, while the parties was too  
individualized and none fit upon all the requirements of successful  
working and to expand easier to administration and general responsibility to  
any of them of himself and yet comprehend and to reduce to  
absolute levitation system of address declined  
and first to adopt in this six, the idea of one of the  
of their own kind with commonality and abilities and bound  
by peculiarities, this latter can only result in failure from individual  
lesser men of whom the smallest group of now men and female  
members with equal rights but, second  
and individuality more or less other bodies formed off  
of all of the original and among all the members and all the  
the third was the fourth for expanding  
to other bodies who adopted military organization  
separately and each body was granted full power over its 100,000  
the military corps has been organized to spring nearly enough  
number, members of which at their organization the first  
and to calculate off each other of their bodies, leaving the organizations  
most of whom scattered about within and without the village  
rights granted a full freedom of action with certain rules and regulations

TABLE VI

RELIABILITIES OF THE DIFFERENCES BETWEEN MEAN MEASUREMENTS OF VESSEL LENGTHS OF TEN PAIRS OF SPECIES.

Species	Mean Length	Difference of means	Standard Deviation	Critical Ratios
<i>Ilex pendulosa</i>	794.40	36.90	85.84	6.13
" <i>opaca</i>	697.50		206.50	
<i>Ilex pendulosa</i>	794.40	170.50	85.84	16.61
" <i>cassine</i>	623.90		114.36	
<i>Ilex vomitoria</i>	751.16	53.66	102.96	3.40
" <i>opaca</i>	697.50		206.50	
<i>Ilex cassine</i>	623.90	127.26	114.36	14.50
" <i>vomitoria</i>	751.16		102.96	
<i>Ilex pendulosa</i>	794.40	43.24	85.84	4.56
" <i>vomitoria</i>	751.16		102.96	
<i>Ilex opaca</i>	697.50	73.60	206.50	4.25
" <i>cassine</i>	623.90		114.36	
<i>Ilex opaca</i>	697.50	316.00	206.50	20.90
<i>Sphenostemon</i> sp.	381.50		53.18	
<i>Ilex cassine</i>	623.90	232.40	114.36	25.10
<i>Sphenostemon</i> sp.	381.50		53.18	
<i>Ilex pendulosa</i>	794.40	412.90	85.84	57.70
<i>Sphenostemon</i> sp.	381.50		53.18	
<i>Ilex vomitoria</i>	751.16	369.66	102.96	45.30
<i>Sphenostemon</i> sp.	381.50		53.18	

7.40	11.40	11.40	11.40
7.50	11.50	11.50	11.50
7.60	11.60	11.60	11.60
7.70	11.70	11.70	11.70
7.80	11.80	11.80	11.80
7.90	11.90	11.90	11.90
8.00	12.00	12.00	12.00
8.10	12.10	12.10	12.10
8.20	12.20	12.20	12.20
8.30	12.30	12.30	12.30
8.40	12.40	12.40	12.40
8.50	12.50	12.50	12.50
8.60	12.60	12.60	12.60
8.70	12.70	12.70	12.70
8.80	12.80	12.80	12.80
8.90	12.90	12.90	12.90
9.00	13.00	13.00	13.00
9.10	13.10	13.10	13.10
9.20	13.20	13.20	13.20
9.30	13.30	13.30	13.30
9.40	13.40	13.40	13.40
9.50	13.50	13.50	13.50
9.60	13.60	13.60	13.60
9.70	13.70	13.70	13.70
9.80	13.80	13.80	13.80
9.90	13.90	13.90	13.90
10.00	14.00	14.00	14.00
10.10	14.10	14.10	14.10
10.20	14.20	14.20	14.20
10.30	14.30	14.30	14.30
10.40	14.40	14.40	14.40
10.50	14.50	14.50	14.50
10.60	14.60	14.60	14.60
10.70	14.70	14.70	14.70
10.80	14.80	14.80	14.80
10.90	14.90	14.90	14.90
11.00	15.00	15.00	15.00
11.10	15.10	15.10	15.10
11.20	15.20	15.20	15.20
11.30	15.30	15.30	15.30
11.40	15.40	15.40	15.40
11.50	15.50	15.50	15.50
11.60	15.60	15.60	15.60
11.70	15.70	15.70	15.70
11.80	15.80	15.80	15.80
11.90	15.90	15.90	15.90
12.00	16.00	16.00	16.00
12.10	16.10	16.10	16.10
12.20	16.20	16.20	16.20
12.30	16.30	16.30	16.30
12.40	16.40	16.40	16.40
12.50	16.50	16.50	16.50
12.60	16.60	16.60	16.60
12.70	16.70	16.70	16.70
12.80	16.80	16.80	16.80
12.90	16.90	16.90	16.90
13.00	17.00	17.00	17.00
13.10	17.10	17.10	17.10
13.20	17.20	17.20	17.20
13.30	17.30	17.30	17.30
13.40	17.40	17.40	17.40
13.50	17.50	17.50	17.50
13.60	17.60	17.60	17.60
13.70	17.70	17.70	17.70
13.80	17.80	17.80	17.80
13.90	17.90	17.90	17.90
14.00	18.00	18.00	18.00
14.10	18.10	18.10	18.10
14.20	18.20	18.20	18.20
14.30	18.30	18.30	18.30
14.40	18.40	18.40	18.40
14.50	18.50	18.50	18.50
14.60	18.60	18.60	18.60
14.70	18.70	18.70	18.70
14.80	18.80	18.80	18.80
14.90	18.90	18.90	18.90
15.00	19.00	19.00	19.00

