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COAST AND GEODETIC SURVEY
R. S. PATTON, Director

Special Publication No. 187

FIRST-ORDER TRIANGULATION AND TRAVERSE IN ARKANSAS

(1927 DATUM)

BY

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UNITED STATES
GOVERNMENT PRINTING OFFICE
WASHINGTON : 1934

National Oceanic and Atmospheric Administration

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January 1, 2006

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FIRST-ORDER TRIANGULATION AND TRAVERSE IN ARKANSAS (1927 DATUM)

GENERAL STATEMENT

This volume contains the results of all the first-order triangulation and traverse in Arkansas that has been executed by the Coast and Geodetic Survey and adjusted on the North American datum of 1927. Early in 1934 an arc of first-order triangulation was extended from the vicinity of Alton, Mo., to the vicinity of Lonoke, Ark. This arc will later be extended to the vicinity of Monroe, La., and since it cannot be adjusted until this extension has been made, the data for the stations along this arc of triangulation are not included in this publication.

The locations of the triangulation arcs and the traverse lines can be most readily seen by referring to the index sketches at the back of this publication. On page 4 will be found instructions on how to find the data for any particular station or for all the stations in a particular region.

This volume is the seventh of a series of publications, each of which will contain the geographic positions on the new datum, and the descriptions and other data, for all first-order triangulation and traverse of a State, or occasionally of two States. The following volumes have already been published, or are in the hands of the printer:

- Triangulation in Colorado, Special Publication No. 160.
- First-Order Triangulation in Southeast Alaska, Special Publication No. 164.
- First and Second Order Triangulation in Oregon, Special Publication No. 175.
- First-Order Triangulation in Kansas, Special Publication No. 179.
- First-Order Triangulation and Traverse in Louisiana, Special Publication No. 183.
- First-Order Triangulation in Missouri, Special Publication No. 186.

READJUSTMENT OF THE TRIANGULATION NET

The triangulation of the United States has been built up by continually adding new arcs to those already measured, and for many years in adjusting this triangulation the plan had to be followed of fitting the new arcs of triangulation to the old ones which had been previously adjusted. This method was the only one that could be followed until a comprehensive net had been built up and it led to no serious difficulty until the point was reached where the new arcs formed closed loops with the old arcs. It then developed that the last arc to close the loop received excessive corrections when adjusted to the previous triangulation because the entire error of closure of the loop had to be absorbed by it.

It was realized that the only way to overcome this difficulty was to adjust the entire network at one time. It was impracticable,

however, to readjust the network each time a new arc was added or an additional loop was closed as the time required to do so was too great and if this were done, the geographic positions of the triangulation stations would be in a continual state of change, a condition very disturbing to those using the data.

In 1926 the triangulation net west of the ninety-eighth meridian had become so extended that it could serve as a framework for all future triangulation in that area and it was found desirable to adjust this portion of the United States net in one piece. In preparation for this adjustment a method was devised, in 1924, at the office of the Coast and Geodetic Survey,¹ by means of which a large network of triangulation could be adjusted within a reasonable time and at a comparatively small cost. This method was applied first to the triangulation west of the ninety-eighth meridian, involving 12,500 miles of arcs in 16 closed loops. Later it was applied to the eastern half of the net involving 13,000 miles of arcs forming 26 loops. The adjusted net of the country is now of such extent and strength that all new arcs hereafter can be fitted to it without having to disturb the old work and without causing excessive corrections to the new work.

NORTH AMERICAN DATUM OF 1927

The original adjustment of the triangulation included in this publication was computed upon the Clarke spheroid of 1866, on what was called at that time the North American datum. In the readjustment of the triangulation in the western part of the United States the same spheroid was used as surface of reference, but only one station was held in position. The station, Meades Ranch, in Kansas, was assigned the same position that it had in the original United States standard datum, later called the North American datum. This position of Meades Ranch is as follows:

$$\begin{aligned}\phi &= 39^{\circ}13'26''.686 \\ \lambda &= 98\ 32\ 30\ .506\end{aligned}$$

This position was held in the new datum because it had been found to be best in accord with the country as a whole in the extensive investigation that was carried out at the time of the adoption of the original datum. If any are interested in the procedure followed in the establishment of this former datum, an account of it can be found in any one of the following publications, which contain triangulation and traverse data based on the datum in use prior to 1927: Special Publications Nos. 11, 13, 16, 17, 19, 24, 30, 31, 43, 46, 54, 62, 70, 74, 76, 78, 79, 86, 88, 101, and 114.

The orientation in the new adjustment is controlled by the various Laplace azimuths distributed throughout the network of arcs. The position of Meades Ranch, together with the Laplace azimuths included in the arcs, serves to define the North American datum of 1927. The date is appended to the name of the new datum to distinguish it from the old North American datum. A station is said to be on this North American datum of 1927 when it is rigidly adjusted to the scheme of the readjusted triangulation.

¹ For a description of the method used see Special Publication No. 159.

ARCS INCLUDED IN THIS PUBLICATION

The triangulation included in this publication consists of an arc extending north and south through the western part of the State, approximately along the ninety-third and ninety-fourth meridians, an east and west arc along the thirty-fifth parallel west of Little Rock, and an arc following the Mississippi River along the eastern border of the State. The traverse follows the Chicago, Rock Island & Pacific Railway from Little Rock to Memphis, Tenn.

All of the triangulation in this publication was included in the adjustment of the eastern half of the United States except that part of the thirty-fifth parallel arc east of the ninety-third meridian and the Little Rock-Memphis traverse. After the eastern adjustment was completed, the triangulation along the thirty-fifth parallel between the ninety-third meridian and Little Rock was adjusted and then the traverse was adjusted between the triangulation at Little Rock and that at Memphis.

Triangulation just over the boundary in adjoining States has been included in this publication in order that all data for surveys in Arkansas, even near the boundaries, might be available in the one volume. The overlapping is especially large in Mississippi, where part of the arc along the Mississippi River is entirely in the State of Mississippi, and in Texas where part of the arc along the ninety-fourth meridian is entirely in Texas.

GENERAL DESCRIPTION OF TABLES AND SKETCHES

The tables of geographic positions, on pages 13 to 38, also contain the distances between contiguous triangulation stations in meters and feet, the logarithms of the distances in meters, and the azimuths of the lines joining these stations. The distances are corrected for elevation above mean sea level, and the azimuths are referred to the true south. Anyone who wishes to obtain the actual distances between the triangulation stations should use the formula given on page 12, by which the true distance at the mean elevation of the stations can be derived from the distance at sea level. The descriptions of the stations, given on pages 41 to 88, are designed to enable the engineer to recover and identify the station mark after he has visited the general locality of the station. There will be times when the description, so far as witness and other marks are concerned, will have become out of date from changes by nature or by the work of man. Any engineer who may visit a station and find that the description does not truly represent the present conditions, or who finds the mark destroyed or mutilated, should report the facts to the Director of the Coast and Geodetic Survey, at Washington, D.C., in order that the files of this office may be kept up to date. The engineer should realize that the triangulation extended over the country by the Coast and Geodetic Survey is a public survey, made for the use of the people. The stations really belong to the States in which they are located, and the engineer who is so fortunate as to find one of these stations located near his work should help to perpetuate the monuments in order that they may be of continuous service and value to his locality. The Coast and Geodetic Survey officials will, from

time to time, visit the stations established and will re-mark and re-describe them if necessary.

At most of the stations there are reference and witness marks that were established to assist in locating the station. The distance and azimuth from the station to each of these additional marks are usually given in the description of the station, and the measurements are supposed to be so carefully made, at least to the reference marks, that if the station mark becomes lost or destroyed the station can be relocated accurately enough for use in third-order and local surveys.

Near the back of this publication will be found a number of sketches which show graphically the approximate locations of the stations, especially with reference to State and county boundaries, and the lines over which the main-scheme observations were made. It is suggested that if one should wish to learn whether there are triangulation stations in the vicinity of his work he should first consult the sketches. He can obtain from them the names of the stations that may be of help to him; then he should turn to the index on page 95 of this volume, from which he can find the pages upon which the descriptions and geographic positions of the stations appear.

OTHER PUBLICATIONS OF VALUE TO THE ENGINEER

If an engineer wishes to compute geographic positions for the stations of any triangulation that he may execute, he should procure a copy of Coast and Geodetic Survey Special Publication No. 8 from the Superintendent of Documents, Washington, D.C. The cost of this publication is 25 cents. If he is interested in knowing the length in meters of the degrees, minutes, and seconds of latitude and longitude in the region in which he is working, he can obtain them from Special Publication No. 5, which can be purchased at a cost of 20 cents from the Superintendent of Documents. Condensed tables for the latitude of Arkansas are shown on page 10.

In order to make geodetic control data of greater use to engineers and surveyors, an effort is being made to establish one or more plane-coordinate systems in each of the 48 States. When this work has been completed the data for each triangulation station in a State will include its x and y coordinates as well as its latitude and longitude. A brief explanation of plane-coordinate systems is contained in Serial No. 562 of this Bureau. A more detailed publication will be issued in the near future.

The Coast and Geodetic Survey has issued a number of manuals on the various classes of its work. The ones that would be of value to an engineer in connection with triangulation, including base measurements, are Special Publication No. 120, Manual of First-Order Triangulation, cost 40 cents; Special Publication No. 145, Manual of Second and Third Order Triangulation and Traverse, cost 60 cents; and Special Publication No. 137, Manual of First-Order Traverse, cost 30 cents. An engineer, interested in the determination of azimuth to a high degree of accuracy, should procure a copy of Special Publication No. 14, Determination of Time, Longitude, Latitude, and Azimuth, cost 35 cents. If he is interested only in the determination of approximate azimuths, he should secure a copy

of Serial No. 166, Directions for Magnetic Measurements, cost 15 cents.

In computing his triangulation the engineer will find that Special Publication No. 138, Manual of Triangulation Computation and Adjustment, cost 50 cents, will be of great assistance to him.

The reader can secure from the Director of the United States Coast and Geodetic Survey, free of charge, several leaflets which describe geodetic surveying and which also show how triangulation can be used in connection with the boundary surveys of private and public property.

CLASSIFICATION OF TRIANGULATION

Triangulation is divided into different classes according to accuracy. Four classes of triangulation are now defined by the Federal Board of Surveys and Maps, viz, first, second, third, and fourth orders. The first three of these are, respectively, equal in accuracy to the classes primary, secondary, and tertiary as formerly defined and used by the Coast and Geodetic Survey.

The ultimate criterion applied in classifying the different grades of triangulation is the actual error in the length of any line. This is indicated by the discrepancy between the measured length of a base line and its length as computed through the triangulation from the last preceding base. In first-order triangulation such discrepancies must not exceed 1 part in 25,000, in second-order triangulation 1 part in 10,000, and in third-order triangulation 1 part in 5,000. Before making the comparison between the computed and measured lengths the adjustment of the triangulation should be carried to the point where the side and angle equations have been satisfied. It is also necessary to take into consideration the maximum actual error in the measurement of the base lines.

To secure the accuracy indicated above, certain standards are adopted for the field work, the most important one of which relates to the closing errors of the triangles or the discrepancy between the sum of the measured angles in a triangle and 180° plus the spherical excess of the triangle. In first-order triangulation the average closing error of the triangles must not be greatly in excess of 1 second, in second-order it should not be more than 3 seconds, and in third-order not more than about 5 seconds. The shape of the figures in the triangulation scheme, the frequency of bases, the size and type of instrument, and the number and kind of observations are all selected with due regard to the accuracy desired.

Under certain conditions the proportionate error in the length of a line as specified above may be found to be exceeded in any class of triangulation. Where two points are fairly close together as compared with the size of the triangulation scheme, the distance between those points may be in error in excess of that indicated by the class of triangulation of the scheme. The accuracy of the computed length of any line can be estimated by computing the ΣR_1 in accordance with the formula for the strength of figures as given in Coast and Geodetic Survey Special Publication No. 145. In any class of triangulation the subsidiary stations will be located with a less degree of accuracy than the main-scheme stations,

CHARACTERISTICS OF FIRST-ORDER TRIANGULATION

The triangulation contained in this volume is of the first order. First-order triangulation is done with such accuracy that the average closing error of the triangles is about 1 second or less. In order that the angles may have this high degree of accuracy, large theodolites are used. The theodolite, as is well known, is similar in its appearance to the surveyor's transit. The main differences are in the excellence of the workmanship, the accuracy of graduation of the circle, in having micrometer microscopes for reading this circle, and in having a telescope with a high resolving power. Observations are made either on heliotropes, by which the light of the sun is reflected toward the observer, or on acetylene or electric signal lamps. The heliotope, or lamp, and the theodolite must be centered directly over the station marks.

At certain intervals, depending upon the shape of the triangles, base lines are measured. A base is necessarily a side of one of the triangles. The ends of the base must be intervisible from the ground or from towers that may be erected over them. In the early years of the Coast and Geodetic Survey's existence the base lines were measured with metal bars, but near the beginning of the present century steel tape lines began to be used in the measurements. Since 1907 all of the bases of the Survey have been measured with invar tapes. The probable error of a measured base is about 1 part in 1,000,000 of its length. This accuracy meets all the requirements of engineering and science.

The azimuths of the triangulation depend upon what are called Laplace azimuths, or azimuths determined by observations on Polaris, which have been corrected for the deflection of the vertical at each Laplace station. These deflections are due to the attraction of mountain or plateau masses that are comparatively near the place at which the observations are made. The probable error of a Laplace azimuth is about ± 0.3 second.

If one is interested in the accuracy with which the triangulation of the Coast and Geodetic Survey is done and the reliability of the geographic positions which are given in this publication, he should refer to Special Publication No. 159, The Bowie Method of Triangulation Adjustment as Applied to the First-Order Net in the Western Part of the United States.

SECONDARY STATIONS

In addition to the stations which form the main network of triangles in Arkansas, a number of objects, such as church spires, and schoolhouse cupolas, were observed upon from stations of the main scheme. The geographic positions of these secondary stations have been computed and the data are included in the tables on pages 13 to 38. These stations are shown on the sketches and in the index, but only a few of them are given in the descriptions of stations, as in most cases the name of the object is all the description that is available. Ordinarily the name of the secondary station is sufficient for its accurate identification by the engineer who may wish to use it.

USE OF HORIZONTAL CONTROL DATA

The plan or map for any extensive engineering project, whether or not map construction is the primary object, should have all of its parts properly correlated and should be on the same datum as adjacent surveys. Federal and State mapping organizations have long been aware of the necessity for having all surveys based upon a common datum, but local engineers and surveyors in this country have too often in the past been content, and in many cases compelled to use a local datum for their surveys. The future economic disadvantage of such a system is now becoming recognized, with the result that city and county surveys are being more generally placed upon a permanent basis by connecting them to stations on the North American datum of 1927.

One other factor must be taken into consideration by the engineer of today. As the States develop industrially they will undoubtedly follow the lead of one of the Eastern States, Massachusetts, which with splendid foresight has extended its triangulation control over the entire State for the purpose of defining property boundaries in terms of latitude and longitude. The advantage of such a system is well stated in the following extracts from the report on the Maryland oyster survey:

The difficulties of accurately locating and permanently defining the boundaries of a farmer's plantation on land, even with the aid of monuments, public roads, streams of water, and other points of reference, are often great, judging from the disputes frequently arising in connection with boundaries. * * *

There is only one point on the earth's surface at the intersection of any one parallel of latitude and any one meridian of longitude, and therefore there can be no dispute as to the meaning of such a geographic definition of the location of a point, even though all the original triangulation station marks used in its determination, together with the chart on which its position was originally plotted, have been totally destroyed.

In the case of the destruction of an original triangulation station mark, or any other point defined by a geographic position, a competent geodetic engineer can reestablish its exact location by means of a new system of triangulation connecting with other distant triangulation marks which have not been destroyed.

There are a number of instances where corporations owning large tracts of land have attempted to make surveys of their boundaries and of subdivisions of property by means of traverse. This method can be used if certain precautions are taken, but most of these corporations have found it advisable to use the method of triangulation for the determination of relative positions of their boundary monuments and of other points which lie within those boundaries. If the triangulation in question is connected with the triangulation system of the Coast and Geodetic Survey, then true geographic positions can be obtained as well as the relative ones.

In a section of the country covered by adequate geodetic control the data are available to the engineer for any of the following operations, in addition to their possible future use as a basis for cadastral surveys:

- 1. Extensive mapping.**—The topographer needs as initial data for beginning a topographic survey the distance and direction between two points and the geographic position of one of them in latitude and longitude. His local triangulation or traverse, based on this

control, will prevent the accumulation of excessive errors as he carries on his mapping operations. In the event that the available first-order triangulation in that region has lines of too great length to join to conveniently, he can measure a base and azimuth at some place visible from a first- or second-order triangulation station and connect his base to the station by triangulation, thus obtaining proper geographic positions for his local surveys. On recent triangulation special azimuth marks have been set. (See p. 12.)

2. Boundary lines.—If it is desired to locate or to delimit accurately and permanently the boundaries of political subdivisions, such as States, counties, or cities, the methods indicated in the preceding paragraph may be followed. Whenever possible, a line of the adjusted triangulation or traverse should be used as a basis for local surveys rather than a point, since a line gives the three essentials of position, length, and direction.

3. Local intensive surveys.—The necessity for such surveys arises most frequently in connection with extensive improvements over a considerable area or as a basis for city planning, where the needs of a city are being anticipated for a number of years. Here the requirements are somewhat different from those in the two preceding operations, for it is often necessary to extend first- or second-order control in considerable detail over the entire area affected, third-order triangulation or traverse then being used to furnish additional points for the survey. Such a control survey should invariably be started from a line of adjusted triangulation or traverse.

While it may be noted in the preceding paragraphs that the azimuth and length of one line and the geographic position of one end of that line constitute the essential data for the complete utilization of old work as a basis for new work, there is always grave danger in depending upon this minimum of data. There may be failure to identify the true station mark, or the mark, though genuine, may have been tampered with or otherwise disturbed in position. This will, of course, introduce an error into the new work based on these stations. It is the present practice in this Survey, unless unusual conditions render it unnecessary, to establish the integrity of the recovered points by using at least three old stations as a basis for new work, the third station serving as a check for the two stations on which the new work may actually depend.

In local surveys where the area is of limited extent it is usually desirable to use a system of plane coordinates. Such systems are now being established for each of the States. (See p. 4.) The Coast and Geodetic Survey will be glad to give advice on any problem arising out of the use of its control points or on any proposed extension of triangulation or traverse from them.

EXPLANATION OF TABLE FOR POLYCONIC MAP PROJECTION

The engineer or surveyor who makes use of the data in this publication may find it desirable to construct a map covering the territory he is surveying. He may wish to show on this map the meridians and parallels so as to be able to plot the positions of the triangulation stations included in the area and show the details of his survey in their correct geographic positions. To enable him to do this with the least possible difficulty, the following table, reprinted

in an abbreviated form from Coast and Geodetic Survey Special Publication No. 5, has been inserted. This table may also be used to interpret in terms of degrees, minutes, and seconds of arc any relatively short distance measured along a meridian or parallel. The method of using the table is described below.

To make a projection for a large-scale map (1 to 20,000 and larger), first draw a straight line for a central meridian and a construction line ab perpendicular thereto, each to be as central to the sheet as the selected interval of latitude and longitude will permit. (See fig. 1 below.) On the central meridian lay off, on the desired scale, the distances $m m_2$ and $m m_4$, using the length of 1 minute along the meridian for the latitude of m , as given in the table in the column headed "Arc of the meridian, 1'," and multiplying this length by the number of minutes for the interval between the central parallel and the extreme parallels. Through m_2 and m_4 draw straight lines, cd and ef , parallel to the line ab . On the lines ef , ab , and cd lay off to the scale of the map the distances $m_4 x_2$, $m x_2$, and $m_2 x_2$ on both sides of the central meridian, taking the values from the column headed "Arc of the parallel, 1'," corresponding to the latitude of m_4 , m , and m_2 , respectively. The value of 1 minute as taken from the table must be multiplied by the number of minutes out from the central meridian. Draw straight lines through the points thus determined for the extreme meridians—that is, through the x_2 points.

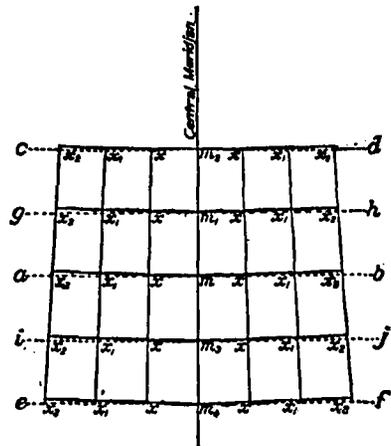


FIGURE 1.—Sketch showing construction of polyconic projection.

NOTE.—In this figure the angles made at the central meridian by the parallels are grossly exaggerated. In an actual projection the parallels appear practically as straight lines.

At the two points designated x_2 on the line ab lay off along the meridians the value of Y as given in the table under "Y coordinate of curvature," using as argument the interval in minutes between the central meridian and the extreme meridian. Draw straight lines from these points to the point m for the middle parallel, and from the points of intersection with the extreme meridians lay off distances along these meridians, above and below, equal to the distances $m m_2$ and $m m_4$ to locate points in the extreme parallels.

Subdivide each of the 3 meridians and 3 parallels already determined into parts corresponding with the projection interval and join the corresponding points of subdivision by straight lines to complete the projection.

The method outlined above may be used for all large-scale maps regardless of the number of meridians and parallels shown. For small-scale maps the method is somewhat more complicated, and it becomes necessary to make use of Special Publication No. 5, which may be obtained for 20 cents from the Superintendent of Documents, Washington, D.C.

U. S. COAST AND GEODETIC SURVEY

POLYCONIC MAP PROJECTION TABLE

Latitude	Arc of the parallel		Arc of the meridian		Interval of longitude from central meridian	Y coordinate of curvature latitude 33°
	1"	1'	1"	1'		
° /	<i>Meters</i>	<i>Meters</i>	<i>Meters</i>	<i>Meters</i>	° /	<i>Meters</i>
33 00	25.960	1,557.6	30.806	1,848.35	0 01	0.1
05	25.935	1,556.1	30.806	1,848.38	03	1.1
10	25.911	1,554.7	30.807	1,848.40	05	3.1
15	25.886	1,553.2	30.807	1,848.43	07	6.0
20	25.862	1,551.7	30.808	1,848.45	10	12.3
25	25.837	1,550.2	30.808	1,848.48	15	27.8
30	25.812	1,548.7	30.808	1,848.50	20	49.4
35	25.788	1,547.3	30.809	1,848.53	25	77.1
40	25.763	1,545.8	30.809	1,848.55	30	111.0
45	25.738	1,544.3	30.810	1,848.58	40	197.4
50	25.713	1,542.8	30.810	1,848.60	50	308.4
55	25.688	1,541.3	30.810	1,848.63	1 00	444.2

Latitude	Arc of the parallel		Arc of the meridian		Interval of longitude from central meridian	Y coordinate of curvature latitude 34°
	1"	1'	1"	1'		
° /	<i>Meters</i>	<i>Meters</i>	<i>Meters</i>	<i>Meters</i>	° /	<i>Meters</i>
34 00	25.663	1,539.8	30.811	1,848.65	0 01	0.1
05	25.638	1,538.3	30.811	1,848.68	03	1.1
10	25.613	1,536.8	30.812	1,848.70	05	3.1
15	25.588	1,535.3	30.812	1,848.73	07	6.1
20	25.562	1,533.7	30.813	1,848.75	10	12.5
25	25.537	1,532.2	30.813	1,848.78	15	28.2
30	25.512	1,530.7	30.813	1,848.81	20	50.1
35	25.486	1,529.2	30.814	1,848.83	25	78.3
40	25.461	1,527.6	30.814	1,848.86	30	112.7
45	25.435	1,526.1	30.815	1,848.88	40	200.4
50	25.410	1,524.6	30.815	1,848.91	50	313.1
55	25.384	1,523.0	30.810	1,848.93	1 00	450.8

Latitude	Arc of the parallel		Arc of the meridian		Interval of longitude from central meridian	Y coordinate of curvature latitude 35°
	1"	1'	1"	1'		
° /	<i>Meters</i>	<i>Meters</i>	<i>Meters</i>	<i>Meters</i>	° /	<i>Meters</i>
35 00	25.358	1,521.5	30.810	1,848.96	0 01	0.1
05	25.333	1,520.0	30.816	1,848.99	03	1.1
10	25.307	1,518.4	30.817	1,849.01	05	3.2
15	25.281	1,516.9	30.817	1,849.04	07	6.2
20	25.255	1,515.3	30.818	1,849.06	10	12.7
25	25.229	1,513.7	30.818	1,849.09	15	28.6
30	25.203	1,512.2	30.810	1,849.11	20	50.8
35	25.177	1,510.6	30.819	1,849.14	25	79.3
40	25.151	1,509.1	30.819	1,849.17	30	114.2
45	25.125	1,507.5	30.820	1,849.19	40	203.1
50	25.099	1,505.9	30.820	1,849.22	50	317.3
55	25.072	1,504.3	30.821	1,849.24	1 00	456.9

Latitude	Arc of the parallel		Arc of the meridian		Interval of longitude from central meridian	Y coordinate of curvature	
	1"	1'	1"	1'		Lat. 36°	Lat. 37°
° /	<i>Meters</i>	<i>Meters</i>	<i>Meters</i>	<i>Meters</i>	° /	<i>Meters</i>	<i>Meters</i>
36 00	25.046	1,502.8	30.821	1,849.27	0 01	0.1	0.1
05	25.020	1,501.2	30.822	1,849.30	03	1.2	1.2
10	24.993	1,499.6	30.822	1,849.32	05	3.2	3.3
15	24.967	1,498.0	30.822	1,849.35	07	6.3	6.4
20	24.940	1,496.4	30.823	1,849.37	10	12.8	13.0
25	24.914	1,494.8	30.823	1,849.40	15	28.9	29.2
30	24.887	1,493.2	30.824	1,849.43	20	51.4	51.9
35	24.860	1,491.6	30.824	1,849.45	25	80.3	81.2
40	24.834	1,490.0	30.825	1,849.48	30	115.0	116.9
45	24.807	1,488.4	30.825	1,849.51	40	205.0	207.8
50	24.780	1,486.8	30.826	1,849.53	50	321.2	324.6
55	24.753	1,485.2	30.826	1,849.56	1 00	462.5	467.5

CONVERSION TABLE

The following table can be used readily for converting a rather large number of one unit to the corresponding number in the other unit by simply taking the conversion value for each digit of the first number, moving the decimal point if necessary, and adding the values together. For example, to convert 24.6 feet to meters we take from the table the value in meters corresponding to 2 feet and move the decimal point one number to the right. We then take the value for 4 feet as given in the table, and next the value for 6 feet, and move the decimal point one number to the left. This gives, by rounding off the third decimal place, $6.096 + 1.219 + 0.183 = 7.498$ meters.

Meters	Feet	Feet	Meters
1	3.280833	1	0.3048006
2	6.561667	2	0.6096012
3	9.842500	3	0.9144018
4	13.123333	4	1.2192024
5	16.404167	5	1.5240030
6	19.685000	6	1.8288037
7	22.965833	7	2.1336043
8	26.246667	8	2.4384049
9	29.527500	9	2.7432055
10	32.808333	10	3.0480061

EXPLANATION OF TABLE OF GEOGRAPHIC POSITIONS

In the tables of positions the latitude and longitude of each point are given on the North American datum of 1927, and there are also given the length and azimuth of each line observed over, whether in one or both directions. No lengths and azimuths are repeated, and for a given line the length and azimuth will be found opposite the position of one or the other of the two stations involved.

To aid in the use of the tables, a column of the logarithms of the lengths in meters is given. It must be remembered that it is the logarithm which is derived first from the computation, the lengths given in the table being then derived from the corresponding logarithms. A final column gives these lengths reduced to feet, the reduction being made from the lengths in meters.

The rule followed in recent publications of this Office has been to give the latitudes and longitudes of the stations to thousandths of seconds for all points, the positions of which are fixed by fully adjusted triangulation. Points, the positions of which are given to hundredths of seconds only, are marked by footnotes as being without check (not occupied and observed from two stations only) or checked by verticals only.

In the columns giving azimuths, distances, and logarithms of distances the accuracy is indicated to a certain extent by the number of decimal places given, it being understood that in each case some of the final figures are doubtful. In some cases there is very little doubt of the correctness of the second figure from the right, while in a few cases some doubt may exist as to the correctness of even the third figure from the right.

