

Lloyd *Lop* home 3/5/65
Area ~ 2 acres
Wants to find wells, etc.

RICHARD W. LLOYD

1119 LITTLE STREET
CAMDEN, SOUTH CAROLINA 29020

January 6, 1965

People should be
take a check
J. J.

Possibility of
Bergh & Borstling
survey in June -
Cochran

Dr. Froelich G. Rainey, Director
University Museum
33rd & Spruce Streets
Philadelphia, Pennsylvania

Dear Fro:

I was interested to read in the Fall issue of "Museum Newsletter" about the proton magnetometer survey. I am wondering if it would help with an archaeological problem down here.

In the lower outskirts of Camden (which, as a town, has slowly moved upward in the last century or so) there used to be a magazine, built in 1777. When the British Army occupied Camden and made it their forward base and staging area in 1780, they transformed the magazine into a redoubt by adding palisades and earthworks. Two major battles and a number of skirmishes were fought in this general area; finally, in 1781, the British were compelled to withdraw. Recently there has come to light a drawing made by the Polish General Kosciusko, who was the engineer serving with Nathanael Greene's army upon the British retreat. To the great surprise of a group of us working as a committee for the Chamber of Commerce, this sketch shows not merely one redoubt, but a very much more elaborate fortification - probably the largest south of Yorktown. Our earliest available aerial photographs (1941) show "suspicious" spots where several of the redoubts were located. We have had photographic planes from nearby Shaw Field use their special high powered cameras but they have turned up nothing of interest. Hence I was wondering about the magnetometer. Could you tell me more about the device and how it works: would it be feasible to use it to search for the areas of the redoubts and, particularly, to try to locate a well which might have been filled up with materiel which could not be burned, when the works were abandoned and destroyed? (Before we acquired the site of the magazine redoubt, someone had used a dragline there and it kept hitting something deep in the ground, which we feel might have been cannonballs or even a cannon in a well. Several cannonballs and bullets have been found in that particular area close to the surface; we think similar things might be in the other redoubt sites.)

We have had an application with the Area Rehabilitation Administration for a study grant: a group of experts would work as a team to find out what is on the site and what is in books and documents; to plan a museum; to lay out an interlocking marker system of battles, skirmishes, etc.; and, particularly, to see if a museum and partial restoration would be attractive enough to draw tourists to Camden and help our economy. These experts are: Conover Fitch of Boston, representing the architectural firm of Perry, Shaw, Hepburn, and Dean; Mrs. Joye E. Jordan of the North Carolina Department of Archives and History; Dr. Robert Bass, a history professor formerly of Furman University, Greenville, S. C.; Dr. William

2

Dr. Rainey
January 6, 1965

Edwards, South Carolina State Archaeologist; and Dr. Robert T. Collins of the University of South Carolina, an economist. I am quite sure you know Mrs. Jordan and, possibly, Dr. Edwards. The ARA has indicated they will not approve our entire application but might give us a reduced amount. We tried to get Dr. Edwards to make a more limited survey last summer but he felt it should be "all or nothing." He, himself, is not available this coming summer but we would like to go ahead and find out what we can, with the feeling that anything that can be discovered which would be of significance would help generate more interest and hence support.

Some friends of mine were in Philadelphia recently and took their children to see your museum. They were very much impressed by how much it had been changed and improved in the last ten years. Since we moved to Camden from Haverford we realize how much we miss having such opportunities right nearby - and wish we had made better use of them while we were there!

With best wishes for 1965,

Sincerely,

Dick

L/o

January 22, 1965

Dr. Richard W. Lloyd
1119 Little Street
Camden, South Carolina 29020

Dear Dr. Lloyd:

Fro Rainey has asked me to reply to your letter of January 6th (the delay is my fault, please excuse). During the past few years we have conducted a number of instrument surveys at various historical sites in addition to our big archaeological search on the plain of Sybaris in southern Italy.

We should like very much to tackle your problem on the outskirts of Camden during the summer if we can arrange our schedules mutually, find a little financial support for our "instrument men", and so forth. We have several student assistants who had three months of experience with our instruments last summer at a project on the Ile-aux-Noix (site of Fort Lennox) in collaboration with the Canadian government. Thanks to the generosity of the Canadian government, we established the bad precedent of paying them \$60 a week plus travelling and living expenses. Could you contribute funds of this sort? If not, possibly we can arrange something here.

Our Elsec proton magnetometer is capable of detecting any buried feature that exhibits a contrast in magnetism with the surrounding earth. Cannonballs and other iron objects, of course, are very strongly magnetic, but frequently wells and other soil disturbances may be detected because of their increased magnetic susceptibility. The usual problem at historical sites, however, is that there is so much magnetic clutter, both ancient and modern, that it is hard to interpret the anomalies found. When this is the case we frequently have better luck with our Geohms (electrical resistivity instruments). Unfortunately, these are slower to use, but when manned by three people (the magnetometer requires two), can be speeded up.

Dr. Richard W. Lloyd

January 22, 1965

If you would let me know the extent of the area to be surveyed, I could perhaps make an estimate of the time required for the instruments. Also, when would be the best time of the year? Our plans are not yet definite, but our magnetometer may be in Europe during the spring and early summer. If so, the latter part of the summer would be most convenient for us. We have several Geohms so that they are available at any time.

Sincerely yours,

Elizabeth K. Ralph

EKR/deh

RICHARD W. LLOYD
411 PINE STREET
CAMDEN, SOUTH CAROLINA

1-803-
1-432-4433

18 March, 1965

Dr. Froelich G. Rainey, Director
University Museum
33rd & Spruce Streets
Philadelphia, Pennsylvania

Dear Fro:

Thank you for referring my letter of January 6 about our historical project here to Mrs. Ralph at the Applied Science Center for Archaeology. I talked to her on the phone about a week before she went overseas. I understood she was taking the magnetometer with her and would not be back until July. However, she told me that there would be several Geohms available and that Mr. Hugh Bergh from Princeton would be available to come down to Camden in June. This was so that I could be here, since, by Doctors' orders, I have to get out of the heat and humidity for July and August.

Since I talked to Mrs. Ralph, we have been in touch with Dr. William E. Edwards, Professor of Anthropology at the University of South Carolina. He wrote me: "In large part because of the NSF grant of some \$30,000, it is likely that the Department of Archaeology could this summer finance half the cost of a small-scale project to last one to six weeks in the field and a somewhat greater amount of time in laboratory work and writing - possibly commencing as early as June 1, but preferably occurring some time between August 1 and September 15. Likely it would be possible to spend two to three weeks on the work from August 1 to August 22 with perhaps twelve students, with salary required only for me (I would not then be receiving salary from the University despite the work's being part of a course) and one or two assistants. If you desired to continue the work after August 22, likely several laborers could be procured from the county jail". *He has been away since then*

Would Mrs. Ralph be available in August? I think her experience and the more sophisticated Magnetometer would be desirable, but we would, of course, be glad to have Mr. Bergh and the Geohm.

Very sincerely,

D.L.

P.S. Your secretary told me you would be away until Tuesday. Hope you had a good trip. Dr. Edwards is anxious to make his summer plans so in words appreciate hearing from you as soon as your filed if check about

RICHARD W. LLOYD
411 PINE STREET
CAMDEN, SOUTH CAROLINA

March 24, 1965

Dr. Froelich G. Rainey, Director
University Museum
33rd & Spruce Streets
Philadelphia, Pennsylvania

Dear Fro:

I had a long talk with Dr. Edwards yesterday. He would like to start on the project on August 9th instead of August 1st. He will have his students working on an Indian mound earlier and believes they will gain experience thereby and hence be more useful on our project.

