

July, 1968

Eleutherian Mills

Du Pont's residence at the Eleutherian Mills was constructed in 1803 on a steep hillside overlooking the powder mills on the Brandywine River. With the stuccoed stone - residence, a formal garden was lay of approximately two acres in area. A plan of such a garden was drawn, in 1925, from memory by a former resident. In this plan, a pump, cold frames, green houses and definite garden paths are indicated. Based upon this sketch, an area about 200' by 200' was surveyed with the proton-magnetometer and the resistivity meter. The resistivity meter indicated several regions of high electrical resistance. At these location (as of early July), a well, the foundations of the green house and a cold frame, the drainage system of the garden paths and possibly a water way have been uncovered.

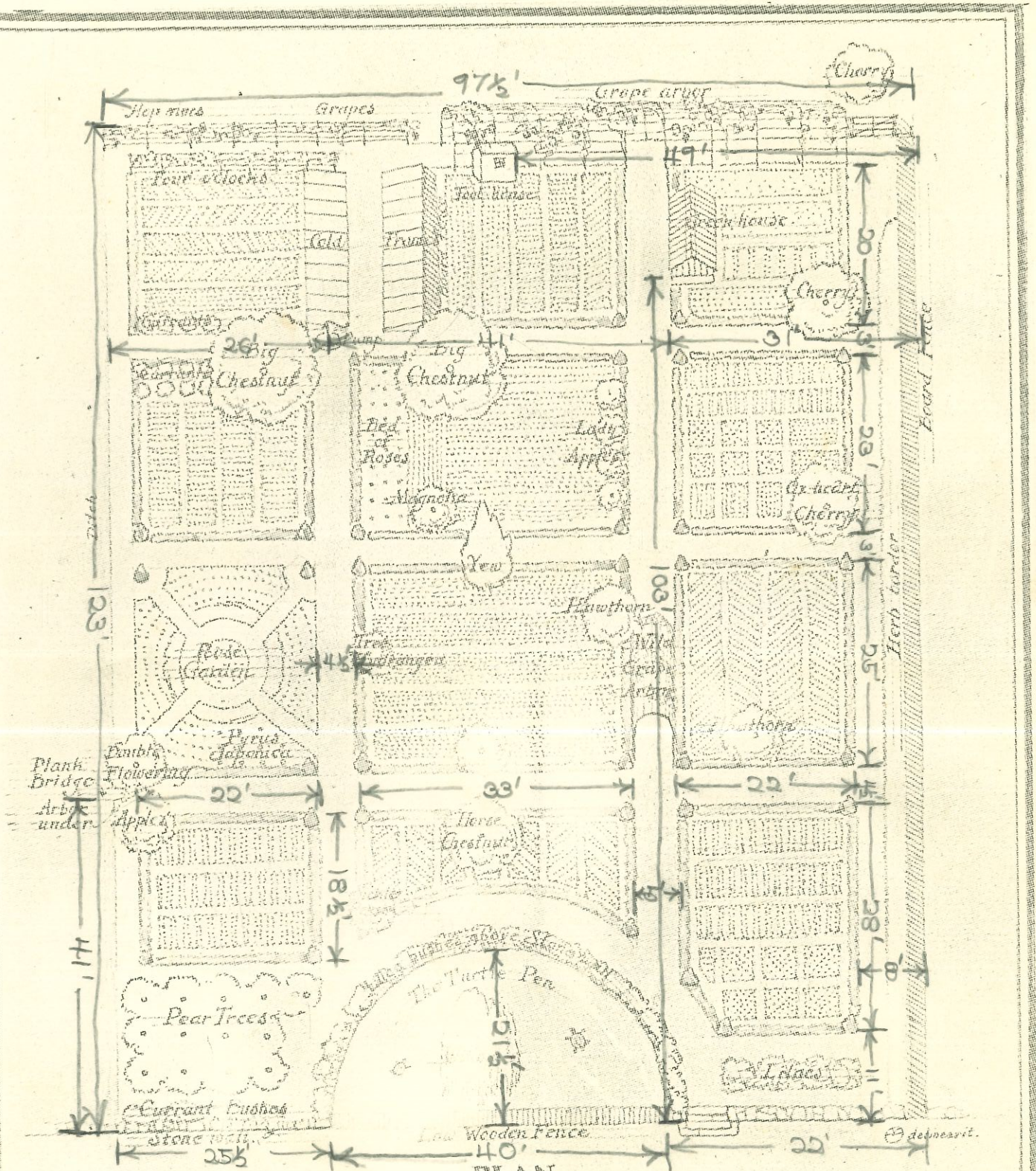
The garden area had been completely altered within the last 50 years. All the structures were leveled and filled with debris. Considerable amount of soil had been dumped over the entire area, and at the present time it is a beautiful rolling lawn. Much of the man-made structures discovered are well below 2.5'---the spacing between the resistance probs. However, the interior of these structures were filled with stones, bricks and other debris, and they gave these high resistivity indications.