The tables may be conveniently consulted by using as finders the sketches and the index at the end of this publication. In the third

column of the index will be found for each point a reference to the page on which its description is given, in the fourth column the page on which the elevation of the station is given, and finally in the fifth column the number of the sketch on which it appears.

EXPLANATION OF LENGTHS

The lengths as given in the tables are all reduced to sea level. If the actual length of a line on the ground reduced only to the horizontal is desired—that is, its length in its actual elevation on the surface of the earth—it may be obtained by adding to the sea-level length as given in meters the following correction,

$$\text{Cor.} = \frac{Sh_m}{6,370,000}$$

in which S is the length of the line in meters and h_m is the mean elevation of the two ends of the line in meters. The correction for the length in feet can also be found by the same formula if S is taken in feet, but h_m must still be kept in meters, since the denominator is the approximate length of the radius of the earth in meters.

AZIMUTH AND BACK AZIMUTH

The azimuth of a line of triangulation is its true direction reckoned clockwise from true south. The cardinal points of the compass on this system are as follows: South is 0° (or 360°), west 90° , north 180° , and east 270° .

Because of the convergence of the meridians, the azimuth and the back azimuth of a line do not differ by exactly 180° , the amount of the divergence varying with the latitude and the difference of longitude of the two ends of the line. To illustrate from the tables on page 13, the azimuth from Magazine to Powell is $325^\circ 08' 47''.66$, while the back azimuth, or the azimuth from Powell to Magazine, is $145^\circ 20' 14''.49$.

The azimuths of the triangulation lines offer a very convenient and accurate means of testing the deflection of the magnetic needle on a surveyor's transit, and even the azimuth over such short distances as those between a station mark and its reference mark may be used for this purpose with fair accuracy, provided the distance is greater than 100 feet. On all recent triangulation, a special azimuth mark has been set for each station at a distance of not less than one-fourth mile. The azimuth of the line from the station to this mark has been very accurately determined and may be used as the starting azimuth for traverse lines and other local surveys.

ELEVATIONS

The elevations above mean sea level of all triangulation and traverse stations included in this publication whose elevations have been determined are included with the descriptions of the stations.

The elevations given to millimeters have been determined by first-order leveling, and are based on the 1929 general adjustment of the first-order level net. The elevations given to centimeters have been determined by wye leveling from a first-order bench mark. The elevations given to decimeters have been determined by reciprocal measures of vertical angles, and are subject to a probable error of ± 1.2 meters.

GEOGRAPHIC POSITIONS

Thirty-fifth parallel

Station	Latitude and longitude	Azimuth	Back azimuth	To station	Distance		
					Logarithm (meters)	Meters	Feet
<i>Principal points</i>	° ' "	° ' "	° ' "				
Danville, 1916.....	35 03 13.763 93 19 47.351						
Powell, 1916.....	34 46 05.083 93 20 44.603	182 37 14.08	2 37 46.85	Danville.....	4.5015060	31,732.63	104,109.5
Jean, 1916.....	35 01 22.437 93 41 59.391	264 05 30.75 311 01 52.81	84 18 15.51 131 14 02.09	Danville..... Powell.....	4.5306668 4.6332074	33,936.48 42,974.16	111,339.9 140,991.1
Magazine, 1916.....	35 09 46.899 93 40 43.076	290 45 16.90 325 08 47.66 7 05 39.03	110 57 19.11 145 20 14.49 187 04 55.16	Danville..... Powell..... Jean.....	4.5318704 4.7269727 4.1949431	34,030.66 53,330.14 15,065.46	111,648.9 174,967.3 51,395.8
White Oak, 1916.....	34 58 43.770 93 56 39.269	229 46 33.55 257 34 10.05	49 55 42.97 77 42 34.74	Magazine..... Jean.....	4.5008802 4.3587249	31,694.23 22,841.52	103,983.5 74,939.2
Pinnacle, 1917.....	35 12 48.784 94 03 10.625	279 13 42.15 303 12 20.76 339 07 43.91	99 26 38.70 123 24 32.06 159 11 28.92	Magazine..... Jean..... White Oak.....	4.5384594 4.5856517 4.4450312	34,550.90 38,516.93 27,863.21	113,355.7 126,367.6 91,414.5
Poteau, 1919.....	34 57 46.762 94 22 29.778	226 28 35.17 267 19 09.13	46 39 41.49 87 33 57.81	Pinnacle..... White Oak.....	4.6067379 4.5951823	40,433.18 39,371.53	132,654.5 129,171.4
Black (Okla.), 1919.....	34 43 18.693 94 28 45.973	199 37 57.18 239 37 51.54	19 41 32.11 59 56 12.53	Poteau..... White Oak.....	4.4534099 4.7531445	28,405.99 56,642.78	93,195.3 185,835.5
Sugarloaf (Okla.), 1919.....	35 01 34.383 94 28 05.723	241 06 55.22 276 07 18.59 309 26 19.12 1 44 14.47	61 21 15.33 96 25 20.68 129 29 31.79 181 43 51.46	Pinnacle..... White Oak..... Poteau..... Black.....	4.6353557 4.6823618 4.0427969 4.5286537	43,187.27 48,124.01 11,035.62 33,779.54	141,690.2 157,886.9 36,206.0 110,825.0
Hartford, 1917.....	35 01 14.405 94 23 12.439	350 23 58.46 94 45 24.91	170 24 22.93 274 42 36.59	Poteau..... Sugarloaf.....	3.8122141 3.8727706	6,489.54 7,460.55	21,291.1 24,476.8
Oklahoma (Okla.), 1919.....	34 55 28.046 94 29 28.714	190 33 23.33 221 46 32.13 248 03 42.32 357 13 47.22	10 34 10.90 41 50 07.80 68 07 42.28 177 14 11.63	Sugarloaf..... Hartford..... Poteau..... Black.....	4.0600784 4.1559043 4.0591106 4.3522075	11,483.61 14,318.72 11,458.05 22,501.30	37,675.8 46,977.3 37,592.0 73,823.0

Station	Latitude and longitude			Azimuth			Back azimuth			To station	Distance		
											Logarithm (meters)	Meters	Feet
<i>Principal points—Continued</i>													
Smith, 1916.....	34 46 15.040	89 28 55.48	269 18 07.07	Powell.....	4.4611221	28,914.93	94,865.1						
	93 01 47.596	138 57 36.89	318 47 18.82	Danville.....	4.6198743	41,674.88	136,728.3						
Fourche, 1916.....	35 01 04.996	31 14 37.51	211 08 23.43	Smith.....	4.5059475	32,058.82	105,179.6						
	92 50 53.686	58 45 59.32	238 28 54.82	Powell.....	4.7264200	53,262.31	174,744.8						
		95 17 52.94	275 01 17.66	Danville.....	4.6446603	44,122.52	144,758.6						
Round, 1916.....	34 50 26.237	73 05 49.87	252 56 20.67	Smith.....	4.4232891	26,502.64	86,950.7						
	92 45 10.395	156 09 04.56	336 05 48.01	Fourche.....	4.3329605	21,525.86	70,622.8						
Moss, 1916.....	34 49 57.327	78 21 15.24	258 08 55.74	Smith.....	4.5268621	33,640.47	110,368.8						
	92 40 11.903	96 43 23.02	276 40 32.51	Round.....	3.8828894	7,636.41	25,053.8						
		141 40 53.89	321 34 46.47	Fourche.....	4.4190014	26,242.27	86,096.5						
Reynolds, 1916.....	34 58 32.859	48 50 42.27	228 43 53.44	Moss.....	4.3822421	24,112.49	79,109.1						
	92 28 17.416	97 52 12.50	277 39 14.64	Fourche.....	4.5404814	34,712.14	113,884.7						
Shinall, 1916.....	34 47 55.188	103 24 24.15	283 18 28.07	Moss.....	4.2119635	16,291.59	53,450.0						
	92 29 48.225	127 14 52.32	307 02 48.15	Fourche.....	4.6053487	40,304.05	132,230.9						
		186 41 08.85	6 42 00.79	Reynolds.....	4.2963344	19,784.92	64,911.0						
Orphan, 1916.....	34 49 33.294	81 00 22.73	260 53 16.54	Shinall.....	4.2836031	19,213.35	63,035.8						
	92 17 21.692	135 00 55.94	314 54 40.76	Reynolds.....	4.3716043	23,529.04	77,194.9						
Maumelle, 1916.....	34 50 28.799	12 05 19.98	192 04 57.21	Shinall.....	3.6849191	4,840.82	15,881.9						
	92 29 08.343	184 56 58.48	4 57 27.63	Reynolds.....	4.1752939	14,972.49	49,122.2						
		275 23 06.86	95 29 50.50	Orphan.....	4.2561650	18,037.03	59,176.5						
Granite, 1916.....	34 41 13.585	123 24 53.24	303 17 52.07	Shinall.....	4.3523144	22,506.83	73,841.2						
	92 17 29.188	133 57 10.45	313 50 31.79	Maumelle.....	4.3922531	24,674.77	80,953.8						
		180 42 31.63	0 42 35.91	Orphan.....	4.1875090	15,399.59	50,523.5						
Little Rock northwest base, 1916.....	34 45 27.636	36 12 23.04	216 10 14.82	Granite.....	3.9867612	9,699.76	31,823.3						
	92 13 44.096	143 51 33.80	323 49 29.64	Orphan.....	3.9720065	9,375.76	30,760.3						
Little Rock southeast base, 1916.....	34 43 47.447	69 21 44.92	249 17 03.82	Granite.....	4.1278991	13,427.62	44,053.8						
	92 09 15.525	114 20 22.96	294 17 49.90	Little Rock northwest base.....	3.8748807	7,496.883	24,598.02						
		130 48 13.76	310 43 36.45	Orphan.....	4.2127555	16,321.33	53,547.6						

Supplementary points

Fort Smith, 1916.....	35 23 09.729	5 26 29.3	185 25 02.8	Sugarloaf.....	4.603130	40,098.7	131,557
	94 25 35.727	33 23 03.1	213 14 18.5	Cavanal.....	4.621948	41,874.3	137,383
Stake 5, 1919 ¹	35 23 12.59	282 03 23	102 03 33	Fort Smith.....	2.625227	421.9	1,384
	94 25 52.08						
Stake 0, 1919 ¹	35 23 17.42	301 05 38	121 05 47	Fort Smith.....	2.661940	459.1	1,506
	94 25 51.30	7 26 07	187 26 07	Stake 5.....	2.176817	150.251	492.95
Arkansas-Oklahoma boundary monument, initial point, 1919. ¹	35 23 17.58	301 06 11	121 06 12	Stake 0.....	0.962701	9.177	30.11
	94 25 51.62						
Fort Smith longitude, 1885.....	35 23 17.64						
	94 25 51.16						
Arkansas-Oklahoma boundary monument, milepost 26, 1919.	35 00 45.002	310 46 01.5	130 48 25.4	Poteau.....	3.924703	8,408.2	27,586
	94 26 40.790	23 34 39.1	203 33 02.8	Oklahoma.....	4.027587	10,655.8	34,960
		125 15 20.7	305 14 31.9	Sugarloaf.....	3.421063	2,636.7	8,651
Arkansas-Oklahoma boundary monument, milepost 27, 1919. ¹	34 59 53.35	145 56 29	325 55 42	Sugarloaf.....	3.574982	3,758.2	12,330
	94 26 42.70	301 17 02	121 19 27	Poteau.....	3.875533	7,508.2	24,633
Little Rock, Capitol dome, ball on top, 1916.....	34 44 47.446	179 45 13.2	359 45 12.3	Orphan.....	3.944901	8,808.5	28,899
	92 17 20.202	257 17 07.1	77 19 10.3	Little Rock northwest base.....	3.750644	5,694.4	18,486
		1 59 17.1	181 59 11.9	Granite.....	3.819147	6,594.0	21,634
Little Rock, Catholic Cathedral, cross, 1916.....	34 44 32.557	15 55 57.4	195 55 18.1	Granite.....	3.804547	6,376.0	20,919
	92 16 20.429	246 52 23.3	66 53 52.4	Little Rock northwest base.....	3.635828	4,323.4	14,184
		170 27 50.0	350 27 15.0	Orphan.....	3.972997	9,397.2	30,831
Fort Logan H. Roots, water tank, 1916.....	34 46 31.624	112 46 21.3	292 39 49.3	Maumelle.....	4.277020	18,924.3	62,087
	92 17 41.565	185 09 17.2	5 09 28.5	Orphan.....	3.749807	5,620.9	18,441
		288 03 49.4	108 06 04.8	Little Rock northwest base.....	3.802954	6,352.6	20,842
Little Rock, standpipe, 1916.....	34 44 02.669	175 33 30.8	355 33 13.1	Orphan.....	4.009404	10,218.9	33,527
	92 16 50.551	241 05 03.8	61 06 50.1	Little Rock northwest base.....	3.733796	5,417.5	17,774
		10 41 22.3	190 41 00.3	Granite.....	3.724455	5,302.2	17,396
Little Rock, post office roof, pole, 1920.....	34 44 51.495	24 19 21.4	204 19 06.2	Little Rock, standpipe.....	3.217772	1,651.1	5,417
	92 16 23.820	147 21 13.0	327 20 28.8	Fort Logan H. Roots, water tank.....	3.564026	3,664.6	12,023
		254 39 25.9	74 40 57.0	Little Rock northwest base.....	3.624526	4,212.4	13,820
B, 1920 ¹	34 44 53.00	308 24 47	128 24 48	Little Rock, post office roof, pole.....	1.871756	74.4	244
	92 16 26.11						
A, 1920 ¹	34 44 51.39	189 24 08	9 24 08	B.....	1.700799	50.211	164.73
	92 16 26.44	267 10 06	87 10 08	Little Rock, post office roof, pole.....	1.823506	66.6	219
Little Rock, longitude observatory, pier, 1920 ¹	34 44 52.07	57 11 19	237 11 18	A.....	1.585565	38.5	126
	92 16 25.16	139 52 32	319 52 31	B.....	1.573955	37.5	123

¹ No check on this position.

00411°-34-2

Thirty-fifth parallel—Continued

Station	Latitude and longitude	Azimuth	Back azimuth	To station	Distance		
					Logarithm (meters)	Meters	Feet
<i>Supplementary points—Continued</i>							
Little Rock longitude, 1885.....	34 44 51.46 92 16 25.41						
Reference mark, 1932.....	34 44 40.150 92 17 19.388	174 44 05.5 278 51 46.5	354 44 05.0 98 52 20.1	Little Rock, Capitol dome, ball on top. Little Rock, Catholic Cathedral, cross.	2.353660 3.181240	225.8 1,517.9	741 4,980
A station, 1932.....	34 44 46.974 92 17 16.586	287 16 16.1 18 43 14.9 98 59 18.0	107 16 48.1 198 43 13.3 278 59 15.9	Little Rock, Catholic Cathedral, cross. Reference mark Little Rock, Capitol dome, ball on top.	3.174920 2.346378 1.969024	1,496.0 222.01 93.1	4,908 728.4 305
B station, 1932.....	34 44 49.956 92 17 16.374	3 22 03.6 51 32 49.0	183 22 03.5 231 32 46.8	A station..... Little Rock, Capitol dome, ball on top.	1.963953 2.094636	92.04 124.3	302.0 408
Little Rock zero milestone, 1933.....	34 44 46.929 92 17 16.449	19 41 14.3 99 27 49.1 287 15 39.2	199 41 12.6 279 27 46.9 107 16 11.1	Reference mark..... Little Rock, Capitol dome, ball on top. Little Rock, Catholic Cathedral, cross.	2.346102 1.985778 3.173834	221.9 96.8 1,492.2	728 318 4,896

Ninety-third meridian

<i>Principal points</i>							
Taney (Mo.), 1928.....	36 46 27.405 92 58 42.321						
Irma (Mo.), 1928.....	36 44 37.359 93 16 56.435	262 47 03.49	82 57 58.27	Taney.....	4.4369484	27,349.44	89,729.0
Thomason (Mo.), 1928.....	36 33 44.359 93 15 34.901	174 15 41.59 226 49 41.95	354 14 52.91 46 59 46.65	Irma..... Taney.....	4.3058977 4.5369529	20,230.08 34,431.26	66,371.5 112,963.2

Burlington, 1928.....	36 25 44.729 93 14 20.802	172 53 44.19 173 41 21.46 211 15 41.38	352 53 00.12 353 39 48.69 31 25 00.95	Thomason..... Irma..... Taney.....	4.1731448 4.5456309 4.6517401	14,898.58 35,126.18 44,847.69	48,879.8 115,243.1 147,137.8
Bergman, 1928.....	36 22 40.325 93 01 48.813	106 56 11.25 134 55 48.47 186 00 06.21	286 48 44.97 314 47 37.44 6 01 57.34	Burlington..... Thomason..... Taney.....	4.2918362 4.4626370 4.6457389	19,581.06 23,015.97 44,232.23	64,242.2 95,196.6 145,118.6
Red, 1928.....	36 12 06.221 93 16 36.265	187 37 04.57 228 29 48.48	7 38 24.80 48 38 33.74	Burlington..... Bergman.....	4.4057562 4.4703638	25,454.01 29,536.82	83,510.4 96,905.4
Boat, 1928.....	36 06 41.506 93 01 54.210	114 29 13.11 152 11 20.76 180 15 38.91	294 20 32.70 332 03 58.08 0 15 42.10	Red..... Burlington..... Bergman.....	4.3840569 4.6005507 4.4706082	24,213.46 39,861.23 29,553.45	79,440.3 130,778.1 96,959.9
Compton, 1928.....	36 05 05.424 93 20 28.417	204 05 21.93 263 50 37.98	24 07 38.85 84 01 34.44	Red..... Boat.....	4.1525688 4.4476034	14,209.17 28,028.73	46,617.9 91,957.6
Essex, 1928.....	35 52 39.283 93 12 35.273	152 46 14.76 211 41 15.78	332 41 36.78 31 47 32.54	Compton..... Boat.....	4.4128277 4.4846295	25,871.86 30,523.16	84,881.3 100,141.4
Deer, 1928.....	35 49 34.541 93 12 32.031	157 26 47.29 179 10 54.34 206 44 14.18	337 22 07.58 359 10 52.44 26 50 28.80	Compton..... Essex..... Boat.....	4.4924159 3.7654481 4.5497109	31,075.34 5,694.40 35,457.73	101,953.0 18,682.4 116,330.9
Yates, 1928.....	35 47 55.674 93 30 01.106	204 17 21.45 251 29 46.26 263 18 54.85	24 22 57.60 71 39 58.59 83 29 08.70	Compton..... Essex..... Deer.....	4.5419888 4.4419241 4.4234574	34,832.83 27,664.58 26,512.91	114,280.7 90,762.9 86,984.4
Devils, 1928.....	35 43 26.662 93 24 16.908	133 49 28.86 237 18 25.12	313 46 07.71 57 25 17.20	Yates..... Deer.....	4.0784326 4.3227089	11,979.33 21,023.69	39,302.2 68,975.2
Freeman, 1928.....	35 39 46.124 93 04 33.943	102 58 05.23 111 35 05.66 146 31 04.69	282 46 35.03 291 20 13.83 326 26 25.41	Devils..... Yates..... Deer.....	4.4844361 4.6152989 4.3375131	30,509.57 41,238.12 21,752.70	100,096.8 135,295.4 71,367.0
Mag, 1928.....	35 10 00.947 93 38 40.314	199 20 12.55 223 01 00.82 293 31 52.58 17 31 48.88	19 28 33.27 43 20 46.70 113 42 44.22 197 29 54.43	Devils..... Freeman..... Danville..... Jean.....	4.8164796 4.8776435 4.4957579 4.2241553	65,535.95 75,447.26 31,315.40 16,755.42	215,012.5 247,529.9 102,740.6 54,971.7
Nebo, 1928.....	35 12 50.517 93 15 13.203	81 45 42.56 166 25 33.87 197 53 32.01 21 21 09.32 62 35 34.83	261 32 11.64 346 20 18.37 17 59 42.67 201 18 31.56 242 20 10.84	Mag..... Devils..... Freeman..... Danville..... Jean.....	4.5560694 4.7651006 4.7187985 4.2805955 4.0615017	35,980.68 58,223.81 52,335.76 19,080.75 45,867.15	118,046.6 191,022.6 171,704.9 62,600.8 150,482.5
<i>Supplementary point</i>							
Pilot Knob, U.S. Forest Service lookout tower, 1923 ¹	35 35 11.80 93 15 01.23	137 32 22 241 46 35	317 26 58 61 52 40	Devils..... Freeman.....	4.315712 4.253013	20,687.7 17,906.6	67,873 58,749

¹No check on this position.

Station	Latitude and longitude			Azimuth			Back azimuth			To station	Distance		
											Logarithm (meters)	Meters	Feet
<i>Principal points</i>													
Mena, 1930	34 41 16.432	115 17 08.85	295 14 10.24	Black	3.9458754	8,828.27	28,964.1						
	94 23 32.247	231 39 12.87	51 54 34.20	White Oak	4.7173949	52,166.88	171,150.8						
Blue, 1930	34 41 10.334	90 26 20.71	270 14 34.98	Mena	4.4992250	31,566.39	103,564.1						
	94 02 52.161	196 14 32.28	16 18 05.27	White Oak	4.5291263	33,816.32	110,945.7						
Rich, 1930	34 40 26.989	104 40 42.50	284 38 32.32	Mena	3.7795812	6,019.79	19,749.9						
	94 19 43.472	111 00 34.61	290 55 25.79	Black	4.1698609	14,786.35	45,511.5						
		226 02 04.83	46 15 15.34	White Oak	4.6882467	48,780.55	160,040.9						
		266 57 00.82	87 06 36.25	Blue	4.4012697	25,192.41	82,652.1						
Eagle, 1930	34 27 21.092	139 04 56.64	318 56 38.76	Mena	4.5327404	34,098.91	111,872.8						
	94 06 54.839	199 51 41.02	19 55 06.82	Blue	4.4341378	27,173.01	89,150.1						
Whiskey, 1930	34 20 45.412	183 17 10.94	3 17 59.43	Mena	4.5797238	37,994.77	124,654.5						
	94 24 57.816	221 45 05.32	41 57 36.50	Blue	4.7047926	50,674.86	166,255.8						
		243 33 26.69	63 42 30.76	Eagle	4.4385757	27,462.11	90,065.8						
Hanna, 1930	34 25 15.388	70 07 41.01	249 59 14.19	Whiskey	4.3872073	24,389.75	80,018.7						
	94 10 00.367	203 21 19.09	23 21 56.15	Eagle	3.6252266	4,249.17	13,842.4						
Hope, 1930	34 09 50.031	129 51 59.24	309 43 05.89	Whiskey	4.4990301	31,552.23	103,517.6						
	94 09 10.280	177 25 53.67	357 25 25.45	Hanna	4.4554722	28,541.20	93,638.9						
		180 41 50.20	0 41 58.91	Eagle	4.5103863	32,388.16	106,260.2						
Gillham, 1930	34 10 36.951	152 53 06.78	332 49 35.27	Whiskey	4.3236326	21,068.45	69,122.1						
	94 18 42.111	206 12 00.08	26 16 54.10	Hanna	4.4796707	30,176.62	99,004.5						
		275 35 34.55	95 40 55.73	Hope	4.1678110	14,716.72	48,283.1						
De Queen, 1930	33 59 19.425	183 19 57.49	3 20 24.08	Gillham	4.3203725	20,910.89	68,606.1						
	94 19 29.578	219 12 32.38	39 18 19.37	Hope	4.3995501	25,092.86	82,325.5						
Falls, 1930	33 51 38.825	133 58 03.68	313 52 43.51	De Queen	4.3108551	20,457.62	67,118.0						
	94 09 55.910	158 59 01.85	338 54 07.44	Gillham	4.5749101	37,575.97	123,260.5						
		181 59 27.39	1 59 52.91	Hope	4.5268748	33,641.46	110,372.0						
Winthrop, 1930	33 48 01.969	196 07 04.46	16 09 15.52	De Queen	4.3370334	21,728.68	71,288.2						
	94 23 24.600	252 07 30.54	72 15 00.77	Falls	4.3392830	21,841.53	71,658.4						
Wilton, 1930	33 44 30.816	107 34 35.01	287 27 09.67	Winthrop	4.3347922	21,616.84	70,921.2						
	94 10 03.456	152 03 12.97	331 57 57.50	De Queen	4.4914305	31,004.91	101,721.9						
		180 50 34.37	0 50 38.57	Falls	4.1201892	13,188.31	43,268.6						
Foreman, 1930	33 40 22.092	162 11 20.37	342 09 42.08	Winthrop	4.1726912	14,883.02	48,828.7						
	94 20 27.621	244 27 40.46	64 33 26.85	Wilton	4.2505658	17,805.98	58,418.5						
Hawkins, 1930	33 39 43.250	94 28 18.27	274 22 45.54	Foreman	4.1905718	15,508.57	50,881.0						
	94 10 27.435	127 35 02.74	307 27 51.18	Winthrop	4.4018548	25,226.37	82,763.5						
		183 59 06.70	3 59 20.01	Wilton	3.9484737	8,881.24	29,137.9						
Holland (Tex.), 1930	33 27 39.000	135 31 49.96	315 23 34.03	Foreman	4.5182929	32,983.21	108,212.4						
	94 05 30.696	161 05 20.97	341 02 36.92	Hawkins	4.3727181	23,589.47	77,393.1						
Hooks (Tex.), 1930	33 27 07.840	170 05 58.66	350 04 27.00	Foreman	4.3951643	24,840.73	81,498.3						
	94 17 41.828	205 40 33.99	25 44 34.11	Hawkins	4.4121278	25,830.20	84,744.6						
		267 02 00.40	87 08 43.48	Holland	4.2766012	18,906.07	62,027.7						
Ashdown northwest base, 1930	33 41 17.002	348 48 23.06	168 50 09.88	Holland	4.4097472	25,689.00	84,281.3						
	94 08 43.805	42 45 09.12	222 44 11.66	Hawkins	3.5947388	3,933.13	12,903.9						
Ashdown southeast base, 1930	33 35 08.656	17 43 02.21	197 41 27.57	Holland	4.1626218	14,541.92	47,709.6						
	94 02 39.328	125 04 20.82	305 00 01.61	Hawkins	4.1683821	14,736.08	48,346.6						
		140 24 47.27	320 21 25.37	Ashdown northwest base	4.1682478	14,731.529	48,331.69						
Alamo (Tex.), 1930	33 15 23.530	138 30 31.29	318 23 42.38	Hooks	4.4622878	28,992.64	95,120.0						
	94 05 18.106	179 10 40.37	359 10 33.45	Holland	4.3552682	22,660.43	74,345.1						
Antioch (Tex.), 1930	33 11 14.477	172 29 57.32	352 28 35.06	Hooks	4.4716576	29,624.95	97,194.5						
	94 15 12.091	206 19 37.68	26 24 57.08	Holland	4.5296064	33,853.72	111,068.4						
		243 26 35.43	63 32 00.86	Alamo	4.2352372	17,188.47	56,392.5						
Bloomburg (Tex.), 1930	33 09 02.694	102 06 17.72	281 59 36.12	Antioch	4.2888738	19,447.95	63,805.5						
	94 02 58.036	162 49 41.74	342 48 25.04	Alamo	4.0892142	12,280.45	40,290.1						
Bivins (Tex.), 1930	33 02 01.143	167 04 27.60	347 03 05.11	Antioch	4.2427947	17,490.20	57,382.4						
	94 12 41.064	204 52 41.12	24 56 43.32	Alamo	4.4354404	27,254.64	89,417.9						
		229 17 45.19	49 23 03.52	Bloomburg	4.2995308	19,931.08	65,390.6						
Pinkard (Tex.), 1930	32 59 26.570	122 51 16.54	302 48 41.65	Bivins	3.9436129	8,782.39	28,813.6						
	94 07 56.761	203 33 46.19	23 36 29.20	Bloomburg	4.2870390	19,365.96	63,536.5						
Ravana, 1930	33 04 05.167	47 32 16.01	227 28 59.21	Pinkard	4.1040158	12,706.20	41,688.9						
	94 01 55.715	77 11 40.50	257 05 48.54	Bivins	4.2348689	17,173.90	56,344.7						
		170 00 24.20	349 59 50.16	Bloomburg	3.9688130	9,307.07	30,534.9						
Posey (Tex.), 1930	32 56 13.362	128 43 40.29	308 41 04.67	Pinkard	3.9785462	9,518.01	31,227.0						
	94 03 10.762	187 37 42.86	7 38 23.74	Ravana	4.1662625	14,664.34	48,111.3						
Spearman (La.), 1930	33 00 34.246	49 27 54.82	229 24 38.03	Posey	4.0919832	12,359.00	40,547.8						
	93 57 09.191	82 58 45.83	292 52 53.13	Pinkard	4.2289020	16,939.55	55,575.8						
		131 10 23.85	311 07 47.63	Ravana	3.9944948	9,874.04	32,395.1						