Hastily,

Dick

L/o

Technique

March 27, 1965

Dear Dick:

I have your letter of the 18th and 24th of March, upon my return from the Near East and, of course, we should be glad to collaborate in your excavations near Camden. Beth Ralph should be back here in August and I will certainly try to arrange for her to be with you by the 9th of August with the proton-magnetometer. But if there is any change in her plans which makes it impossible for her to be there, I should be able to find one of the boys to do it.

We will keep in touch and I will advise you as soon as the thing is firm.

Very best wishes,

Froelich Rainey
Director

Mr. Richard W. Lloyd
411 Pine Street
Camden, South Carolina

FGR/vg

RICHARD W. LLOYD
411 PINE STREET
CAMDEN, SOUTH CAROLINA

June 29, 1965

Mr. Froelich Rainey, Director
The University Museum
University of Pennsylvania
33rd & Spruce Streets
Philadelphia, Pennsylvania 19104

Dear Fro:

About two months ago I had a telephone call from a very efficient young lady (whose name escapes me) from The Applied Science Center. She was getting their ducks in a row for the magnetometer for the summer in the absence of Mrs. Ralph.

It has since struck me that it would be wise if I should send up some background material so that whoever comes down will be better prepared. I am therefore sending with this a copy of Historic Camden, Part I, Colonial and Revolutionary. Chapters 5, 6, and 7 cover the period with which we are most concerned: in particular, pages 127 - 133 describe the Magazine, whose foundations we have already located, and which would be the principle focus of excavation. Chapters 8, 9, 10, and 11 cover the period immediately following, and concerns the Battle of Hobkirk Hill and the British withdrawal from Camden.

Diagram #11, opposite page 130, shows the general location of the Magazine. Diagram #14, opposite page 233, shows a "British redoubt" at four different locations (see below) and also "Rawdon's Hdqtrs" which was the house of General Kershaw, later known as the Cornwallis House. We have a pretty good idea where this house was located, but would like to pinpoint it more exactly.

I believe I sent Mrs. Ralph a copy of the plan of Camden, made for General Greene by a Polish engineer, Koskiusko, which shows more redoubts than diagram #14. We hope to verify the location of as many of these as possible; most of them are located in "friendly" hands and we expect to get permission to dig.

Diagram #14 also shows the road to the ferry. We know that the western side of this ferry was protected by Cary's Fort (see pages 105 and 153). If time permitted, we would like to try to locate this fort. We have reason to believe that there was another fort on the eastern, or Camden, side of the ferry and would like to look for this.

I will send other material along as I become aware of it.

Dr. Edwards plans to start operations on August 9th. If anything interferes, he will, of course, get in touch with you or the Center at once. His address is: Dr. William E. Edwards, Department of Anthropology and Sociology, University of South Carolina, Columbia, S. C. He has unexpectedly been able to do some preliminary work on the Magazine foundation but found nothing very significant as yet.

2

Mr. Froelich Rainey
June 29, 1965

617

I am off to Cotuit, Mass. (Zip Code 02635, phone 619-428-6872) tomorrow and will be back after Labor Day. Since this is primarily a project of the Historical Committee of the Chamber of Commerce, I have asked the Chairman of that Committee, Mr. James L. Anderson (Mill Street, Camden, home phone 803-432-3065, office phone 803-432-2286) to sit in for me; although, naturally, whoever comes down from the Center should work directly with Dr. Edwards.

With best wishes,

Sincerely,

Richard W. Leigh

L/o
Enclosure

Copies to Mr. Anderson

Dr. Edwards

I've been quiet letter to me Mrs. Ralph
mentioned the expenses for the people
who would come down with me tomorrow.
I've asked for money that might be
some funds at the center to pay
pay part. All this first year is
coming out of my own pocket. - I
want to pay my way but if there
were funds from the center to pay
some of their expense I would
naturally be delighted I can't
pay in securities.

RICHARD W. LLOYD
411 PINE STREET
CAMDEN, SOUTH CAROLINA

31 March 1965

Asc H
Hand for
B side

Mr. Froelich Rainey, Director
The University Museum
University of Pennsylvania
33rd & Spruce Streets
Philadelphia, Pa. 19104

Dear Fro:

I appreciate very much your letter of the 27th about making the magnetometer available to us this summer. It sounds like a most interesting device for archaeology and we are all in great hopes that it will help us here.

Very sincerely,

Dick

c.c. Dr. Edwards

803-765-3127
3124 ←
3125

Cotuit, Mass., 02635.
July 24, 1965.

Dr. William E. Edwards
Dept. of Anthropology & Sociology,
University of South Carolina,
Columbia, S. C. 29208

(also in care of Mrs. Addie Brown
Gravel Hill Plantation, Allendale, S.C.
phone: 803-584-2585

WEEK DAY ADDRESS-DIGGING
ON AN INDIAN MOUND

Dear Dr. Edwards:

Confirming our conversation of a few days ago Mrs. Ralph prefers your date of August 2 rather than the 9th. This will enable her to come with the technician the first week and during that time to train someone (either from your group or from Camden) to act as assistant for the second week.

I understand that you will be there yourself for the first week with 6 or 7 students, plus Jeanie and Jim, and that for the second week Allen Calmes will be in charge in your absence, but that the students will be able to stay on with some modest stipend.

I wish that I could be there but it looks more and more hopeless. I know that you/our ^{know} general ideas of what should be dug intensively and what should be explored with the magnetometer, and am quite sure that you and Mrs. Ralph will be able to get the most out of this short first "dig" and work out ideas for further digging and exploration.

With best wishes,

Sincerely

Richard W. Lord

✓ c.c. Mrs. Elizabeth K. Ralph
Applied Science Center for Archaeology,
University Museum, 33 & Spruce Sts., Phila. 4, Pa.
(phones: 215-EV6-7400
215-EV6-~~8168XXXX~~. 0100, ext. 8168.)

Withhoff = 717-787-4362

Camden
Columbia

Rice House, Green St,

765-3124

9:00 Monday - Aug. 2nd
Anthropology & Sociology Office
in Barrett Bldg.

Site Chamber of Commerce
Cr. Market & Bull St.
S. central edge of town
2 1/2 blocks on dirt road,
Will find the site
2 10:00 A.M.

Morning
Am. - Aug. 10th
Papke

Call Papke Monday evening
LA 3-0053

7 1/8" ea. ~ 80
east on Rt.
N ~ 2 blocks

CAMDEN & KERSHAW COUNTY CHAMBER OF COMMERCE

CAMDEN, SOUTH CAROLINA

August 6, 1965

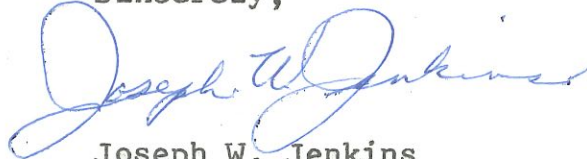
Miss Elizabeth K. Ralph

Dear Miss Ralph:

Apparently Mr. Richard Lloyd has had a change of heart regarding publicity. He did call the Chronicle editor, Bill Calk, yesterday and authorized him to get a story with a provision that he hold publicity until two weeks following completion of yours and Dr. Edwards work at the site. Accordingly, I request you release whatever information you deem prudent to Miss Harriett Holland and photographs by Miss Gretchen Robinson for ultimate publication. Whatever data you have on magnetometer which might be releasable, should certainly make good copy.