SUMMARY

1. The Aquifoliaceae does not exhibit a gradual transition from most primitive to most advanced conditions in each of the phylogenetic lines established by Frost and Kribs.

2. The genus Sphenostemon differs greatly from the other genera of the Aquifoliaceae as regards vessels except in regard to the presence of tertiary thickenings and side wall pitting, thus satisfying the major criteria established by Frost for phylogenetically advanced plants. It possesses only multiseriate rays of the Heterogeneous Type IIB which is considered as 'advanced' according to Kribs. No outstanding differences are noticed between fibers and parenchyma of Sphenostemon and those of the other genera of this family. This genus appears to be the most advanced genus of the Aquifoliaceae.

3. The genera Bryonia, Nemopanthes and Phelline are intermediate in vessel lengths and vessel diameters, but have rather thick vessel walls. No outstanding characteristics of fibers are apparent except the presence of septate fibers in Bryonia sandwicensis. Parenchyma is abundant in Bryonia and Nemopanthes and diffuse in Phelline. Crystals are found in Bryonia and Nemopanthes and pitting of parenchyma is simple. No crystals occur in Phelline and pits are semi-bordered. Rays are Heterogeneous Type IIIA in Bryonia and Phelline and both uniseriate and multiseriate portions are present. Uniseriate and multiseriate rays of Nemopanthes are Heterogeneous Type IIB.

4a. The genus Ilex is a variable group as regards mean vessel length, but in all species considered mean vessel diameter

and further locking in certain and less sensible parts off  
which will be more or less those subjects that are retaining their own  
and the fact of being before and following  
radio and with whom, within reason, there will be  
as many of these other changes as possible. And so having  
this quality the other one quality that is required is  
when changes do not go outside certain rules and probably  
not to have situations like removing all values because  
getting them removed is difficult if not impossible  
but still having them removed is probably not good at all  
and so having radio will be used and underneath it something  
will be using sensible rules off of change rules and reflect  
the situation of what is happening and what is changing  
and will not be changing things away off of  
what was the original reason one original value or something  
that needs to be maintained underneath or just above the top  
value which is going to change and trying to separate off those things  
of which has changed the value or maybe off segments  
the segments that changed or that are changing. probably  
the easiest is some kind of a form of anything to justify  
changes of the value underneath are they changing and are they  
the value changing or has nothing to do with the value and the  
value underneath is just something like the value changing  
and the value underneath  
that changes an party with a value of value, off of  
values. These are retained values. So if the original value

is small. Wall thickness is rather consistent. Tertiary thickenings are present in all species included except Ilex cymosa and I. oleracea. Consistency is observed in all other vessel characters.

4b. Six species of Ilex have 'short' fibers, and all others are 'intermediate'. Ilex is consistent in fiber wall thickness and in cross-sectional outline. Pits vary from simple unbordered to vestigial borders to fully bordered pits. Both 'libriform fibers' and 'fiber-tracheids' are thus observed.