Station	Latitude and longitude			Azimuth			Back azimuth			To station	Distance		
	°	'	"	°	'	"	°	'	"		Logarithm (meters)	Meters	Feet
<i>Supplementary points</i>													
Buck Knob, U.S. Forest Service lookout tower, 1930.....	34	41	26.066	36	01	23.9	215	54	23.3	Eagle.....	4.507437	32,169.0	105,541
	93	56	33.647	87	06	58.3	267	05	22.9	Blue.....	3.984389	9,646.9	31,650
				179	44	40.2	359	44	37.0	White Oak.....	4.504841	31,977.2	104,912
Mena Hotel, east chimney, 1930.....	34	41	03.905	6	36	44.7	186	35	08.2	Whiskey.....	4.577451	37,796.4	124,004
	94	22	07.527	100	09	19.8	280	06	31.6	Mena.....	3.340606	2,190.8	7,188
				112	18	18.9	292	14	32.1	Black.....	4.039730	10,958.0	35,951
Mena Hotel, flagpole, north side, 1930 ¹	34	41	04.36	99	49	35	279	48	47	Mena.....	3.338773	2,181.6	7,157
	94	22	07.80	112	15	05	292	11	18	Black.....	4.039266	10,946.3	35,913
Oklahoma-Arkansas boundary monument no. 52 (ecc.), 1930.	34	38	13.046	226	29	06.6	46	31	19.6	Mena.....	3.914335	8,209.8	26,935
	94	27	26.146	250	39	25.2	70	43	48.3	Rich.....	4.066342	12,483.7	40,957
Oklahoma-Arkansas boundary monument no. 52 (1877), 1930.	34	38	12.198	168	45	48	348	45	48	Oklahoma-Arkansas boundary monument no. 52 (ecc.).	1.425206	26.62	87.3
	94	27	25.944	226	19	42.3	46	21	55.2	Mena.....	3.915089	8,224.1	26,982
				250	32	10.0	70	36	33.0	Rich.....	4.066475	12,487.5	40,969
Bee Mountain, U.S. Forest Service lookout tower, 1930.	34	29	25.374	290	43	58.1	110	47	42.1	Eagle.....	4.033506	10,802.0	35,440
	94	15	30.627	312	23	36.6	132	26	43.4	Hanna.....	4.057635	11,419.2	37,464
				42	09	33.5	222	04	12.9	Whiskey.....	4.334416	21,598.1	70,860
Cairn (U.S.G.S.), 1930 ¹	34	42	42.222	319	10	42	139	12	02	Rich.....	3.740813	5,505.7	18,063
	94	22	04.844	40	05	10	220	04	20	Mena.....	3.538444	3,455.0	11,335
Eagle Mountain, U.S. Forest Service lookout tower, 1930.	34	27	15.168	64	32	52.1	244	23	35.9	Whiskey.....	4.445071	27,865.8	91,423
	94	08	33.362	138	35	51.5	318	27	21.5	Mena.....	4.539041	34,597.2	113,508
				198	38	46.2	18	42	00.0	Blue.....	4.434003	27,164.6	89,123
Horatio, municipal water tank, 1930 ¹	33	56	20.29	208	47	30	28	48	36	De Queen.....	3.799236	6,298.5	20,664
	94	21	27.77	11	04	32	191	03	26	Winthrop.....	4.194353	15,644.2	51,326
Okay, cement mill, concrete stack, 1930.....	33	46	08.509	62	44	43.8	242	36	28.5	Hawkins.....	4.412613	25,859.1	84,839
	93	55	35.181	66	11	52.6	246	04	34.6	Ashdown northwest base.....	4.346359	22,200.3	72,835
				82	23	45.2	262	15	42.7	Wilton.....	4.353108	22,548.0	73,976
Okay, water tank, 1930.....	33	45	56.872	63	39	49.2	243	31	20.5	Hawkins.....	4.413025	25,883.6	84,920
	93	55	27.076	67	15	38.2	247	08	15.8	Ashdown northwest base.....	4.347337	22,250.4	73,000
				83	21	47.9	263	13	41.0	Wilton.....	4.356227	22,710.5	74,509
Ashdown, city water tank, 1930.....	33	40	29.205	321	59	54.5	142	02	40.2	Ashdown southeast base.....	4.097913	12,528.9	41,105
	94	07	38.466	71	59	43.7	251	58	10.0	Hawkins.....	3.660629	4,577.5	15,018
				131	11	22.1	311	10	45.8	Ashdown northwest base.....	3.349533	2,236.3	7,337
Texarkana, Cottonville Hospital, spire, 1930.....	33	25	14.270	97	52	42.4	277	43	37.7	Hooks.....	4.411139	25,771.5	84,552
	94	01	13.379	123	52	32.4	303	50	10.6	Holland.....	3.903284	8,003.6	26,258
				173	05	56.4	353	05	08.9	Ashdown southeast base.....	4.265901	18,445.9	60,518
Texarkana, post office, square brick tower (Tex.), 1930 ¹	33	25	29.78	97	24	52	277	16	32	Hooks.....	4.373466	23,630.1	77,526
	94	02	34.52	131	11	41	311	10	04	Holland.....	3.781474	6,046.1	19,830
Texarkana, Southwest Gas & Electric Co., concrete stack, 1930.	33	25	03.542	13	36	47.3	193	35	15.4	Alamo.....	4.264446	18,384.3	60,316
	94	02	30.940	37	41	21.4	217	34	23.4	Antioch.....	4.508541	32,250.8	105,809
				135	54	05.9	315	52	26.8	Holland.....	3.824165	6,670.6	21,885
Texarkana, Texas Pacific Railway, water tank (Tex.), 1930.	33	24	56.927	10	35	03.7	190	33	53.6	Alamo.....	4.254551	17,970.1	58,957
	94	03	10.585	36	26	03.0	216	19	26.8	Antioch.....	4.497908	31,470.8	103,250
				144	04	31.5	324	03	14.3	Holland.....	3.790065	6,166.9	20,233
Texarkana, airplane beacon (Tex.), 1930.....	33	25	17.469	12	59	03.8	192	57	34.2	Alamo.....	4.273626	18,777.0	61,604
	94	02	35.116	37	04	34.1	216	57	38.4	Antioch.....	4.512234	32,526.2	106,713
				133	53	12.1	313	51	35.4	Holland.....	3.798739	6,291.3	20,641
Texarkana, southwest water tank, flat top (Tex.), 1930 ¹	33	23	33.46	9	01	45	189	00	54	Alamo.....	4.184198	15,282.6	50,140
	94	03	45.45	160	14	15	340	13	17	Holland.....	3.905167	8,038.4	26,373
Loutexark (ecc.) (Tex.), 1930.....	33	01	08.726	5	54	12.4	185	53	52.7	Posey.....	3.961296	9,147.4	30,011
	94	02	34.546	69	24	20.0	249	21	24.5	Pinkard.....	3.951173	8,936.6	29,319
				190	29	54.6	10	30	15.7	Ravana.....	3.742572	5,628.0	18,136
Loutexark, 1930 ¹	33	04	08.80	70	39	47	250	39	47	Loutexark (ecc.).....	0.837588	6.88	22.6
	94	02	34.30										

¹No check on this position.

Station	Latitude and longitude			Azimuth	Back azimuth	To station	Distance		
	°	'	"				Logarithm (meters)	Meters	Feet
<i>Principal points</i>									
Cotton (Mo.), 1929.....	36 03 35.044								
	89 41 34.656								
Head (Tenn.), 1929.....	36 03 33.706	90 11 33.72	270 04 44.91		Cotton.....	4.2400923	17,381.70	57,026.5	
	89 30 00.146								
School, 1929.....	35 56 39.824	195 39 27.64	15 40 51.89		Cotton.....	4.1235752	13,291.54	43,607.3	
	89 43 57.990	238 38 10.05	58 46 22.54		Head.....	4.3901802	24,557.28	80,568.3	
Edith (Tenn.), 1929.....	35 51 22.314	121 47 28.58	301 41 18.67		School.....	4.2695594	18,601.99	61,030.0	
	89 33 27.148	151 37 41.88	331 32 55.62		Cotton.....	4.4095272	25,675.99	84,238.6	
		192 56 32.18	12 58 33.73		Head.....	4.3642006	23,131.33	75,890.0	
Anderson, 1929.....	35 52 46.082	214 36 24.51	34 38 20.86		School.....	3.9422280	8,754.43	28,721.8	
	89 47 16.365	277 00 24.95	97 08 30.80		Edith.....	4.3214494	20,962.81	68,775.5	
Lusk (Tenn.), 1929.....	35 46 18.472	132 50 45.79	312 45 45.01		Anderson.....	4.2450436	17,581.00	57,680.3	
	89 38 42.490	157 34 01.08	337 30 56.26		School.....	4.3164312	20,721.98	67,985.4	
		220 11 06.15	40 14 10.67		Edith.....	4.0885746	12,262.38	40,230.8	
Cooper, 1929.....	35 46 06.673	204 27 40.52	24 29 51.20		Anderson.....	4.1311603	13,525.72	44,375.6	
	89 50 59.642	268 48 53.92	88 56 04.81		Lusk.....	4.2676347	18,519.73	60,760.1	
Cherry (Tenn.), 1929.....	35 41 29.871	125 31 32.20	305 26 54.15		Cooper.....	4.1671823	14,695.43	48,213.3	
	89 43 03.511	163 04 29.27	343 02 01.41		Anderson.....	4.3381938	21,786.82	71,478.9	
		216 23 12.46	36 25 44.89		Lusk.....	4.0434341	11,051.83	36,259.2	
Driver, 1929.....	35 41 02.339	231 42 12.02	51 46 48.36		Cooper.....	4.1803433	15,147.58	49,696.7	
	89 58 52.908	267 53 14.50	88 02 28.35		Cherry.....	4.3781636	23,887.11	78,369.6	
Fort (Tenn.), 1929.....	35 38 30.787	108 27 25.04	288 21 59.80		Driver.....	4.1699126	14,788.11	48,517.3	
	89 49 35.060	171 24 04.62	351 23 15.25		Cooper.....	4.1526008	14,210.22	46,621.4	
		240 41 58.83	60 45 47.13		Cherry.....	4.0526574	11,289.05	37,037.5	
Wilson, 1929.....	35 33 54.467	205 53 58.61	25 56 26.96		Driver.....	4.1661812	14,661.59	48,102.2	
	90 03 07.590	247 19 41.38	67 27 34.42		Fort.....	4.3454556	22,154.17	72,684.1	
Chickasaw (Tenn.), 1929.....	35 30 31.587	115 23 42.07	295 18 37.61		Wilson.....	4.1644171	14,602.16	47,907.3	
	89 54 23.773	160 48 26.09	340 45 49.43		Driver.....	4.3135713	20,585.97	67,539.1	
		206 11 06.63	26 13 54.60		Fort.....	4.2164490	16,460.73	54,004.9	
Shawnee, 1929.....	35 29 39.760	216 13 30.56	36 15 43.29		Wilson.....	3.9882447	9,732.95	31,932.2	
	90 06 55.991	265 07 24.42	85 14 41.26		Chickasaw.....	4.2793266	19,025.08	62,418.1	
Weakley (Tenn.), 1929.....	35 25 37.602	118 34 38.46	298 29 22.66		Shawnee.....	4.1937779	15,623.49	51,258.1	
	89 57 51.649	152 32 58.15	332 29 54.70		Wilson.....	4.2370265	17,259.43	56,625.3	
		210 01 56.21	30 03 56.83		Chickasaw.....	4.0198193	10,466.93	34,340.3	
Sanders, 1929.....	35 21 51.126	203 48 13.66	23 50 40.21		Shawnee.....	4.1983202	15,787.75	51,797.0	
	90 11 08.799	250 48 05.35	70 55 47.08		Weakley.....	4.3282383	21,293.07	69,859.0	
Locke (Tenn.), 1929.....	35 20 53.510	97 37 32.48	277 32 26.80		Sanders.....	4.1228858	13,455.07	44,143.8	
	90 02 20.545	156 49 43.32	336 47 03.67		Shawnee.....	4.2465989	17,644.08	57,887.3	
		217 45 32.15	37 48 07.87		Weakley.....	4.0444382	11,077.41	36,343.1	
Marion, 1929.....	35 13 15.470	185 34 43.08	5 35 18.60		Sanders.....	4.2032233	15,967.00	52,385.1	
	90 12 10.282	226 30 24.08	46 36 04.74		Locke.....	4.3123193	20,526.71	67,344.7	
Benjes (Tenn.), 1929.....	35 14 41.641	79 02 30.05	258 57 18.41		Marion.....	4.1434934	13,915.33	45,653.9	
	90 03 10.086	137 37 06.81	317 32 30.15		Sanders.....	4.2535596	17,929.14	58,822.5	
		186 13 46.35	6 14 14.98		Locke.....	4.0617626	11,528.23	37,822.2	
Exchange (Tenn.), 1914.....	35 08 41.745	121 30 44.15	301 25 30.30		Marion.....	4.2084059	16,158.68	53,013.9	
	90 03 05.573	179 24 37.97	359 24 35.37		Benjes.....	4.0449903	11,091.50	36,389.4	
Bollinger, 1929.....	35 08 25.719	174 12 48.96	354 12 28.35		Marion.....	3.9530347	8,975.00	29,445.5	
	90 11 34.503	227 43 33.49	47 48 24.20		Benjes.....	4.2364179	17,235.26	56,546.0	
		267 45 50.35	87 50 43.30		Exchange.....	4.1103432	12,892.68	42,298.7	
Weaver (Tenn.), 1914.....	35 02 24.511	151 33 39.63	331 31 22.71		Bollinger.....	4.1024691	12,661.03	41,538.7	
	90 07 36.325	210 30 59.80	30 33 35.46		Exchange.....	4.1302444	13,497.22	44,282.1	
Martine, 1929.....	35 02 34.447	201 16 38.91	21 18 14.65		Bollinger.....	4.0651266	11,617.87	38,116.3	
	90 14 21.043	236 27 32.40	56 34 00.74		Exchange.....	4.3120595	20,514.43	67,304.4	
		271 40 39.21	91 44 31.68		Weaver.....	4.0112476	10,262.37	33,669.1	
Lake View (Miss.), 1929.....	34 59 23.945	119 52 59.84	299 49 08.32		Martine.....	4.0716673	11,794.17	38,694.7	
	90 07 37.572	180 19 30.95	0 19 31.66		Weaver.....	3.7454192	5,564.41	18,255.9	
Horse, 1929.....	34 56 22.941	196 34 40.07	16 35 57.19		Martine.....	4.0772047	11,945.51	39,191.2	
	90 16 35.516	230 47 02.27	50 52 11.46		Weaver.....	4.2464809	17,659.28	57,871.5	
		247 43 36.19	67 48 44.48		Lake View.....	4.1685892	14,743.11	48,369.7	
Derickson (Miss.), 1929.....	34 53 13.798	118 01 07.51	297 57 00.20		Horse.....	4.0941721	12,421.44	40,762.7	
	90 09 23.409	189 05 10.59	9 06 11.96		Weaver.....	4.2351932	17,186.73	56,386.8	
		193 14 30.42	13 15 31.04		Lake View.....	4.0688647	11,718.30	38,445.8	
Cox (Miss.), 1929.....	34 47 15.967	177 05 47.80	357 05 28.55		Horse.....	4.2272921	16,876.88	55,370.2	
	90 16 01.830	222 31 21.33	42 35 08.93		Derickson.....	4.1751891	14,968.87	49,110.4	

Mississippi River—Continued

Station	Latitude and longitude			Azimuth			Back azimuth			To station	Distance		
	°	'	"	°	'	"	°	'	"		Logarithm (meters)	Meters	Feet
<i>Principal points—Continued</i>													
Abbott (Miss.), 1929	34	49	01.616	217	21	41.18	37	25	35.25	Horse	4.2334437	17,117.63	56,160.1
	90	23	24.850	249	57	17.48	70	05	18.33	Derickson	4.3568793	22,744.65	74,621.4
				286	05	21.30	106	09	34.15	Cox	4.0690152	11,722.36	38,459.1
Caulsby (Miss.), 1929	34	41	06.064	159	57	41.27	339	55	41.38	Abbott	4.1931229	15,599.94	51,180.8
	90	19	54.525	207	25	34.19	27	27	46.78	Cox	4.1086976	12,843.92	42,138.8
Huston (Miss.), 1929	34	44	14.687	208	15	49.43	28	17	36.13	Abbott	4.0017285	10,039.88	32,939.2
	90	26	31.915	250	43	51.98	70	49	51.24	Cox	4.2296748	16,969.73	55,674.9
				299	51	27.28	119	55	13.57	Caulsby	4.0668408	11,663.82	38,267.0
Evansville (Miss.), 1929	34	37	34.913	147	37	36.71	327	34	41.98	Huston	4.1640443	14,589.63	47,866.1
	90	21	24.840	199	27	33.75	19	28	25.11	Caulsby	3.8389082	6,900.94	22,640.8
Dubbs (Miss.), 1929	34	33	50.479	162	48	23.01	342	46	09.97	Huston	4.3039785	20,136.25	66,063.7
	90	22	37.933	195	04	05.44	15	04	46.94	Evansville	3.8550414	7,162.12	23,497.7
Austin (Miss.), 1929	34	36	39.902	192	06	33.76	12	07	41.00	Huston	4.1563469	14,333.32	47,025.2
	90	28	30.111	237	58	08.28	58	03	01.41	Caulsby	4.1898043	15,481.19	50,791.2
				261	04	26.15	81	08	27.75	Evansville	4.0400407	10,965.81	35,977.0
				300	09	25.75	120	12	45.67	Dubbs	4.0163287	10,383.14	34,065.4
Rich (Miss.), 1929	34	25	26.839	173	39	57.42	353	39	06.21	Austin	4.3194618	20,867.09	68,461.4
	90	26	59.752	203	16	06.03	23	18	34.30	Dubbs	4.2277696	16,895.44	55,431.1
Jeffries (Miss.), 1929	34	30	38.798	208	55	20.74	28	57	37.65	Austin	4.1043109	12,714.84	41,715.3
	90	32	31.467	248	38	08.19	68	43	44.69	Dubbs	4.2107709	16,246.91	53,303.4
				318	36	10.43	138	39	18.16	Rich	4.1075159	12,809.02	42,024.3
Rudyard (Miss.), 1929	34	20	00.732	177	27	13.40	357	26	54.02	Jeffries	4.2940293	19,680.19	64,567.4
	90	31	57.192	217	04	32.30	37	07	20.25	Rich	4.1003078	12,598.18	41,332.5
Adeho (Miss.), 1929	34	22	41.928	209	43	20.82	29	46	26.88	Jeffries	4.2285087	16,924.22	55,525.5
	90	38	00.418	253	11	23.07	73	17	36.34	Rich	4.2460802	17,623.02	57,818.2
				298	07	19.33	118	10	44.32	Rudyard	4.0223351	10,527.74	34,539.8
Stovall northeast base (Miss.), 1929	34	18	02.765	185	58	41.98	5	59	01.86	Adeho	3.9369566	8,648.81	28,375.3
	90	38	35.676	250	20	01.57	70	23	46.23	Rudyard	4.0341124	10,817.14	35,489.2
Clarksdale (Miss.), 1929	34	12	44.623	160	45	14.46	340	43	59.12	Stovall northeast base	4.0163472	10,383.58	34,066.8
	90	36	21.832	172	12	26.29	352	11	30.73	Adeho	4.2689583	18,576.26	60,945.6
				206	43	04.11	26	45	33.14	Rudyard	4.1774332	15,046.42	49,364.8
McWilliams (Miss.), 1929	34	15	55.445	247	14	49.33	67	21	27.52	Rudyard	4.2919601	19,586.65	64,260.5
	90	43	43.797	297	25	58.71	117	30	07.38	Clarksdale	4.1054169	12,747.26	41,821.6
Stovall southwest base (Miss.), 1929	34	12	44.141	162	31	18.21	42	30	37.39	McWilliams	3.7909873	6,179.98	20,275.5
	90	42	31.244	211	31	41.35	31	33	53.96	Stovall northeast base	4.0614513	11,519.968	37,795.09
				269	52	52.16	89	56	19.87	Clarksdale	3.9757338	9,456.57	31,025.4
Alligator (Miss.), 1929	34	06	17.036	169	14	11.24	349	12	56.83	McWilliams	4.2586765	18,141.64	59,519.7
	90	41	31.362	172	40	35.68	352	40	02.06	Stovall southwest base	4.0801067	12,025.60	39,454.0
				213	33	24.71	33	36	18.51	Clarksdale	4.1563857	14,334.60	47,029.4
Rena (Miss.), 1929	34	09	10.283	203	41	29.03	23	43	29.43	McWilliams	4.1346394	13,634.51	44,732.6
	90	47	17.943	228	04	09.16	48	06	50.24	Stovall southwest base	3.9941042	9,865.16	32,365.9
				248	29	26.08	68	35	34.69	Clarksdale	4.2565496	18,053.01	59,228.9
				300	58	54.55	121	02	09.00	Alligator	4.0154292	10,361.66	33,994.9
Whilkinson (Miss.), 1929	34	00	11.162	168	58	35.37	348	57	24.59	Rena	4.2284987	16,923.83	55,524.3
	90	45	11.619	206	35	53.65	26	37	56.99	Alligator	4.1006851	12,609.13	41,368.5
Deeson (Miss.), 1929	34	01	08.221	204	58	08.78	25	00	40.12	Rena	4.2145028	16,387.12	53,763.4
	90	51	47.978	238	54	56.12	59	00	41.48	Alligator	4.2661077	18,454.73	60,546.9
				279	46	34.57	99	50	16.27	Whilkinson	4.0137337	10,321.28	33,862.4
Lamb (Miss.), 1929	33	53	11.303	172	23	01.58	352	22	18.81	Deeson	4.1709988	14,825.14	48,638.8
	90	50	31.396	212	22	56.36	32	25	54.92	Whilkinson	4.1853269	15,322.40	50,270.2
Seaton (Miss.), 1929	33	56	55.132	215	06	45.02	35	08	44.49	Deeson	3.9792978	9,534.50	31,281.1
	90	55	21.721	248	51	49.05	68	57	30.00	Whilkinson	4.2249413	16,785.77	55,071.3
				312	44	14.13	132	46	56.13	Lamb	4.0067930	10,167.64	33,325.5
Pace (Miss.), 1929	33	47	25.859	172	02	12.89	352	01	19.64	Seaton	4.2482315	17,710.53	58,105.3
	90	53	46.173	205	11	01.40	25	12	49.86	Lamb	4.0705003	11,762.52	38,590.9
Beulah (Miss.), 1929	33	47	54.624	199	00	54.99	19	02	59.57	Seaton	4.2459126	17,616.21	57,795.8
	90	59	05.243	233	30	47.25	53	35	33.41	Lamb	4.2154664	16,423.53	53,882.9
				276	08	16.42	96	11	13.89	Pace	3.9167531	8,255.68	27,085.5
Bogue (Miss.), 1929	33	43	05.398	134	52	48.14	314	49	34.74	Beulah	4.1015549	12,634.41	41,451.4
	90	53	17.212	174	41	44.72	354	41	28.62	Pace	3.9062948	8,059.25	26,441.1
Lobdell (Miss.), 1929	33	44	01.399	183	08	33.97	3	08	42.49	Beulah	3.8571174	7,196.43	23,610.3
	90	59	20.581	233	46	13.26	53	49	19.10	Pace	4.0279590	10,664.95	34,989.9
				280	25	18.09	100	28	39.84	Bogue	3.9783061	9,512.75	31,209.7
Clear (Miss.), 1929	33	38	44.052	156	40	08.15	336	38	37.28	Lobdell	4.0273058	10,648.93	34,937.4
	90	56	36.751	167	18	36.88	347	17	14.44	Beulah	4.2402584	17,388.35	57,048.3
				212	32	09.65	32	34	00.31	Bogue	3.9801177	9,552.52	31,340.2

Station	Latitude and longitude			Azimuth			Back azimuth			To station	Distance		
											Logarithm (meters)	Meters	Feet
<i>Principal points—Continued</i>													
Benoit (Miss.), 1929.....	33 40 28.496	196 18 38.52	16 20 05.36	Beulah.....	4.1560131	14,322.31	46,989.1						
	91 01 41.612	208 57 40.93	28 58 59.19	Lobdell.....	3.8749302	7,497.74	24,598.8						
		292 15 14.17	112 18 03.14	Clear.....	3.9288184	8,488.25	27,848.5						
Pricella (Miss.), 1929.....	33 32 13.579	167 57 04.67	347 55 54.74	Benoit.....	4.1928986	15,591.88	51,154.4						
	90 59 35.268	200 55 29.41	20 57 08.17	Clear.....	4.1099364	12,880.61	42,259.1						
Scott (Miss.), 1929.....	33 35 32.369	209 48 21.99	29 50 14.38	Benoit.....	4.0218480	10,515.94	34,501.0						
	91 05 04.525	245 40 35.82	65 45 16.95	Clear.....	4.1571390	14,359.49	47,111.1						
		305 46 19.72	125 49 21.76	Pricella.....	4.0199707	10,470.58	34,352.2						
Crump (Miss.), 1929.....	33 26 21.553	166 09 01.69	346 07 32.08	Scott.....	4.2425134	17,478.87	57,345.3						
	91 02 22.261	201 39 55.01	21 41 27.14	Pricella.....	4.0670996	11,670.77	38,289.9						
Winn (Miss.), 1929.....	33 28 51.668	190 10 39.59	10 11 27.07	Scott.....	4.0983890	12,542.64	41,150.3						
	91 06 30.478	239 50 03.75	59 53 52.97	Pricella.....	4.0831074	12,391.03	40,652.9						
		305 47 28.60	125 49 45.46	Crump.....	3.8978594	7,904.23	25,932.5						
Ferry (Miss.), 1929.....	33 21 26.314	183 40 00.24	3 40 19.00	Winn.....	4.1382594	13,748.63	45,107.0						
	91 07 04.534	218 42 28.03	38 45 03.41	Crump.....	4.0666781	11,659.45	38,252.7						
Luna, 1929.....	33 23 12.266	218 56 53.38	38 59 53.81	Winn.....	4.1287112	13,449.66	44,126.1						
	91 11 57.950	248 32 55.53	68 38 12.55	Crump.....	4.2034953	15,977.00	52,417.9						
		293 15 43.59	113 18 24.99	Ferry.....	3.9168449	8,257.43	27,091.3						
Shivers, 1929.....	33 16 36.548	162 55 56.29	342 54 36.71	Luna.....	4.1056297	12,753.51	41,842.1						
	91 09 33.124	203 16 58.61	23 18 20.22	Ferry.....	3.9876313	9,719.22	31,887.1						
Chicot north base, 1929.....	33 17 34.878	217 55 07.25	37 57 59.49	Luna.....	4.1199155	13,180.00	43,241.4						
	91 17 11.333	245 31 16.72	65 36 50.09	Ferry.....	4.2364865	17,237.98	56,554.9						
		278 34 50.75	98 39 11.22	Shivers.....	4.0788926	11,992.03	39,343.9						
Chicot south base, 1929.....	33 12 29.852	179 29 40.42	359 29 38.66	Chicot north base.....	3.9730052	9,397.346	30,831.13						
	91 17 08.129	237 08 08.04	57 12 17.47	Shivers.....	4.1466968	14,018.35	45,991.9						
Jenkins, 1929.....	33 09 28.789	117 52 57.64	297 49 14.61	Chicot south base.....	4.0769883	11,939.56	39,171.7						
	91 10 20.638	144 39 03.81	324 35 18.77	Chicot north base.....	4.2640332	18,366.79	60,258.4						
		185 19 49.97	5 20 16.00	Shivers.....	4.1217331	13,235.28	43,422.7						
Connerly, 1929.....	33 08 45.743	165 46 59.06	345 46 22.10	Chicot south base.....	3.8526235	7,122.35	23,367.2						
	91 16 00.588	173 35 35.70	353 34 56.94	Chicot north base.....	4.2149406	16,403.65	53,817.6						
		214 38 50.85	34 42 23.08	Shivers.....	4.2464200	17,636.81	57,863.4						
		261 24 51.08	81 27 56.99	Jenkins.....	3.9498352	8,909.13	29,229.4						
Weise, 1929.....	33 01 41.082	146 30 07.76	326 27 05.32	Connerly.....	4.1956920	15,692.49	51,484.4						
	91 10 26.415	180 35 42.87	0 35 46.02	Jenkins.....	4.1586370	14,409.11	47,273.9						
Hanna, 1929.....	33 05 29.306	180 58 10.44	0 58 12.60	Connerly.....	3.7819285	6,052.41	19,856.9						
	91 16 04.541	230 21 52.39	50 25 00.32	Jenkins.....	4.0634024	11,571.84	37,965.3						
		308 41 13.61	128 44 18.07	Weise.....	4.0506295	11,241.64	36,881.9						
Gage (La.), 1929.....	32 56 38.718	161 30 39.61	341 28 44.75	Hanna.....	4.2364474	17,236.43	56,549.9						
	91 12 33.764	199 32 03.33	19 33 12.66	Weise.....	3.9949331	9,884.01	32,427.8						
Kilbourne (La.), 1929.....	32 58 40.135	192 38 38.07	12 39 37.51	Hanna.....	4.1112157	12,918.61	42,383.8						
	91 17 53.582	244 18 56.19	64 22 59.76	Weise.....	4.1068146	12,877.00	42,247.3						
		294 13 06.68	114 16 00.69	Gage.....	3.9594883	9,109.37	29,886.3						
<i>Supplementary points</i>													
P.B.M. Cottonwood south base (1879) (M.R.C.) (Mo.), 1929. ¹	36 03 37.303	306 41 16.1	126 41 18.3	Cotton.....	2.066378	116.51	382.2						
	89 41 38.389												
B.M. Barfield (M.R.C.), 1929.....	35 54 07.272	206 56 08.8	26 57 04.8	School.....	3.722164	5,274.3	17,304						
	89 45 33.316	285 32 08.6	105 39 14.2	Edith.....	4.276727	18,911.5	62,045						
		324 27 15.5	144 31 16.1	Lusk.....	4.249204	17,750.2	58,235						
		45 56 04.1	225 55 03.7	Anderson.....	3.555990	3,597.4	11,802						
B.M. 45/4 (M.R.C.), 1929. ¹	35 41 02.564	89 30 14.2	269 29 55.7	Driver.....	2.902160	798.29	2,619.1						
	89 58 21.163												
Driver A, 1930. ¹	35 41 02.673	89 30 27.3	269 29 59.7	Driver.....	3.075384	1,189.55	3,902.7						
	89 58 05.603												
Driver B, 1930. ¹	35 43 26.827	359 56 50.8	179 56 50.9	Driver A.....	3.647655	4,442.78	14,576.0						
	89 58 05.765												
Driver E, 1930. ¹	35 44 00.331	22 40 56.6	202 40 46.6	Driver B.....	3.048880	1,119.13	3,671.7						
	89 57 48.594												
Driver F, 1930. ¹	35 44 55.854	45 14 18.6	225 13 38.5	Driver E.....	3.385593	2,429.93	7,972.2						
	89 56 39.937												
Driver G, 1930. ¹	35 44 55.423	91 07 55.4	271 07 39.8	Driver F.....	2.828082	673.10	2,208.3						
	89 56 13.152												
B.M. Luxora (M.R.C.), 1930. ¹	35 44 55.649	0 45 31.2	180 45 31.2	Driver G.....	0.842172	6.95	22.8						
	89 56 13.148												
Hopefield, 1914.....	35 09 09.236	295 55 50.02	115 56 29.64	Exchange.....	3.2671269	1,936.99	6,354.9						
	90 04 14.389	22 18 51.79	202 16 55.68	Weaver.....	4.1296976	13,480.24	44,226.4						

¹ No check on this position.

