

FIELD MUSEUM OF NATURAL HISTORY

MUSEUM TECHNIQUE SERIES

No. 1

HERBARIUM ORGANIZATION

BY

CHARLES F. MILLSPAUGH

Late Curator, Department of Botany



B. E. DAHLGREN

Acting Curator, Department of Botany

EDITOR

CHICAGO, U. S. A.

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HERBARIUM ORGANIZATION

BY C. F. MILLSPAUGH

The organization and maintenance of the herbarium of the Field Museum of Natural History has been under my personal supervision since its incipiency. The system employed in this herbarium, which now contains over a half million sheets, embraces useful practices not common in other herbaria in America or Europe. It has been built up on the premise that each specimen should tell its *whole* story for all time and not be dependent upon the memory of those who form the staff under whose necessarily temporary care it falls.

ACCESSIONS

Immediately upon the receipt of a collection of plants in the herbarium, the recording clerk assigns to the package, or to each package, the next consecutive "accession number" and fills in all the items of which he has information at the time on an *accession blank* (represented in a condensed form in fig. 1) which is filed in the department. For the archives of the Museum, for filing in the Recorder's office together with the correspondence, receipts and other matter pertaining to the acquisition of each accession, an *accession card*, such as shown in fig. 2, is used by all departments of the Museum. The recording clerk then attaches to the packages a *routine ticket* (fig. 3) and stores the packages away to await their turn in mounting.

The mounting preparator selects all the packages of a given accession number and passes the specimens through the poisoning, laying-out, gluing and strapping processes. At the conclusion of each process he enters the date on the routine ticket, appending his initials thereto, and eventually the ticket is turned over to the recording clerk for entry on the department accession blank. Information is thus always at hand to check the work done by each preparator.

When the plants of an accession are mounted, they are passed over to the recording clerk who arranges the sheets in the order of the collector's numbers. (Should the accession be a mixed one, the sheets are first arranged according to collectors and localities under each collector.)

Anno..... Accession No.....

Field Museum of Natural History
DEPARTMENT OF BOTANY

COLLECTION FROM

.....
.....
.....

Acquired by

Received by..... Date.....

Coll. by.....

Coll. at..... Date.....

Poisoned by..... Date.....

Laid out and labeled by..... Date.....

Mounted by..... Date.....

Entered by..... Vol..... Page.....

Catalogue Nos..... to.....

Accession filed.....

Stored..... Case.....

Distributed by..... Date.....

Herbarium specimens
Economic “
Dry Fruits
Fruits in Formalin

Dupl. for Distribution *Total specimens installed*.....

Collector	Locality	Date	Spec.

Fig. 1, Accession Blank (x $\frac{2}{3}$) front and back

Accession Card **B** No.....
Date..... 191.....
Field Museum of Natural History
Chicago

GIFT, EXCHANGE, PURCHASE, COLLATED,
FROM MUSEUM EXPEDITION.

Credit to

Address

Received from

By

Collected by

Date Collected

Locality

Description of Objects:

.....

Total Number of Specimens Cataloged.....

Catalog Numbers

Duplicates for Distribution

Notes.....

Signed

Curator

Fig. 2 (x ½)

<hr/> ACCESSION	
LABEL	DETERMINE
DISTRIBUTE	
ARRANGE	ENTER
PERF.	STAMP
MOUNT	STRAP
POISON	LAY OUT

Fig. 3, Routine Ticket (x 2)

The recording clerk then enters the sheets in sequence in the current *Herbarium Catalogue*, stamping each sheet with its catalogue number over the herbarium stamp. (Every herbarium should mark its sheets by impressing them with a characteristic ownership stamp.)