Thank you so much for remembering our admonition about news releases. You may retain this note as your authority for release of information to the Chronicle.

Sincerely,



Joseph W. Jenkins
Manager

JWJ:gt

↑
send report

2

August 13, 1965

Mr. Joseph W. Jenkins, Manager
Camden and Kershaw County Chamber of Commerce
Camden, S. Carolina

Dear Mr. Jenkins:

Our week in Camden was an enjoyable one even though we did not have much luck in finding redoubts.

I have enclosed 5 copies of our Instrument Survey Report and shall appreciate it if you will send a copy to Mr. Lloyd and to Dr. Edwards. May I trouble you also to send prints of the map and plots which were given to Mr. Anderson to these same people?

Sincerely yours,

Elizabeth K. Ralph
Associate Director

EKR:ewj

CAMDEN & KERSHAW COUNTY CHAMBER OF COMMERCE

CAMDEN, SOUTH CAROLINA

August 16, 1965

Miss Elizabeth K. Ralph
Associate Director
Applied Science Center for Archaeology
University Museum - University of Pennsylvania
Philadelphia 4, Pennsylvania

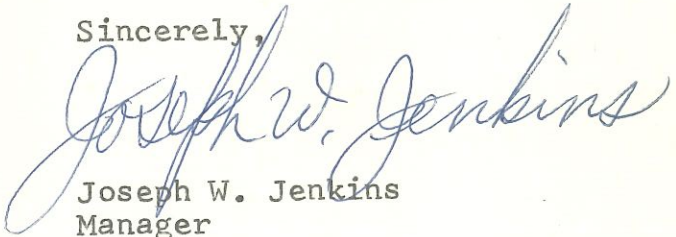
Dear Miss Ralph:

Thank you very much for your letter and enclosed complete reports which arrived today. In accordance with your instructions, a copy has been mailed to Mr. Lloyd and I have delivered a copy of all materials to Dr. Edward's assistant at the site.

Just before his departure, Henry Boerstling requested that we mail the original intensity graphs to you. They are being mailed under separate cover. Copies have been made and furnished to those authorized by you.

On behalf of the Historic Committee, I thank you for all of the hard work you and Henry put in on this project.

Sincerely,



Joseph W. Jenkins
Manager

JWJ;gt

ALSO SEE:

Historic Camden (Part One: Colonial and Revolutionary)

T. J. Kirkland and R. M. Kennedy

Kershaw County Historical Society, Camden, S.C.
Second Reprinting 1964 (Original, 1905)

A.S.C.A. lib.

by Henry Börssting
8/12/65

The Instrumental Survey in Camden, S. Carolina.

The site was on the edge of a swamp. ^{the soil} And ~~it~~ was sandy; ^{but} however, we did not find out about ^{it} ~~the condition of the soil~~ until a couple of days later. D. Edwards of the University of S. C. was in charge of the excavation. With him, there were seven students from ^{the same} ~~that~~ university. For the ~~x~~ first three days in ~~Camden~~ Camden, Miss ~~Rap~~ Ralph and I were instructing the students how to use ~~the~~ our proton-magnetometer and resistivity meter. In the evenings, we did some plotting. After these first three days, ~~we~~ ^{we} accustomed ourselves to the ^{condition} ~~environment~~ and developed an efficient ~~systematic~~ system of covering the area. So, ~~it felt like~~ that we also had more plotting and mapping to do in the evenings. The P.M. worked well at first, but it gradually gave ~~more~~ ^{reason was} more and more erratic readings. The ~~cause~~ ^{reason was} probably ~~was~~ that the hot sun ~~made the transistors~~ heated the transistors higher to their normal working temperatures, ~~and thus we had inconsistent readings.~~ Also the Geohm did not work well there because the area was extremely sandy. ~~After about two feet we came to a level.~~ ^{The water level was about 2 feet below the surface} As the sandy soil is porous, we had readings in hundreds of ohms, and ~~variations~~ ^{they were} of a hundred ohms ~~meant~~ very little or nothing. ~~It probably was a variation of the density of sandy.~~ ^{density.} The interesting ~~point~~ ^{point} was that we had lower readings over brick piles. That was because bricks ~~retain more~~ retain more moisture than sand did.

We finished the P.M. survey on Saturday morning. ~~On~~ The same morning, we started the resistivity survey of the "Cornwallis House". From the plotting, we noticed some definite pattern of the former structure, this ~~happy~~ welcoming information induced me to stay in Camden ~~for~~ till Monday when I did a few perpendicular lines to the ones we ran on Saturday.

Miss Ralph,

I hope this is alright.

Henry

placements. Also, it was very hot and the place was full of
battle fields. Most of the students were very enthusiastic about the
of Camden and the surrounding ~~xxxxxx~~ historic regions. Such as the
interesting and meaningful sites. Mr. Anderson gave us a guided tour.
This historic site was not very attractive at first. But it became more
~~xxxxxxxxxxxxxxxxxxxxxxxxxxxx~~

INSTRUMENT SURVEYS

CAMDEN, S. CAROLINA

August 2-7, 1965

by

Elizabeth K. Ralph and Henry B^urstling
Applied Science Center for Archaeology
University Museum
University of Pennsylvania
Philadelphia

Historical Background

Camden. In 1733, the British Royal Council employed J. St. Julien to survey a township on the Wateree River. This town was first named Fredricksburg. In 1750, a colony of Irish Quakers settled in this town. Joseph Kershaw arrived in Fredricksburg in 1758, and the town was named after his shop, Pine Tree Hill. In 1768, this town became officially known as Camden.

During the early Revolutionary War, an ammunition magazine was constructed. In 1780, the British army captured Camden, and used it as a defensive outpost. In May, 1780, General Gates' Revolutionary army was defeated by the British Army of Lord Cornwallis. Through this battle, Camden became a strategic town for the English. Within a short time, they constructed a wall around the town of Camden with eight fortifications surrounding it. The magazine, probably the only brick structure, was further fortified with ditches and a stockade. In April of 1781, the British Army under Lord Rawdon suffered severe losses in spite of their victory. In May, 1781, Lord Rawdon evacuated Camden within ten hours. His army burnt and destroyed all the fortifications, armaments and city works. Cornwallis House. It was built by Joseph Kershaw. During the Revolutionary War it was the Headquarters of Lord Cornwallis, Commander of the Southern British Army. It was destroyed by the Union Army during the Civil War.

Instruments

Elsec proton magnetometer - made by Littlemore Scientific & Engineering Co.,
Oxford, England

Geohm - made by Gossen Co., Erlangen, Germany (Sold by National Electronics,
Sheridan, Wyoming, U.S.A.)

Gardiner Electronic Metal Detector, deLuxe Model, Phoenix, Arizona (loaned
by Chamber of Commerce, Camden, S. Carolina)

Ground Conditions in Areas Surveyed

Soil was light in color and sandy; and contained negligible magnetization.
Water table in most of the areas surveyed was less than 3 feet deep.

Choice of Instruments for this Area

The fact that a sample of soil which was tested had negligible magnetization indicated that surveys with the proton magnetometer (an instrument which detects changes in magnetic intensity) would produce meaningful results; that is, if anomalies (small regions which differed in magnetic intensity) were found, they would be representative of man made disturbances.

For use of the Geohm, sandy soil is not good. The Geohm detects the resistivity of the soil between the inner two electrodes (the outer two, all spaced equidistantly, serve to introduce an alternating current into the ground). Areas of concentrated sand above the water table produced unusually high resistance anomalies (200 to 300 ohms at 2 1/2 ft. rod spacing in Grid #1). These represented only natural changes in the ground, but were much larger in magnitude than those expected from walls or other historic features.