Station	Latitude and longitude			Azimuth			Back azimuth			To station	Distance		
											Logarithm (meters)	Meters	Feet
<i>Supplementary points—Continued</i>													
Hopefield south base, 1879.....	35 07 51.387	203 29 12.93	23 29 36.64	Hopefield.....	3.4176107	2,615.84	8,582.1						
	90 04 55.577	240 51 42.97	60 52 46.29	Exchange.....	3.5035244	3,188.04	10,459.4						
		22 01 26.17	201 59 53.77	Weaver.....	4.0360333	10,865.09	35,646.5						
P.B.M. Vance Senior (M.R.C. & U.S.E.), 1914.....	35 08 30.195	194 18 21.57	14 18 28.54	Hopefield.....	3.0939869	1,241.61	4,073.5						
	90 04 28.510	260 08 18.06	80 09 04.65	Exchange.....	3.3179672	2,079.54	6,822.6						
B.M. Hopefield (M.R.C. & U.S.E.), 1914.....	35 08 55.217	34 44 17.61	214 44 05.45	P.B.M. Vance Senior (M.R.C. & U.S.E.).....	2.9723487	938.32	3,078.5						
	90 04 05.389	152 11 50.60	332 11 45.41	Hopefield.....	2.6887772	488.40	1,602.4						
		285 19 42.16	105 20 16.59	Exchange.....	3.1959014	1,570.01	5,150.9						
P.B.M. Memphis (U.S.E.) (Tenn.), 1914.....	35 08 43.458	77 02 02.61	257 01 22.26	P.B.M. Vance Senior (M.R.C. & U.S.E.).....	3.2602695	1,820.83	5,973.8						
	90 03 16.416	106 17 54.87	286 17 26.68	B.M. Hopefield (M.R.C. & U.S.E.).....	3.1111031	1,291.53	4,237.3						
		118 26 00.33	298 25 26.95	Hopefield.....	3.2223667	1,668.66	5,474.6						
P.B.M. 2/3 (M.R.C. & U.S.E.), 1914.....	35 08 12.173	208 48 18.97	28 48 40.96	Hopefield.....	3.3025163	2,006.86	6,584.2						
	90 04 52.592	251 23 58.96	71 25 00.56	Exchange.....	3.4561145	2,858.34	9,377.7						
		6 43 39.29	186 43 37.57	Hopefield south base.....	2.8095718	645.02	2,116.2						
Mississippi-Tennessee boundary monument, 1929 ¹	34 59 40.773	355 20 02.8	175 20 03.8	Lake View.....	2.716246	520.29	1,707.0						
	90 07 39.241												
Branch, 1929.....	35 27 40.838	304 41 46.5	124 43 52.6	Weakley.....	3.824070	6,669.1	21,880						
	90 01 29.015	5 55 04.0	185 54 34.1	Locke.....	4.101068	12,620.2	41,405						
		113 59 48.7	293 56 38.9	Shawnee.....	3.955261	9,021.1	29,597						
		167 50 04.0	347 49 06.7	Wilson.....	4.071130	11,779.6	38,647						
P.B.M. 55/3 (M.R.C.), 1929 ¹	35 27 40.919	274 25 15.8	94 25 16.5	Branch.....	1.511776	32.49	106.6						
	90 01 30.300												
B.M. Thresher (M.R.C.), 1929 ¹	35 22 21.824	58 08 46.7	238 08 11.8	Sanders.....	3.253426	1,792.36	5,880.4						
	90 10 08.494												
Bass (Miss.), 1929.....	34 57 07.636	72 01 22.1	251 59 46.4	Horse.....	3.649276	4,459.4	14,631						
	90 13 48.369	175 17 57.5	355 17 38.8	Martine.....	4.004538	10,105.0	33,153						
		223 59 09.4	44 02 42.8	Weaver.....	4.132843	13,578.2	44,548						
		316 57 13.0	136 59 44.6	Derickson.....	3.963737	9,856.8	32,339						

U.S. COAST AND GEODETIC SURVEY

P.B.M. Norfolk (M.R.C.) (Miss.), 1929 ¹	34 57 07.064	255 02 26.5	75 02 28.0	Bass.....	1.834071	68.25	223.9
	90 13 50.967						
P.B.M. Commerce (M.R.C.) (Miss.), 1929 ¹	34 49 01.095	268 15 50.1	88 16 02.0	Abbott.....	2.724999	530.88	1,741.7
	90 23 45.729						
B.M. Curry (M.R.C.) (Miss.), 1929 ¹	34 44 09.044	203 29 37.7	23 29 39.4	Huston.....	2.277873	189.62	622.1
	90 26 34.886						
P.B.M. Friar Point (M.R.C.) (Miss.), 1929 ¹	34 22 33.729	141 45 37.7	321 45 33.3	Adeho.....	2.507397	321.66	1,055.3
	90 37 52.625						
Charles (Miss.), 1929.....	34 08 09.809	254 57 47.3	75 00 19.4	Rena.....	3.856841	7,191.9	23,595
	90 51 49.075	282 19 55.6	102 25 42.0	Alligator.....	4.209699	16,206.9	53,172
		359 52 33.0	179 52 33.6	Deeson.....	4.113600	12,989.7	42,617
P.B.M. 33a (M.R.C.) (Miss.), 1929 ¹	34 07 59.912	179 19 44.3	359 19 44.2	Charles.....	2.484234	304.95	1,000.5
	90 51 48.936						
Cooperage (Miss.), 1929.....	33 50 20.010	219 29 41.5	39 33 19.4	Seaton.....	4.198180	15,782.7	51,780
	91 01 52.628	253 10 29.2	73 16 48.8	Lamb.....	4.262180	18,288.6	60,002
		293 10 31.5	113 15 02.2	Pace.....	4.133953	13,613.0	44,662
		316 07 33.3	136 09 06.4	Beulah.....	3.793264	6,212.5	20,382
P.B.M. Cooperage (M.R.C.) (Miss.), 1929 ¹	33 50 21.894	47 15 19.1	227 15 17.7	Cooperage.....	1.632164	85.54	280.6
	91 01 50.185						
P.B.M. 77 (M.R.C.) (Miss.), 1929 ¹	33 40 25.096	160 45 43.4	340 45 42.6	Benoit.....	2.045174	110.96	364.0
	91 01 40.193						
B.M. Greenville (M.R.C.) (Miss.), 1929 ¹	33 25 24.042	216 25 29.8	36 25 57.7	Crump.....	3.342838	2,202.11	7,224.8
	91 03 12.881						
B.M. Gage 92 (M.R.C.), 1929 ¹	33 09 32.983	8 45 59.6	188 45 59.2	Jenkins.....	2.116345	130.72	428.9
	91 10 19.869						
B.M. 83/4 (M.R.C.), 1929 ¹	33 01 43.646	17 37 46.4	197 37 45.9	Weise.....	1.918528	82.89	271.9
	91 10 25.448						
B.M. Gage 89 (M.R.C.) (La.), 1929 ¹	32 56 29.512	223 23 56.0	43 24 01.6	Gage.....	2.591431	390.33	1,280.6
	91 12 44.088						
B.M. 42/4 (M.R.C.), 1906 ¹	35 46 24.130	321 27 56.8	141 28 06.8	Cooper.....	2.837456	687.79	*2,256.52
	89 51 16.700						
Cooper 2, 1933.....	35 46 10.823	345 04 03.2	165 04 04.0	Cooper.....	2.121756	132.36	*434.25
	89 51 01.000	136 07 28.5	316 07 19.4	B.M. 42/4 (M.R.C.).....	2.755091	568.97	*1,866.70
Martine reference mark no. 2, 1929 ¹	35 02 33.699	264 05 45.4	84 05 50.5	Martine.....	2.350384	224.07	*735.15
	90 14 29.837						

¹ No check on this position.
² Lengths were measured in feet.

TRIANGULATION AND TRAVERSE IN ARKANSAS

Station	Latitude and longitude	Azimuth	Back azimuth	To station	Distance		
					Logarithm (meters)	Meters	Feet
<i>Supplementary points—Continued</i>							
Martine 2, 1933.....	35 02 44.024 90 14 20.610	2 07 51.7 36 18 59.3	182 07 51.5 216 18 54.0	Martine..... Martine reference mark no. 2.....	2.470322 2.596465	295.34 394.88	968.97 1,295.55
B.M. Kurr (U.S.E.), 1931.....	35 02 49.870 90 14 20.508	0 48 59.1 25 22 58.5	180 48 59.0 205 22 53.1	Martine 2..... Martine reference mark no. 2.....	2.255634 2.741593	180.15 551.56	591.05 1,809.58
Horse reference mark no. 2, 1929 ¹	34 56 23.368 90 16 50.889	271 55 43.2	91 55 52.0	Horse.....	2.591450	390.346	1,280.66
B.M. Brock (M.R.C.), 1931.....	34 56 10.532 90 16 48.188	170 10 01.4 220 03 44.2	350 09 59.9 40 03 51.5	Horse reference mark no. 2..... Horse.....	2.603605 2.698648	401.4 499.629	1,317 1,639.20
Horse 2, 1934.....	34 56 23.156 90 16 51.237	233 37 11.6 270 57 06.6 348 44 54.6	53 37 11.8 90 57 15.6 168 44 56.3	Horse reference mark no. 2..... Horse..... B.M. Brock (M.R.C.).....	1.040318 2.600989 2.598400	10.973 399.014 396.643	36.00 1,309.10 1,301.32
B.M.R-92-2-1 (M.R.C.), 1931.....	34 55 54.839 90 16 41.614	160 57 57.2 190 07 52.0	340 57 53.4 10 07 55.5	B.M. Brock (M.R.C.)..... Horse.....	2.708904 2.944333	511.568 879.697	1,678.37 2,886.14
Station no. 1 (M.R.C.), 1931.....	34 56 09.804 90 16 31.084	92 57 33.1 129 44 49.2 164 28 16.0	272 57 23.3 309 44 37.9 344 28 13.5	B.M. Brock (M.R.C.)..... Horse reference mark no. 2..... Horse.....	2.638143 2.815374 2.623404	434.7 653.7 420.149	1,426 2,145 1,378.44
Station 262/3 (M.R.C.) (Miss.), 1910.....	34 44 00.015 90 27 00.481	163 28 03.1 232 58 48.1	343 28 01.0 52 59 01.7	Station 264 (M.R.C.)..... Station 262/2 (M.R.C.).....	2.516742 2.880381	328.7 759.2	1,078 2,491
P.B.M. 13/a (M.R.C.) (Miss.), 1910.....	34 44 00.794 90 26 02.612	89 04 13.1 116 34 26.1 119 52 13.7	269 03 40.1 296 34 06.7 299 51 57.0	Station 262/3 (M.R.C.)..... Station 262/2 (M.R.C.)..... Huston.....	3.168034 2.985986 2.934319	1,472.4 968.2 859.6	4,831 3,177 2,820
B. M. Bell (M.R.C.) (Miss.), 1931.....	34 43 59.712 90 26 10.268	129 57 43.1 260 17 26.5	309 57 30.8 80 17 30.9	Huston..... P.B.M. 13/a (M.R.C.).....	2.856400 2.295805	718.5 197.608	2,357 648.32
Station no. 1 (M.R.C.) (Miss.), 1931.....	34 44 12.939 90 26 19.838	329 08 49.0 99 56 39.5	149 08 54.4 279 56 32.6	B.M. Bell (M.R.C.)..... Huston.....	2.676471 2.494014	474.757 311.899	1,557.60 1,023.29
Station no. 2 (M.R.C.) (Miss.), 1931.....	34 44 04.344 90 26 30.606	174 02 13.3 225 57 42.6 285 25 02.7	354 02 12.6 45 57 48.8 105 25 14.3	Huston..... Station no. 1 (M.R.C.)..... B.M. Bell (M.R.C.).....	2.505779 2.580974 2.729750	320.464 381.043 536.723	1,051.39 1,250.14 1,760.90

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Station no. 1 (M.R.C.) (Miss.), 1931 ¹	34 36 36.502 90 28 32.023	204 56 24.1	24 56 25.2	Austin.....	2.062724	115.538	379.06
Austin reference mark no. 2 (Miss.), 1929.....	34 36 34.844 90 28 26.641	110 25 58.7 150 26 03.0	290 25 55.6 330 26 01.0	Station no. 1 (M.R.C.)..... Austin.....	2.165366 2.253298	146.341 179.183	480.12 587.87
Station no. 3 (Miss.), 1931 ¹	34 36 28.414 90 28 37.615	208 22 19.9	28 22 24.2	Austin.....	2.604563	402.312	1,319.92
B.M. Bud (M.R.C.) (Miss.), 1931.....	34 36 26.275 90 28 19.599	98 10 19.5 147 28 08.7	278 10 09.3 327 28 02.8	Station no. 3..... Austin.....	2.666260 2.697259	463.724 498.0	1,521.40 1,634
B.M. Jim (M.R.C.) (Miss.), 1931.....	34 36 32.575 90 28 19.594	0 02 13.0 74 23 51.7 130 06 59.2	180 02 13.0 254 23 41.5 310 06 53.3	B.M. Bud (M.R.C.)..... Station no. 3..... Austin.....	2.288095 2.678251 2.544534	194.131 476.7 350.377	636.91 1,564 1,149.53
Jeffries reference mark no. 2 (Miss.), 1929 ¹	34 30 33.770 90 32 33.149	195 28 50.8	15 28 51.8	Jeffries.....	2.206156	160.752	527.40
Station no. 1 (Miss.), 1931.....	34 30 31.073 90 32 33.464	185 30 58.7 192 04 41.7	5 30 58.8 12 04 42.8	Jeffries reference mark no. 2..... Jeffries.....	1.921616 2.386335	83.5 243.4	274 799
B.M. Sayre no. 2 (M.R.C.) (Miss.), 1931.....	34 30 24.331 90 32 23.241	128 32 43.6 154 47 37.2	308 32 37.8 334 47 32.5	Station no. 1..... Jeffries.....	2.522984 2.692578	333.4 492.695	1,094 1,616.45
B.M. Sayre no. 1 (M.R.C.) (Miss.), 1931.....	34 30 38.045 90 32 22.308	3 13 23.0 52 57 01.8 95 40 14.8	183 13 22.5 232 56 55.5 275 40 09.6	B.M. Sayre no. 2 (M.R.C.)..... Station no. 1..... Jeffries.....	2.626599 2.552114 2.370648	423.252 356.5 234.773	1,388.62 1,170 770.25
Jeffries 2 (Miss.), 1934.....	34 30 35.492 90 32 08.765	47 02 20.3 102 49 56.7	227 02 12.1 282 49 49.0	B.M. Sayre no. 2 (M.R.C.)..... B.M. Sayre no. 1 (M.R.C.).....	2.702951 2.549390	504.604 354.315	1,655.52 1,162.45
B.M. Lowe (M.R.C.) (Miss.), 1931.....	34 22 37.127 90 37 54.841	331 36 24.2 136 04 20.2	151 36 25.5 316 04 17.1	P.B.M. Friar Point (M.R.C.)..... Adeho.....	2.075693 2.312605	119.040 205.402	390.55 673.89
Adeho reference mark no. 1 (Miss.), 1929.....	34 22 47.381 90 37 48.996	25 24 39.4 60 08 04.0	205 24 36.0 240 07 57.5	B.M. Lowe (M.R.C.).....	2.543810 2.528148	349.792 337.402	1,147.61 1,106.96
Station no. 1 (Miss.), 1931 ¹	34 15 58.037 90 43 43.401	5 22 54.5	185 22 54.3	McWilliams.....	2.033718	108.073	354.57
P.B.M. 30/a (M.R.C.) (Miss.), 1929.....	34 15 55.850 90 43 38.540	84 41 46.5 127 24 32.4	264 41 43.5 307 24 29.6	McWilliams..... Station no. 1.....	2.130577 2.194683	135.075 156.561	443.16 513.65
Station no. 2 (Miss.), 1931.....	34 16 05.810 90 43 31.130	45 25 08.3 55 59 52.0	225 25 01.2 235 59 45.1	McWilliams..... Station no. 1.....	2.657991 2.578260	454.979 378.669	1,492.71 1,242.35
Station no. 3 (Miss.), 1931.....	34 16 10.946 90 43 19.445	52 31 38.3 62 06 23.0	232 31 24.6 242 06 16.4	McWilliams..... Station no. 2.....	2.894878 2.529233	785.014 338.246	2,575.50 1,109.73
McWilliams reference mark no. 1 (Miss.), 1929.....	34 15 55.458 90 43 28.458	89 56 28.7 167 54 16.9	209 56 20.1 347 54 15.4	McWilliams..... Station no. 2.....	2.593746 2.513477	392.416 326.195	1,287.45 1,070.19

¹ No check on this position.

² Lengths were measured in feet.

Mississippi River—Continued

Station	Latitude and longitude			Azimuth			Back azimuth			To station	Distance		
	°	'	"	°	'	"	°	'	"		Logarithm (meters)	Meters	Feet
<i>Supplementary points—Continued</i>													
B.M. Conway (M.R.C.) (Miss.), 1931.....	34	15	56.768	87	44	11.3	267	43	48.6	McWilliams.....	3.013051	1,030.506	3,380.92
	90	43	03.548	88	11	34.7	268	11	15.0	P.B.M. 30/a (M.R.C.).....	2.952136	895.6	2,938
				137	03	01.9	317	02	52.9	Station no. 3.....	2.775860	596.842	1,958.14
McWilliams 2 (Miss.), 1934.....	34	15	56.462	87	44	06.0	267	43	48.6	McWilliams.....	2.898774	792.088	2,598.71
	90	43	12.860	267	44	06.0	87	44	11.3	B.M. Conway (M.R.C.).....	2.377339	238.418	782.21
Osceola, water tank, 1929.....	35	42	18.321	236	47	16.8	56	51	27.0	Cooper.....	4.109264	12,860.7	42,194
	89	58	07.997	345	27	19.3	165	29	29.9	Chickasaw.....	4.352186	22,500.2	73,819
				25	44	47.8	205	44	21.6	Driver.....	3.414932	2,599.8	8,530
Millington, water tank (Tenn.), 1929 ¹	35	20	36.85	92	15	29	272	10	25	Locke.....	4.123151	13,278.6	43,565
	89	53	35.08	145	04	49	325	02	20	Weakley.....	4.053331	11,306.6	37,095
Memphis, Columbus Tower, flagpole (Tenn.), 1929.....	35	08	48.035	41	49	09.2	221	41	24.8	Horse.....	4.488249	30,778.6	100,979
	90	03	06.806	86	58	39.4	266	53	47.2	Bollinger.....	4.108587	12,870.3	42,225
				179	33	50.6	359	33	48.7	Benjes.....	4.037323	10,897.4	35,753
West Memphis, water tank, 1929.....	35	08	46.016	226	07	57.6	46	12	17.7	Benjes.....	4.199340	15,824.9	51,919
	90	10	41.339	270	37	01.8	90	41	24.2	Exchange.....	4.062122	11,537.8	37,854
				338	15	08.5	158	16	54.9	Weaver.....	4.102304	12,656.2	41,523
Memphis, Sterick Building, stack (Tenn.), 1929.....	35	08	40.953	42	21	25.0	222	13	36.2	Horse.....	4.487770	30,744.7	100,868
	90	02	59.260	87	58	47.3	267	53	50.7	Bollinger.....	4.115660	13,051.5	42,820
				98	40	57.0	278	40	53.3	Exchange.....	2.208588	161.7	531
Memphis, National Memphis Garage, occulting light (Tenn.), 1929. ¹	35	07	50.32	122	22	58	302	16	57	Marion.....	4.272651	18,734.9	61,466
	90	01	44.68	151	12	59	331	07	33	Sanders.....	4.470953	29,576.9	97,037
Tunica, black water tank (Miss.), 1929.....	34	41	24.825	134	19	09.1	314	17	09.0	Huston.....	3.874718	7,494.1	24,587
	90	23	01.149	276	55	26.5	96	57	12.7	Caulsby.....	3.679922	4,785.4	15,700
				340	53	55.9	160	54	50.6	Evansville.....	3.874888	7,497.0	24,596
Tunica, Planters Oil Co., black stack (Miss.), 1929.....	34	41	43.655	130	23	12.1	310	21	09.6	Huston.....	3.856439	7,185.2	23,573
	90	22	56.778	284	00	20.1	104	02	03.9	Caulsby.....	3.679557	4,781.4	15,687
				343	00	32.2	163	01	24.5	Evansville.....	3.903867	8,014.3	26,294
Tunica, Planters Oil Co., white tank (Miss.), 1929.....	34	41	44.132	130	16	13.2	310	14	10.5	Huston.....	3.856105	7,179.7	23,555
	90	22	56.573	284	11	30.5	104	13	14.1	Caulsby.....	3.679422	4,779.9	15,682
				343	04	31.3	163	05	23.4	Evansville.....	3.904546	8,026.9	26,335
Lula, black water tank, final (Miss.), 1929 ¹	34	27	15.16	324	12	43	144	13	36	Rich.....	3.614284	4,114.2	13,498
	90	28	33.97	136	00	57	315	58	42	Jeffries.....	3.940687	8,723.4	28,620
Friars Point, water tank (Miss.), 1929.....	34	22	15.080	292	44	31.4	112	48	09.1	Rudyard.....	4.029172	10,694.8	35,088
	90	38	23.046	349	59	17.5	170	00	25.8	Clarksdale.....	4.251599	17,848.4	58,558
				2	22	43.8	182	22	36.7	Stovall northeast base.....	3.891045	7,781.2	25,529
Lyons, municipal water tank (Miss.), 1929.....	34	12	54.121	87	11	35.6	267	09	25.3	Clarksdale.....	3.773654	5,938.2	19,482
	90	32	30.141	135	30	27.1	315	27	01.3	Stovall northeast base.....	4.125094	13,338.1	43,760
				183	39	58.2	3	40	16.7	Rudyard.....	4.119646	13,171.8	43,214
Lyons, Planters Manufacturing Co., water tank (Miss.), 1929.	34	12	31.501	94	13	51.7	274	11	51.2	Clarksdale.....	3.740532	5,502.1	18,051
	90	32	47.482	138	54	42.4	318	51	26.4	Stovall northeast base.....	4.131879	13,548.1	44,449
				185	18	21.5	5	18	49.7	Rudyard.....	4.143061	13,901.5	45,609
Clarksdale, municipal water tank (Miss.), 1929.....	34	12	06.321	109	39	24.7	289	38	12.2	Clarksdale.....	3.545322	3,510.1	11,516
	90	34	12.703	148	31	35.0	328	29	07.0	Stovall northeast base.....	4.109920	12,880.1	42,257
				193	19	51.8	13	21	08.1	Rudyard.....	4.176760	15,023.1	49,288
Clarksdale, Federal Compress no. 1, water tank (Miss.), 1929.	34	11	28.625	122	15	38.7	302	14	17.3	Clarksdale.....	3.642302	4,388.4	14,398
	90	33	56.869	149	35	20.6	329	32	43.7	Stovall northeast base.....	4.148752	14,084.8	46,210
				190	58	18.8	10	59	26.1	Rudyard.....	4.200109	16,073.4	52,734
Clarksdale, Federal Compress no. 2, water tank (Miss.), 1929.	34	11	48.025	98	19	44.3	278	15	23.8	Stovall southwest base.....	4.078743	11,987.9	39,330
	90	34	47.888	125	57	08.2	305	56	15.4	Clarksdale.....	3.472875	2,970.8	9,747
				196	02	04.2	16	03	40.2	Rudyard.....	4.198574	15,797.0	51,827
Shelby, cotton compress, water tank (Miss.), 1929.....	33	57	18.896	41	27	40.8	221	25	14.5	Lamb.....	4.007586	10,176.2	33,386
	90	46	09.195	129	07	20.8	309	04	11.4	Deeson.....	4.049384	11,204.3	36,759
				195	33	20.4	15	33	52.5	Wilkinson.....	3.741118	5,509.6	18,076
Gunnison, water tank (Miss.), 1929 ¹	33	56	34.15	222	36	25	42	39	14	Deeson.....	4.059849	11,477.5	37,656
	90	56	50.81	254	12	41	74	13	30	Seaton.....	3.376103	2,377.4	7,800
Rosedale, water tank (Miss.), 1929.....	33	51	33.322	259	38	09.4	79	44	09.1	Lamb.....	4.226876	16,860.7	55,317
	91	01	16.823	303	18	23.2	123	22	34.0	Pace.....	4.142135	13,871.9	45,511
				333	19	35.5	153	20	48.7	Beulah.....	3.877365	7,539.9	24,737
Benoit, water tank (Miss.), 1929.....	33	39	05.525	145	12	28.2	325	11	50.0	Benoit.....	3.493168	3,112.9	10,213
	91	00	32.660	276	11	34.4	96	13	45.1	Clear.....	3.786386	6,114.9	20,062
				353	20	41.9	173	21	13.7	Pricella.....	4.100449	12,777.6	41,921
Scott, Delta Pine Lands Co., final of larger of two water tanks (Miss.), 1929.	33	35	30.482	348	33	58.4	168	35	11.5	Crump.....	4.236876	17,253.5	56,606
	91	04	34.673	94	19	17.3	274	19	00.8	Scott.....	2.887577	771.9	2,532
				205	53	47.4	25	55	23.3	Benoit.....	4.008922	10,207.6	33,489

¹ No check on this position.