THE CATALOGUE

The catalogue volumes are uniform, first class "bookkeeper's ledgers," firmly and flexibly bound. They are "title-backed" with consecutive volume numbers. The page lines are consecutively numbered beginning with 1, in volume 1, and continuing to infinity. Each volume used in this institution contains 625 pages of 40 lines

NAME <i>Wright, Charles</i>						
LOCALITY	DATES	FIRST VOL.	ENTRY PAGE	LAST VOL.	ENTRY PAGE	TOTAL SPECIMENS
<i>Bonin Isls. (Japan)</i>	<i>1855-56</i>	<i>31</i>	<i>112</i>			<i>1</i>
<i>Shima</i>	<i>1853-56</i>	<i>51</i>	<i>477</i>			<i>2</i>
<i>Colorado</i>		<i>51</i>	<i>477</i>			<i>1</i>
<i>Cuba</i>	<i>1851-67</i>	<i>4</i>	<i>166</i>	<i>59</i>	<i>202</i>	<i>527</i>
<i>Kamtchatka</i>	<i>1855-56</i>	<i>51</i>	<i>479</i>			<i>1</i>
<i>Mexico</i>		<i>40</i>	<i>46</i>			<i>9</i>
<i>New Mexico</i>	<i>1851-53</i>	<i>2</i>	<i>108</i>	<i>59</i>	<i>202</i>	<i>281</i>
<i>Nicaragua</i>		<i>40</i>	<i>47</i>	<i>55</i>	<i>47</i>	<i>4</i>

Fig. 4, Specimen Card from the *Index of Collectors*

each and therefore accommodates 25,000 specimens. Every plant placed in the organized herbarium is catalogued even if it is the only one ever received from a given collector.

When the cataloguing of the plants of an accession is completed, the recording clerk fills the remaining blanks on the accession form, files it away, and turns over the catalogued plants to the keeper-of-the-herbarium. He then selects from the "*Index of Collectors*" the cards of the collectors comprised in the accession and adds to each (fig. 4) the number of newly catalogued specimens, changing the last page record after adding the volume and page of the last previous

Cuba.		
		Saldie, J. de J. 1
		Saw & Germann, B. A. 1185
Underwood, L. M.	13	
Underwood & Sook	4	Wilson, S. 276
Underwood & Sparks	4	Wilson & Lion 7
		Hright, G. 527
		Hright & Dawalls 1

PAT. MAY 25, '97, APR. 26, '99

LIBRARY BUREAU N 5558

Specimen Card from the *Geographic Index*

entry in the catalogue. Should there have been no previous accession from a collector, a new card is added to the index. He then removes the proper cards from the "*Geographic Index*" and makes the appropriate record thereon (fig. 5.)

The objects achieved by this method of cataloguing are many:

(a) The date of receipt; size and character of a collection; the person or herbarium from which it was received, etc., etc., are now on permanent record.

(b) Should a collection be offered for sale the curator can immediately inform himself as to whether it is needed in the herbarium in his charge or not.

(c) It can be ascertained in a moment, how complete is the representation in the herbarium of any collector's plants, from any locality.

(d) The knowledge may at once be gained of how well any given geographic region is represented.

(e) Idiosyncrasies in label writing and abbreviations that are frequently indecipherable when taken alone become legible in the light of a large series when handled together. These are made plain during the process of cataloguing, and are permanently translated in the records*.

(f) The Index of Collectors forms a source of biographical data concerning individual activities.

(g) Botanists engaged upon special floras find the greatest aid in referring from the geographic index to the catalogue entries pertaining to their field of investigation. Others interested in plants collected in certain regions are referred to all the species in the herbarium from the region of their interest.

(h) Consulting botanists will never need to depend on the working staff of the herbarium for information concerning any particular plant sheet. Everything known concerning each sheet or plant may be learned through the catalogue number stamped on the sheet.

(i) Should a plant number of any collector be referred to in a publication under another name than that of its original label, the specimen can be found readily from its catalogue number.

*The following is an interesting example of this. A package of plants was received in exchange from another herbarium, evidently a cast-off from their excess room. It contained a series of plants plainly of West Indian origin. Most of the collecting sheets bore simply a number. Later one appeared marked "B 38"; another turned up "I. P. 47"; on still another was "J. B. 106"; and finally one was marked "José B. 105." It proved to be the "lost" collection of Don José Blain, made on the Isle of Pines in the 60s., that had been discarded on account of lack of label information.