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The proton-magnetometer was not as helpful for the reason that numerous metallic garden tools and objects were scattered throughout the garden, plus the fact that a pipe runs through the width of the garden and the possibility of a high voltage line in the vicinity.

Mr. J. Akerman is extremely pleased with the survey, and of course, the discoveries.

[Henry Börstling]
8/24/68



PLAN
of the Old Garden
ELEUTHERIAN MILLS
Montchanin, Delaware.

Shown as it
was about 1880

Drawn in 1925
from memory.

ELEUTHERIAN MILLS GARDEN SITE

In 1800 a French emigré arrived in America and by 1802 had purchased a 67-acre millsite three miles north of Wilmington, Delaware, on the banks of the Brandywine River. This man, although best remembered as the founder of the E. I. du Pont de Nemours Company, was also well known as an agriculturist and botanist during his lifetime.

By 1804 du Pont had not only constructed and was operating his black powder works, but had also built a handsome residence overlooking this industrial operation. Simultaneously he laid out a formal garden of an "acre or more" on the fairly level ground to the west of his residence, and shortly thereafter increased its size to "2 acres 2 quarters and--perches."

Du Pont's botanical background had taken root at the early home of the family at Chevannes near Paris. In 1799 he entered the school of botany at the Jardin des Plantes, the botanical gardens in Paris. In America he continued an active interest in gardening and he corresponded with many persons who shared this interest, exchanging plant materials, some of which went into the orchard and garden he was developing at his home "Eleutherian Mills." During his years on the Brandywine du Pont and his family lavished attention on the garden.

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Although a number of documents survive dealing with the garden plantings and operation, only a few pertain to its layout and structure. Throughout du Pont's lifetime and long after his death in 1834 the garden flourished. Industrial expansion almost encompassed the manor house by the end of the nineteenth century and it was no longer desirable as a residence. At that time the garden was abandoned. Its plantings were neglected or moved, the structures were torn down and the area was returned to agricultural use.

After the powder mills ceased operations in 1921, the property was obtained by a great-great-granddaughter of their founder, Mrs. Francis B. Crowninshield, who restored the residence. The former garden site became part of a sheep pasture. This was the situation when the property was turned over to the Eleutherian Mills-Hagley Foundation in 1952. The Foundation, established on the 150th anniversary of the founding of the mills, was created to preserve and interpret the Du Pont millsite on the Brandywine and to relate the overall growth of American industry as exemplified by the Brandywine industry.

Because of the importance of the garden site in the interpretation of the residence and surrounding area, the decision was made to conduct an

archaeological ^{excavation} investigation of the garden area in order to add
surviving
what/evidence could be found to the meager documentary material extant.
The ^{University Museum at the} University of Pennsylvania ~~Museum~~ was contacted and asked to run a
protomagnetometer and resistometer survey of the area in hope of locating
underground structures ^{such} as the well, the cold frames, the greenhouse, the
tool shed and possibly the garden paths. With the loan of this under-
ground detection equipment and operators furnished by the University
Museum and voluntary assistance from the Archaeological Society of
Delaware this survey was completed. Two young archaeological students
were hired to do the excavations, under my supervision, during their
summer vacations.

The Garden plot was laid out, based on an existing stone wall ^{and} ~~and~~
^{on} ~~on~~ early property survey maps. A grid of five-foot squares was then
imposed over the area. Each square was ~~designated by a number~~ depending
on its distance and cardinal position from a central base point.
Excavating procedures were to follow this pattern: - the sod was to be
removed and the squares excavated in about 6-inch levels. The bottom and
sides of each level was to be troweled and studied for evidence of
features, ~~to~~ continuing in depth until sterile soil was reached. Field

notes were to be ^{KEPT} taken of every level, drawings made and photographs taken wherever features appeared. Artifacts were to be saved and properly recorded but no dirt screened. This procedure was followed throughout the Garden Site excavations with the exception of where overburden was very deep. Here a tractor shovel was employed.

Based on the results of survey maps prepared from the readings of the electronic underground detection devices, and evidence of surface irregularities and density of growth, a likely square was selected in hope of unearthing the well site. At a depth of 39 inches we came upon the stone walled well. Adjoining squares were then excavated to expose the top of this structure in its entirety.

The Foster map - an important guide should be mentioned in this paragraph or in a prior paragraph.