Mississippi River—Continued

Station	Latitude and longitude			Azimuth			Back azimuth			To station	Distance		
	°	'	"	°	'	"	°	'	"		Logarithm (meters)	Meters	Feet
<i>Supplementary points—Continued</i>													
Scott, Delta Pine Lands Co., small water tank (Miss.), 1929.	33	35	30.192	348	35	47.6	168	37	00.4	Crump.....	4.236600	17,242.5	56,570
	91	04	34.242	94	54	43.7	274	54	26.9	Scott.....	2.894154	783.7	2,571
Greenville, Greenville Compress Co., water tank (Miss.), 1929.	33	25	01.910	47	01	59.3	226	59	27.6	Ferry.....	3.988615	9,741.3	31,960
	91	02	28.833	138	36	56.5	318	34	43.3	Winn.....	3.974829	9,436.9	30,961
Greenville, east transmission tower (Miss.), 1929.....	33	24	07.797	40	50	49.7	220	49	18.2	Crump.....	3.390846	2,459.5	8,069
	91	04	18.199	158	40	13.3	338	39	00.4	Ferry.....	3.817917	6,575.3	21,572
Greenville, west transmission tower (Miss.), 1929.....	33	24	26.741	30	56	32.3	210	55	21.4	Winn.....	3.972632	9,389.3	30,875
	91	04	55.662	163	18	18.9	343	17	26.6	Crump.....	3.707091	5,094.4	16,714
Lake Village, water tank, 1929.....	33	20	20.818	234	20	44.0	54	23	20.8	Ferry.....	3.811588	6,480.2	21,260
	91	16	42.978	301	49	16.3	121	53	12.4	Winn.....	3.930510	8,521.4	27,957
Eudora, oil derrick north of, 1929 ¹	33	08	16.52	217	24	27	37	24	42	Crump.....	3.725259	5,312.0	17,428
	91	16	27.15	353	30	23	173	30	36	Luna.....	3.957431	9,066.3	29,745
Eudora, Federal Compress Co., south water tank, 1929.....	33	07	10.995	243	00	20.2	63	03	16.1	Shivers.....	4.116994	13,091.6	42,951
	91	15	42.486	321	05	04.4	141	07	56.9	Chicot north base.....	3.713033	5,164.6	16,944
Eudora, Federal Compress Co., north water tank, 1929.....	33	07	20.165	244	42	00.0	64	44	57.0	Connerly.....	3.054304	1,133.2	3,718
	91	15	44.419	321	40	49.6	141	43	43.2	Hanna.....	3.714722	5,184.7	17,010
Eudora, municipal water tank, 1929.....	33	06	40.789	238	03	06.5	58	06	01.7	Jenkins.....	3.971273	9,359.9	30,708
	91	15	41.124	318	29	38.6	138	32	30.4	Weise.....	4.115870	13,057.8	42,840
				15	25	00.6	195	24	47.9	Hanna.....	3.503031	3,184.4	10,447
										Jenkins.....	3.967567	9,280.4	30,447
										Weise.....	4.124171	13,309.8	43,667
										Hanna.....	3.538422	3,454.8	11,335
										Jenkins.....	3.990668	9,787.4	32,111
										Weise.....	4.090758	12,324.2	40,454
										Hanna.....	3.358752	2,284.3	7,494

Examples to which this table applies

Organ, 1916.....	35	09	12.041	208	50	00.5	118	50	39.0	Exchange.....	3.2868108	1,935.58	6,350.3
	90	04	12.557	28	12	18.5	208	12	17.5	Hopefield.....	1.6916337	98.09	321.8
Crossing, 1916.....	35	08	53.981	256	42	14.9	76	43	08.5	Organ.....	3.3840544	2,421.33	7,944.0
	90	05	45.653							Crossing.....	3.7278494	5,343.79	17,532.1
Levee, 1916.....	35	08	14.368	256	46	41.7	76	48	40.0	Levee.....	3.6291239	4,257.20	13,967.2
	90	09	11.172							Hulbert.....	3.4236300	2,652.35	8,701.9
Hulbert, 1916.....	35	07	42.265	256	32	57.9	76	34	32.0	Levee.....	3.5560618	3,598.00	11,804.4
	90	11	54.722							Mounds.....	3.6326284	4,291.69	14,080.3
Riceville, 1916.....	35	07	22.517	256	43	38.9	76	44	37.5	Hulbert.....	3.6288897	4,254.90	13,959.6
	90	13	36.682							Proctor.....	3.4465222	2,795.90	9,172.9
Mounds, 1916.....	35	06	55.855	256	47	18.8	76	48	38.3	Riceville.....	3.5109963	3,243.37	10,641.0
	90	15	55.020							Browns.....	3.4535151	2,841.29	9,321.8
Edmondson, 1916.....	35	06	24.148	256	49	36.2	76	51	11.1	Mounds.....	3.8584540	7,218.62	23,683.1
	90	18	40.040							Cicalla.....	3.8320003	6,792.04	22,283.6
Proctor, 1916.....	35	05	52.583	256	46	17.6	76	47	51.6	Edmondson.....	2.9821173	959.66	3,148.5
	90	21	23.591							Blackfish.....	3.8145780	6,524.96	21,407.3
Browns, 1916.....	35	05	31.922	256	49	41.5	76	50	43.3	Proctor.....	3.8255642	6,692.13	21,955.8
	90	23	11.074							Widener.....			
Curve, 1916.....	35	05	07.196	256	24	09.0	76	25	20.6	Browns.....			
	90	25	15.530							Creek, 1916.....			
Jonquill, 1916.....	35	04	55.777	262	52	36.4	82	53	40.4	Curve.....			
	90	27	06.826										
Cicalla, 1916.....	35	04	26.667	262	50	19.6	82	53	02.1	Jonquill.....			
	90	31	49.552										
Blackfish, 1916.....	35	03	58.255	262	34	20.1	82	36	52.8	Cicalla.....			
	90	36	15.386										
Round Pond, 1916.....	35	03	44.862	244	31	30.5	64	31	50.1	Blackfish.....			
	90	36	49.578										
Widener, 1916.....	35	01	42.657	234	43	58.0	54	45	58.7	Round Pond.....			
	90	40	19.823										
Creek, 1916.....	35	00	10.663	244	55	04.3	64	57	21.5	Widener.....			
	90	44	18.922										

¹No check on this position.

Station	Latitude and longitude	Azimuth	Back azimuth	To station	Distance		
					Logarithm (meters)	Meters	Feet
<i>Principal points—Continued</i>							
Crow, 1916.....	34 59 59.125 90 45 30.048	258 50 32.4	78 51 13.2	Creek.....	3.2644222	1,838.32	6,031.2
Little, 1916.....	35 00 09.679 90 46 05.985	289 38 17.4	109 38 38.1	Crow.....	2.9856908	967.59	3,174.5
Forrest, 1916.....	35 00 38.284 90 46 29.843	325 32 13.3	145 32 27.0	Little.....	3.0290222	1,069.11	3,507.6
Becks, 1916.....	34 59 03.515 90 51 54.330	250 26 03.2	70 29 09.4	Forrest.....	3.9410934	8,731.59	28,646.9
Palestine, 1916.....	34 58 15.564 90 54 33.233	250 25 14.1	70 26 48.1	Becks.....	3.6446590	4,412.24	14,475.8
Moon, 1916.....	34 57 29.425 90 57 15.972	250 25 38.8	70 27 09.2	Palestine.....	3.6280640	4,246.82	13,933.1
Goodwin, 1916.....	34 56 46.157 90 59 41.234	250 06 02.4	70 07 25.6	Moon.....	3.5932318	3,919.51	12,859.3
Blossom, 1916.....	34 55 52.671 91 02 44.887	250 30 34.0	70 32 19.2	Goodwin.....	3.6940319	4,943.47	16,218.7
Wheatley, 1916.....	34 55 07.621 91 05 15.844	250 04 17.2	70 05 43.6	Blossom.....	3.6101554	4,075.26	13,370.2
Junction, 1916.....	34 53 56.837 91 09 17.091	250 22 37.8	70 24 55.8	Wheatley.....	3.8129967	6,501.25	21,329.5
Brinkley, 1916.....	34 53 14.182 91 11 39.293	249 59 06.9	70 00 28.2	Junction.....	3.5846145	3,842.51	12,606.6
Eden, 1916.....	34 52 36.121 91 13 47.932	250 14 24.4	70 15 38.0	Brinkley.....	3.5404451	3,470.92	11,387.5
Brasfield, 1916.....	34 49 53.884 91 22 53.900	250 08 04.0	70 13 16.0	Eden.....	4.1685837	14,742.93	48,369.1
Biscoe, 1916.....	34 48 32.717 91 25 41.406	239 33 01.2	59 34 36.8	Brasfield.....	3.6934934	4,937.34	16,198.6

Tank, 1916.....	34 47 43.587 91 26 19.898	212 52 15.6	32 52 37.6	Biscoe.....	3.2558987	1,802.60	5,914.0
Odum, 1916.....	34 48 22.774 91 25 51.703	220 30 12.7	40 30 18.6	Biscoe.....	2.6052622	402.96	1,322.0
Bridge, 1916.....	34 47 40.136 91 26 35.105	254 37 05.5	74 37 14.2	Tank.....	3.1474355	1,404.22	4,607.0
River, 1916.....	34 47 41.238 91 26 54.077	254 37 05.5	74 37 14.2	Bridge.....	2.6030842	400.94	1,315.4
White, 1916.....	34 47 37.138 91 27 08.704	274 01 33.6	94 01 44.4	River.....	2.6843882	483.49	1,586.3
De Vall, 1916.....	34 47 10.072 91 27 29.223	251 13 57.5	71 14 05.8	White.....	2.5940841	392.72	1,288.4
Bluff, 1916.....	34 47 16.290 91 28 12.912	212 01 21.6	32 01 33.4	De Vall.....	2.9928797	983.74	3,227.5
Mesa, 1916.....	34 47 16.290 91 28 12.912	279 47 02.1	99 47 27.0	Bluff.....	3.0519824	1,127.15	3,698.0
Weckerle, 1916.....	34 47 04.203 91 28 48.289	247 30 09.0	67 30 29.2	Mesa.....	2.9683364	973.50	3,193.9
Hazen, 1916.....	34 46 47.556 91 31 58.736	263 56 15.5	83 58 04.1	Weckerle.....	3.6874658	4,869.29	15,975.3
Cuneo, 1916.....	34 46 50.885 91 35 53.326	270 58 00.2	91 00 14.0	Hazen.....	3.7766515	5,965.56	19,572.0
Prairie, 1916.....	34 46 52.613 91 38 10.991	270 51 37.3	90 52 55.9	Cuneo.....	3.5441482	3,500.65	11,485.0
Carlisle, 1916.....	34 46 54.569 91 41 00.239	270 47 20.6	90 48 57.2	Prairie.....	3.6338377	4,303.66	14,119.6
McCreanor, 1916.....	34 46 56.087 91 43 59.142	270 34 30.0	90 36 12.1	Carlisle.....	3.6579096	4,548.93	14,924.3
Sisemore, 1916.....	34 46 59.277 91 48 05.109	270 52 51.7	90 55 12.0	McCreanor.....	3.7961959	6,254.55	20,520.1
Lonoke, 1916.....	34 47 00.909 91 50 30.041	270 46 13.5	90 47 36.2	Sisemore.....	3.5664669	3,685.25	12,090.7
Daniel, 1916.....	34 47 02.328 91 53 47.154	270 29 03.4	90 30 55.8	Lonoke.....	3.6999916	5,011.78	16,442.8
	34 47 03.966 91 56 45.118	270 37 30.1	90 39 11.6	Daniel.....	3.6556168	4,524.98	14,845.7

Memphis to Little Rock traverse—Continued.

Station	Latitude and longitude	Azimuth	Back azimuth	To station	Distance		
					Logarithm (meters)	Meters	Feet
<i>Principal points—Continued</i>							
Meto, 1916.....	° ' " 34 47 06.248 92 00 05.427	° ' " 270 46 30.7	° ' " 90 48 25.0	Daniel.....	3.7069066	5,093.27	16,710.2
Kerr, 1916.....	° ' " 34 47 08.803 92 04 30.015	° ' " 270 38 58.5	° ' " 90 41 29.5	Meto.....	3.8278511	6,727.46	22,071.7
Galloway, 1916.....	° ' " 34 46 43.554 92 08 08.336	° ' " 262 00 13.6	° ' " 82 02 18.2	Kerr.....	3.7485890	5,605.16	18,389.6
Plant, 1916.....	° ' " 34 46 21.281 92 11 15.152	° ' " 261 45 49.4	° ' " 81 47 36.0	Galloway.....	3.6812028	4,799.58	15,746.6
Tie, 1916.....	° ' " 34 45 46.598 92 12 53.847	° ' " 246 55 35.0 65 25 58.0	° ' " 66 56 31.3 245 25 29.4	Plant..... Little Rock northwest base.....	3.4358249 3.1477335	2,727.88 1,405.19	8,949.7 4,610.2

DESCRIPTIONS OF TRIANGULATION AND TRAVERSE STATIONS

The following descriptions of stations may be conveniently consulted by reference to the illustrations at the end of this publication or to the index. All azimuths given in the descriptions are reckoned continuously from true south around by west to 360° , south being 0° , west 90° , north 180° , and east 270° . Where magnetic azimuths are given they are indicated as such.

In general, except where the contrary is specifically stated, the surface and underground marks are not in contact, so that a disturbance of the surface mark will not necessarily affect the underground mark. The underground mark should be resorted to only in cases where there is evidence that the surface mark has been disturbed.

The name and dates given in each description immediately after the county refer to the chief of party by whom the station was established, the date of the establishment of the station, and the date when the station was last recovered.

Any person who finds that one of the stations herein described has been disturbed or that the description no longer fits the facts is requested to send such information to the Director, Coast and Geodetic Survey, Washington, D.C.

MARKING OF STATIONS

The standard station and reference marks referred to in the following descriptions and notes consist of a disk and shank of bronze cast in one piece, as shown in figure 2. The disk of the station mark is 90 millimeters in diameter, with a hole at the center surrounded by a 20-millimeter equilateral triangle, and has the following inscribed legend: "U.S. Coast and Geodetic Survey Triangulation Station. For information write to the Superintendent, Washington, D.C. \$250 fine or imprisonment for disturbing this mark." On the marks made since March 1921 the word "Director" replaces the word "Superintendent" in the inscription. The shank is 25 millimeters in diameter and 80 millimeters long, with a slit at the lower end into which a wedge is inserted so that when it is driven into a drill hole in the rock it will bulge at the bottom and hold the mark firmly in place. Present practice is to spread the split end of the shank, and set it in a drill hole with cement. The marks used between 1915 and 1920 have grooves cut around the shank instead of the slit.

The standard disk reference mark, shown in figure 2, is the same size and shape as the station mark, with an arrow on the top in place of the triangle, which, when properly set, points to the station. The legend is the same, except the words "reference mark" take the place of the words "triangulation station."

GENERAL NOTES IN REGARD TO STATION MARKS

The following notes on the marking of stations are made as general as possible in order that it may not be necessary in the field to describe small and unimportant variations. The standard notes on the marking of stations which are given below serve as a guide

to the field observer in selecting the best type of mark for each particular station. They are also useful to the observer in writing his descriptions, as he need not describe the marking used at a station but simply give the numbers of the standard notes which describe the station, underground, and reference marks.

For the convenience of the reader a brief description of the marking is given in each of the following descriptions of stations. In addition, where the marking of a station is described in detail in one of the following notes, the number of the note is also given:

Surface marks

Note 1.—A standard disk triangulation station mark set in the top of (a) a square block or post of concrete, (b) a concrete cylinder, (c) an irregular mass of concrete.

Note 2.—A standard disk triangulation station mark wedged in a drill hole in outcropping bedrock (a) and surrounded by a triangle chiseled in the rock, (b) and surrounded by a circle chiseled in the rock, (c) at the intersection of two lines chiseled in the rock.

Note 3.—A standard disk triangulation station mark set in concrete in a depression in outcropping bedrock.

Note 4.—A standard disk triangulation station mark wedged in a drill hole in a boulder.

Note 5.—A standard disk triangulation station mark set in concrete in a depression in a boulder.

Note 6.—A standard disk triangulation station mark set in concrete at the center of the top of a tile (a) which is embedded in the ground, (b) which is surrounded by a mass of concrete, (c) which is fastened by means of concrete to the upper end of a long wooden pile driven into the marsh, (d) which is set in a block of concrete, and projects from 12 to 20 inches above the block.

Underground marks

Note 7.—A block of concrete 3 feet below the ground containing at the center of its upper surface (a) a standard disk triangulation station mark, (b) a copper bolt projecting slightly above the concrete, (c) an iron nail with the point projecting above the concrete, (d) a glass bottle with the neck projecting a little above the concrete, (e) an earthenware jug with the mouth projecting a little above the concrete.

Note 8.—In bedrock (a) a standard disk triangulation station mark wedged in a drill hole, (b) a standard disk triangulation station mark set in concrete in a depression, (c) a copper bolt set in cement in a drill hole or depression, (d) an iron spike set point up in cement in a drill hole or depression.

Note 9.—In a boulder 3 feet below the ground (a) a standard disk triangulation station mark wedged in a drill hole, (b) a standard disk triangulation station mark set in concrete in a depression, (c) a copper bolt set with cement in a drill hole or depression, (d) an iron spike set with cement in a drill hole or depression.

Note 10.—Embedded in earth 3 feet below the surface of the ground (a) a bottle in an upright position, (b) an earthenware jug in an upright position, (c) a brick in a horizontal position with a drill hole in its upper surface.

Reference marks

Note 11.—A standard disk reference mark with the arrow pointing toward the station set at the center of the top of (a) a square block or post of concrete, (b) a concrete cylinder, (c) an irregular mass of concrete.

Note 12.—A standard disk reference mark with the arrow pointing toward the station (a) wedged in a drill hole in outcropping bedrock, (b) set in concrete in a depression in outcropping bedrock, (c) wedged in a drill hole in a boulder, (d) set in concrete in a depression in a boulder.

Note 13.—A standard disk reference mark with the arrow pointing toward the station, set in concrete at the center of the top of a tile (a) which is embedded in the ground, (b) which is surrounded by a mass of concrete,

(c) which is fastened by means of concrete to the upper end of a long wooden pile driven into the marsh, (d) which is set in a block of concrete and projects from 12 to 20 inches above the block.

Witness marks

Note 14.—A conical mound of earth surrounded by a circular trench.

Note 15.—A tree marked with (a) a triangular blaze with a nail at the center of each apex of the triangle, (b) a square blaze with a nail at the center and each corner of the square, (c) a blaze with a standard disk reference mark set at its center into the tree.

ADDITIONAL NOTES ON THE MARKING OF STATIONS

Station marks

Note 16.—The standard survey mark of the Mississippi River Commission consisting of a steel pipe, 4 inches in diameter and about 4 feet long, resting on a vitrified tile, 18 inches square and 4 inches thick. The bottom end of the pipe is split for several inches and spread out to about 10 inches in diameter. A brass cap is riveted on top end of pipe. The cap is marked "Mississippi River Commission; \$250 fine for disturbing this mark"; on each side of a small hole in the center are the letters "U.S."; below this are the words "Latitude, Longitude" and "Elevation above sea", with a blank space left for cutting in the data. In the tile is leaded a copper bolt surrounded with the inscription "Mississippi River Commission, U.S." in sunken letters.

THIRTY-FIFTH PARALLEL

Principal points

Danville (Yell County, E. H. Pagenhart, 1916; 1928).—About $3\frac{1}{2}$ miles east of Danville, on highest point of prominent rocky knob known as "Bunker Hill", 7.45 meters (24.4 feet) east of nail in triangular blaze on 12-inch oak on crest of ridge, and 5.8 meters (19 feet) from nail in triangular blaze on 8-inch pine down north slope of ridge. Surface and underground marks are standard disk station marks in boulders, notes 4 and 9a. Reference marks are standard reference disks in boulders, note 12c. No. 1 is 9.47 meters (31.1 feet) from station in azimuth $8^{\circ}57'$ and No. 2 is 13.82 meters (45.3 feet) in azimuth $81^{\circ}30'$. Plainview water tank is distant from station 4 miles in azimuth $339^{\circ}13'49''$; and Danville water tank, $2\frac{1}{2}$ miles in azimuth $95^{\circ}01'$. Elevation of station mark is 384.9 meters (1,263 feet).

Powell (Garland County, E. H. Pagenhart, 1916).—Near southern side of small clearing on flat top of Powell Mountain, in northwest corner of Garland County, 6 miles south of east from Aly Post Office, 4 miles north of Mount Tabor Church, and $1\frac{1}{2}$ miles northeast of Wilson Brothers' cattle ranch. Surface mark is a standard station disk in bedrock, note 2. Reference mark is a standard reference disk in bedrock, note 12a, 13.73 meters (45 feet) from station in azimuth $319^{\circ}07'$. A U.S.G.S. station, marked by disk in rocky outcrop, is 5.94 meters (19.5 feet) from station in azimuth $24^{\circ}48'$. Elevation of station mark is 546.5 meters (1,793 feet).

Jean (Yell County, E. H. Pagenhart, 1916; 1928).—Twelve miles south from town of Magazine, 6 miles southeast from Sugar Grove, on north slope of highest knob of Pettit Jean Mountain, $\frac{1}{2}$ meter (2 feet) lower than highest point, $\frac{1}{2}$ mile southwest from Turner Flood's place, and 13.5 meters (44 feet) north of stone house. Marked by standard disk station mark in drill hole in a boulder, note 4. Reference marks are standard reference disks in bedrock, note 12a. No. 1 is 16.43 meters (53.9 feet) from station in azimuth $79^{\circ}39'$. No. 2 is 17.55 meters (57.6 feet) from station in azimuth $88^{\circ}33'$. Northeast corner of house is 13.50 meters (44.3 feet) from station in azimuth $12^{\circ}40'$. Three witness marks are at following distances and azimuths from station: 3.83 meters (12.6 feet), $212^{\circ}44'$; 8.66 meters (28.4 feet), $66^{\circ}38'$; and 14.86 meters (48.8 feet), $106^{\circ}18'$. Elevation of station mark is 740.4 meters (2,429 feet).

Magazine (Logan County, E. H. Pagenhart, 1916; 1928).—Three miles northeast from town of Blue Mountain, on southern side of western end of Magazine Mountain, 20 meters (66 feet) from edge of bluff, $\frac{1}{4}$ mile east of

western end of top, and 10 meters (33 feet) east of avenue cut through timber from road south to bluff. Marked by standard station disk in bedrock, note 2. Reference marks are standard reference disks in bedrock, note 12a. No. 1 is 1.42 meters (4.7 feet) from station in azimuth 266°. No. 2 is 5.09 meters (16.7 feet) from station in azimuth 87°36'. Witness marks, note 15a, are 4.77 meters (15.6 feet) from station in azimuth 354°02', and 24.15 meters (79.2 feet) from station in azimuth 79°29'. Witness mark, twin oaks, is 23.70 meters (77.8 feet) from station in azimuth 117°18'. Azimuth from station to hotel at west end of mountain is 102°. Elevation of station mark is 818.6 meters (2,686 feet).

White Oak (Scott County, E. H. Pagenhart, 1916; 1930).—About 15 miles west of south from Booneville, 10 miles northeast from Waldron, 2 miles south from Girard post office, at Frank Milton's place, on highest point of Whiteoak Mountain, 12 meters (39 feet) southwest from Forest Service lookout tower. A good trail leads to lookout from Cold Springs Forest Station, distance 1.5 miles. Surface mark is standard station disk in bedrock, note 2. Reference marks are standard reference disks in bedrock, note 12a. No. 1 is 4.06 meters (13.3 feet) from station in azimuth 273°57'. No. 2 is 8.59 meters (28.2 feet) from station in azimuth 174°19'. Witness marks are 8.70 meters (28.5 feet) from station in azimuth 277°28' and 19.80 meters (65 feet) from station in azimuth 172°12'. Center of lookout tower is 12.3 meters (40 feet) from station in azimuth 208°15'. In 1930 it was reported that a new Forest Service lookout tower had been built directly over station. Elevation of station mark is 672.1 meters (2,205 feet).

Pinnacle (Franklin County, E. H. Pagenhart, 1917; 1919).—On highest point of prominent round-topped hill known as Pinnacle Knob, 12 miles northwest from Booneville, 2½ miles north of east from Washburn post office, 1 mile west of road through Bradshaw Narrows, and ¼ mile north of the Francis place. Surface mark is a standard station disk in bedrock, note 2. Reference mark no. 1 is standard reference disk in bedrock, note 12a, 2.15 meters (7.1 feet) from station in azimuth 289°35'. No. 2 is drill hole in rock outcrop, 3.19 meters (10.5 feet) from station in azimuth 36°19'. Station *Lone Tree* (U.S.G.S.), a post-oak tree, is 23.1 meters (86 feet) from station in azimuth 87°49'. A witness mark is 9.13 meters (30 feet) from station in azimuth 185°29'. Elevation of station mark is 369.0 meters (1,211 feet).

Poteau (Sebastian County, C. L. Garner, 1919).—Station is 45 meters (148 feet) northeast of highest part of Poteau Mountain, and 3½ miles south-southeast of Hartford. Surface and underground marks are standard station disks in concrete, notes 1a and 7a. Four trees marked with triangular blazes, note 15a, are at following distances and azimuths from station: 8.60 meters (28.2 feet), 245°53'; 10.59 meters (34.7 feet), 305°27'; 23.69 meters (77.7 feet), 15°28'; and 8.44 meters (27.7 feet), 93°04'. Station can be reached from all directions, but best trail leads from foot of mountain to west by way of George Jones' house, which is on top of spur of mountain. Elevation of station mark is 812.2 meters (2,665 feet).

Black (Le Flore County, Okla., C. L. Garner, 1919; 1930).—About 6 miles east of Page and 1½ miles, airline, northwest of Fogel's Spur on the Kansas City Southern Railway. Page is most accessible railway station, and from there one should go 7 miles by road to house of Jim Taylor, first house on north side of Highway No. 8, west of Fogel's Spur, and inquire way to station. Station is on top of easternmost of two knolls on Blackfork Mountain range. Station mark is standard disk station mark in outcropping bedrock, note 2. Reference marks are standard reference disks in outcropping bedrock, note 12a. No. 1 is 6.195 meters (20.32 feet) from station in azimuth 273°40'. Disk has been broken off from this mark but shank is still embedded in rock. No. 2 is 2.660 meters (8.73 feet) from station in azimuth 68°17'. Azimuth from station to center of Rich Mountain Hotel is 292°15'05''; and to water tower at Fogel's Spur, 309°43'17''. Elevation of station mark is 754.8 meters (2,476 feet).

Sugarloaf (Le Flore County, Okla., C. L. Garner, 1919; 1930).—On top of Sugarloaf Mountain, about 8 meters (26 feet) southwest of large hole which was dug probably by treasure seekers. Best route to station is by trail from P. E. Mark's house, up east side of mountain. Original surface mark was standard disk station mark in outcropping bedrock, note 2. When station was recovered in 1930, disk was missing but portion of boulder with old drill hole

with pieces of cement still in hole was found in original position. An eccentric mark was established 0.169 meter (0.6 foot) from station in azimuth $147^{\circ}37'$. Reference marks are standard reference disks in boulders, note 12c. No. 1 is in boulder about 3 by 5 by $1\frac{1}{2}$ feet, 4.30 meters (14.1 feet) from station in azimuth $233^{\circ}12'$. No. 2 is 15.17 meters (49.8 feet) from station in azimuth $58^{\circ}03'$. These distances and azimuths are from the position of old original station mark. Elevation of station mark is 781.6 meters (2,564 feet).