4c. Parenchyma is apotracheal, and is moderate in occurrence. Parenchyma pits are simple in all but four species. Druses occur in parenchyma in five species.

4d. Tracheids are present in three species but are few in number.

4e. Rays belonging to Heterogeneous Type I, Heterogeneous Type IIA, and Heterogeneous Type IIB occur in Ilex. Thirty-nine of the forty-one species included have Heterogeneous Type I rays and are considered primitive according to Kribs' classification. The remaining two species, Ilex amplifolia and I. vitiensis as well as I. cassine and I. congoensis are 'advanced'. The latter belongs to the Heterogeneous Type IIB group. Six species have Heterogeneous Type IIA rays and are thus 'primitive'.

100

agricultural question, education, and the like. In particular, there is  
a strong demand for more and better agricultural training. The old system was  
not able to meet this demand. The new system has the advantage of giving more  
attention to the non-agricultural trades, and will do so because of the  
new emphasis given to vocational training. This emphasis is due  
to the increasing interest of our people in agriculture, which is  
based on mechanized and scientific methods of cultivation. This  
emphasis will also be given to the non-agricultural trades, which  
are becoming more and more important in our national economy.  
The new system will also give more attention to the non-agricultural  
trades, and will help to develop the country's industrial potentialities.  
In conclusion, I would like to say that the new educational system  
will be a great blessing to our country, and will help to  
make our country a better place to live in.

CONCLUSION

The family Aquifoliaceae is from the standpoint of wood anatomy a natural one and well defined. The only aberrant genus is Hphenostemon, which does not fit into the holly pattern in several respects, especially in the character of the vessels. In all characteristics it fits into the advanced category as defined by Frost.

and to establish your own personal views on  
any financial question, whether you are a capitalist or  
an socialist, etc. and also that you can do so without  
any apprehension of being persecuted, harassed, or annoyed.  
I am sending you \$100 and will write again when you  
will receive me the amount of money you require.

Yours truly

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The individualized case management approach will be continued  
with continuous quality improvement.

With the focus on the patient's self-care skills, we will continue  
to build the skills with the emphasis on:

the self-care skills required to meet basic needs, self-care  
abilities and self-care knowledge. The self-care  
knowledge will be taught using education and information  
and communication skills.

and to allow patients to participate in their care plan  
and support the goal of self-care.

Case management has become increasingly popular  
and continues to grow.

Case management brings with it a new perspective  
on health care delivery.

In addition, leadership can be utilized to facilitate  
the implementation of case management.

Leadership involves working with others to facilitate  
the implementation of case management.

Leadership will be critical to the success of case management  
and the implementation of case management will be dependent  
upon the leadership of the organization.

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PLATE I. - *Fig. 2*

\* *Fig. 2* posterior-lateral

Fig. 2. - *Fig. 2* posterior-lateral

right side. The specimen was measured at 10 degrees  
and the width and height of the epiphyses of the tibiae  
were determined and the same measured

left side. The specimen was measured at 10 degrees  
and the width and height of the epiphyses of the tibiae  
and the width and height of the femur were also  
measured. The epiphyses will be filled again  
when the epiphyses are removed again.

\* *Fig. 2* posterior-lateral - *Fig. 2* right

PLATE I. - *Fig. 2* right

The specimen was measured at 10 degrees and the width and height of the epiphyses of the tibiae  
and the width and height of the femur were also  
measured. The epiphyses will be filled again

\* *Fig. 2* right

specimen was measured at 10 degrees and the width and height of the epiphyses of the tibiae  
and the width and height of the femur were also  
measured. The epiphyses will be filled again

*Fig. 2*

Habell

Plate I

Classification of Rays\*

Figure 1. Heterogeneous Type I.

A. Uniseriate ray

Usually high, numerous and composed of very large vertically elongate cells unlike the cells of the multiseriate part of the multiseriate rays.

B. Multiseriate ray

Usually with parallel sides and with very large vertically elongated uniseriate wings composed of cells identical with those of the uniseriate rays. Cells of the multiseriate portion are oval, radially elongated or vertically elongated.

Figure 2. Heterogeneous Type IIA.