With the metal detector pieces of iron on or just under the surface of the ground were detected when the detector head was directly over the object. This disadvantage and the fact that depth penetration is very poor limits the usefulness of metal detectors for large scale prospecting.

For these reasons, the major areas of interest--Grids #1, #2, and #3 (see locations on City Plan) were surveyed with the proton magnetometer. Because of

the proximity of power lines (makers of artificial magnetic fields) the area west of Grid #1 and the region of the Cornwallis house could not be covered with the proton magnetometer.

Proton Magnetometer Surveys

(See City Map for grid locations and grid plots for line locations)

The large area just north and ~~w~~^est of the wire enclosure surrounding previous and current test trenches and extending north to a line of trees was surveyed first. It was covered by means of 23 lines each 10 feet apart. Within each line readings were taken at intervals of 3 feet, and recorded on graph paper. These lines and readings comprise Grid #1. In a similar way Grid #2 (~~w~~^est and north of Grid #1 and bounded by bushes on its ~~w~~^estern side) was covered with lines 24 to 27, each 20 feet apart. Grid #3 covers the area directly north of Grid #1. It is bounded on the south by the line of trees and on the north and north~~w~~^est by brush and trees. It consists of lines 28 to 49, each 10 feet apart. The relationship of these lines to those of Grid #1 is shown on the plot of Grid #1.

When the lines of each grid were completed, the readings were then plotted on coordinate paper. On the basis of these readings, contour lines of equal magnetic intensity were then drawn. From these contour plots and from the graphs of the individual lines, one must try to interpret the results. A plot of line 6 is included as an example. It is seen in line 6 that there were irregularities in the readings and also general trends from north to south. These irregularities--sharp and narrow--are found frequently at historical sites where much iron debris has been deposited. The steep upward (or downward) peaks such as those at readings 71 and 93 usually represent reactions, in this case positive, from small pieces of iron just under or on the surface of the ground. (High proton magnetometer readings, abbreviated P.M.U., represent anti-magnetic areas and low, magnetic. One P.M.U. is roughly equivalent to the reciprocal of one gamma). Since, however,

there was a considerable region of disturbance centered around reading 80, this area was suggested for a test trench. Trench B was dug and only a few small scraps of iron were found.

Near the south end of line 6, one sees a gap in the readings. This is where the magnetic intensity or gradient was so intense that the protons could not precess. These regions are labeled "FE" on all plots. When several lines had been run and this strong magnetic region was found near the southern end of each, and when it was noticed that the stakes marking these "anomalies" appeared to be almost in a line, we began to suspect the presence of a buried pipeline. Mr. Anderson and a representative of the gas company confirmed this suspicion. These large anomalies were, therefore, caused by two cast iron gas pipes, 6 in. and 8 in. diameters, 5 feet apart, and three feet deep. This magnetic region is seen also in the upper right hand corner of Grid #1. It is not in a straight line, mostly because the three-foot intervals of each line were measured only by pacing and the paces varied somewhat.

In the contour plots of the grids, one may overlook the small irregularities that appear in the line graphs and have a better look at the overall picture. In Grid #1 on the left or north side one sees fairly regularly spaced contours most of which extend all the way from east to west. These are typical patterns of natural changes in magnetic intensity due to normal geological causes. In the central south portion there is a more or less circular magnetic region with lesser ones WSW and ENE of it. With the hope that the central large pronounced region of greater magnetic intensity and the lesser adjacent areas might represent the line of a ditch or moat surrounding the magazine, test trenches C were dug. Trenches C-1, C-7, C-13, and C-16 revealed only undisturbed earth at a depth of 18 inches, but in test trench C-4, evidence of a ditch in which water had flowed was found at a depth of 12 inches. Further excavation revealed, however, that this was a modern disturbance, probably from plowing.

The other feature worth mentioning in Grid #1 is the long narrow anti-magnetic area of line 6 where test trench B was dug. Nothing significant was found.

In Grid #2, one sees many "FE" readings which are emphasized on the plot with cross hatching. This grid and part of Grid #3 are just south of a known dump area. It is likely that the dump spilled into these regions and that the clutter of modern civilization is the cause of these strongly magnetic areas. In spite of this confusion, the trend of regularly spaced contours due to natural earth conditions may be seen.

Grid #3 reveals little except regularly spaced contours and many "FE" reactions near the dump area. Test trench D is designated as a likely spot for investigation of the dump refuse. The contours which increase in the anti-magnetic sense to a maximum of 44300 P.M.U. follow roughly the land contours of increasing elevation and happen to encircle the dump area. On the south side the contour values approach those at the north end of Grid #1 as expected. Unfortunately, Grid #3 could not be continued on the western side because of the proximity of power lines. It is not known whether or not the possible location of a redoubt as indicated in aerial photographs was surveyed. An extensive "FE" reaction in the SW quadrant (line 46) may represent a larger buried object of iron.

Geohm Survey

The area of the possible location of the Cornwallis house was also too close to power lines to enable the use of the proton magnetometer. Therefore, Grid #4 was made with the Geohm with the hope that there would be some differences in ground resistivity in the region of the house foundations. Since this small field had been under recent cultivation, pockets of sand were less troublesome than in the areas of Grids #1, 2, and 3. Readings were taken at 2 1/2 foot rod spacings along lines 50-64, spaced 10 feet apart. ~~An incomplete~~ ^{The} survey shows a

large central region of low resistance which may represent the inside area of the house foundations.

Summary

The available instrument which was most useful at this site was the proton magnetometer. With it the major find was a modern gas pipeline. The possible detection of part of the trench surrounding the magazine as first indicated in test trench C-4 is more likely only a modern disturbance. We may assume that the rest of the areas of Grids #1, 2, and 3 have been eliminated with respect to the existence of buried historic features unless they were constructed only of wood and have disappeared completely.

Acknowledgements

We are indebted to Mr. Richard W. Lloyd for suggesting and arranging that these instrument surveys be made at Camden. We wish to acknowledge the help and kind welcome offered by the citizens of Camden and, especially, in addition to Mr. Lloyd, the following members of the Camden and Kershaw County Chamber of Commerce Committee:

Mr. James L. Anderson, Chairman

Mr. Henry Savidge

Mr. Joseph Jenkins, Manager of the Chamber of Commerce

Mr. Michael Clark

We are indebted, in particular, to Mr. Anderson for sharing his knowledge of the site and guiding our work, for the tours to the other sites of interest, and for the cool soda drinks which he provided daily.

The collaboration of Dr. William Edwards and his students in a field research course in archaeology at the University of S. Carolina was a vital phase of the program, and we wish to acknowledge our gratitude to them. The students learned to use the instruments and offered able assistance. The test trenches dug by the students and supervised by Dr. Edwards helped materially in the interpretation of the anomalies found. The persons who participated actively in the instrument surveys are as follows:

Dr. William Edwards

Miss Jane Woodle

Miss Jeanne Fillman

Mr. James Thomas Green

Mr. Wick Morris

Mr. Préntice Thomas

Mr. Mike Edge

Mr. Robert Creighton

Mr. Carl Stone

Mr. Alan Calmes

Mr. James Anderson

Miss Elizabeth K. Ralph

Mr. Henry BÜrstling

References for Principles and Use of Instruments

M. J. Aitken, Physics and Archaeology, Interscience Publishers, 1961.

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ASCA Newsletter, vol. 1 (published by the Applied Science Center for Archaeology, University Museum, University of Pennsylvania, Philadelphia 4, 1965)

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Excerpt from ARA Application
CAMDEN IN THE REVOLUTIONARY WAR AND TODAY

When after the long years of cold war, years of bitterness and defiance, there remained no peaceful solution of the differences between the American Colonies and their mother country and the desperate colonies finally resorted to arms, the combat arena was very soon almost as wide as the coastal expanse of the colonies. Lexington and Concord were followed by Moore's Creek Bridge in North Carolina. On the very day that Thomas Jefferson arose in the Continental Congress to read the flowing words of his Declaration of Independence, summarizing the grievances of the American Colonies and declaring them free and independent, South Carolina was feeling the full force of British naval might as a fifty vessel armada augmented by a formidable ground force of some 3500 troops attempted an onslaught on Charleston only to be humiliatingly turned back to sea by a handful of partly armed men in a partly completed fort hurriedly fashioned from palmetto logs and sand.