510

CATALOG NO.	COLL. NO.	SPECIES	LOCALITY	DATE OF COLL.	COLLECTED BY	ACC. NO.	SEE ALSO	
							VOL.	PAGE
503320		<i>Bidens melanocarpus</i> , King.	Germany	1907	A. Lehmann.	1505		
1		"	"	"	"		59	580
2		<i>Kipastilus</i> , L.	"	1910	A. R. Gaul.			
3		<i>Helicophyllum</i> , Det. var. <i>tripleii</i> , G.	Italy	1912	G. Bellenden.		59	582
4		<i>Simua</i> , L. var. <i>minima</i> , Kunt.	Austria	1909	F. Svehk.			
5		"	Germany	1884	H. Zely.		52	327
6		<i>melanocarpus</i> , King.	"	1902	H. S. Fotherbach.		54	582
7		<i>Simua</i> , L. f. <i>Distida</i> , St.	Austria	1882	J. Wipplid.		52	407
8		<i>Spicipina</i> , Fend.	Germany	1895	E. Farnslof.			
9		<i>hipinata</i> , L.	Austria	1903	Trinmay.			
503330	A. 272	<i>Polypodium mucronum</i> , Kunt.	Colombia	1918	Dr. Luis J. J. J.	2497		
1	A. 400	<i>Polypodium</i>	"	1919	"			
2	A. 863	<i>Polypodium</i>	"	1920	"			
3		<i>Polypodium rava</i> , L. f.	"	"	"			
4	711	<i>Polypodium hypoleucoides</i> , (L.) Kt.	Trinidad	1921	L. H. & G. J. Bailey.			
5	T. 12	<i>polypodioides</i> , -	"	"	"			
6	722	<i>Polypodium occidentale</i> , L.	Venezuela	"	"			
7	876	<i>Nephrolepis</i>	"	"	"			
8		<i>Polypodium lamellatum</i> , L.	Germany	1860	F. V. B. B.		50	408
9	616	<i>Dryopteris filix-mas</i> , var.	Germany	1897	A. G. S.		52	125
503340	2337	<i>Dryopteris schimperiana</i> , G. & G.	Vassia, Ital.	1859	F. S. G. & H. K. V.		56	497
1	272	<i>Polypodium peruvianum</i> , Sw.	Brazil	1915	H. M. S.			
2	116	<i>Dichomanes elegans</i>	Colombia	1916	"			
3	120	<i>peruvianum</i> , Kunt.	"	"	"			
4	186	<i>Oleophila</i>	"	"	"			
5	120	<i>Dichomanes diversifrons</i> , (Guss.) Met.	"	"	"			
6	183	<i>Oleandra</i>	"	"	"			
7		<i>Polypodium rubiacifolium</i>	Siam	1909	J. J. S.			
8	4024	<i>Polypodium palmatum</i> , (Guss.) Sw.	New Jersey	1906	Philip S.			
9	4839	<i>Polypodium nigrophylloides</i> , (L.) Kunt.	"	1907	"			
503350	3024	<i>Polypodium fragilis</i> , (L.) Underw.	New York	1905	"		50	261
1	3850	<i>Dryopteris Clintoniana</i> , (L. & G.) Sw.	"	"	"			
2	4293	<i>Polypodium alliquem</i> , Nutt.	"	"	"			
3	5425	<i>Dryopteris (Boottii) (Tuck.) Underw.</i>	"	1909	"			
4	6617	<i>Polypodium alliquem</i> , Nutt.	"	1910	"			
5	6622	<i>Dryopteris simulata</i> , Sw.	"	"	"			
6	6624	<i>Woodwardia areolata</i> , (L.) Moore.	"	"	"			
7	6625	<i>virginica</i> , (L.) f. G. Sw.	"	"	"			
8		<i>Oleochloa aureum</i>	Bole, Pa.	1921	G. R. English.			
9		<i>Dryopteris Sprungelii</i>	"	"	"			