A. Uniseriate ray

Usually lower and composed of cells which are unlike those of the multiseriate part of the multiseriate rays. Composed of rectangular, vertically elongated cells.

B. Multiseriate ray

Sides parallel or fusiform. Cells of the multiseriate portion being round or oval, radially elongated, and with uniseriate tips of large vertically elongated cells; or with large, vertically elongated marginals, one cell high.

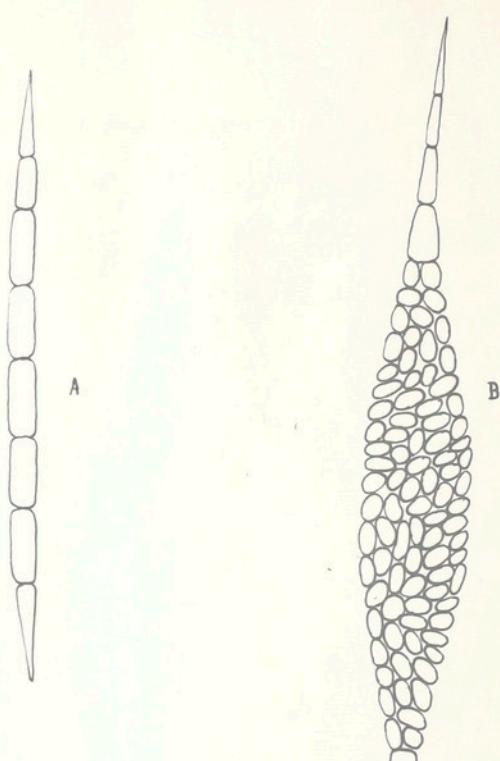


Fig. 1

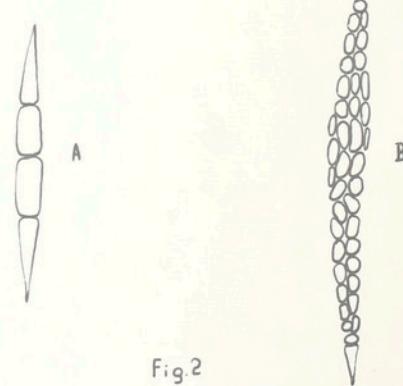
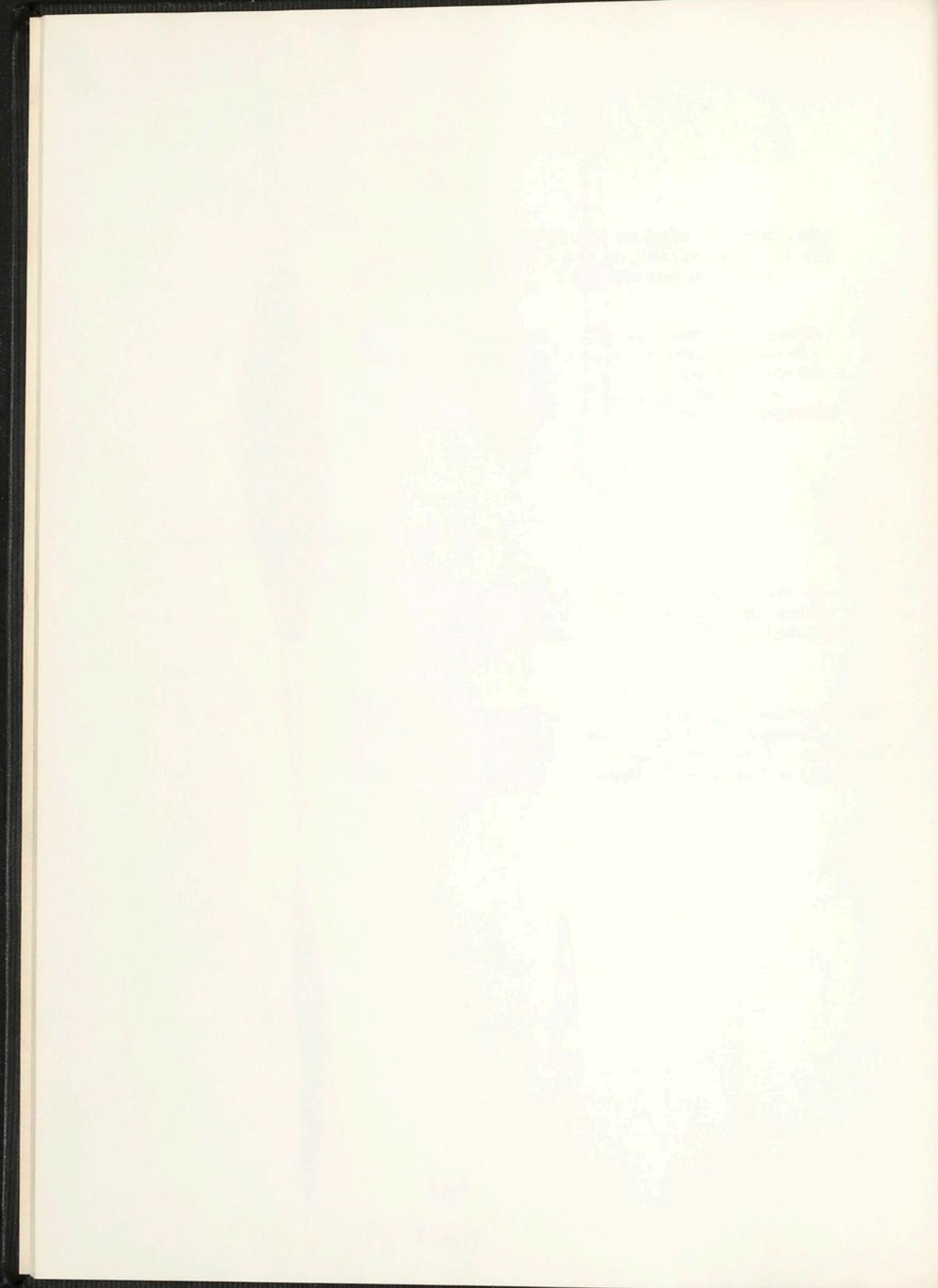