Based on the position of this exposed structure and compared with other data and terrain irregularities, it was decided to dig an exploratory trench the width of the garden area hoping to expose evidence of the cold frame and greenhouse. Near the south end of this trench heavy stone walls laid with lime mortar were exposed. Upon "probing out" the extremities of this structure and digging the squares ^{at} of its ends, this proved indeed to be ^A the cold frame feet long, feet wide with inch walls. An unusual feature was evidence of a plank floor laid on a cross beam

which in turn was supported on both ends by mortar. Although the flooring and supports had completely disintegrated, evidence of its presence remained as dark outlines in the soil. The cut nails which held this structure together still remained in position. Before filling, some of the building stone had been removed and the foundation became a ^{Burning} pit. Judging by the dateable local brew bottles in the fill, this area was leveled about 1900.

Continuing the trench farther north an unexplained feature was exposed feet long feet wide and was squarely cut inches into the sub soil. The bottom consisted of a dense layer of crushed brick 3 inches deep. Above this was crushed brick mixed with brown organic soil with pockets of cut, cooked kitchen beef bones. The area was overlaid with a thin layer of oyster shell. Flower pot shreds were in abundance.

The brick foundation of the greenhouse furnace room appeared as the trench was continued northward. This ^{Greenhouse} complex, the largest of the garden structures, was excavated in its entirety, including the surrounding area, to make sure no wings or attached structures had existed. Many individual features were exposed which date this structure as having been built in the first quarter of the nineteenth century. The furnace room attached to the east end of this greenhouse contained ~~the~~ wrought iron pokers and a small deposit of anthracite coal. The furnace was built into the east

wall of the greenhouse, ^{and} Although it was practically destroyed it still contained coal ash. Iron grating bars were found nearby. The brick flue that carried the smoke across the floor to the west wall and into a chimney base on the outside of the southwest corner still contained a deposit of soot. Particles of rusted sheet metal in the chimney base suggested that the vertical section of this chimney was metal pipe. ^{AMPLE} Strong research evidence indicates that this greenhouse had a high stone north wall with a glass top slanting to the south. No evidence of major alterations to this building were found. ~~some~~ The final fill contained dateable bottle fragments of 1880-1900.

In our search for the garden paths we excavated the square at the top of the stone steps that led through the stone wall bounding the garden area on the east without success. Reference to early garden paths suggested that they may have been made of crushed brick, washed gravel and sand, tanbark or sod. Drainage systems under paths were recommended in most cases. The resistometer survey indicated an anomaly in the east section which we investigated with laborious digging through the hot, dry, August weather. Here - underneath a foot of gravelly soil - we located a stone drain. The hot dry weather proved beneficial in this situation (at this time) for the grass began to discolor in patches and patterns. Upon climbing a

high tree adjoining the garden area one could see discernible traces of all of the former garden paths in their proper pattern. These were immediately staked out and intercepting trenches dug across them. The paths had been made of washed gravel laid in the soil with stone drains or stone rubble underneath them in the low sections where ~~good~~ drainage was desirable. Plowing had distorted these paths in only a few places.