During the two years following that stern rebuff, the British high command directed all its efforts to bring the Colonies to heel against the Northern Colonies. Throughout the remainder of 1776 and on through 1778 and 1779, except for the capture of the port village of Savannah, the war was all but confined to Pennsylvania, New Jersey, New York and New England. By 1780 the campaign there, despite an almost unbroken series of British victories, had reached a virtual stalemate. The once high hope for success for the Colonial cause had reached almost the vanishing point. The only hope that remained was centered on General Washington and the remnants of the army which his skill in leadership and dogged

determination had kept in the field in the face of reverses and discouragements which would have overwhelmed any lesser leader.

To break that stalemate and give the final coup de grace to the flagging American resistance the British command early in 1780 directed its attention to the Southern Colonies which were believed, not without justification, to be less disaffected than the mercantile areas of the East.

Moving north from their foothold in Savannah, a strong British force set seige to Charleston forcing its surrender in the late Spring of 1780. Lost with that principal Southern port were all the Continental forces in the South. Consequently the British commander, General Clinton, had every reason to believe that with Georgia, the Carolinas and Virginia now all but defenseless in the face of his formidable forces, the South was virtually subdued and, considering the nadir which Colonial morale had reached in the North, the war was all but won.

How it came to pass that General Clinton's apparently justifiable confidence was in fact an unjustified assumption and a disastrous error on his part is the story of the Southern Campaign -- a series of events which border on the miraculous -- a series of events which turned defeat into victory and the successful birth of a nation.

Long before the fall of Charleston, the curtain had rung down on the War north of Virginia. But in the Carolinas the battle for that port city was but the beginning of what was to turn out to be by far the most active and bloody phase of the entire struggle.

After the fall of Charleston, General Clinton thought that all he had to do to put the capstone on his subjugation of the South was to occupy the hinterland and garrison a few strategically located settlements. To that task he set General Lord Cornwallis.

Camden being at that time the principal back country town of the region and also being well located strategically to serve as a supply and garrison base for the Carolina interior, very soon after the occupation of Charleston the bulk of the British army moved up to that village and began the construction there of extensive fortifications. A drawing made by General Nathaniel Greene's chief engineer the following Spring shows the extent of those works.

In the months that followed all the way up to the last pitched battle of the war of any consequence, the Battle of Eutaw Springs in September of 1781, Camden and its fortifications remained the focal point of the entire struggle. We have prepared a map embracing an area about a hundred and twenty five miles square centered on Camden. (See Map of South Carolina) On that map, despite its very limited coverage, you will find every battle of consequence in the entire Southern Campaign excepting Savannah to the south and Guilford Courthouse to the north. You will find there the Battle of Kings Mountain, without a rival for the honor of being the most fantastic and glamorous battle of the Revolution, the battle regarded by many historians as marking the turning point of the Revolution and hence the key to the ultimate Colonial victory. There also to the northwest from Camden is Cowpens, which has been called by military experts the most imitated battle in

history. East and south of Camden you will see the river swamp haunts of the war's most dramatic leader, Francis Marion, and his dragoon leader, Lighthorse Harry Lee, the father of Robert E. Lee. Also there you will find Ninety-Six, Blackstock's, and Hanging Rock where young Andrew Jackson fought, and many others. Camden itself was the site of two of the major engagements of the campaign - one, Hobkirk Hill, in the town itself, the other, the Battle of Camden a few miles northward. George Washington, General Greene, the Marquis deLafayette, Lord Rawdon, Lord Cornwallis, Colonel Tarleton walked the streets of the village. Andrew Jackson was a prisoner of war there. Baron deKalb lies buried there.

We suspect that when we were mentioning the names of some of those battles which appear on our little map, unless you happen to be a history buff or happen to have a special interest in our region or in the Revolution, most of those names were quite unfamiliar to you, well educated Americans, proud of our country's heritage, as I am sure you are. Yet, on some of those names hung the very destiny of America. The fate of the infant nation often hung in balance on those battlefields. And yet, I am sure that to most Americans they are little more than far away places with strange sounding names.

And thereon hangs our case.

The Mayflower is so well known to every American school child that a shocking proportion of them are quite ready to identify it as the ship which brought the first settlers to America, which is an almost excusable error when one considers that, at least until recent editions, one could not find even in the Encyclopedia

Brittanica any mention of the Susan Constant, the Goodspeed and the Discovery, those ships which actually had the honor of bringing the first English settlers to our shores. Of course, the trouble here is that Virginia had no longfellows, Lowells and Holmes' to build verbal monuments to its all but forgotten boats. It took Rockefeller millions and the physical restoration of old Williamsburg to rescue Susan Constant and her companions from practical oblivion.

So, likewise, Lexington and Concord can thank Emerson for the fame that they enjoy far beyond their contemporary significance.

Unfortunately, for a proper appreciation of the significance of the Southern Campaign in the shaping of the destiny of America, the Carolinas had no literary flowering such as New England had in the nineteenth century to build verbal monuments to glamorize and make memorable what happened there. And so the world has largely forgotten. Nor have we at our disposal Rockefeller millions to rescue from oblivion those glamorous pages of our national history.

Lacking those things we are here to ask your assistance. If it is granted we have high hopes that we may take tangible steps towards remedying the relative oblivion of that great segment of our historical heritage, steps which will serve the dual purpose of aiding our economy while enhancing America's understanding of its history and appreciation of its heritage.

To accomplish those objectives, we visualize a partial restoration of the Camden fortifications, a combination museum and exposition in which topographical maps, animated maps, the campaign

marches and battles will be graphically displayed. Those exhibits will be correlated with permanently marked tours leading out from Camden to guide the interested tourist along the lines of march of the contending forces and to the battlefields of the campaign where on-the-site plans of each battle will be on display.

Over the years the Kershaw County Historical Society and the Daughters of the American Revolution have sought to keep alive a wide interest in Camden's historic background. They have been responsible for erecting markers on the battle sites, printing pamphlets on the era, conducting essay contests for school children and in numerous other ways promoted historic appreciation of Camden.

These efforts have greatly assisted the development of a healthy tourist business in the city. There are in Camden at least fifty dwellings that are more than one hundred years old. In addition, two specimens of Robert Mills architecture still stand: the Bethesda Presbyterian Church and the Old Court House. Each spring a tour of these fine buildings is conducted and attracts wide attention. Among these is the beautiful ante-bellum home in which George Washington dined in 1791 as he passed through Camden on his tour of the Southern States.