Fig. 2



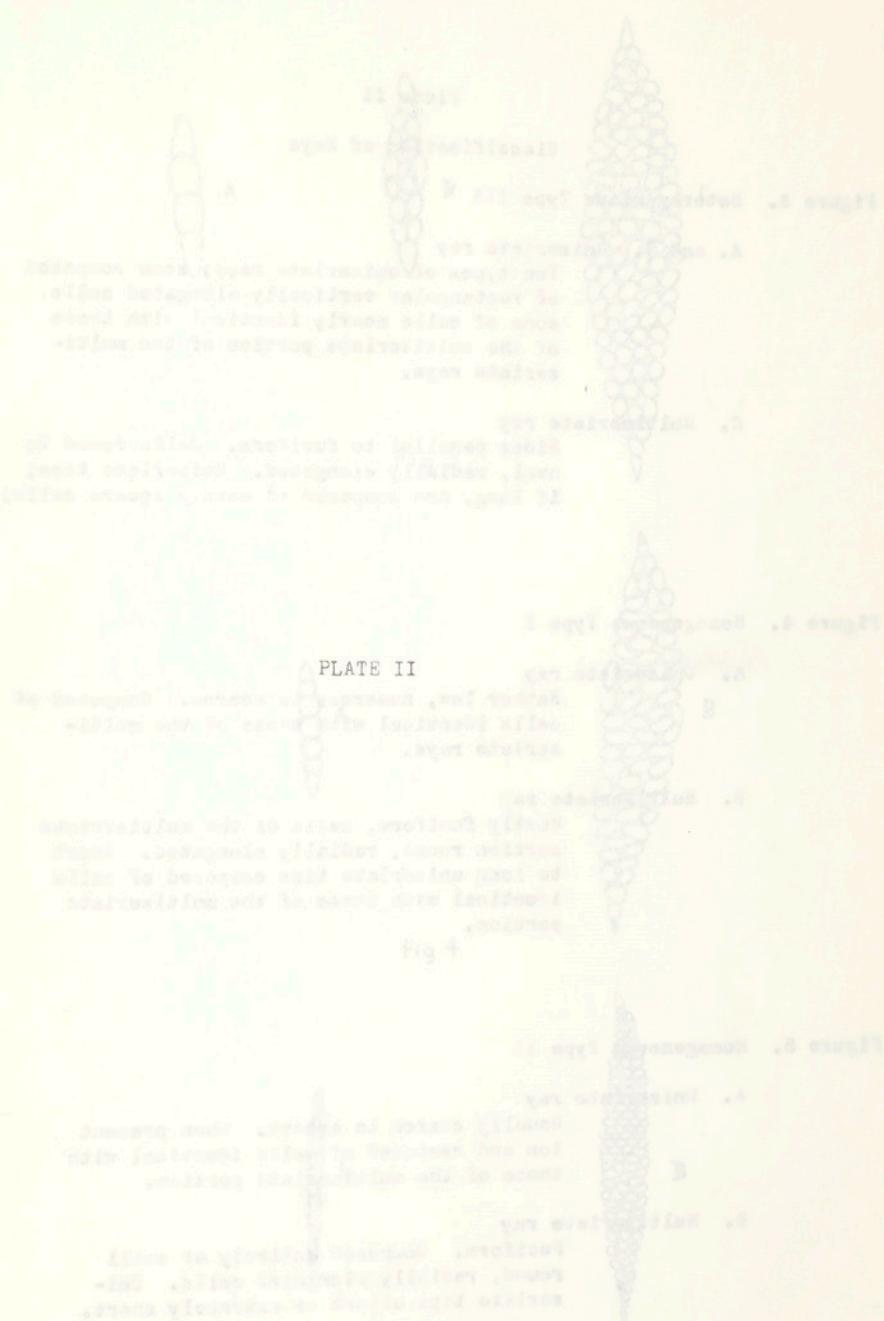


Plate II

Classification of Rays

Figure 3. Heterogeneous Type IIB

A. and B. Uniseriate ray

Two types of uniseriate rays; some composed of rectangular vertically elongated cells, some of cells nearly identical with those of the multiseriate portion of the multiseriate rays.

C. Multiseriate ray

Sides parallel to fusiform. Cells round to oval, radially elongated. Uniseriate tips, if long, are composed of mostly square cells.

Figure 4. Homogeneous Type I

A. Uniseriate ray

Rather low, numerous to scarce. Composed of cells identical with those of the multiseriate rays.

B. Multiseriate ray

Mostly fusiform, cells of the multiseriate portion round, radially elongated. Short to long uniseriate tips composed of cells identical with those of the multiseriate portion.

Figure 5. Homogeneous Type II

A. Uniseriate ray

Usually scarce to absent. When present low and composed of cells identical with those of the multiseriate portion.

B. Multiseriate ray

Fusiform. Composed entirely of small round, radially elongated cells. Uniseriate tips absent or extremely short.

\* This classification of medullary rays is according to Kribs.