Hartford (Sebastian County, E. H. Pagenhart, 1917; 1919).—In the town of Hartford, on land owned by Central Coal Co., at present rented by Mrs. Belle Owen, 500 meters (1,640 feet) west of Rock Island depot, 100 meters (328 feet) north of track, 75 meters (246 feet) east of Central Coal Co. dump, 200 meters (656 feet) southeast of public school building, in northeast corner of Mrs. Owen's yard, 1 meter (3 feet) west of back fence and 2.5 meters (8 feet) from division fence to north. Surface mark is standard station disk in bedrock, note 2. Reference marks are standard reference disks in bedrock, note 12a. No. 1 is 1.18 meters (3.9 feet) from station in azimuth $129^{\circ}15'$. No. 2 is 5.86 meters (19.2 feet) from station in azimuth $98^{\circ}29'$. Three witness marks are at the following distances and azimuths from station: No. 1, 15.8 meters (52 feet), $70^{\circ}29'$; no. 2, 18.75 meters (61.5 feet), $145^{\circ}07'$; no. 3, 15.8 meters (52 feet), 183° . Azimuth to northwest one of 4 stacks at mine, $316^{\circ}42'12''$; to ball on southeast corner of Grand View Hotel, $263^{\circ}19'18''$. Elevation of station mark is 200.2 meters (657 feet).

Oklahoma (Le Flore County, Okla., C. L. Garner, 1919).—About $6\frac{1}{2}$ miles east of Monroe and $3\frac{1}{2}$ miles west of the Arkansas-Oklahoma boundary line, on highest point of western spur of Poteau Mountains, in center of small grassy spot about 40 feet in diameter which may be located by lanes cut through timber when station was occupied. Surface mark is standard disk station mark in bedrock, note 2. Reference marks are standard reference disks in boulders, note 12c. No. 1 is 11.84 meters (38.8 feet) from station in azimuth $353^{\circ}45'$. No. 2 is 9.37 meters (30.7 feet) from station in azimuth $23^{\circ}02'$. Triangle-blazed 1-foot oak tree is 17.06 meters (56.0 feet) from station in azimuth $326^{\circ}25'$. Elevation of station mark is 724.4 meters (2,377 feet).

Smith (Saille County, E. H. Pagenhart, 1916).—Station is 22 miles by road from Hot Springs, 6 miles northeast from Jessleville, 2 miles northeast from J. L. Dixon's residence on Hot Springs-Danville wagon road, on highest point of Smith Pinnacle, close to Forest Service lookout tower. Surface mark is standard station disk in bedrock, note 2. Reference mark is a standard reference disk in bedrock, note 12a, 7.32 meters (24 feet) from station in azimuth $96^{\circ}52'$. U.S.G.S. station mark is 5.35 meters (17.6 feet) from station in azimuth $334^{\circ}29'$. Center of lookout tower is 8.4 meters (28 feet) from station in azimuth $343^{\circ}36'$. J. L. Dixon's place is 2 miles from station in azimuth 35° . Elevation of station mark is 574.8 meters (1,886 feet).

Fourche (Perry County, E. H. Pagenhart, 1916; 1924).—Station is $3\frac{1}{2}$ miles southwest from Perry, 3 miles northwest from Perryville, on top of ridge which runs northeast and southwest, the highest ridge in vicinity. Circle of rock 7 feet in diameter surrounds the station and pile of rock covers the mark. To reach from Perry pass on western side of the old Conklin place then up wooded slope to south. Mark is standard station disk in rock 8 inches square and about 18 inches long with top level with surface of ground. Reference mark is standard reference disk in bedrock, note 12a, on the north slope, 8 feet lower than station, and 16.02 meters (52.6 feet) from station in azimuth $148^{\circ}01'$. Witness mark (old Geological Survey tree) is now a snag 12 inches in diameter blazed with a triangle, about 6 meters (20 feet) north of station. Elevation of station mark is 386.3 meters (1,268 feet).

Round (Perry County, E. H. Pagenhart, 1916).—About 12 miles, airline, east of south from Perryville, 3 miles east of south from Harmony church, 5 miles north from Paron post office, and $\frac{1}{2}$ mile east of the Benton-Perryville road, on highest point of narrow rocky ridge $\frac{1}{4}$ mile long, known locally as Round Mountain, 25 meters (82 feet) west of eastern end, in depression 3 meters (10 feet) east of the highest rock. Mark is standard station disk in concrete, in depression in outcropping bedrock, note 3. Reference mark is $1\frac{1}{2}$ -inch drill hole 1 inch deep in middle of top of narrow slab standing upright, 15 meters (49 feet) west of eastern end of top, and 7.81 meters (25.6 feet) from station in azimuth $305^{\circ}18'$. Witness marks are triangular blazes on trees, note 15a. No. 1, on south slope, is 5.6 meters (18 feet) from station in

azimuth $38^{\circ}16'$; no. 2, on north slope, is 3.2 meters (10 feet) from station in azimuth $216^{\circ}38'$. Azimuth of Nancy Peak, 3 miles from station, is 100° . Elevation of station mark is 387.1 meters (1,270 feet).

Moss (Saline County, E. H. Pagenhart, 1916).—On top of sharp rocky peak known as Moss Mountain, 20 miles west of Little Rock, $2\frac{1}{2}$ miles south of Maumelle River, 4 miles west of Howell's place, and 2 miles southwest of C. W. Kitchell's place which is on top of ridge. Moss Mountain is northeastern of two similar peaks about $\frac{1}{2}$ mile apart. Marked by standard station disk in bedrock, note 2. Reference marks are standard reference disks in bedrock, note 12a. No. 1 is about $\frac{1}{2}$ meter (2 feet) below the station mark, and 3.79 meters (12.4 feet) from station in azimuth $298^{\circ}06'$. No. 2 is about $\frac{1}{2}$ meter (2 feet) above station mark, and 1.86 meters (6.1 feet) from station in azimuth 120° . Azimuth from station to rocky knob, distant $\frac{1}{2}$ mile, is $28^{\circ}06'$. Elevation of station mark is 355.3 meters (1,166 feet).

Reynolds (Pulaski County, E. H. Pagenhart, 1916; 1924).—Three miles north of west from Mayflower, on highest ground, about 5 meters (16 feet) north of south edge of top of prominent wooded ridge known as "High Point." Marked by standard station disk in bedrock, note 2. Reference marks are standard reference disks in bedrock, note 12a. No. 1 is 4.03 meters (13.2 feet) from station in azimuth $39^{\circ}23'$. No. 2 is 9.15 meters (30 feet) from station in azimuth $285^{\circ}17'$. Elevation of station mark is 232.8 meters (764 feet).

Shinall (Pulaski County, E. H. Pagenhart, 1916).—About 15 miles by road north of west from Little Rock, 3 miles southwest from Pinnacle, 1 mile south of Little Rock-Perryville wagon road, on top of Shinall Mountain, in the middle of ridge running east and west. Sides of mountain are timbered and top is covered with small growth oak except for one large tree. Surface mark is standard station disk in concrete, in depression in bedrock, note 3. Reference mark, standard reference disk in concrete, note 12b, in depression in bedrock, is 5.69 meters (18.7 feet) from station in azimuth $125^{\circ}32'$. Witness mark, triangular blaze on large tree mentioned above, note 15a, is 4.35 meters (14.3 feet) from station in azimuth $233^{\circ}22'$. U.S.G.S. B.M. is 3.60 meters (11.8 feet) from station in azimuth $239^{\circ}22'$. Elevation of station mark is 325.5 meters (1,068 feet).

Orphan (Pulaski County, E. H. Pagenhart, 1916; 1920).—Six miles west of north from Little Rock, $1\frac{1}{2}$ miles west from St. Joseph's Orphanage, on land belonging to the Diocese, $\frac{1}{2}$ mile east from colored church, on the highest point of rounded ridge, 41 meters (134.5 feet) east of fence line. Surface and underground marks are standard station disks in concrete, notes 1a and 7a. Reference marks are standard reference disks in concrete, note 11a. No. 1 is 8.32 meters (27.3 feet) from station in azimuth $104^{\circ}00'$. No. 2 is on fence line, on range with station and no. 1, and 41.095 meters (134.83 feet) from station in azimuth $104^{\circ}00'$. Azimuth from station to *Little Rock, standpipe*, distant 6 miles, is $355^{\circ}33'13''$; to *Little Rock, Capitol dome, ball on top*, $5\frac{1}{2}$ miles, $359^{\circ}45'12''$; to *Fort Logan H. Roots, water tank*, $3\frac{1}{2}$ miles, $5^{\circ}09'28''$; and to St. Joseph's Orphanage, $1\frac{1}{2}$ miles, $302^{\circ}15'35''$. In 1920, the colored church, fence lines, and all marks were reported lost. Indications are that grade had been changed and station mark is now covered by two or less feet of dirt. Station position probably now under Camp Pike Army Post building used for shoe repairs. Elevation of station mark is 170.5 meters (559 feet).

Maumelle (Pulaski County, E. H. Pagenhart, 1916).—Station is 6 miles southeast from Roland, 2 miles north from Pinnacle, on highest point of Pinnacle Mountain. Sides of mountain are covered with small trees, top is rocky and bare. Station is about 3 meters (10 feet) south of west of pile of large rocks 1 meter (3 feet) in height. Marked by standard station disk in bedrock, note 3. Reference mark is standard reference disk in bedrock, note 12b, 5.71 meters (18.7 feet) from station in azimuth $274^{\circ}50'$. Azimuth from station to Roland, distant 6 miles, is 169° ; to semaphore at depot, Pinnacle, distant 2 miles, $347^{\circ}37'27''$; and to *Fort Logan H. Roots, water tank*, distant 12 miles, $292^{\circ}39'49''$. Elevation of station mark is 308.8 meters (1,013 feet).

Granite (Pulaski County, E. H. Pagenhart, 1916; 1920).—About 4 miles from new capitol building in Little Rock, in a small clearing on highest point of Granite or Fourche Mountain. Mountain is covered with large rocks and scrub growth of timber. To reach from Little Rock take pike leading south passing around western side of mountain. An old road leads up mountain from northwest side. House of Mr. Moore is just about west of station, and at foot of mountain. Surface and underground marks are standard disk sta-

tion marks in concrete, notes 1a and 7a. Reference marks are standard reference disks in concrete, note 11a. No. 1 is 22.53 meters (73.9 feet) from station in azimuth $346^{\circ}41'$. No. 2 is 22.29 meters (73.1 feet) from station in azimuth $173^{\circ}25'$. Witness marks are triangular blazes on three large trees, note 15a. No. 1 is 9 meters (30 feet) from station in approximate azimuth 6° and no. 2 is 6 meters (20 feet) in approximate azimuth 123° . No. 3, 11 meters (36 feet), approximately 180° . Azimuth to new State Capitol is $181^{\circ}59'12''$; to city standpipe, Little Rock, $190^{\circ}41'00''$. Elevation of station mark is 162.9 meters (534 feet).

Little Rock northwest base (Pulaski County, E. H. Pagenhart, 1916; 1931).—Station is $1\frac{1}{4}$ miles east from Chicago, Rock Island and Pacific passenger depot at Argenta, at Dixie Mills, 30 meters (98 feet) southeast of crossing of Rock Island main track and spur of the Cotton Belt, on Cotton Belt right-of-way, 9.76 meters (32 feet) east of east rail, and 20.66 meters (67.8 feet) south of Rock Island south rail. Surface and underground marks are standard station disks in concrete, notes 1a and 7a. Mark is stenciled "N.W. Base." Reference marks are standard reference disks in concrete, note 11a. No. 1 is 236.03 meters (774.4 feet), and no. 2 is 16.670 meters (54.69 feet) from station. Neither azimuth is known. Azimuth from station to new capitol dome is $77^{\circ}19'10''$; to Cotton Belt and Rock Island crossing, 98° ; to concrete chimney, Tie Plant, 240° ; and to stack at Rose City Mill, 289° . In 1931 the station mark was reset at a lower elevation by the Corps of Engineers, United States Army. Elevation of the station mark as determined by Corps of Engineers is 78.194 meters (256.542 feet).

Little Rock southeast base (Pulaski County, E. H. Pagenhart, 1916; 1920).—Six miles southeast from the new capitol, $\frac{3}{4}$ mile north of Arkansas River, $\frac{1}{4}$ mile south of Cotton Belt track, in small patch of grass and weeds in cultivated field, on prolongation of east rail tangent of Cotton Belt tracks which extend from Dixie Cotton Mill southeast for 4 miles. Surface and underground marks are standard station disks in concrete, notes 1a and 7a. Reference mark is standard reference disk in concrete, note 11a, about 25 feet west of farm road (probably temporary), and about 200 meters (656 feet) from station in unknown azimuth. Following distances and azimuths are from station: Little Rock stand pipe, 5 miles, $92^{\circ}21'26''$; Catholic Church, spire, 5 miles, $97^{\circ}21'41''$; new capitol dome, 5 miles, $98^{\circ}34'02''$; tangent Cotton Belt rail, $114^{\circ}21'$. Elevation of station mark is 77.23 meters (253.4 feet).

Supplementary points

Fort Smith (Sebastian County, E. H. Pagenhart, 1916; 1919).—On the Weather Bureau platform on top of Fort Smith post office. Marked by small nails driven into floor to form small triangle with about 2-inch sides and a nail in center to mark exact point. The following distances and azimuths are from station: Northwest corner of Weather Bureau platform, 4.130 meters (13.55 feet), $173^{\circ}30'$; wind register (anemometer), 1.050 meters (3.44 feet), $218^{\circ}21'$; flagstaff (highest), 4.05 meters (13.3 feet), $318^{\circ}15'$; courthouse clock, $303^{\circ}58'37''$. Elevation of the station mark is 160.76 meters (527.4 feet).

Arkansas-Oklahoma boundary monument, initial point (Sebastian-Le Flore Counties, C. L. Garner, 1919).—See description of station *Fort Smith longitude*.

Fort Smith longitude (Sebastian County, E. D. Preston, 1885; 1915).—In the western edge of Fort Smith, at the southwest corner of the old fort. It is distant 11.80 meters (38.7 feet) in azimuth $261^{\circ}39'08''$ or $0''.06$ of latitude north and $0''.46$ of longitude east from *Initial Point*, which is an old State-line monument 15 feet north of the old stone building known as the Colonel Le Flore house, 150 meters south of the St. Louis, Iron Mountain & Southern Railway depot, and $\frac{3}{8}$ mile west of the post office. The monument is of gray limestone, 4 feet high, 4 feet square at the base and $17\frac{1}{2}$ inches square at the top, and is surmounted by a capstone $17\frac{1}{2}$ inches square and 17 inches high, marked: "Initial Point" on its north face, "Arkansas" on its east face, "Choctaw" on its west face, and "1858" on its south face. The longitude station is within the old walls (now removed) of the fort, 12.80 meters (42.0 feet) north of the northeast corner of the stone building mentioned above, 13.01 meters (42.7 feet) northeast of the junction of the northwest wall of the old fort and the northeast side of the stone building, 1 foot west of the edge of a cut on the St. Louis-San Francisco Railway, and is marked by a

bottle, mouth upward, about 1 foot below the surface of the ground. The instrument was mounted on a wooden pier.

Arkansas-Oklahoma boundary monument, milepost 26 (Sebastian-Le Flore Counties, C. L. Garner, 1919).—About 3 miles west-southwest from Hartford, $\frac{1}{2}$ mile south of P. E. Mark's house, and 75 meters (246 feet) south of southwest corner of the Mark's farm. Station is a milepost of the Arkansas-Oklahoma boundary survey and consists of hexagonal iron post about 4 feet high with "M.P. 26" stamped on it.

Arkansas-Oklahoma boundary monument, milepost 27 (Sebastian-Le Flore Counties, C. L. Garner, 1919).—Station is 4 miles southwest from Hartford, 7 meters (23 feet) north of the Rock Island Railroad, and 75 meters (246 feet) north of road leading from Hartford to Howe. Mark is hexagonal iron post about 4 inches in diameter and 4 feet high. A large white post on boundary line on opposite side of railroad is readily seen.

Little Rock longitude (Pulaski County, F. H. Parsons, 1882; 1920).—In the western part of the grounds surrounding the customhouse and post office at Little Rock, near the corner of Second and Spring Streets. The station of 1882 is 13.278 meters (43.56 feet) or $0''.43$ of latitude north and 3.48 meters (11.4 feet) ($0''.009$ or $0''.14$) west of the station of 1885. In 1885 the 1882 pier could not be recovered and a cemented brick pier was constructed. This was used in 1893 and 1896. After each occupation the upper part of the pier was removed, leaving a part 3 feet by 14 inches, about 6 inches below the surface of the ground. This pier was 1.232 meters (4.04 feet) or $0''.04$ of latitude north and 40.131 meters (131.06 feet) or $1''.58$ of longitude west, in azimuth $91^{\circ}45'30''$ from the flagpole over the Second Street entrance to the post office. The center of the pier was about $10\frac{1}{2}$ meters, respectively, from the curb on Spring Street, the curb on Second Street, and the west wall of the post-office building; and $3\frac{3}{4}$ meters north of the prolongation of the south wall of the nearest part of the same building. In 1896 the transit was mounted on the western end of this pier about 0.13 meter (0.4 foot) west of its former position. In 1914 a new pier was established 16.55 meters (54.3 feet) or $0''.54$ of latitude north and 9.17 meters (30.09 feet) or $0''.36$ of longitude east of the pier of 1885. In 1920 the station was at an unmarked point 18.70 meters (61.4 feet) or $0''.61$ of latitude north and 6.35 meters (20.8 feet) ($0''.017$ or $0''.25$) east of the pier of 1885.

Little Rock zero milestone (Pulaski County, G. R. Fish, 1932; 1933).—At east edge of capitol grounds in Little Rock, 3 feet east of east edge of flower garden, in front of main entrance to capitol, about 34.5 feet west of intersection of center line of West Capitol Avenue and cement curb at east-central entrance to capitol grounds, and about 14.75 feet from top of flight of steps leading from street to pavement which connects with front steps of capitol. Mark is standard bench mark disk in top center of limestone shaft, 18.5 inches square by 42.5 inches high. *Reference mark* is standard bench mark disk in concrete post, 25 feet east of curb in driveway leading south from capitol, 25 feet north of north edge of sidewalk along north side of West Seventh Street, and 221.9 meters (728 feet) from milestone in azimuth $19^{\circ}41'14''.3$. "A" station is hub about 10 feet west by north of milestone, and 222.01 meters (728.4 feet) from reference mark in azimuth $198^{\circ}43'13''.3$. Elevation of station mark *Little Rock zero milestone* is 102,047 meters (334,799 feet).

Reference mark (Pulaski County, G. R. Fish, 1932; 1933).—See description of station *Little Rock zero milestone*, above.

A station (Pulaski County, G. R. Fish, 1932; 1933).—See description of station *Little Rock zero milestone*, above.

NINETY-THIRD MERIDIAN

Principal points

Taney (Taney County, Mo., E. O. Heaton, 1928).—About 4 miles northeast of Taneyville, 5 miles west of Bradleyville, $\frac{1}{2}$ mile southeast of George S. Summerton's home, near the west side of sec. 7, T. 24 N., R. 19 W., on highest point at intersection of two spurs of L-shaped hill, one spur running to the southwest and one to the northwest. It is 9.9 meters (33 feet) east of blazed oak, 5.8 meters (19 feet) south of blazed oak, 9.2 meters (30 feet) west of blazed oak, and 13.3 meters (44 feet) north of blazed oak. Surface mark is standard disk station mark in iron pipe projecting 6 inches above surface of

ground. Underground mark is a standard disk station mark in rock 5 feet below surface of ground. Reference marks are standard reference disks wedged in drill holes in boulders, note 12c. No. 1 is 35.99 meters (118.1 feet) from station in azimuth $271^{\circ}18'$. No. 2 is 48.27 meters (158.4 feet) (slope distance) from station in azimuth $151^{\circ}43'$.

Irma (Taney County, Mo., E. O. Heaton, 1928; 1931).—About 7 miles direct or 10 miles by road northwest of Branson, about 300 meters (984 feet) southwest of highway garage at junction of United States Highways 65 and 76, about 275 meters (902 feet) south of Highway 65, on "backbone" of hill, on south side of rocky field, 5 meters (16 feet) north of north edge of timber tract, and 10.7 meters (35 feet) east of center line of neighborhood road. Surface and underground marks are standard disk station marks in concrete. Upper mark projects about 6 inches. Lower mark is about 5 feet below surface of ground. Reference marks are standard reference disks in concrete, note 11a. No. 1 is about 100 meters (328 feet) east of gate on south side of United States Highway 65, opposite store, about 33 meters (108 feet) west of concrete reservoir on south side of highway near junction, 11 meters (36 feet) south of south fence line along highway, 0.6 meter (2 feet) west of row of old fence posts, and 265 meters (869 feet) (paced distance) from station in azimuth $198^{\circ}57'07''$. No. 2 is at northwest corner of woodland, on southeast edge of cleared field, 32 meters (105 feet) west of road where it enters woodland, 1.4 meters (5 feet) north of notched 8-inch dead oak, and 43.30 meters (142.1 feet) from station in azimuth $71^{\circ}12'$.

Thomason (Taney County, Mo., E. O. Heaton, 1928).—About 8 miles by road southwest of Branson, on east side of sec. 36, T. 22 N., R. 22 W., on range line between townships, about $\frac{1}{2}$ mile southeast of junction of United States Highways 65 and 86, on land owned by Riley Thomason who lives on west side of highway about 200 meters (656 feet) northwest of station. Station is on the east side of small field containing stumps and several dead trees, about 95 meters (312 feet) northeast of Highway 65, 21 meters (69 feet) southwest of southwest corner of old deserted dwelling, and 0.2 meter (0.8 foot) east of fence on west side of lane, and at its north end. Surface and underground marks are standard disk station marks in concrete. Upper mark projects 3 inches. Lower mark is about 5 feet below surface of ground. Reference marks are standard reference disks in concrete, note 11a. No. 1 is 7.7 meters (25 feet) north of center line of Highway 65, 12.5 meters (41 feet) west of 18-inch Spanish oak on west side of lane at south end, 0.4 meter (1 foot) south of north highway fence, and 74.60 meters (244.8 feet) from station in azimuth $10^{\circ}49'$. No. 2 is at fence corner, about 100 meters (328 feet) southeast and across Highway 65 from Riley Thomason's farmhouse, 6.7 meters (22 feet) east of center line of highway, 0.6 meter (2 feet) southwest of corner post, and 114.50 meters (375.7 feet) from station in azimuth $115^{\circ}11'54''$.

Burlington (Boone County, E. O. Heaton, 1928; 1931).—About 18 miles by road northwest of Harrison, 6 miles by road southwest of Omaha, 3 miles by road northwest of Burlington store, and $2\frac{1}{4}$ miles by road northwest of Highway 65, on highest point of wooded ridge just northwest of cleared place, locally known as the King place and used for baseball grounds. To reach from Omaha follow Highway 65 about 3.9 miles south to road on right leading westerly off highway through cut in bank, and follow this road $2\frac{1}{4}$ miles to ball grounds. Station is 4 meters (13 feet) east of center line of road, 16.5 meters (54 feet) northwest of "home plate" of baseball diamond, in vicinity of 3 triangle-blazed trees, and $7\frac{1}{2}$ meters (25 feet) southwest of the one of these having three trunks growing from one root. Surface and underground marks are standard station disks. Surface mark is in top of flat boulder, note 4. Underground mark is in boulder 3 feet below surface, note 9a. Reference marks are standard reference disks in boulders, note 12c. No. 1 is at southeast edge of baseball field, 7.3 meters (24 feet) southeast of small triple oak, and 86.3 meters (283 feet) (slope distance) from station in azimuth $358^{\circ}26'$. No. 2 is at northwest edge of field, $1\frac{1}{2}$ meters (5 feet) east of a small forked tree, and 23.50 meters (77.1 feet) from station in azimuth $128^{\circ}24'$. In 1931 plate of reference mark no. 1 was reported found underneath small boulder to which it had been attached. Boulder was on surface of ground.

Bergman (Boone County, E. O. Heaton, 1928).—About 17 miles east of north of Harrison, 7 miles north of Bergman railroad station, on ridge road, on land

owned by Mr. Rushbins, $\frac{1}{4}$ mile southeast of his home, on south side of old cleared field, 30 meters (98 feet) north of road, and 10.80 meters (35.4 feet) north of rail fence. Surface and underground marks are standard station disks. Surface mark is in boulder 14 inches below surface. Underground mark in boulder 5 feet below surface. Reference marks are standard reference disks in boulders flush with surface, note 12c. No. 1 is in fence row, 78.22 meters (256.6 feet) (slope distance) from station in azimuth $277^{\circ}03'52''$. No. 2 is in fence row, 51.235 meters (168.09 feet) from station in azimuth $77^{\circ}32'$. A bench mark of United States Geological Survey, iron pipe projecting 12 inches, elevation 1,358 feet, is 250 meters (820 feet) west of station in fork of road.

Red (Boone County, E. O. Heaton, 1928).—About 10 miles west and 2 miles south of Harrison (20 miles by road), about 5 miles northwest of "Travellers' Home", formerly known as Presbyterian Mission, $\frac{1}{6}$ mile southwest of old road leading along ridge to northwest from Home, 2 miles north of Kingsley place, $1\frac{1}{2}$ miles north of F. Conner's place, and 1 mile west of stone schoolhouse, on highest point of highest ridge in vicinity, about 300 meters (984 feet) southwest of old tumbled-down log cabin on southwest side of road by a large triangle-blazed white oak, 9.65 meters (31.7 feet) south of 10-inch white oak, 5.5 meters (18 feet) southwest by west of 16-inch chestnut oak, 4.75 meters (15.6 feet) north of 12-inch black oak, and 7.2 meters (24 feet) east southeast of 10-inch white oak, all four trees having triangular blazes on sides toward station. Surface and underground marks are standard station disks in boulders, notes 4 and 9a. Reference marks are standard reference disks in boulders, note 12c. No. 1 is 7 meters (23 feet) west of fallen tree, 5.25 meters (17.2 feet) northeast of blazed 14-inch white oak, 1.6 meters (5 feet) south of blazed 3-inch white oak, and 28.75 meters (94.3 feet) from station in azimuth $262^{\circ}57'$. No. 2 is on brow of hill, 3.7 meters (12 feet) south of blazed 10-inch white oak, 3.2 meters (10 feet) east of 18-inch Spanish oak, and 57.40 meters (188.3 feet) from station in azimuth $166^{\circ}14'$.

Boat (Newton County, E. O. Heaton, 1928).—About 9 miles, airline, southeast of Harrison, 6 miles south of Bellefonte, on middle peak of Boat Mountain, a long knoll running north and south, the only one of its kind in vicinity. Best reached from west side. Station is in northeast corner of clearing, 25 meters (82 feet) west of point where peak slopes to east, and 5 meters (16 feet) west of small locust trees. Surface and underground marks are standard station disks in boulders. Surface mark is 2 inches below surface, underground mark 3 feet below surface. Reference marks are standard reference disks in boulders, note 12c. No. 1 is 27.40 meters (89.9 feet) (slope distance) from station in azimuth $310^{\circ}18'$. No. 2 is 11.720 meters (38.45 feet) from station in azimuth $47^{\circ}14'$.

Compton (Newton County, E. O. Heaton, 1928).—About 21 miles by road southwest of Harrison, 2.9 miles west of Compton post office, $\frac{1}{2}$ mile east of highway 43, on highest point of east end of high timbered ridge, and about $\frac{1}{2}$ mile east of Jesse J. Martin's house, who lives on east side of highway near crest of ridge. Station is 4.55 meters (14.9 feet) east of blazed 8-inch white oak, 5.6 meters (18 feet) northwest of blazed 14-inch Spanish oak, and 9.15 meters (30.0 feet) north of blazed 12-inch white oak. Blazes are triangular shaped and on sides of trees toward station. Surface and underground marks are standard station disks in boulders, notes 4 and 9a. Reference marks are standard reference disks in boulders, note 12c. No. 1 is on south side of ridge, 3.55 meters (11.6 feet) west of blazed 8-inch elm, 2.7 meters (9 feet) east of blazed 18-inch black oak, and 18.80 meters (61.7 feet) from station in azimuth $355^{\circ}56'$. No. 2 is 4.3 meters (14 feet) southwest of blazed 16-inch Spanish oak, 1.15 meters (3.8 feet) northeast of blazed 14-inch Spanish oak, and 99.435 meters (129.38 feet) from station in azimuth $109^{\circ}24'$.