The tourist today visits the burial site of Joseph Kershaw, the Patriot of the Revolutionary War, and the grave of Lt. Richard R. Kirkland, the "Angel of Mary's Heights" who gave drink to the enemy during the Civil War. In Quaker Cemetery rests one Dr. Todd who was a surgeon in the Confederate Army and brother-in-law of President Abraham Lincoln. Baron DeKalb, hero of the Revolution is buried before the stately columns of Bethesda Presbyterian Church.

These and many others are designated by markers and described on historic and scenic tour maps and pamphlets.

We are fully cognizant of the fact that the accomplishment of all this is a really ambitious project. That being so, we must be sure not only of the feasibility of our project but also of its worthwhileness not only from the historical and educational standpoints but also from the economic standpoint. We can't afford to be wrong in our assumptions that our project does have those merits. It is primarily to test those assumptions through a thorough study by experts in the several fields involved that we are submitting to you today our request for a grant for a technical study of our proposed project.

FREER GALLERY OF ART LABORATORY, WASHINGTON, D.C.

UNDER THE DIRECTION OF R. J. GETTENS

Chinese Bronzes

The work of the laboratory during the past year has concentrated on the technical study of Chinese ceremonial bronze vessels of the Shang and Chou dynasties in the Freer Collection. Chemical and spectrochemical analyses were made on 120 vessels. Much attention has been given to methods of fabrication as revealed by mold join marks, chaplets, and the joining of legs and handles by interlock casting and hard soldering; inlay materials, corrosion products, ancient repairs and "enhancement" of patina in the hands of former owners and collectors have also been investigated. Recently a special study was made using high energy X-rays, which has revealed much about both original methods of construction and modern repairs. All of these findings are being prepared for publication as a supplement to a new Freer Gallery of Art catalogue on the vessels.

Studies in Early Chinese Iron-Bronze Weapons

A small but important problem that has been carried on for several years is the study of two Middle Chou dynasty bronze weapons, one bearing an iron point, the other an iron blade. X-rays have shown that the bronze members of the weapons were inter-lock cast to the iron. Electron micro-probe studies made at the Division of Meteorites, Smithsonian Institution, indicate the iron is probably of meteoric origin.

Staff

Mr. W. Thomas Chase, student at the Conservation Center, Institute of Fine Arts, New York University, is spending an intern period of one year in the Freer Laboratory as Assistant in Technical Research. He is assisting the bronze project by performing X-ray diffraction analysis, micro-analysis and photomicrography. He also supervises the conservation of metal objects, stone objects, and ceramics. Mr. Chase is about to undertake a technical study of the large collection of inlaid Chinese bronze belt hooks in the Freer Collection. Mrs. Ilona Bené is working part-time on the conservation of Japanese wood sculpture and metal objects. Miss Barbara Bernhard, student at Oberlin College has served all summer as intern assistant in the laboratory performing a variety of useful functions.