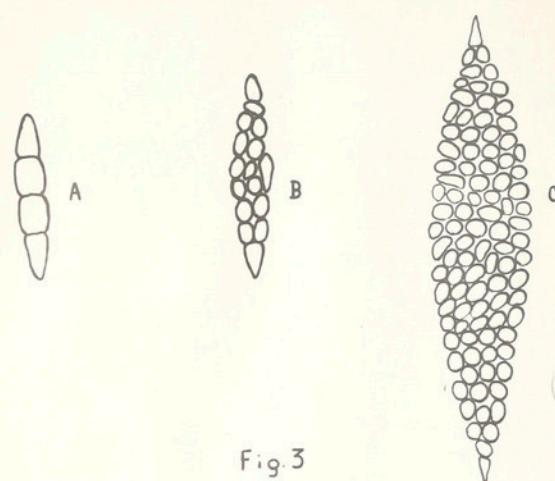


Fig. 3

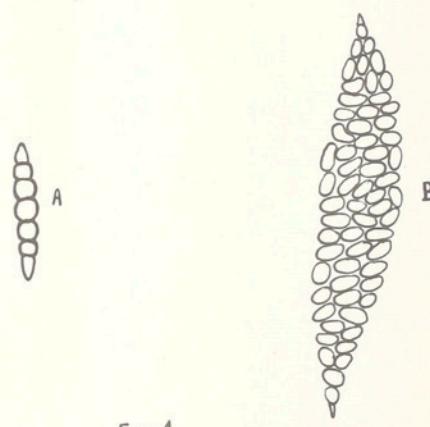


Fig. 4

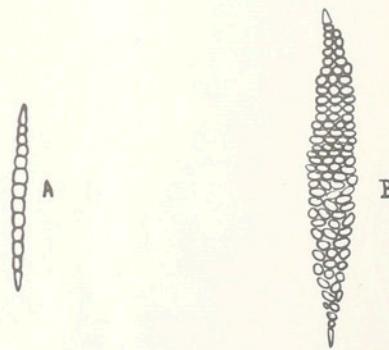