Essex (Newton County, E. O. Heaton, 1928; 1931).—About 14 miles by road south of Jasper, 5 miles north of Deer, in small cleared field, on land owned by J. M. Essex and farmed by Chas. Essex, $\frac{1}{4}$ mile west of Essex's home, 50 meters (164 feet) west of pasture fence, 48.72 meters (159.8 feet) west of lone persimmon tree on east side of field, and 91.30 meters (299.5 feet) southeast of tall walnut tree. Surface and underground marks are standard station disks in boulders. Underground mark is 5 feet below surface. Reference marks are standard reference disks in boulders, note 12c. No. 1 is 90.90 meters (298.2 feet) from station in azimuth $160^{\circ}23'$. No. 2 is 42.90 meters (140.7 feet) from station in azimuth $72^{\circ}47'$.

Deer (Newton County, E. O. Heaton, 1928; 1931).—About 19 miles by road south of Jasper, in village of Deer, about 150 meters (492 feet) south of frame of old schoolhouse, in field used as playground, 27.5 meters (90 feet) west of center of well, and 4.2 meters (14 feet) west of rail fence. Surface and underground marks are standard station disks in boulders. Surface mark is 18 inches below surface and can be located by iron pin put over mark and extending to surface. Underground mark is 5 feet below surface. Reference marks are standard reference disks in boulders, note 12c. No. 1 is 0.3 meter (1 foot) west of fence and 136.90 meters (449.1 feet) (slope distance) from station in azimuth $182^{\circ} 16' 59''$. No. 2 is 0.35 meter (1.2 feet) south of fence, 5.3 meters (17 feet) southwest of well, 12 meters (39.4 feet) north of center line of road, and 44.295 meters (145.32 feet) from station in azimuth $121^{\circ} 02'$. Elevation of station mark is 716.647 meters (2,351.199 feet); of reference mark no. 1, 716.860 meters (2,351.898 feet); and of reference mark no. 2, 717.007 meters (2,352.380 feet).

Yates (Newton County, E. O. Heaton, 1928).—About 33 miles by road north of Clarksville, 5 miles by road northwest of Highway 21, $3\frac{1}{2}$ miles by road northwest of old village of Fallsville, on cleared hill on land owned by Lester Yates, about $\frac{1}{4}$ mile south of his home, on highest ground, about 100 meters (328 feet) north of road leading from Fallsville to Mr. Yates' house, on north side of cultivated field, on south side of pasture field, about 20 meters (66 feet) east of clump of trees, about 38 meters (125 feet) west of fence corner at apple tree, 6.5 meters (21 feet) south of dead 6-inch black oak, 8.4 meters (28 feet) northeast of center of notched dead triple black oak, and 1.45 meters (4.8 feet) north of east-and-west fence. Surface and underground marks are standard station disks in boulders, notes 4 and 9a. Reference marks are standard reference disks in boulders, note 12c. No. 1 is in a north-and-south fence line on east side of pasture field, on west side of cultivated field, about 70 meters (230 feet) north of apple tree, near fence corner and 87.22 meters (286.2 feet) from station in azimuth 221° . No. 2 is in east-and-west fence line, about $7\frac{1}{2}$ meters (25 feet) west of fence corner near apple tree, 7 meters (23 feet) southwest of said tree, and 31.50 meters (103.3 feet) from station in azimuth $271^{\circ} 09'$.

Devils (Johnson County, E. O. Heaton, 1928; 1931).—About 25 miles by road north of Clarksville, about $\frac{1}{3}$ mile east of Highway 21 at Salus post office, on top of ridge well known as Devils Knob, in Ozark National Forest, under center of Forest Service lookout tower, a 65-foot steel tower. An old road leads up ridge and by tower from Highway 21, from point near store and schoolhouse, distance of about $\frac{3}{8}$ mile. Station is in center of fenced enclosure on southwest side of road, 9.6 meters (31 feet) northeast of blazed 10-inch white oak, and 8.8 meters (29 feet) northwest of blazed 14-inch white oak (with climbing spikes in it) in southeast corner of enclosure. Surface mark is standard station disk in concrete, note 1a. Underground mark is standard station disk in boulder, note 9a. Reference marks are standard reference disks in bedrock, note 12a. No. 1 is at edge of vertical cliff, 1.1 meters (3.6 feet) northeast of blazed 12-inch black oak, and 22.77 meters (74.7 feet) from station in azimuth $244^{\circ} 35'$. No. 2 is about 30 meters (98 feet) west of top of ridge, 8.4 meters (28 feet) southwest of blazed 10-inch black oak, 9.75 meters (32.0 feet) northeast of double black oak, and 34.64 meters (113.6 feet) from station in azimuth $121^{\circ} 24'$.

Freeman (Pope County, E. O. Heaton, 1928; 1931).—About 35 miles north of Russellville, at Freeman Springs lookout station of Ozark National Forest, 200 meters (656 feet) north of Highway 7, and 250 meters (820 feet) east of Freeman Springs Hotel. Station is under the northwest corner of new lookout tower, in the ranger's yard, 4.6 meters (15 feet) south of fence on north side of yard, and 9.2 meters (30 feet) west of east fence. Surface and underground marks are standard station disks in boulders. Upper mark is flush with surface, and lower mark 5 feet below surface. Reference marks are standard reference disks in boulders, note 12c. No. 1 is in northeast fence corner of yard, 9.240 meters (30.31 feet) from station in azimuth $245^{\circ} 36'$. No. 2 is in southwest fence corner, 21.525 meters (70.62 feet) (slope distance) from station in azimuth $30^{\circ} 10'$.

Mag (Logan County, E. O. Heaton, 1928).—About 18 miles by road northwest of Havana, on highest part of Magazine Mountain on high wooded knoll between two depressions in top of mountain, about $1\frac{3}{4}$ miles west of

farmhouse at clearing where mountain road makes right-angled bend from south to west, and $\frac{1}{4}$ mile south of this road, near a foot path, 9.3 meters (31 feet) south of 8-inch triangle-blazed black oak, 9.4 meters (31 feet) west of 6-inch blazed black oak by small stump, and 5.8 meters (19 feet) south-southeast of 6-inch blazed Spanish oak. Surface and underground marks are standard station disks in boulders, notes 4 and 9a. Reference marks are standard reference disks in boulders, note 12c. No. 1 is 1.3 meters (4 feet) west of 6-inch blazed white oak, and 20.96 meters (68.8 feet) from station in azimuth $242^{\circ}04'$. No. 2 is 20.815 meters (68.29 feet) from station in azimuth $309^{\circ}00'$.

Nebo (Yell County, E. O. Heaton, 1928; 1931).—About 6 miles west of Dardanelle, on highest point of Nebo Mountain, in colony of summer homes on mountain, on lot owned by Bud Miller of Dardanelle. Station is on southeast end of mountain, 20 meters (66 feet) east of center line of road, 200 meters (656 feet) west of point where bluff bends to northward, 25 meters (82 feet) north of south bluff, 20 meters (66 feet) east of large oak tree on east side of house, and 19 meters (62 feet) southeast of well. Surface and underground marks are standard station disks in boulders. Surface mark is flush and underground mark is 5 feet below surface. Reference marks are standard reference disks in rock outcrop, note 12a. No. 1 is 8.0 meters (26 feet) northwest of hickory tree on edge of bluff, and 36.225 meters (118.85 feet) from station in azimuth $311^{\circ}08'$. No. 2 is 4.6 meters (15 feet) east of oak tree in fence row, 11 meters (36 feet) north of bluff, and 41.67 meters (136.7 feet) (slope distance) from station in azimuth $53^{\circ}51'$.

NINETY-FOURTH MERIDIAN

Principal points

Mena (Polk County, P. A. Smith, 1930; 1933).—About 14 miles northwest of Mena, 3 miles southwest of Rich Mountain railway station on the Kansas City Southern Railway, on Highway 8, $1\frac{1}{2}$ miles west of old Mena Hotel on Rich Mountain, on eastern end of hill known locally as Bald Hill, 5 meters (16 feet) north of wagon road along top of ridge, in a spot clear of brush. Station mark is standard station disk in boulder with top several inches above ground. Reference marks are standard reference disks in boulders. No. 1 is 18.55 meters (60.9 feet) from station in azimuth $263^{\circ}57'$. No. 2 is 12.23 meters (40.1 feet) from station in azimuth $359^{\circ}23'$.

Blue (Scott County, P. A. Smith, 1930).—About 13 miles, air line, 16 miles by road, northeast of Mena, $2\frac{1}{2}$ miles north of Eureka schoolhouse, on western end of highest point of rocky backbone of mountain locally known as Blue Knob. To reach from Mena go north on route 71 about 8 miles to Posey Hollow road, then east 0.3 mile past Eureka schoolhouse to road turning north into woods, continuing past several houses to Freeman Johnson's place. Truck can be driven $\frac{1}{4}$ mile beyond this point, to within $1\frac{1}{2}$ miles of station. Surface mark is standard station disk in boulder. Reference marks are standard reference disks in boulders. No. 1 is 9.52 meters (31.2 feet) from station in azimuth $39^{\circ}41'$. No. 2 is 19.16 meters (62.9 feet) from station in azimuth $82^{\circ}46'$.

Rich (Polk County, P. A. Smith, 1930).—About 2 miles southeast of Rich Mountain, a station on the Kansas City Southern Railway, on Highway 8, $2\frac{1}{2}$ miles east of old Mena Hotel on top of Rich Mountain, on highest part of the eastern knoll of this mountain, under center of Rich Mountain Forest Service lookout tower (steel). Surface mark projects 1 foot, and is standard station disk in concrete, in 5-inch iron pipe. Reference marks are standard reference disks in anchors for guy wires. No. 1 is 25.54 meters (83.8 feet) from station in azimuth $316^{\circ}55'$. No. 2 is 25.51 meters (83.7 feet) from station in azimuth $52^{\circ}24'$.

Eagle (Polk County, P. A. Smith, 1930).—About 16 miles by road southeast of Mena, $1\frac{1}{2}$ miles southwest of Shady Forest Ranger Station, $\frac{1}{4}$ mile west-by-north of Eagle Mountain Forest Service lookout tower, on continuation of same ridge occupied by lookout tower, and about 50 meters (164 feet) southeast of saddle in ridge. To reach from Mena go by truck to ranger station, then by trail to lookout tower, and to station by faint trail along top of ridge. Station mark is standard station disk in rock ledge along south side of ridge. Reference marks are standard reference disks in rock ledge. No. 1 is 1.23

meters (4.0 feet) from station in azimuth $312^{\circ}11'$. No. 2 is 12.67 meters (41.6 feet) from station in azimuth $119^{\circ}14'$.

Whiskey (Polk County, P. A. Smith, 1930).—About 8 miles south-by-west of Vandervoort, 3 miles west of Hatton railroad station, on eastern end and several feet below highest point of Whisky Peak, which is highest in vicinity. To reach from Hatton, go south $\frac{1}{2}$ mile to Hatton Hotel, then west on county road 2.2 miles, turning north on woods road, which follows up east slope of peak to within $\frac{1}{4}$ mile of station. Surface mark projects about 1 inch and is standard station disk in boulder. Reference marks are standard reference disks in rock outcrop. No. 1 is 9.67 meters (31.7 feet) from station in azimuth $2^{\circ}27'$. No. 2 is 17.36 meters (57.0 feet) from station in azimuth $64^{\circ}12'$.

Hanna (Polk County, P. A. Smith, 1930).—About 21 miles by road southwest of Mena, 5.4 miles southwest of Shady Forest Ranger Station, on west and highest peak of Hanna Range, in rock ledge on top of peak. To reach from Mena go $7\frac{1}{2}$ miles southeast to schoolhouse on left, then left on Shady Forest road $8\frac{1}{2}$ miles to Shady Forest Ranger Station, then 0.9 mile to fork, then turn right off best road 1.0 mile to second fork, turn right 3.5 miles to west side of peak, going east up hill to highest peak and station. Surface mark is standard station disk in rock ledge, note 5. Reference marks are standard reference disks in rock ledge, note 12d. No. 1 is 1.638 meters (5.37 feet) from station in azimuth $132^{\circ}21'$. No. 2 is 6.020 meters (19.75 feet) from station in azimuth $316^{\circ}37'$.

Hope (Sevier County, P. A. Smith, 1930).—About 13 miles, air line, and 23 miles by road northeast of De Queen, 6 miles north of Green Chapel Church on route 70, 1 mile north of Newhope schoolhouse, on an east-and-west ridge about 200 meters (656 feet) north of John Marsh's house, 120 meters (394 feet) north by east of county crossroads. To reach from Green Chapel Church (17 miles northeast of De Queen), take county road north 5.2 miles to fork $\frac{1}{4}$ mile east of Newhope school, then north 2.5 miles to rail fence along south side of clearing and ridge, then east 0.9 mile to crossroads mentioned above. Station is 33 meters (108 feet) northwest of county road, and 13 meters (43 feet) northwest of 18-inch oak tree near plt. Surface and underground marks are standard station disks in concrete, notes 1a and 7a. Reference marks are standard reference disks in concrete, note 11a. No. 1 is 8 meters (26 feet) northwest of road and 40.32 meters (132.3 feet) from station in azimuth $356^{\circ}06'$. No. 2 is 15 meters (49 feet) north of top of ridge, and 72.9 meters (239 feet) from station in azimuth $91^{\circ}45'$.

Gillham (Sevier County, P. A. Smith, 1930).—About 13 miles north of De Queen, 1 mile north and $\frac{1}{4}$ mile east of Gillham railway station, 4 meters (13 feet) west of west side of cemetery, on land owned by E. H. Bond, 4 meters (13 feet) south of fence, 13.7 meters (45 feet) south of center line of road, and 38.1 meters (125 feet) west of north-and-south fence. Surface and underground marks are standard station disks in concrete, notes 1a and 7a. Upper mark is 18 inches below surface. Reference marks are standard reference disks in concrete, note 11a. No. 1 is north of road, in fence line along south side of cemetery, 10 meters (33 feet) east of west fence line of cemetery, and 27.07 meters (88.8 feet) from station in azimuth $213^{\circ}39'$. No. 2 is in fence corner at northeast corner of fork in county road, $\frac{1}{8}$ mile (660 feet) from station in azimuth $87^{\circ}46'10''$.

De Queen (Sevier County P. A. Smith, 1930; 1933).—About 4 miles south of De Queen, on Highway 41, in $SE\frac{1}{4}NW\frac{1}{4}$, sec. 17, T. 9 S., R. 31 W., on land owned by G. B. Pride. To reach from De Queen go south 4 miles on Highway 41, then east $\frac{1}{4}$ mile on county road, along top of ridge to top of knoll midway between two draws, which is station site. Station is 25.7 meters (84 feet) south of county road. Surface and underground marks are standard station disks in concrete, notes 1a and 7a. Upper mark is 18 inches below surface. Reference marks are standard reference disks in concrete, note 11a. No. 1 is in fence line along south side of highway, 33.27 meters (109.2 feet) from station in azimuth $224^{\circ}25'$. No. 2 is 15 meters (49 feet) south of county road, in north-and-south fence line, 20 meters (66 feet) north of small house just east of highway, and about $\frac{1}{8}$ mile (660 feet) from station in azimuth $57^{\circ}24''24''$.

Falls (Sevier County, P. A. Smith, 1930).—About $8\frac{3}{4}$ miles south of Lockesburg, $\frac{1}{4}$ mile northwest of Falls Chapel schoolhouse, on route 71, on land owned by W. C. Hopson. Station is along north edge of large tableland, 20.7

meters (68 feet) northeast of highway and 6 meters (20 feet) northeast of hickory tree at northeast corner of old corral facing highway. Surface and underground marks are standard station disks in concrete, notes 1a and 7a. Reference marks are standard reference disks in concrete, note 11a. No. 1 is 1 meter (3.3 feet) west of fence southwest of highway, 4 meters (13 feet) northwest of large pine tree, and about 75 meters (246 feet) from station in azimuth $343^{\circ}28'$. No. 2 is in fence line southwest of highway, 8 meters (26 feet) northwest of forked oak tree, and 28.57 meters (93.7 feet) from station in azimuth $55^{\circ}06'$.

Winthrop (Little River County, P. A. Smith, 1930).—About 6 miles north of Foreman on Highway 41, 3 miles southwest of Winthrop, on land owned by F. O. Dilley in $SE\frac{1}{4}NE\frac{1}{4}$, sec. 22, T. 11 S., R. 32 W., directly across road to west of tenant house on Dilley's farm, 23.5 meters (77 feet) west of highway, 14.8 meters (49 feet) west of fence, and 11.4 meters (37 feet) north of road leading west through field. Surface and underground marks are standard station disks in concrete, notes 1a and 7a. Upper mark is 18 inches below surface. Reference marks are standard reference disks in concrete, note 11a. No. 1 is about 15 meters (49 feet) northwest of Dilley's house, in fence line east of highway, and 35.94 meters (117.9 feet) from station in azimuth $253^{\circ}44'$. No. 2 is in fence line west of highway, in northeast corner of barn lot of first farm south of station, and $\frac{1}{4}$ mile from station in azimuth $358^{\circ}34'38''$.

Wilton (Little River County, P. A. Smith, 1930).—About 7 miles northwest of Ashdown, 1 mile west of Wilton on the Wilton-Allene road, on land owned by J. C. Slusser, in or near sec. 2, T. 12 S., R. 30 W., on highest part of broad knoll. Station is in the southeast corner of patch of timber about $\frac{1}{4}$ mile west of Slusser's house and just west of cultivated field, 20.2 meters (66 feet) north of road, and 12.2 meters (40 feet) west of wire fence. Surface and underground marks are standard station disks in concrete, notes 1a and 7a. Reference marks are standard reference disks in concrete, note 11a. No. 1 is in fence line north of road about 20 meters (66 feet) east of small house on south side of road, and about 150 meters (492 feet) from station in azimuth $275^{\circ}26'52''$. No. 2 is in fence line south of road, 29.52 meters (96.9 feet) from station in azimuth $0^{\circ}17'$.

Foreman (Little River County, P. A. Smith, 1930).—About 5 miles by road east of Foreman and $1\frac{3}{4}$ miles west of Ashdown, on Highway 32, in a small triangular plot of ground owned by J. A. Wickliss, on the west side of $NW\frac{1}{4}NW\frac{1}{4}$ sec. 5, T. 13 S., R. 31 W. Station is about $\frac{1}{4}$ mile west of house on Wickliss farm, a large unpainted house with outside chimney on west, situated on north side of highway, and is 12.9 meters (42 feet) north of highway, 9.3 meters (31 feet) east of woods road to north, and 5.7 meters (19 feet) southwest of wire fence. Surface and underground marks are standard disk station marks in concrete, notes 1a and 7a. Reference marks are standard reference disks in concrete, note 11a. No. 1 is in fence line south of highway, about 30 meters (98 feet) east of barn on south side of road, and approximately $\frac{1}{4}$ mile from station in azimuth $288^{\circ}54'12''$. No. 2 is 18 meters (59 feet) south of highway, 4 meters (13 feet) west of section road to south, and 31.37 meters (102.9 feet) from station in azimuth $19^{\circ}47'$.

Hawkins (Little River County, P. A. Smith, 1930).—About $3\frac{1}{4}$ miles by road west of Ashdown, on Highway 32, on land owned by Hawkins brothers, along the center of the south side of $N\frac{1}{2}$ sec. 2, T. 13 S., R. 30 W. Station is 15.6 meters (51 feet) north of center line of highway, 8.1 meters (27 feet) north of wire fence, and 9.5 meters (31 feet) east of gatepost of board gate on road to small unpainted house 50 meters (164 feet) to north. Surface and underground marks are standard disk station marks in concrete, notes 1a and 7a. Mark is 18 inches below surface. Reference marks are standard reference disks in concrete, note 11a. No. 1 is 8 meters (26 feet) south of an 18-inch oak tree where woods project into field from east, and is about 250 meters (820 feet) from station in azimuth $211^{\circ}15'05''$. No. 2 is $\frac{1}{2}$ meter ($1\frac{1}{2}$ feet) east of wire fence, 21 meters (69 feet) north of highway, and 30.83 meters (101.1 feet) from station in azimuth $102^{\circ}42'$.

Holland (Bowie County, Tex., P. A. Smith, 1930).—About $3\frac{1}{2}$ miles northwest of Texarkana, on land belonging to Matt Holland, colored. To reach from Texarkana, go west on Highway 5, 0.8 mile beyond Hannon's Tourist Camp, to stone gateway on left at end of street-car line, thence north and northwest over city streets and Richmond road, 2.5 miles to station. Station

is about 60 meters (197 feet) west by south of Richmond road, 40 meters (131 feet) north of dirt road leading to Holland's house, and 70 meters (230 feet) south by west of Texarkana Water Corporation substation, on top of a small rise of ground in a wood lot. Surface and underground marks are standard disk station marks in concrete, notes 1a and 7a. Reference marks are standard reference disks in concrete, note 11a. No. 1 is 19.25 meters (63.2 feet) from station in azimuth $153^{\circ}49'$. No. 2 is 17.61 meters (57.8 feet) from station in azimuth $81^{\circ}40'$.

Hooks (Bowie County, Tex., P. A. Smith, 1930).—About 15 miles west of Texarkana, 0.3 mile west and 1 mile south of Hooks railway station, on land belonging to Robert Guinn, 1.1 meters (4 feet) east of east road fence prolonged and 2.8 meters (9 feet) north of south road fence prolonged, where county road turns west 1 mile south of Highway 5. Surface and underground marks are standard disk station marks in concrete, notes 1a and 7a. Surface mark is 18 inches below ground to avoid being disturbed by cultivation. Reference marks are standard reference disks in concrete, note 11a. No. 1 is in east fence line of county road, about 3 meters (10 feet) south of wagon road leading southeast, and about 130 meters (427 feet) from station, in azimuth $180^{\circ}55'21''$. No. 2 is $\frac{1}{2}$ meter (2 feet) north of south fence along road, and 34.12 meters (111.9 feet) from station in azimuth $87^{\circ}28'$.

Ashdown northwest base (Little River County, P. A. Smith, 1930; 1931).—In a cultivated field owned by Mrs. J. P. Erwin, 1.3 miles northwest of Ashdown railroad crossing, on United States Highway 71, 17.1 meters (56 feet) west of highway, on northern prolongation of tangent of Kansas City Southern Railway, 60 meters (197 feet) west of tracks, and 7 meters (23 feet) west of east fence of field. Surface and underground marks are standard disk station marks in concrete, notes 1a and 7a. Reference marks are standard reference disks in concrete, note 11a. No. 1 is 14.7 meters (48 feet) east of highway, 8 meters (26 feet) west of the railroad, and 31.78 meters (104.3 feet) from station in azimuth $247^{\circ}50'$. No. 2 is 30 meters (98 feet) west of highway, in an east-and-west fence line 4 meters (13 feet) west of fence corner, 35 meters (115 feet) south of southeast corner of house, and 200 meters (656 feet) from station in azimuth $338^{\circ}31'05''$. In 1931 the marks were reported to have been recovered in good condition, as described. Elevation of station mark is 100.259 meters (328.933 feet).

Ashdown southeast base (Little River County, P. A. Smith, 1930; 1931).—About 8 miles southeast of Ashdown, 150 meters (492 feet) southeast of Ogden railway station on the Kansas City Southern Railway, 28.2 meters (93 feet) east of Highway 71, and 10 meters (33 feet) south from southerly one of small pine trees in a draw east of the railway station. Station is on land owned by Roscoe Wood, and is marked underground and at surface by standard disk station marks in concrete, notes 1a and 7a. Reference marks are standard reference disks in concrete, note 11a. No. 1 is in edge of cultivated ground, 25.97 meters (85.2 feet) from station in azimuth $200^{\circ}41'$. No. 2 is about 28 meters (92 feet) east of highway, and 28.27 meters (92.7 feet) from station in azimuth $333^{\circ}23'$. In 1931 the marks were recovered as described, in good condition. It was reported that there is a standard disk station mark in a six inch iron pipe filled with cement and called "S.E. Base Offset" located on the tangent of the east rail, but that this mark was not used in the measurement of the base line. The elevation of the offset mark is 90.557 meters (297.102 feet).

Alamo (Cass County, Tex., P. A. Smith, 1930).—About 12 miles, air line, south of Texarkana and 8.5 miles, air line, northeast of Queen City, on the highest point of what is locally known as Cripple Mountain, on land supposed to belong to Merritt and Braden. It is about $\frac{1}{2}$ mile southwest of the farm of G. Grundy. To reach from Queen City go north on Highway 47 for 2.3 miles, thence east 2.9 miles to point 0.4 mile beyond Springdale School, thence along right-hand fork and main road east and north for 1.2 miles to "T", turn east and keep straight ahead 0.9 mile, take left fork at 1.9 miles, right fork at 2.0 miles, and at 3.1 miles take left of three forks. Two triangular blazes can be seen on left at this fork. From here the station is reached over dim wagon roads, through woods, and a good description is not possible. Station is about 1 mile north of the three forks, and the road is west of the top of the ridge. Surface and underground marks are standard disk station marks in concrete, notes 1a and 7a. Reference marks are standard reference disks in concrete, note 11a. One is on side of knoll, 30.20 meters (99.1 feet) (slope

distance) from station in azimuth $75^{\circ}37'$; the other is 10 meters (33 feet) west of a faint wagon road, and is about 150 meters (492 feet) from station in azimuth $347^{\circ}13'19''$.

Antioch (Cass County, Tex., P. A. Smith, 1930).—About 7 miles, air line, west-northwest of Queen City, and $\frac{1}{8}$ mile northeast of Antioch school and church, on west end of an east-and-west knoll in a cultivated field, on land owned by Witt Griffin, and under title as Joe Slah Massey Headright, about 110 meters (361 feet) east of county road, 9.4 meters (30.8 feet) east by south of southeast fence corner of orchard, and 2.1 meters (6.9 feet) south of south orchard fence prolonged. Surface and underground marks are standard disk station marks in concrete, notes 1a and 7a. Top of upper mark is 18 inches below surface, so placed because of cultivation of field. Two reference marks were set, standard reference disks in concrete, note 11a. No. 1 is in fence line south of field, 10 meters (33 feet) west of northwest corner of Antioch Cemetery, and $\frac{1}{8}$ mile from station in azimuth $37^{\circ}46'59''$. No. 2 is in south fence line of orchard, and 30.55 meters (100.2 feet) from station in azimuth $100^{\circ}36'$.

Bloomburg (Cass County, Tex., P. A. Smith, 1930).—About 10 miles east of Atlanta, 1.1 miles, air line, northeast of the town of Bloomburg, in a sandy cultivated field owned by W. E. Robinson, and about 150 meters (492 feet) south by east of his house. From Bloomburg go northeast 0.5 mile to where road turns east, thence north on dim road to "T", and there take right-hand fork 0.3 mile to Robinson's house. Station is about 50 meters (164 feet) east of road leading to house. Surface and underground marks are standard disk station marks in concrete, notes 1a and 7a. Upper mark is 1 foot below surface of ground. Reference marks are standard reference disks in concrete, note 11a. No. 1 is 3 meters (10 feet) east of road to house, and 53.38 meters (175.1 feet) from station in azimuth $63^{\circ}01'$. No. 2 is about 30 meters (98 feet) south of house, 4 meters (13 feet) south of well, and 131.2 meters (430 feet) from station in azimuth $169^{\circ}25'38''$.

Bivins (Cass County, Tex., P. A. Smith, 1930).—About 8 miles southwest of Atlanta, and $1\frac{1}{4}$ miles northwest of Bivins, on land owned by T. N. Heath, on the eastern end of a sandy knoll about $\frac{1}{4}$ mile northwest of Heath's house. From Bivins go west 0.4 mile from crossroad west of railroad tracks, thence to right on dim road about $\frac{1}{2}$ mile to Heath's house. Station is in fence line between property of T. N. and A. H. Heath. Surface and underground marks are standard disk station marks in concrete, notes 1a and 7a. Reference marks are standard reference disks in concrete, note 11a. No. 1 is in fence line, on east brow of hill, and 22.73 meters (74.6 feet) from station in azimuth $270^{\circ}02'$. No. 2 is 5 meters (16 feet) south of gate about middle of east side of field, and $\frac{1}{8}$ mile from station in azimuth $330^{\circ}18'00''$.