SIL. NO.	SPECIES	LOCALITY	DATE OF COLL.	COLLECTED BY	ACC. NO.	SEE ALSO		CATALOG NO.
						VOL.	PAGE	
	<i>Dactyloctenium aegyptium</i>	Balt. Riv.	1921	G. L. Engelm.	2497			503360
1007	<i>Hippoboscoides (C.) F.</i>	Michigan	1915	G. A. Small			22	1
1007	<i>D. spinulosus (C.) F.</i>	"	1917	"				2
1041	<i>Hippoboscoides (C.) F.</i>	"	1918	"				3
1046	<i>Dactyloctenium aegyptium (C.) F.</i>	"	1920	"				4
1046	<i>Dactyloctenium aegyptium (C.) F.</i>	"	1921	"				5
1046	<i>Dactyloctenium aegyptium (C.) F.</i>	"	"	"				6
1046	<i>Dactyloctenium aegyptium (C.) F.</i>	"	"	"				7
1046	<i>Dactyloctenium aegyptium (C.) F.</i>	"	"	"				8
1046	<i>Dactyloctenium aegyptium (C.) F.</i>	"	"	"				9
1082	<i>Dactyloctenium aegyptium (C.) F.</i>	"	"	"				390
	<i>Dactyloctenium aegyptium (C.) F.</i>	Washington	1920	J. B. Steud.				503370
	<i>Dactyloctenium aegyptium (C.) F.</i>	Oregan	1921	L. N. Gooding	35		308	1
	<i>Dactyloctenium aegyptium (C.) F.</i>	"	"	"				2
1082	<i>Dactyloctenium aegyptium (C.) F.</i>	Gumay	1889	J. B. Steud.				3
	<i>Dactyloctenium aegyptium (C.) F.</i>	Balt. Riv.	1912	H. Cronq.	38		182	4
1075	<i>Dactyloctenium aegyptium (C.) F.</i>	Maryland	1917	A. D. K. Small				5
	<i>Dactyloctenium aegyptium (C.) F.</i>	Alabama	1916	A. H. G. Small				6
1046	<i>Dactyloctenium aegyptium (C.) F.</i>	Balt. Riv.	1918	O. S. Jennings	57		260	7
107	<i>Dactyloctenium aegyptium (C.) F.</i>	Guatemala	1900	H. S. Gentry			371	8
100	<i>Dactyloctenium aegyptium (C.) F.</i>	"	"	"				9
1046	<i>Dactyloctenium aegyptium (C.) F.</i>	Salinas	"	J. M. Johnston				503380
103	<i>Dactyloctenium aegyptium (C.) F.</i>	"	"	"				1
143	<i>Dactyloctenium aegyptium (C.) F.</i>	Idaho	1896	John B. Keck	57		226	2
140	<i>Dactyloctenium aegyptium (C.) F.</i>	"	"	"				3
1046	<i>Dactyloctenium aegyptium (C.) F.</i>	"	"	"				4
107	<i>Dactyloctenium aegyptium (C.) F.</i>	"	"	"				5
107	<i>Dactyloctenium aegyptium (C.) F.</i>	"	"	"				6
1046	<i>Dactyloctenium aegyptium (C.) F.</i>	"	"	"				7
1046	<i>Dactyloctenium aegyptium (C.) F.</i>	Oregan	1919	H. R. M. Small	59		581	8
1046	<i>Dactyloctenium aegyptium (C.) F.</i>	Maryland	1900	H. R. M. Small				9
1046	<i>Dactyloctenium aegyptium (C.) F.</i>	"	"	"				503390
1495	<i>Dactyloctenium aegyptium (C.) F.</i>	"	1920	"				1
1400	<i>Dactyloctenium aegyptium (C.) F.</i>	New York	1916	"			57	2
1046	<i>Dactyloctenium aegyptium (C.) F.</i>	Guatemala	1905	H. R. M. Small				3
107	<i>Dactyloctenium aegyptium (C.) F.</i>	California	1921	G. L. May	51		614	4
107	<i>Dactyloctenium aegyptium (C.) F.</i>	"	1920	H. R. M. Small				5
1046	<i>Dactyloctenium aegyptium (C.) F.</i>	Washington	1921	J. B. Steud.				6
1046	<i>Dactyloctenium aegyptium (C.) F.</i>	Oregan	1905	H. R. M. Small	50		568	7
	<i>Dactyloctenium aegyptium (C.) F.</i>	West Virginia	1888	"				8
	<i>Dactyloctenium aegyptium (C.) F.</i>	"	"	"				9

These items and numerous others, constantly occurring as the herbarium grows and is made use of, prove the high value of such a cataloguing system.