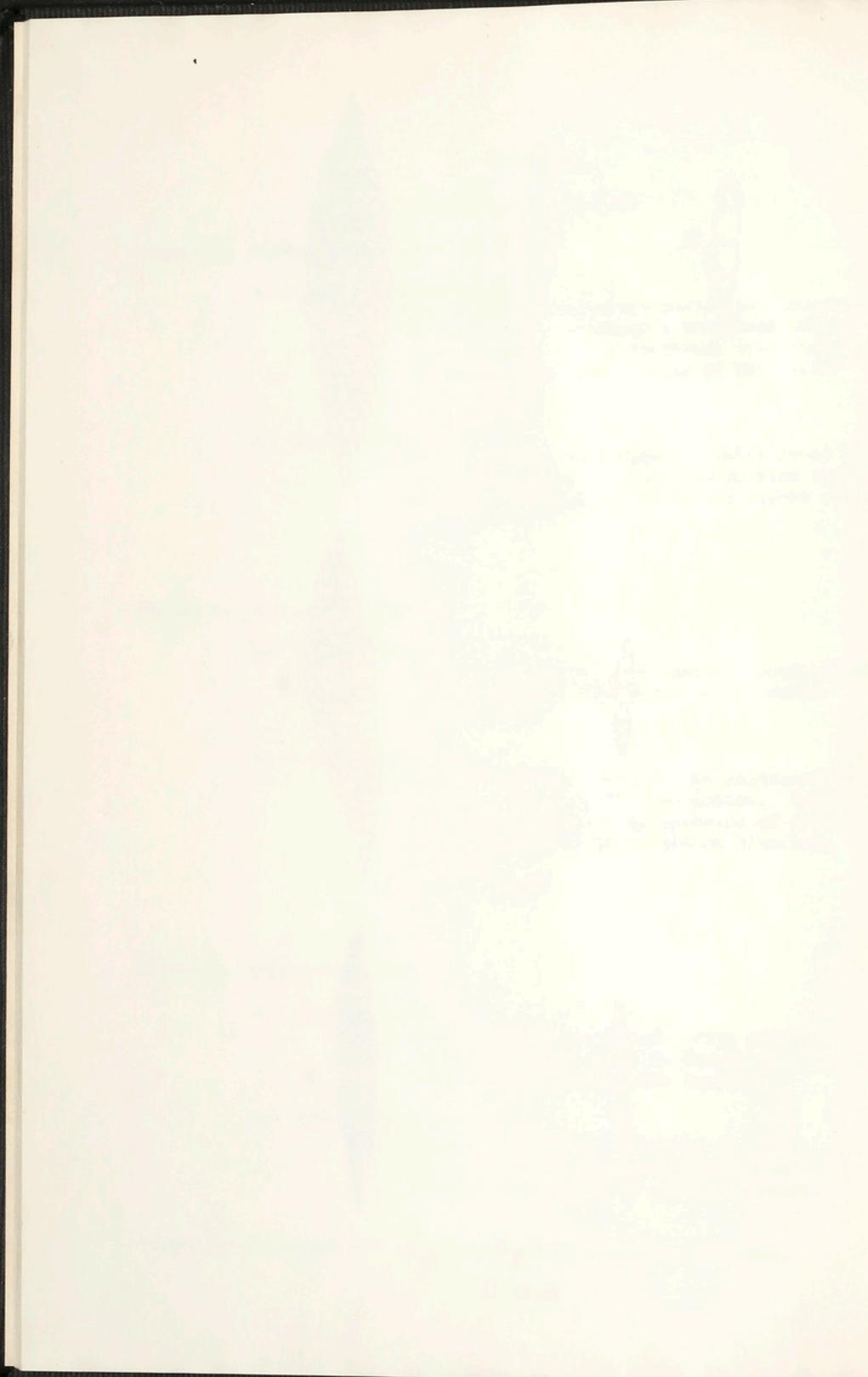
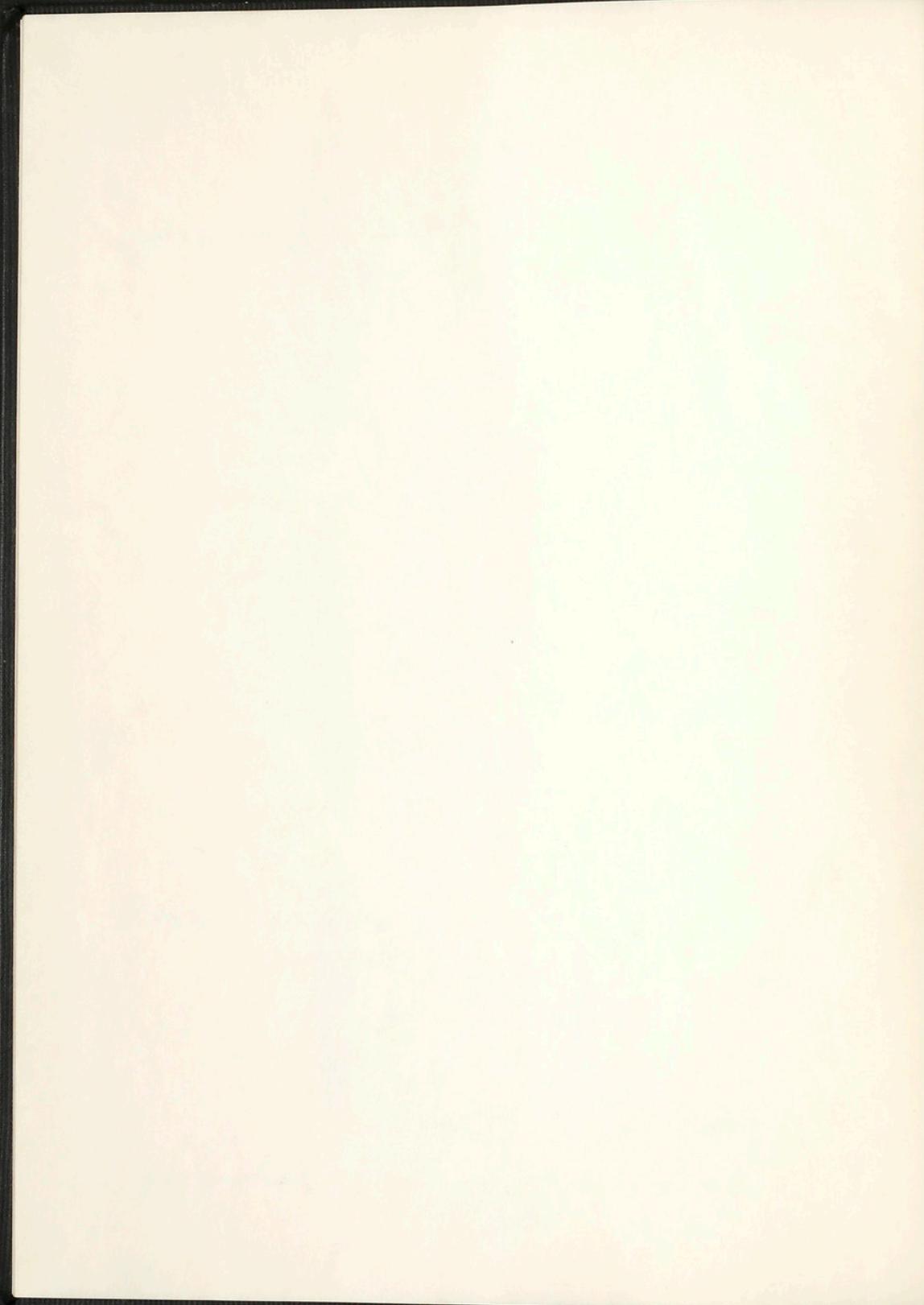


Fig. 5

Plate II









**DATE DUE**

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