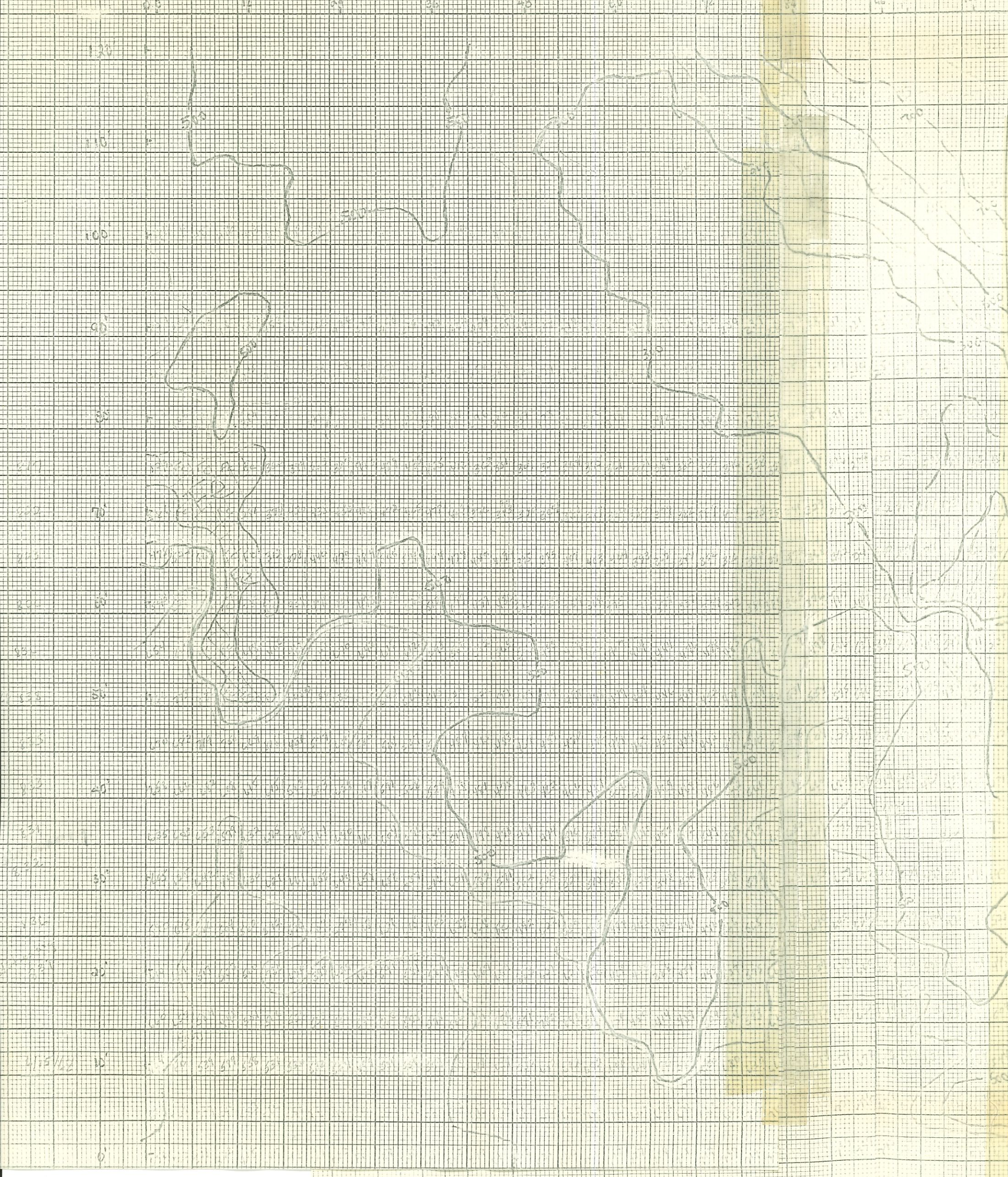
This summer's excavations are now completed. The stone ^{well} ~~wall~~ has been built up to the ground surface and covered. The greenhouse ^{has been} ~~will be~~ ^{back filled} ~~covered~~ temporarily to protect it from the elements. All other excavations have been ~~back~~ filled. The future of the Garden Site at this time is unknown. The completed account of this summer's archaeological excavations, including all field notes and 250 pictures, are available for study at the Eleutherian Mills Historical Library upon request.

[James B. Akerman]