In case the name of a species proves to be wrong on the collector's label, or if for any other reason it is changed, the correction is made near the label and the sheet handed to the recording clerk who writes the new designation in the catalogue in pencil, over the old, and returns the sheet to its new cover in the herbarium. The specific position of a sheet in the herbarium is not allowed to be changed by any one other than the recording clerk or herbarium keeper.

When a large private herbarium of mounted specimens is acquired, it is first broken down into the sheets of the various collectors represented therein and afterward catalogued and re-distributed into the organized herbarium as in small accessions. In this manner the following herbaria have been incorporated in that of the Field Museum:

	Acquired	Sheets
Bebb, M. S.....	June 1, 1896	45,962
Chicago, Univ., of ¹	June 25, 1907	44,127
Hall, Elihu ²	Feb. 26, 1916	21,763
Heller, A. A.....	Jan. 9, 1902	13,166
Hitchcock, A. S ³	Mar. 10, 1908	7,089
Millspaugh, C. F.....	Nov. 28, 1896	5,124
Patterson, Harry W.....	Aug. 17, 1900	37,935
Rothrock, J. T.....	July 19, 1909	22,207
Schott, Arthur.....	Mar. 22, 1897	8,494
Schuette, J. H.....	Dec. 22, 1911	10,992
Small, John K.....	July 12, 1904	20,534
Wahlstedt, L. J.....	Mar. 1, 1907	17,556

Every sheet of these herbaria is impressed with a rubber stamp, of distinctive shape, indicating the herbarium to which it originally pertained. It has not been deemed necessary to append the accession number to the sheets as the catalogue number suffices.

HERBARIUM CASES

The most modern and best cases are constructed of steel. These are tightest against dust; will not warp and cause trouble with doors; are at least in part fire-proof; and occupy less floor space in the herbarium. The type used in this herbarium are so constructed as to leave a space

¹Deposited.

²Not yet fully organized.

³His Florida herbarium.

of an inch between the shelf faces and the door and a like space between the back of the shelves and the case back. This serves the purpose of affording ample ventilation and allows the case interior to be more readily cleaned when necessary.

The blocks of cases are arranged in wings endwise to the side walls. The pigeon holes are spaced 5 inches and are 12 inches wide by 17 inches deep. The cases are 14 pigeon holes high and have two tiers to the door. There are two half doors to each case front. The cases are built back-to-back into a unit, the pigeon holes being separated from each other at the back by longitudinal strips of steel, one inch wide, and a space of an inch is left between the pigeon hole backs. The plans were drawn and the first few cases built when poisoning by carbon bisulphide was thought to be efficient*; hence the thorough ventilation, which is perhaps a good feature still as the cases are very readily cleaned with the vacuum brush.

The case units are set together in blocks of four. Each door is provided with a metal label-holder to carry a 5 x 8-inch card upon which is a printed indication of the contents of the section behind the door.

SLIDES: Each pigeon hole is converted into a drawer by placing beneath its contents a straw-board slide upon the front of which is hinged, with black muslin, a one-inch drop. This drop is of great utility: it serves as a "pull" by which the plants are brought forward, thus doing away with the old method of grasping the covers with both hands—a destructive process injuring the plants and the covers as well; it also serves an excellent purpose in affording a place to which subdivisional labels may be attached. As the muslin hinge is very loose the drop in no way interferes with the withdrawal of the contents of the pigeon hole next beneath. These slides are manufactured by a paper box firm and cost about twenty dollars per thousand.