September 10, 1965

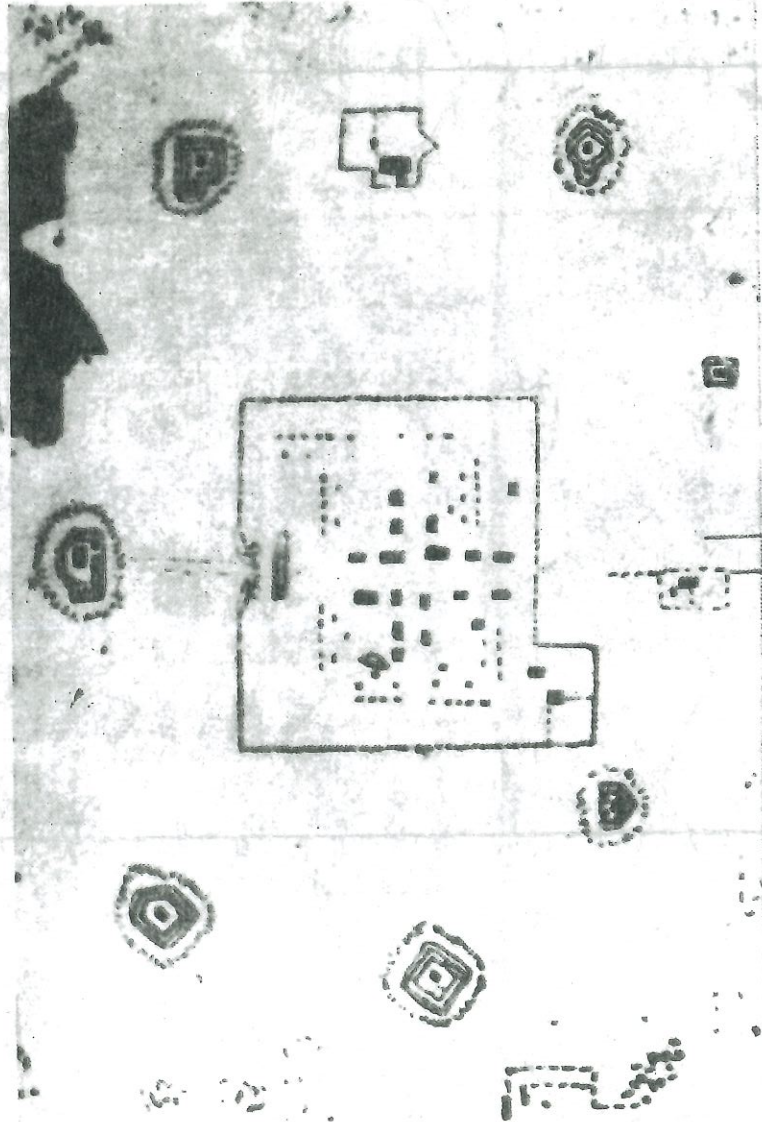


Rutherford J. Gettens
Head Curator
Freer Gallery Laboratory
Freer Gallery of Art

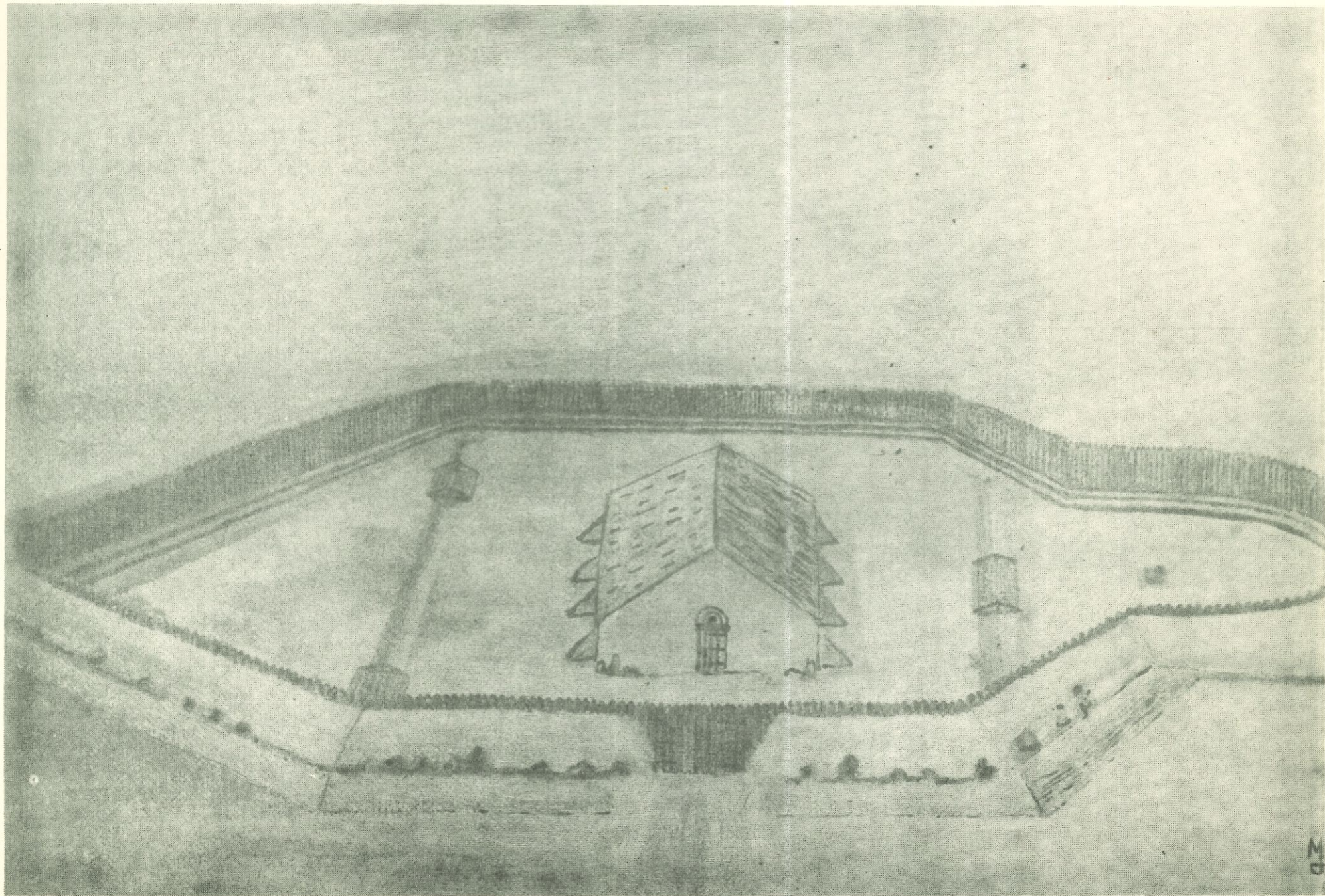
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A Profile of Camden

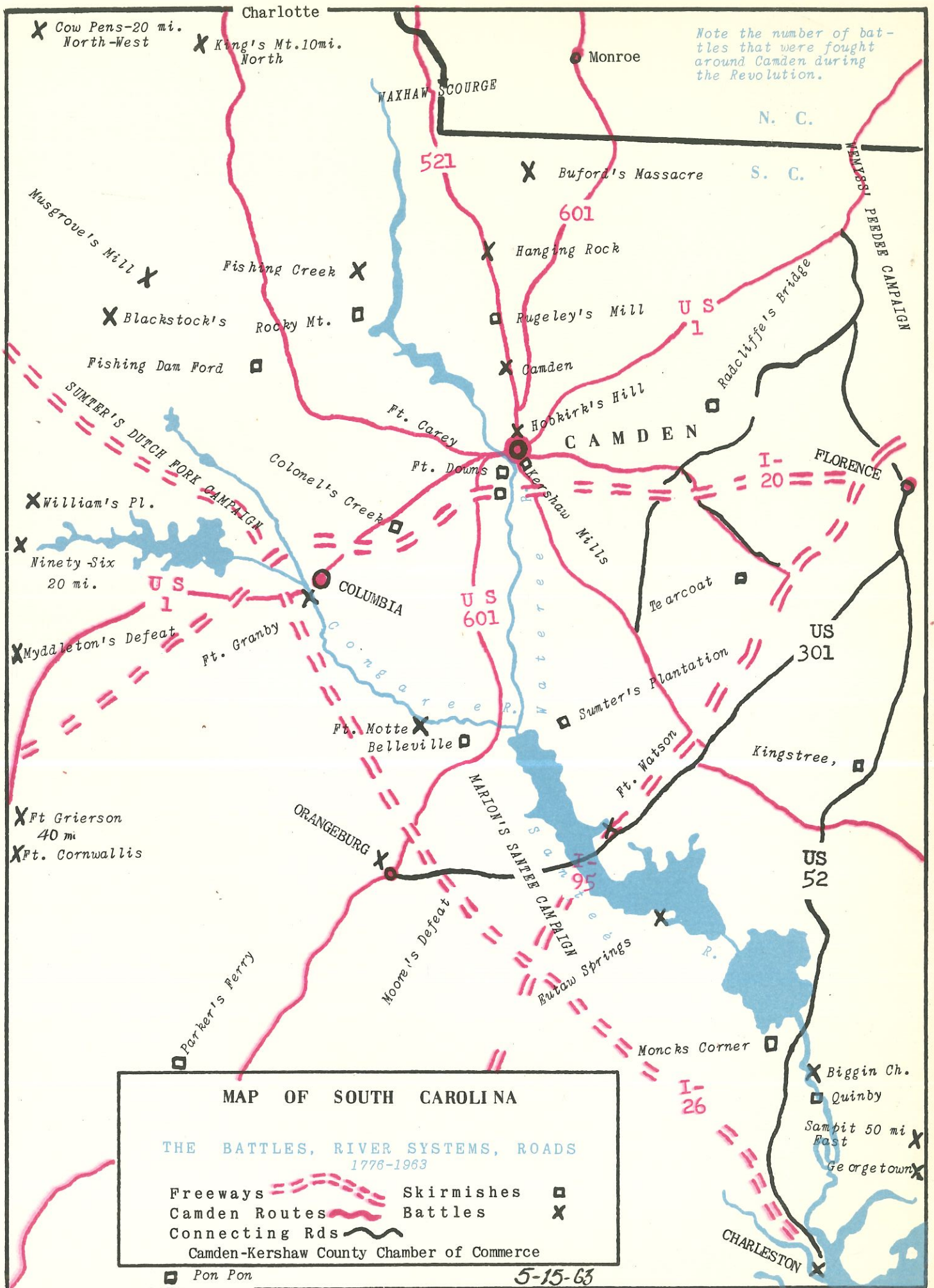
By REV. M. H. OSBORNE



GREENE'S 1781 PLAN OF CAMDEN
(First Time Ever Published)







X Cow Pens-20 mi. North-West
 X King's Mt. 10mi. North

Note the number of battles that were fought around Camden during the Revolution.

MAP OF SOUTH CAROLINA

THE BATTLES, RIVER SYSTEMS, ROADS
 1776-1963

- Freeways Skirmishes
- Camden Routes Battles
- Connecting Rds
- Camden-Kershaw County Chamber of Commerce

Pon Pon

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Fort Diggings

(additional pictures, page 5)



EXPLORATION — This photo shows ten squares which were all dug about 12 inches deep. This was one of the areas in which the magnetometer recorded more than average disturbance.



FINDING AT THE REDOUBT—Bob Crayton and Allen Calmes examine the redoubt excavation around a stump which is covered with wet rags. If the stump had dated back to the late 1700's, it would have fallen to pieces so this precaution was taken.

Chamber Project

Archaeologists Seek Relics At Ft. Camden, Magazine Site

Story by Harriet Holland
 Pictures by Gretchen Robinson

Relics dating back to days of the Revolutionary War are being sought by archaeologists as they dug in the area of the old Fort Camden this month.

The fort and magazine (the room in which powder is kept in a fort), were built in approximately 1770. The site is near Zemp Stadium and Magazine Hill.

Archaeologists from the University of South Carolina and the University of Pennsylvania began exploring the area August 2, and completed this phase today (Friday). Financial support for the project was provided by Mr. and Mrs. Richard W. Lloyd of Camden who own the property on which the fort site is located. Coordination of all research connected with the undertaking since inception of the endeavor several years ago was effected by the Historic Committee of the Camden and Kershaw County Chamber of Commerce. City Commissioner James Anderson is chairman of the committee and Mr. Lloyd is one of the members.