9/16/68

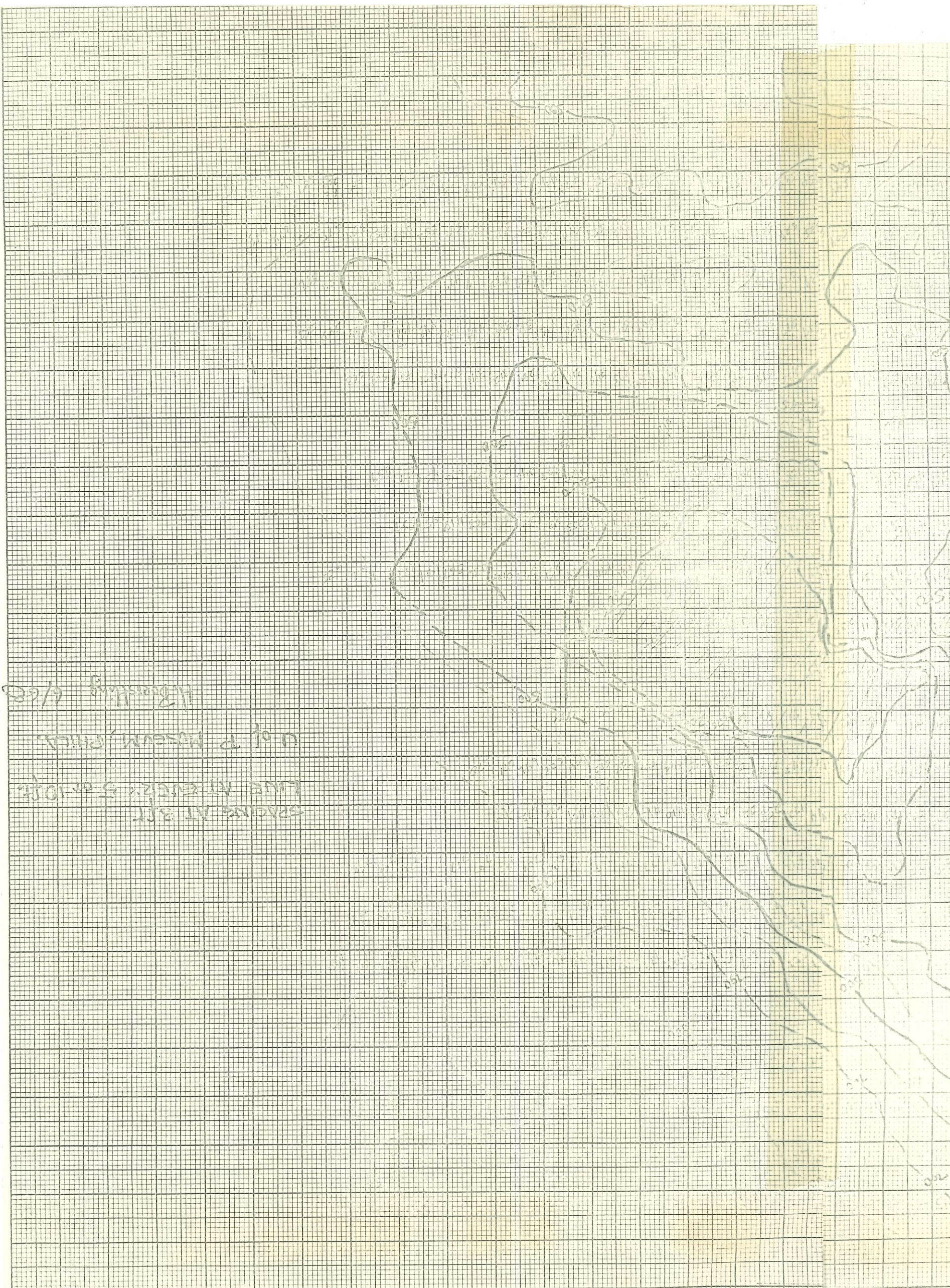
PROTON-MAGNETOMETER SURVEY MAP

SITE: FORMAL GARDEN OF THE WEAUTHEREAN MILL



MAP
AN MILL
Mentham, Del.
120
108
144
135
166
160
142
144

SPACING AT 3 FT
LINE AT QUICK 5 or 10 FT
U of P Museum, Phila.
H. B. G. 6/68



100' - EAST

50' - EAST

10' - E

LINE 0' - 0'

0' 10' - S 20'