HERBARIUM ARRANGEMENT

The families, the genera and the species are arranged alphabetically in this herbarium. The alphabetic arrangement saves everyone connected with the herbarium, or using it, much valuable time. This disposition of genera and of species is open to objection, yet in a large and rapidly growing herbarium it has many important points in its favor—mostly, in saving time. It does away with cumbrous index cards to genera and species which, if kept up to date, require changing with

*All herbarium specimens are now poisoned with corrosive sublimate which affords permanent protection.

the issue of each new monograph; it assists materially in keeping the species in their proper position in the pigeon holes; it saves a vast amount of time in the insertion of new material, and relieves the scientific staff of the mechanical duty of distributing new material.

In this herbarium the species under all genera are kept in individual "species covers" with the name plainly written, or hand-printed in ink at the lower left hand margin near the fold. To this the most important synonym is added when necessary for cross-reference in the genus. The species covers are of "tough check" manila, calendered to a smooth surface, and are of several contrasting colors to distinguish large geographic divisions. The colors used are as follows: North America—buff; Mexico and Central America—red; West Indies—olive; South America—salmon; Europe—green; Asia—purple; Africa—blue; Oceanica—yellow.

HERBARIUM RULES

"When consulting specimens in this herbarium, pull out the slide of the pigeon hole a few inches. On finding the species cover desired push back all the covers above it before withdrawing it. The place for its return is then plainly indicated.

Should a plant be found to be wrongly determined please write your correction neatly, near the label, and append your name or initials. Do not return the sheet to the herbarium, leave it out for the Recorder to replace.

Please do not write upon, or otherwise deface, the original label of any sheet. Annoting the sheet itself is, however, invited."

LOANS

Specimens are loaned to institutions freely but only to individuals accredited by institutions which will guarantee the protection of the material and insure its prompt return.

When a request for a loan of specimens is received by the Director and approved by him on the recommendation of the department, the specimens are taken from the herbarium and a list of their catalogue numbers is made, in order to identify missing specimens in case of error at the time they are returned. The list is attached to a numbered *memo* (fig. 7), which also bears the name of the institution or individual to whom the loan is issued, the date of forwarding and the number of specimens sent. This memo is kept on file in the department. A second memo (fig. 8), bearing the same number and corresponding data, is prepared for the Recorder of the Museum. A permit (fig. 9) to remove the specimens from the Museum is then issued by

Year.....	Memo. No.....
Field Museum of Natural History DEPARTMENT OF BOTANY	
SPECIMENS SENT TO OR RECEIVED FROM:	
.....	
.....	
.....	
For Purpose of.....	
Sent by.....	Date.....
Received by.....	Date.....
Returned by.....	Date.....
Stored in.....	
MEMORANDUM OF SPECIMENS	
.....	
.....	
.....	
.....	
.....	
.....	
.....	
.....	
.....	

Fig. 7 (x 1)

MEMO. No......
Department.....
Field Museum of Natural History

From.....
To.....
Address.....
.....

FOR EXAMINATION, FOR DETERMINATION, EXCHANGE

From Collection of.....
.....**Original Accession Number**.....

Description of Objects:

.....

Date received.....
Signature.....

Date forwarded.....
Signature.....

Accession No......**Transportation No.**.....

Remarks.....
.....
.....

Fig. 8 (x $\frac{3}{4}$)

**FIELD MUSEUM OF NATURAL HISTORY
CHICAGO**

Mr. D. C. DAVIES, Director, 19.....

Dear Sir:

Permission is requested to.....

to.....

.....

by....., charges.....specimens

of.....

.....

.....

Memo. B. No.....

Approved:

Respectfully yours,

.....
Director

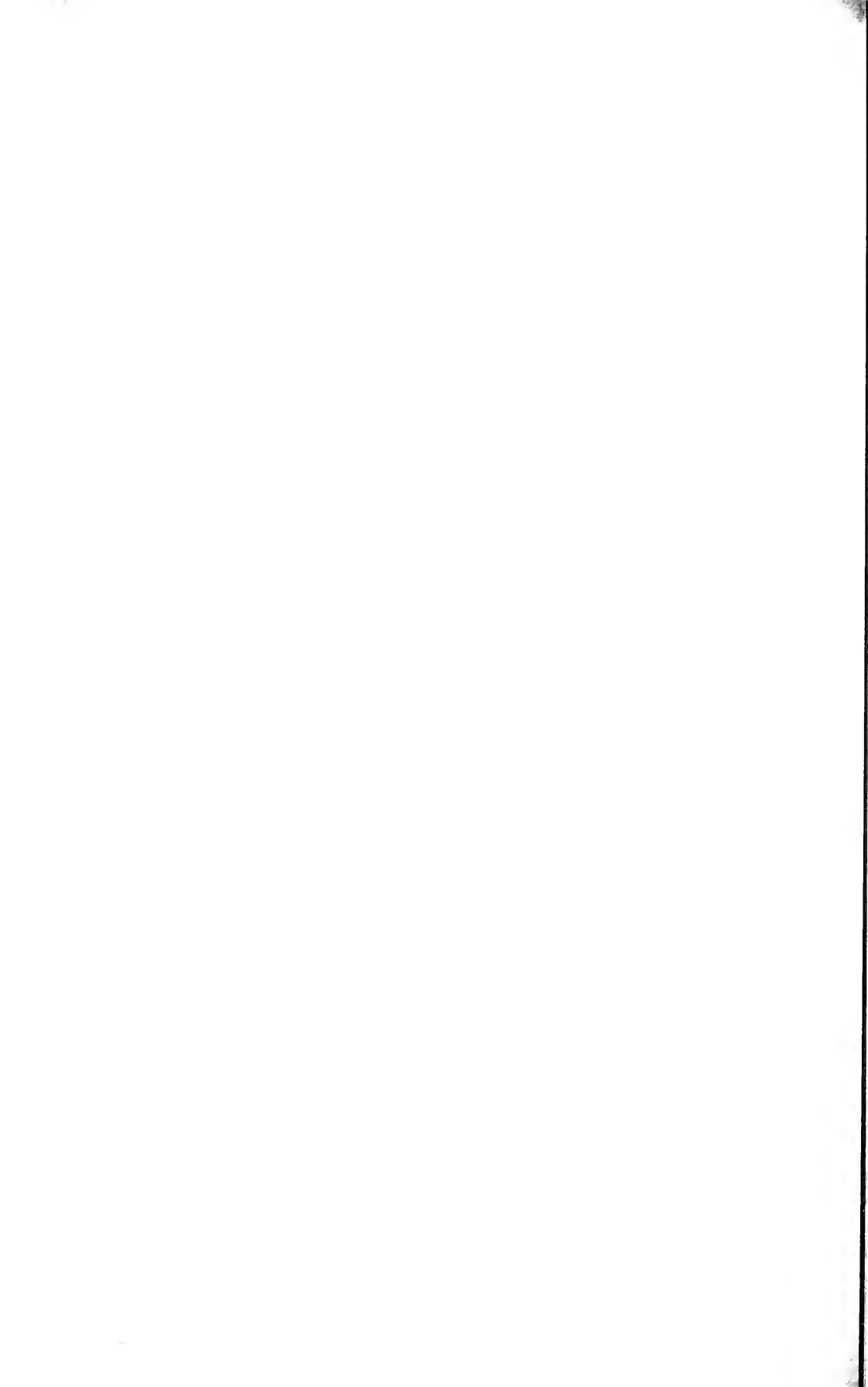
.....
Curator, Dept Botany

Fig. 9 (x 1)

the Director, after which they may be dispatched. When the loan is returned, the record on these memos is completed by checking off the numbers on the department memo, and entering the date of return on both. All correspondence relating to the loan is attached to the memo sent to the office of the Museum Recorder.

In the case of specimens borrowed by the department, a similar procedure is followed. A letter is sent to the Director asking him to request the loan. As soon as the specimens are received, two memos are made out, one for the department files, and one for the Museum Recorder. Both state the number of specimens received, their source and the date of receipt. When study upon them is finished, a permit for their return is issued by the Director, and the memos are completed by adding the date of return. As in the case of outgoing loans, all correspondence pertaining to the transaction is attached to the memo sent to the Recorder's office.





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