FINDING

The main concentration point for the group was the powder magazine. Portions of a brick wall were uncovered in the area, but it is not known at this time whether these were the older wall or a more modern one. It is thought that the walls could have been built of wood and disappeared completely.

Very few artifacts (products of human workmanship) were found other than nails, bricks, and a few pieces of porcelain. However, the artifacts found compare with those found at Yorktown and Williamsburg.

One metal object which could be a trigger guard was uncovered, but it will have to be treated to determine its exact function.

One unusual find caused quite a stir. It seems that the mechanical equipment used detected a strong magnetic region in one area. However, this "find" soon proved to be two cast iron gas pipes, six inches and eight inches diameter, five feet apart and three feet deep.

PERSONNEL

Miss Elizabeth K. Ralph of the University of Pennsylvania spent one week at the fort site. Miss Ralph, who is with the Applied Science Center for Archaeology at the University, is occupied with research work and the testing of instruments.

Dr. William Edwards, professor of archaeology at the University of South Carolina, also participated in the fort work.

With Dr. Edwards were a number of his students in Field Research 105-106. The students' majors ranged from Latin to psychology to history to business administration. These student volunteers worked from 6 a.m. until 6 p.m. each day and, along with class credit, received a state stipend.

Student workers included Jane Woodle, Jeanne Fillman, James Thomas Green, Wick Morris, Prentice Thomas, Mike Edge, Robert Creighton, Carl Stone, and Alan Calmes.

EQUIPMENT

The main instrument used was the Elsec proton magnetometer which is made in Oxford, England. The giration rate of the proton is dependent on magnetic intensity and, for this reason, modern clutter prevents accuracy, as was the case with the pipeline.

Miss Ralph explained that the magnetometer works on a fundamental physics principle: Readings were taken at approximately every yard. The person who walked off the yard held a detector bottle of alcohol. When the button on the machine, located some distance away, was pushed, a DC current flowed in to the coil surrounding the bottle making an artificial magnetic field. Thus the protons were lined up and the

(Continued On Page 2)



MAGAZINE — One of the first excavations was done in the probable location of the old magazine. Jane Woodle scratches the dirt from around the bricks and records her findings by drawing the exact location of each brick. The brick are believed to be part of the magazine's foundation.

Archaeologists

(Continued From Page 1)

speed of rotation gave a measurement of the magnetic intensity under the bottle.

The Geohm was also used in some points but was not the major instrument because it does not operate well in sandy soil. The Geohm was, however, used at the location of the Cornwallis house. Since this small field has been under recent cultivation, pockets of sand were less troublesome than in other areas. The survey shows a large central region of low resistance which may represent the inside area of the house foundations.

LOCAL WORK AND AIMS

The area was found, according to the crew, by aerial photographs, tradition, and exploratory trenches.

One of the main reasons for recovering the area is allegedly to promote the historical significance of Camden. The ideal purpose, one student said, is to aim at the ability to reconstruct a trench entirely in a laboratory.

Workers said it is thought that one reason for the disappearance of the original bricks is they were looted by the townspeople when the magazine was abandoned. It is known some were used in the construction of the old courthouse.

The University of Pennsylvania became interested when they were contacted by the Lloyds. Miss Ralph had previously been occupied with uncovering the lost city of Sycharis, Italy.

BACKGROUND

During the early Revolutionary War, an ammunition magazine was constructed in the town of Camden. In 1780, the British army captured Camden and used it as a combat and supply headquarters thereafter in the Southern Campaign. In May, 1780, General Gates' army was defeated by the British army of Lord Cornwallis and Camden became even more strategic for the English. Within a short time, they constructed a wall around the town with eight fortifications (redoubts) surrounding it. The magazine, probably the only brick structure, was further fortified with ditches and a stockade.

In April of 1781, the British army under Lord Rawdon suffered severe losses in spite of their victory. In May, 1781, Lord Rawdon evacuated Camden within ten hours. His army burned and destroyed the fortifications, armaments, and city works.

The Cornwallis house, which was built by Joseph Kershaw, was the headquarters of Lord Cornwallis, commander of the Southern British Army during the Revolutionary War. It was destroyed by the Union Army during the War Between the States. Lord Cornwallis went to the Battle of Guilford Court House and thence to Yorktown where he surrendered.

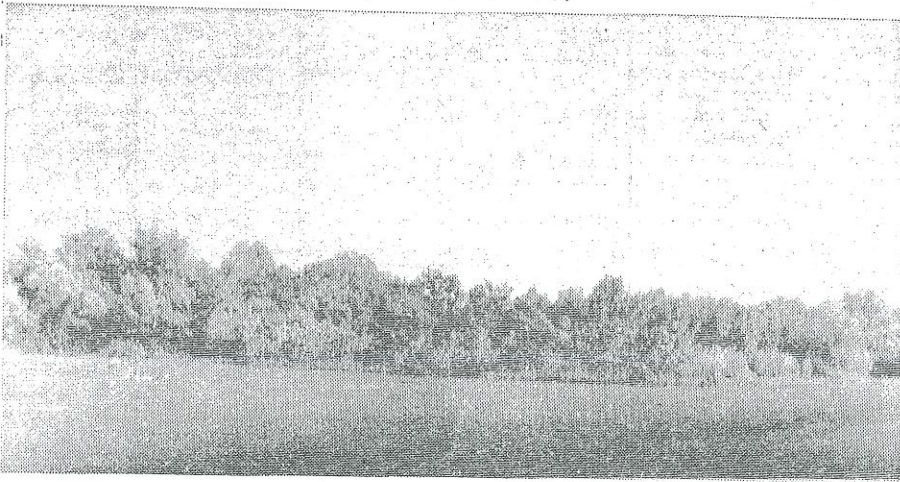
The works of these groups represent the beginning of explorations which the Chamber committee hopes will later materialize in the restoration of the fortifications.



REDOUBT? Bob Crayton and Jeanne Fill van carefully sift through soil in one trench which might have been one of a possible 8 redoubts once located around the Fort for fortification against attackers.



EQUIPMENT AT WORK — Miss Elizabeth K. Ralph (left) of the University of Pennsylvania supervises the students while they work with the Elsec proton magnetometer. The instrument, which measures magnetic intensity, was the major one used at the fort site.

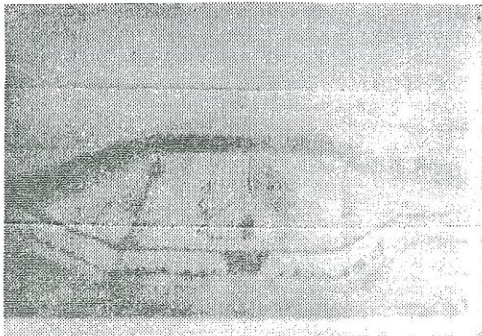


GENERAL VIEW — This view shows a portion of the fort in its modern setting. In the background, personnel dig exploratory trenches.



POST HOLES — The discolorations in the lower part of this photo indicate possible positions of Posts around the redoubt. The post positions were found when the top of the soil was scrapped and darker earth appeared.

CONVERSION ARTSIT
HOUSTON (UPI) — Houston quarterback George Blanda holds the American Football League record for point-after touchdown conversions. Blanda booted 64 one-pointers in 1961.



OLD MAGAZINE — This is a reproduction of a drawing showing what the magazine was believed to have looked like. Studies show that the magazine resembled this drawing.