50' - South

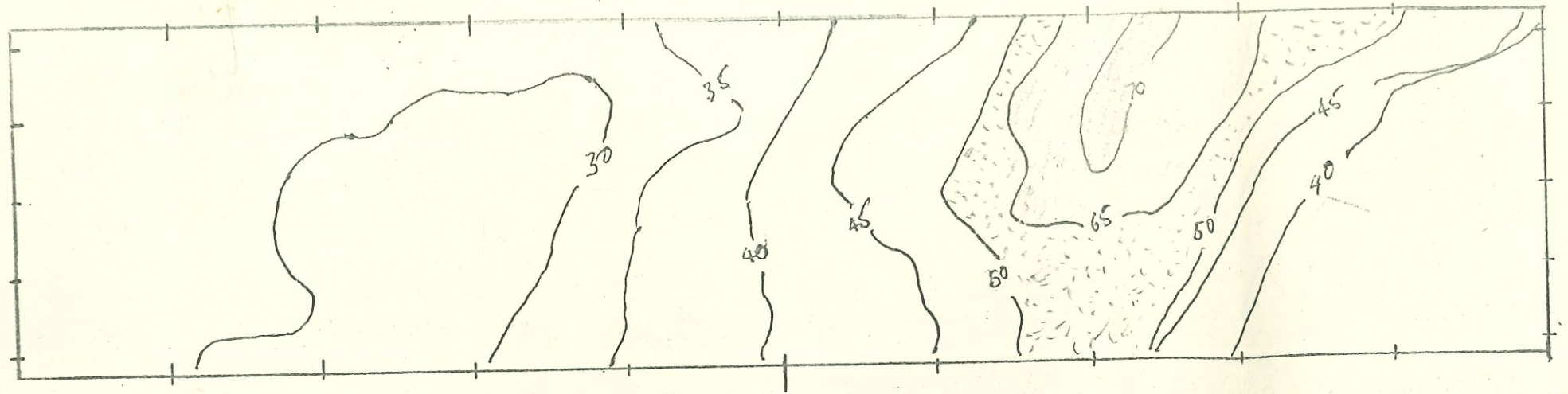
100' - South





230' - EAST

220' - EAST



100' - South

50' - South

150' - EAST

0

10'-S

20'-S

30'-S

40'-S

50'-S

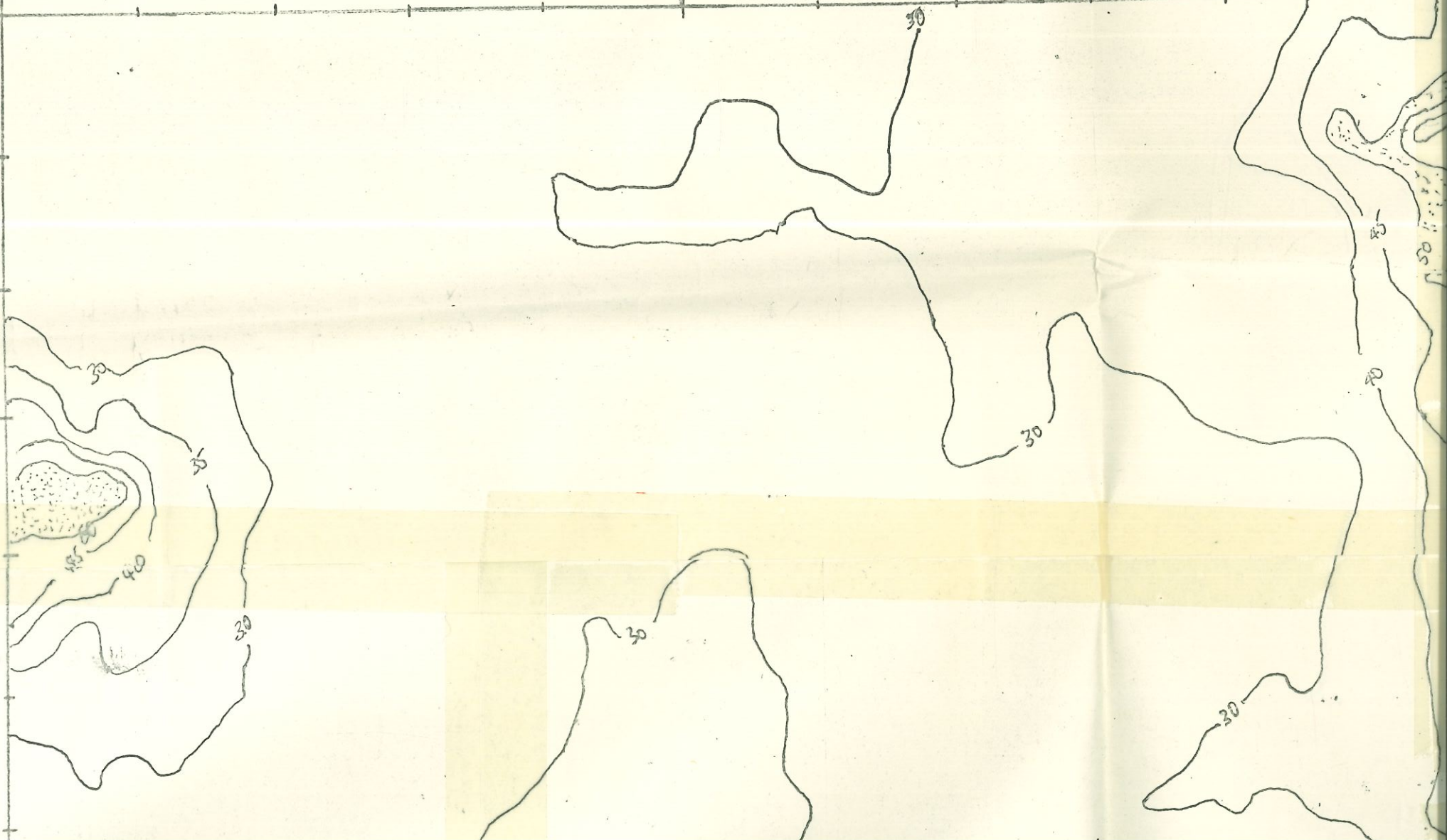
60'-S

70'-S

80'-S

90'-S

100' - EAST

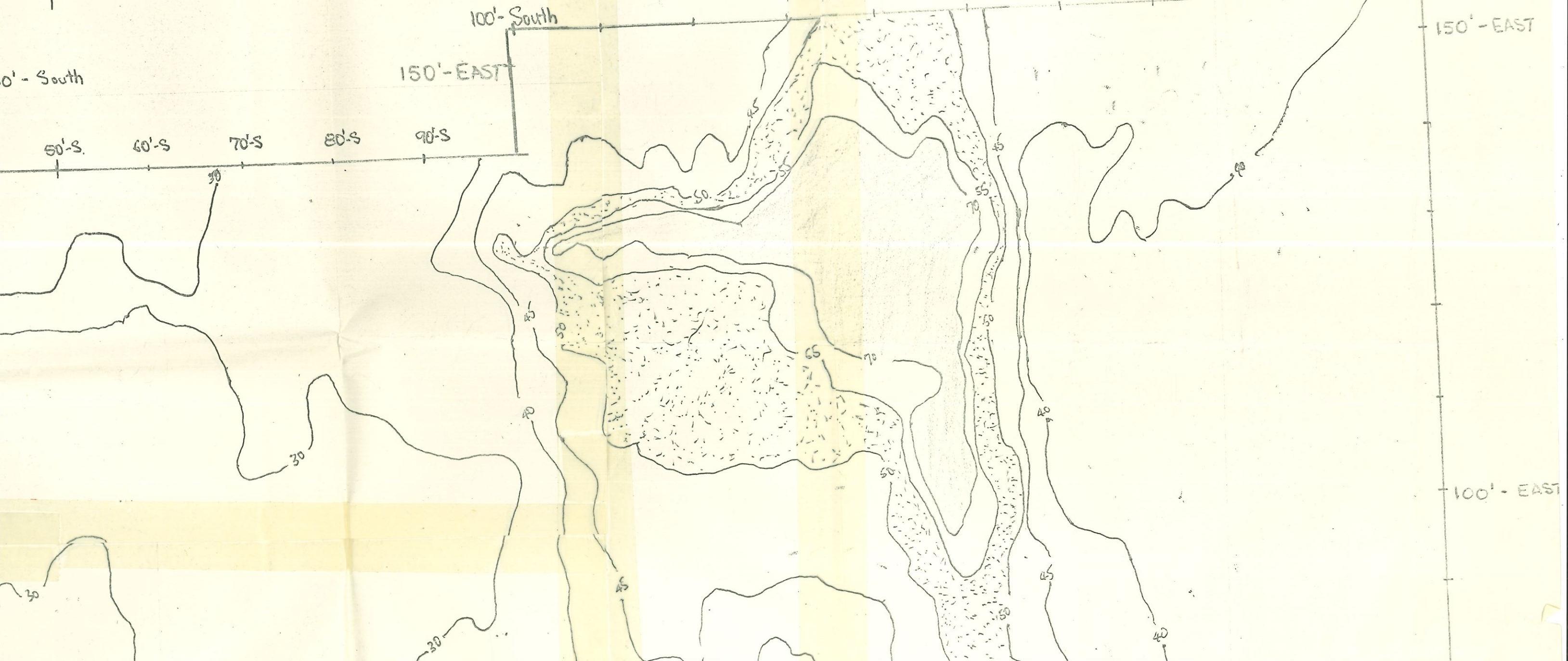
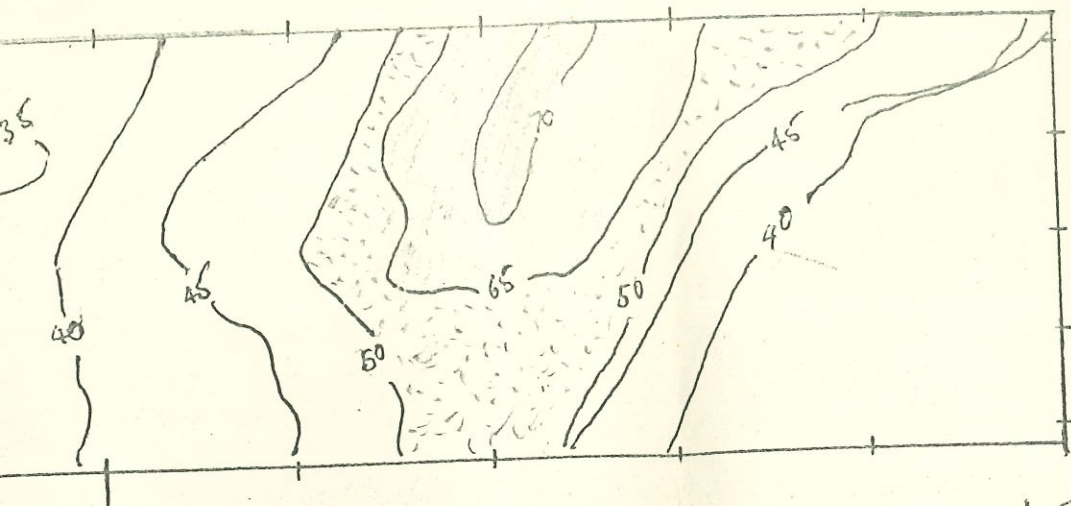


RESISTIVITY MAP OF
ELEUTHEREAN HILLS BURIAL GARDEN

PROBE SPACING : 2.5 ft

LINE SPACING : 5.0 or 10 ft

UNIVERSITY MUSEUM, H. Boerstling
6/68



E. I. du Pont Garden Found

Abandoned After 1890 Blast

By W. EMERSON WILSON

Foundations of the greenhouse, of the cold frames and even of the various paths and walks of E. I. du Pont's 2-acre garden, which long ago disappeared, have again come to light.

This garden to which the founder of the Du Pont Co. devoted so much of his time from 1802 until his death in 1834 is situated south of the driveway that led to his home, Eleutherian Mills, and extends westward along that drive.

The extent of the garden and what structures it contained have been discovered through archeological digging conducted by James B. Akerman, staff archaeologist of the Hagley Museum, and two assistants.

HISTORIANS are giving dual importance to this garden: it shows the great interest of Eleuthere Irenee du Pont in botany, and it may be considered the forerunners of the Longwood and Winterthur Gardens developed by later members of the family.

It was through the work of Dr. Norman B. Wilkinson, research director of the Hagley Museum, that the approximate site of the gardens was established through old records including an 1812 survey and through a sketch drawn by Mrs. Victorine E. Foster, granddaughter of E. I. du Pont, in 1925 as she recalled what it was in 1880. The family abandoned the house and garden after a damaging explosion at the nearby plant in October 1890. Within a decade the garden had been filled in and the area had become a meadow or field.

WHEN the decision to excavate was made an expert from the University of Pennsylvania Museum spent two weekends at the site with detection devices. An electronic graph was made of the whole area. Volunteers from the Archaeological Society of Delaware assisted in test digs. The ridges and contour of the area aided in locating some of the paths and walks.

Akerman laid out the section where he believed the well to be in 5-foot-grids and started digging. Only a few feet below the surface a circular well with its walls lined with stone was exposed.

The most elaborate find was the foundation of the greenhouse



Eleutherian Mills Historical Library Photo

E. I. Du Pont
... As a young man

with its furnace on the eastern end and a brick heat duct leading the full length of the house then allowing the smoke to go up a chimney in the southwest corner.

THERE are indications that the greenhouse had a high stone wall on the northern side from which the glass slanted down to a much lower wall on the southern side.

Rusted pokers were found on the brick floor of the furnace room and some pieces of glass were found all through the foundation. Other artifacts such as glass bottles date from the 1890s when the walls were demolished and below the ground area filled in with rubble.

The stone foundations of the 60-foot long cold frames were

also discovered to the south of the greenhouses. These were partially underground originally with glass covers over the top.

IRON pipes leading from the well and crude stone drainage lines with walls and coverings of stones were also found in the area. Most of these drainage lines were directly beneath the paths and walkways of the garden.

In fact so much of the original garden plan along with the additions and expansions made in the 1820s were uncovered that the garden could be restored to its original appearance with remarkable accuracy, Wilkinson and Akerman believe.

Although E. I. du Pont was a powdermaker one of his greatest interests in life was in gardening and he even listed on his passport when he left France for the United States in 1799 that his occupation was botanist.

WILKINSON has recently completed a manuscript entitled "E. I. du Pont-Botanist; The Beginning of a Tradition" which is expected to be published soon and which deals with that aspect of Du Pont's life.

Du Pont had developed gardens and orchards at the country home of the family at Bois des Fosses (Wood of Ditches) about 60 miles south of Paris and had taken courses at the Ecole de Botanique (School of Botany) in Paris. He once considered serving as a naturalist with the French Navy which was then exploring the South Pacific and bringing back to France specimens of plants from the various islands.

AS soon as the mills were started on the Brandywine and his home finished, he started laying out his garden. In it he raised various vegetables, herbs and spices, berries, grapes and melons and many types of roses. Nearby was a large orchard containing many varieties of fruits.

He corresponded with botanists, naturalists and gardeners throughout the United States



E. I. DU PONT'S GREENHOUSE—James B. Akerman, staff archaeologist for the Hagley Museum, directs Thomas Stafford, foreground, and Albert Bar-tovics in digging the foundations of the

garden greenhouse near E. I. du Pont's home, Eleutherian Mills. At the bottom of the picture is the remains of the furnace with its bricked heating duct leading the length of the building.

and Europe and often exchanged plant materials with them.

Once when he was injured in an accident his family was amazed to find him up and digging in his garden the next morning at 6.

HIS daughter, Victorine, also became an enthusiastic garden-

er and she compiled an herbarium of 200 items with her father's assistance. Other sons and daughters established gardens at their homes with many of the first plantings coming from the gardens at Eleutherian Mills.

Adjoining the garden E. I. du Pont established a turtle pond in which turtles and terrapin were

kept alive and thriving until time came to prepare them as delicacy for the table. Some the drains from the garden empty into this turtle pond which still exists although it has been drained of all water.

Although so much of the garden has now been located the museum has made no decision so far on its restoration.