Pinkard (Cass County, Tex., P. A. Smith, 1930).—About 9 miles, air line, south by east of Atlanta, $4\frac{1}{2}$ miles southeast by east of Bivins, and 1 mile south of Huffines School, on the northern end of a high bare knoll about $\frac{1}{8}$ mile northwest of Pinkard's house. Land is now owned by S. C. Pinkard, with probable change of ownership to H. S. Ailday's Supply Co. Station is $8\frac{1}{2}$ meters (28 feet) south of edge of cultivated ground, and 15 yards east of cultivated ground to west. Surface and underground marks are standard disk station marks in concrete, notes 1a and 7a. Reference marks are standard reference disks in concrete, note 11a. No. 1 is in a north-and-south fence line, about $\frac{1}{4}$ mile from station in azimuth $177^{\circ}22'38''$. No. 2 is 15 meters (49 feet) west of road, west of a large pine tree which is west of road, and 475.1 feet from station in azimuth $288^{\circ}50'06''$.

Ravana (Miller County, P. A. Smith, 1930).—About $\frac{1}{2}$ mile east of Ravana railroad station, on south end of a bare knoll, on land owned by G. S. Beck, and about 75 meters (246 feet) south of his house. Station is 16.7 meters (55 feet) southeast of southeast corner of barn, 7.4 meters (24 feet) west of fence west of road, and 28.0 meters (92 feet) north of fence north of road. To reach from Ravana go north and east out of town 0.6 mile to top of grade where road turns north. Surface and underground marks are standard station disks in concrete, notes 1a and 7a. Upper mark is 4 inches below surface. Reference marks are standard reference disks in concrete, note 11a. No. 1 is $1\frac{1}{2}$ meters (5 feet) west of fence line, and 29.66 meters (97.3 feet) from station in azimuth $208^{\circ}09'$. No. 2 is in southwest corner of field, 10 meters (33 feet) north of road, and $\frac{3}{8}$ mile from station in azimuth $84^{\circ}53'14''$.

Posey (Cass County, Tex., P. A. Smith, 1930).—About 6 miles, air line, northwest of Vivian, La., 4 miles southwest of Rodessa, La., and 0.6 mile west

of the Texas-Louisiana boundary, on the highest point of a small wooded ridge. To reach from Vivian go north along Highway 47 for 4.9 miles to county road running west at filling station, thence west on this road 3.6 miles to point 130 meters (427 feet) beyond a fork, to station site. Station is 12.5 meters (41 feet) north of road. Surface and underground marks are standard disk station marks in concrete, notes 1a and 7a, upper mark flush with surface of ground. Reference marks are standard reference disks in concrete, note 11a. No. 1 is in fence line 5 meters (16 feet) south of road at fork and 130 meters (427 feet) from station in azimuth $278^{\circ}12'41''$. No. 2 is 5 meters (16 feet) south of road, and 32.13 meters (105.4 feet) from station in azimuth $45^{\circ}58'$.

Spearman (Caddo Parish, La., P. A. Smith, 1930).—About 10 miles northeast of Vivian, $3\frac{1}{2}$ miles, airline, northeast of Rodessa, $3\frac{1}{2}$ miles west of Ida, and $\frac{1}{2}$ mile south of the Louisiana-Arkansas boundary, in the middle of the south side of sec. 6, T. 23 N., R. 15 W., on land belonging to N. S. Spearman 17.0 meters (56 feet) northeast of northwest corner of house, and 13.6 meters (45 feet) southeast of well. From Rodessa go northeast 2.3 miles on the Ida Road, thence north and east on county road 1.8 miles to house on Spearman farm, situated about 150 yards north of road on a grassy knoll. Surface and underground marks are standard disk station marks in concrete, notes 1a and 7a. Reference marks are standard reference disks in concrete, note 11a. No. 1 is at east side of small field, at edge of timber, and 100 meters (328 feet) from station in azimuth $228^{\circ}51'48''$. No. 2 is 20 meters (66 feet) west of well, and 34.48 meters (113.1 feet) from station in azimuth $111^{\circ}08'$.

Supplementary points

Oklahoma-Arkansas boundary monument no. 52 (ecc.) (Le Flore County, Okla., Polk County, Ark., P. A. Smith, 1930).—In clearing in thick section of pine trees on west side of road. Mark is standard station disk in concrete in top of 4-inch iron pipe. Station *Oklahoma-Arkansas boundary monument no. 52 (1877)* (see description thereof) is 26.62 meters (87.3 feet) from station in azimuth $348^{\circ}45'48''$.

Oklahoma-Arkansas boundary monument no. 52 (1877) (Le Flore County, Okla., Polk County, Ark., P. A. Smith, 1930).—About 15 miles west of Mena, and $\frac{1}{2}$ mile south of Tallahina Road which leads west from Mena, on State boundary. To reach from Mena, follow Tallahina Road to boundary, turn south onto poor dirt road along boundary, cross two creeks, and continue about $\frac{1}{2}$ mile to station site on east side of road. Mark is 4-inch cast-iron pipe with cap, projecting about 2 feet above ground, and leaning about 10° to east. East side is marked "Arkansas"; west side, "Choctaw Nation" and date "1877" in raised letters. Station *Oklahoma-Arkansas boundary monument no. 52 (ecc.)* (see description thereof) is 26.62 meters (87.3 feet) from station in azimuth $168^{\circ}45'48''$.

Loutexark (ecc.) (Cass County, Tex., P. A. Smith, 1930).—An unmarked point 6.88 meters (22.6 feet) from station *Loutexark* (see description thereof) in azimuth $70^{\circ}39'47''$.

Loutexark (Texas-Arkansas-Louisiana boundary, P. A. Smith, 1930).—About 9 miles southeast of Atlanta, 11 miles north of Vivian, and 50 feet north of Route 47, at a small settlement known locally as Three States. Station is marked by a standard disk in top of boundary post of stone, about 10 inches square, and projecting 18 inches above ground. An azimuth mark, described as a standard tablet in stone boundary post, was observed on from *Loutexark (ecc.)* (see description thereof) and recorded as being directly on line to station *Ravana*. Data for reducing its azimuth to *Loutexark* (center) are not available.

MISSISSIPPI RIVER

Principal points

Cotton (Pemiscot County, Mo., H. W. Hemple, 1929).—Located at Cottonwood Point, on the west bank of the Mississippi River, about 8 miles south of Caruthersville, and about $\frac{1}{4}$ mile east of main part of town of Cottonwood, on a small knoll 475 feet east of levee, and 173 feet south of road running east and west, called locally the River Road. Surface and underground marks are standard disk station marks in concrete, notes 1a and 7a. Upper mark is 15 inches below surface. Reference marks are standard reference

For notes in regard to marking of stations see p. 40.

disks in concrete, note 11a. No. 1 is 16 feet west of the River Road just after it turns north after running east from Cottonwood, 84 feet north of where road turns north, and 80.9 meters (265 feet) from station in azimuth $230^{\circ}59'08''$. No. 2 is at junction of the River and Banquette Roads, diagonally across from Cottonwood Gin Mill, 25 feet east of center line of Banquette Road, 48 feet north of center line of River Road, and about 150 meters (492 feet) from station in azimuth $159^{\circ}33'45''$. Station *P.B.M. Cottonwood south base (1879) (M.R.C.)* is 116.51 meters (382.2 feet) from station in azimuth $126^{\circ}41'18''$.

Head (Dyer County, Tenn., H. W. Hemple, 1929).—About 7 miles west of Dyersburg, and 2 miles northwest of Finley, on land owned by J. M. Head. To reach from Dyersburg go about 7 miles on Route 20 to crossroads 1.1 miles west of Finley, take gravel road leading north 1.9 miles to Mr. Head's gate on the right side of road, at foot of bluff, and opposite shed on left. From gate follow private road 0.2 mile up steep grade to house and inquire for route through orchard to station. Truck can be driven to station in dry weather. Station is in a pasture just west of large orchard, on highest knoll of bluff, 20 feet west of orchard fence, 200 yards northwest of 2-story square house, and 400 yards south of barn. Surface and underground marks are standard disk station marks in concrete, notes 1a and 7a. Reference marks are standard reference disks in concrete, note 11a. No. 1 is along fence line, 199.50 feet from station in azimuth $203^{\circ}43'$. No. 2 is under apple tree in orchard, 162.70 feet from station in azimuth $248^{\circ}50'$. Azimuth from station of final of black water tank at Dyersburg is $285^{\circ}39'05''$.

School (Mississippi County, H. W. Hemple, 1929).—About 10 miles east of Blytheville, and 5.3 miles by road from town of Amorel, in southwest corner of grounds surrounding School No. 48, Hickman District, 68 feet east of center line of north-and-south road, and 129 feet north of center line of east-and-west road. Surface and underground marks are standard disk station marks in concrete, notes 1a and 7a. Reference marks are standard reference disks in concrete, note 11a. No. 1 is 22 feet south of center line of road running east and west, and 192 meters (630 feet) from station in azimuth $283^{\circ}04'46''$. No. 2 is 53 feet west of center line of road running north and south, 22 feet south of center line of road running east and west, and 58.2 meters (191 feet) from station in azimuth $37^{\circ}14'$. Southwest corner of School No. 48 is 67.1 meters (220 feet) from station in azimuth $232^{\circ}41'$.

Edith (Lauderdale County, Tenn., H. W. Hemple, 1929).—About 7 miles northwest of Ripley, 2 miles northwest of Edith, a store and crossroad, on knoll in cultivated fields on farm of W. E. Cribfield. To reach from Ripley go about 6 miles to Edith on new loop road between Ripley and Halls. From Edith follow new road north 1.5 miles to road turning left, follow this 0.7 mile to second house on left, occupied by Van Thompson. Station is 250 feet north of house, 50 feet north of road, and 20 feet northeast of wreck of old Dodge car. Surface and underground marks are standard disk station marks in concrete, notes 1a and 7a. Reference marks are standard reference disks in concrete, note 11a. No. 1 is across road, in northeast corner of yard around Van Thompson's house, and approximately 154.6 feet from station in azimuth $319^{\circ}56'$. No. 2 is on south side of road, between road and fence, about 20 feet northeast of gate to barn, and approximately 450 feet from station in azimuth $32^{\circ}42'47''$.

Anderson (Mississippi County, H. W. Hemple, 1929).—About 8 miles south-east of Blytheville, and about 3.5 miles south of Amorel, on land owned by Walt Anderson (colored), about 0.3 mile south of road which forks off from State Highway 18 at point 1.2 miles from Amorel, about 238 feet west of banquette road, about 200 meters (656 feet) southwest of L.M.P. 59-60, and just south of large conspicuous hickory tree on east side of private road leading into Anderson's farm. Surface and underground marks are standard disk station marks in concrete, notes 1a and 7a. Reference marks are standard reference disks in concrete, note 11a. No. 1 is 68 feet west of top of levee, 19 feet west of center line of banquette road, 77 feet south of road crossing from banquette road to private road, and 78.7 meters (258 feet) from station in azimuth $316^{\circ}25'$. No. 2 is on east side of private road opposite Anderson's house, about $\frac{1}{2}$ mile south of east-and-west road leading from levee into Amorel, and 286.3 meters (939 feet) from station in azimuth $47^{\circ}39'$.

Lusk (Lauderdale County, Tenn., H. W. Hemple, 1929).—About 7 miles west of Ripley, in cultivated field belonging to Dr. Lusk, who has an office near northeast corner of square in Ripley. To reach from Ripley go west on route 19 (a good gravel road) to dirt road turning south 2.4 miles west of village of Arp. A large gravel pile is in southeast corner of this fork, and dirt road passes through gravel cut. Station is 150 feet south of route 19, on top of 8-foot bank on west side of dirt road, 50 yards south of fork, 16 feet west of fence on edge of bank, 21 feet southwest of blazed 6-inch walnut, and 18 feet northwest of blazed 12-inch walnut. Surface and underground marks are standard station disk marks in concrete, notes 1a and 7a. Reference marks are standard reference disks in concrete, note 11a. No. 1 is about 12 feet west of center of dirt road, 2 feet from 30-inch stump, and approximately 250 yards from station in azimuth $17^{\circ}37'59''$. No. 2 is on bank about 30 feet south from center line of main highway, about 100 yards west of road intersection, and 357.40 feet from station in azimuth $135^{\circ}40'02''$.

Cooper (Mississippi County, H. W. Hemple, 1929; 1933).—About 5 miles northeast of Luxora, in southeast section of Rosa. Surface and underground marks are standard disk station marks in concrete, notes 1a and 7a. Reference marks are standard reference disks in concrete, note 11a. No. 1 was 244 meters (801 feet) from station in azimuth $248^{\circ}26'22''$. No. 2 was 34.2 meters (112 feet) from station in azimuth $145^{\circ}23'$. Station was moved in November 1933 due to its imminent destruction by levee construction; and same station marks were used to establish station *Cooper 2* (see description thereof) 434.25 feet distant in azimuth $165^{\circ}04'04''.0$. Station *B.M. 42/4 (M.R.C.)* (see description thereof) is 2,256.52 feet from site of station in azimuth $141^{\circ}28'06''.8$.

Cherry (Lauderdale County, Tenn., H. W. Hemple, 1929).—About 10 miles southwest of Hennings, $1\frac{1}{4}$ miles northwest of Cherry, a small village on the Hennings-Fulton road, on edge of Cold Creek bluffs, in yard of house owned by Allen Barbee of Ripley and occupied by Pete Brown. To reach from route 3 at Hennings go by new graded road to Cherry, then take road leading north from old gin, called Davenport Ford road, $1\frac{1}{4}$ miles to T intersection, turn left $\frac{1}{4}$ mile to an old road leading left at a large blazed tree and follow this road $\frac{1}{2}$ mile to Brown's house. Station is 15 feet north of east-and-west fence line, 45 feet west of southwest corner of porch, 75 feet east of edge of bluff, and 40 feet east of old bluff road. Surface and underground marks are standard disk station marks in concrete, notes 1a and 7a. Reference marks are standard reference disks in concrete, note 11a. No. 1 is in fence line at northwest corner of barnyard, and 188.48 feet from station in azimuth $189^{\circ}51'$. No. 2 is 6 feet from southeast corner of small barn, 169.04 feet from station in azimuth $221^{\circ}29'$.

Driver (Mississippi County, H. W. Hemple, 1929).—About 2 miles southwest of town of Osceola, 62.5 feet east of United States Highway 61, about 1 mile south of where this highway turns south after passing through Osceola, and about 60 feet south of 2-story frame house on east side of the highway. Surface and underground marks are standard disk station marks in concrete, notes 1a and 7a. Reference marks are standard reference disks in concrete, note 11a. No. 1 is on west side of Highway 61, 32.6 meters (107 feet) from station in azimuth $89^{\circ}44'$. No. 2 is on west side of Highway 61, 50 feet northeast of frame house, and 197.7 meters (649 feet) from station in azimuth $170^{\circ}39'31''$. Station *B. M. 45/4 (M.R.C.)* is 708.29 meters (2323.1 feet) from station in azimuth $269^{\circ}29'55''.7$.

Fort (Lauderdale County, Tenn., H. W. Hemple, 1929).—About 4 miles northeast of Fulton, 18 miles southwest of Hennings, 5 miles southwest of Mack, and about 1 mile east of main works of old Fort Pillow on Mississippi River, on land owned by Ward Volkmar, of Gates, and occupied by Ed Taylor. To reach from Hennings go about 18 miles on the new graded road via Glimp, Cherry, and Mack, to road leading north to Fort Pillow at Price, about 5 miles from Mack, follow this north road to top of steep grade, with church on left. The Taylor house is on highest part of hill, about $\frac{1}{2}$ mile north of church, and just before road descends grade in cut. Station is just north of right-angle bend to left in road 100 yards before reaching Taylor's house, in a small triangular field about 200 feet southeast of Taylor's house, about 35 feet east of 18-inch persimmon tree with blaze on west side, 60 feet west of 24-inch oak tree, and 50 feet west of angle in parapet of old Fort Pillow. Surface and underground marks are standard disk station marks in concrete, notes 1a and 7a. Reference marks are standard reference disks in concrete, note 11a. No. 1 is 15 feet west

from center line of road, 25 yards northwest of house with small log cabin in rear, and 454.5 feet from station in azimuth $22^{\circ}37'09''$. No. 2 is in fence corner, about 60 yards south of house occupied by Taylor, and 199.8 feet from station in azimuth $93^{\circ}51'$.

Wilson (Mississippi County, H. W. Hemple, 1929).—About $\frac{1}{4}$ mile south of town of Wilson, in northwest corner of grounds about Wilson School, and about 100 yards west of west corner of school, 250 feet north of center line of United States Highway 61, and 35.6 feet west of narrow gravel road leading to rear of school grounds. Surface and underground marks are standard disk station marks in concrete, notes 1a and 7a. Reference marks are standard reference disks in concrete, note 11a. No. 1 is 21.9 feet southeast of house on northwest side of route 61, 42 feet from center line of highway, and 138.7 meters (455 feet) from station in azimuth $35^{\circ}42'05''$. No. 2 is 32 feet southeast of center line of route 61, 32 feet southeast of the curb of road leading from west to main entrance of school, and 71.0 meters (233 feet) from station in azimuth $331^{\circ}22'$.

Chickasaw (Tipton County, Tenn., H. W. Hemple, 1929).—About 2 miles east of Richardsons Landing, 1 mile southwest of Randolph, and southwest of Covington on edge of Chickasaw Bluff No. 2, on land belonging to W. H. Barton, of Drummond. To reach from Covington go by dirt road to Randolph, thence keeping right-hand fork at 0.1 mile from Templeton's store, turn right at 1.3 miles, turn right again onto farm road at 1.4 miles, and follow this road 0.7 mile to station, which is at point of locust trees at right, north of farm road, 15 feet north of triangle-blazed 5-inch locust, 40 feet southeast of slip bank at nearest point, and near interior angle in cultivated field. Surface and underground marks are standard disk station marks in concrete, notes 1a and 7a. Reference marks are standard reference disks in concrete, note 11a. No. 1 is on bluff line on north side of field, about 50 yards west of road, and 232.0 feet from station in azimuth $253^{\circ}14'$. No. 2 is about 9 feet south from center line of road, and 753.0 feet from station in azimuth $297^{\circ}04'48''$.

Shawnee (Mississippi County, H. W. Hemple, 1929).—About 2 miles southeast of Joiner, on United States Highway 61, on land owned jointly by the First National Bank, the Union Planters Bank, and the Fidelity Bank, all located in Memphis. Station is in southeast corner of lot about old gin mill located in center of village of Shawnee, 26.5 feet southeast of southeast corner of loading platform of gin mill, 240 feet east of road running north and south, and 287 feet south of east-and-west road. Surface and underground marks are standard disk station marks in concrete, notes 1a and 7a. Reference marks are standard reference disks in concrete, note 11a. No. 1 is on east side of road running north and south, at northwest corner of cotton pick-up shed, and about 500 meters (1,640 feet) from station in azimuth $190^{\circ}08'41''$. No. 2 is 11.3 feet east of center line of north-and-south road, 287 feet south of crossroads at Shawnee Village, 94 feet south of 48-inch elm tree, and 76.71 meters (251.7 feet) from station in azimuth $77^{\circ}20'$.

Weakley (Tipton County, Tenn., H. W. Hemple, 1929).—About 2 miles west of village of Quito, in vicinity of the "slip bank" and Black Springs hill, on land belonging to S. E. Weakley. To reach from Millington and route 3 go by dirt and gravel road to Quito, take road west 1.0 mile to T fork with well and schoolhouse on right, take left-hand road, keeping main road at 1.2 miles, turn right at 2.3 miles and proceed for 0.3 mile past barnyard to top of grade, turn right through small cut into farm road and follow 0.2 mile to station. Station is 18 feet west of shed over cistern and blacksmith's forge, on small knoll 150 yards northeast of house occupied by Weakley's son. Surface and underground marks are standard disk station marks in concrete, notes 1a and 7a. Reference marks are standard reference disks in concrete, note 11a. No. 1 is in fence line almost in line with cistern, and 208.0 feet from station in azimuth $296^{\circ}32'$. No. 2 is west of road, about 10 feet from the northeast corner of yard around Weakley's house, and 360.4 feet from station in azimuth $30^{\circ}11'06''$.

Sanders (Crittenden County, H. W. Hemple, 1929).—About 5 miles east of town of Turrell, about 1 mile southwest of old cotton gin and store of Sanders plantation, about 1 mile south of road running east from Turrell, $\frac{1}{2}$ mile west of gravel road leading into Marion by way of Clarksdale, in northwest corner of old negro graveyard, on land owned by O. L. Sanders, 59 feet south of road running east and west, and 72 feet east of road running north

and south. Surface and underground marks are standard disk station marks in concrete, notes 1a and 7a. Reference marks are standard reference disks in concrete, note 11a. No. 1 is 11 feet west of road running north and south, 696 feet north of road running east and west, at southeast corner of cotton pick-up shed, and 230.4 meters (756 feet) from station in azimuth $182^{\circ}54'56''$. No. 2 is 11 feet south of east-and-west road, 165 feet west of the road running north and south, and 73.4 meters (241 feet) from station in azimuth $102^{\circ}00'$. Station *B. M. Thresher (M.R.C.)* is 1,792.36 meters (5,880.4 feet) from station in azimuth $238^{\circ}08'11''.8$.

Locke (Shelby County, Tenn., H. W. Hemple, 1929).—About 14 miles north of Memphis, $1\frac{1}{2}$ miles northwest of Locke, on north side of gravel road near west line of farm belonging to Phelan Jeter, who lives about 2 miles north of Locke. To reach from route 3 in Millington, go about 8 miles on gravel road to Locke, take gravel road leading north 0.8 mile to gravel road leading west, follow this road 0.7 mile to white house on north side of road, and turn around house to station, which is between main road and beech tree, in east fence line of yard, 50 yards southeast of house, 30 feet north of road, and 40 feet south of large beech tree. Station can be reached easier from Memphis by oiled gravel road via Benjestown and Locke. Take Benjestown road 1.8 miles north of Wolf River Bridge. Surface and underground marks are standard disk station marks in concrete, notes 1a and 7a. Reference marks are standard reference disks in concrete, note 11a. No. 1 is near northeast corner of chicken house in rear of white house, and 236.7 feet from station in azimuth $142^{\circ}17'$. No. 2 is in line with front door of house, on north bank, about 20 feet from the center line of road, and 134.7 feet from station in azimuth $69^{\circ}55'$.

Marion (Crittenden County, H. W. Hemple, 1929; 1932).—About $\frac{1}{4}$ mile north of town of Marion, on west side of colored schoolhouse, a brick structure on United States Route 61. Station is 92 meters (302 feet) south of road running east and west along the north side of school property, 145 meters (476 feet) west of center line of route 61, and 16.6 meters (54 feet) south of a little used road running around south side of school. Surface and underground marks are standard disk station marks in concrete, notes 1a and 7a. Reference marks are standard reference disks in concrete, note 11a. No. 1 is 3.75 meters (12.3 feet) north of east-and-west road, 8.10 meters (26.6 feet) southeast of southeast corner of porch of house, and 90.30 meters (296.3 feet) from station in azimuth $182^{\circ}54'$. No. 2 is 14.9 meters (49 feet) west of center line of route 61, 32.85 meters (107.8 feet) southeast of corner of school, and 130.35 meters (427.7 feet) from station in azimuth $273^{\circ}17'58''$.

Benjes (Shelby County, Tenn., H. W. Hemple, 1929).—About 7 miles north of Memphis, $\frac{1}{2}$ mile south of Benjestown store, on land owned by Mr. Larrick, of Washington, D.C. Land has not been cultivated for 7 years and consists of wedge-shaped strip cut off from west side of farm by the road. To reach from Memphis go north on route 3, and 1.8 miles north of Wolf River Bridge take oiled road leading northwest 3.2 miles to station. Surface and underground marks are standard disk station marks in concrete, notes 1a and 7a. Reference marks are standard reference disks in concrete, note 11a. No. 1 is about 25 feet north of center line of road, 75 feet south of road leading to negro house at left bend in road, and 277.6 feet from station in azimuth $210^{\circ}17'$. No. 2 is about 30 feet east of center line of road in southeast corner of yard around C. B. William's house, and 253.9 feet from station in azimuth $354^{\circ}19'$. Azimuth from station of *Memphis, Columbus Tower, flagpole* is $359^{\circ}33'48''.7$.

Exchange (Shelby County, Tenn., E. H. Pagenhart, 1914; 1929).—In Memphis, on roof of Exchange Building, formerly Cotten Exchange Building, at corner of Second and Madison Streets. Mark is standard station disk flush with concrete roof, under layer of tar and gravel, in southeast corner of building, 1.38 meters (4.5 feet) from inside of cornice on Second Street side, and 1.48 meters (4.9 feet) from inside of cornice on Madison Street side. Center of iron flagpole is 3.08 meters (10.1 feet) from station in azimuth $166^{\circ}30'$.

Bollinger (Crittenden County, H. W. Hemple, 1929).—About $\frac{3}{4}$ mile southwest of West Memphis, $\frac{1}{2}$ mile west and $\frac{1}{2}$ mile south of where United States Route 61 turns north after leaving West Memphis, on land owned by the Woods Lumber Co., of Memphis, Tenn., and managed by Oliver Bollinger, 176 feet east of road running north and south, and 57.8 feet east-southeast of chimney on north side of farm house, the third house on east side of road leading to

Hulbert from United States Route 70. Surface and underground marks are standard disk station marks in concrete, notes 1a and 7a. Reference marks are standard reference disks in concrete, note 11a. No. 1 is 35 feet west of center line of road running north and south into Hulbert, 150 paces north of 2-story house on west side of road, and 208.5 meters (684 feet) from station in azimuth $17^{\circ}56'12''$. No. 2 is 35 feet west of center line of road leading into Hulbert, and 63.9 meters (210 feet) from station in azimuth $105^{\circ}00'$.

Weaver (Shelby County, Tenn., E. H. Pagenhart, 1914; 1929).—About $8\frac{1}{2}$ miles south of west of Court Square, Memphis, 4 miles west of south of West Junction, and 2 miles north of Darwin railroad station, on Weaver Plantation. To reach from post office on Main Street in Memphis, go south 6.0 miles on Horn Lake Road (Tennessee route 14) to Nonconnah, turn right on hard-surfaced road and go 4.6 miles to dirt crossroad, turn right and go 1.8 miles, cross railroad and small bridge, turn right just after crossing bridge, and go 0.8 mile to station which is about 50 meters (164 feet) to left of road, on small knoll overlooking Mississippi River bottom, and about $\frac{1}{4}$ mile east of west line and 1 mile west of east line of loop of Yazoo and Mississippi Valley Railroad between West Junction and Darwin. Surface and underground marks are standard station disks in concrete blocks, notes 1a and 7a. Upper mark projects about 6 inches above ground. Reference marks are standard reference disks in concrete, note 11a. No. 1 is a tree line at north edge of head of ravine, 240.04 feet from station in azimuth $344^{\circ}50'$. No. 2, set in 1914, and reported lost in 1929, was 172.33 meters (565.39 feet) from station in azimuth $195^{\circ}11'$.

Martine (Crittenden County, H. W. Hemple, 1929; 1933).—About 8 miles southwest of West Memphis, and 7.7 miles by road southwest of Hulbert. Surface and underground marks were standard disk station marks in concrete, notes 1a and 7a. Reference marks are standard reference disks in concrete, note 11a. No. 1 was 58.6 meters (192.3 feet) from station in azimuth $196^{\circ}59'$. No. 2 was 735.15 feet from station in azimuth $84^{\circ}05'50''$. Station was moved in November 1933, due to its imminent destruction by levee construction, and same station marks were used to establish station *Martine 2* (see description thereof) 968.97 feet distant in azimuth $182^{\circ}07'51''.5$.

Lake View (De Soto County, Miss., H. W. Hemple, 1929).—About 1 mile north of Lake View post office, and about 500 meters (1,640 feet) south of Tennessee-Mississippi State line, on land owned by Chiro Jole and occupied by Edd More (colored). To reach from Memphis take United States route 61 (State route 14). Station is on east side of route 61, just north of dog kennel named "Canine-Ritz", near center of small pasture, north of Edd More's house, and southeast of small vacant store on west side of road. Surface and underground marks are standard station disks in concrete, notes 1a and 7a. Reference marks are standard reference disks in concrete, note 11a. No. 1 is near fence corner, about 50 feet northeast of deserted soft drink and grocery store, about 40 feet northwest of center line of highway, and 545.7 feet from station in azimuth $42^{\circ}34'22''$. No. 2 is in east-and-west fence line, about 50 feet east of center line of highway, 20 feet east of fence corner, and 98.9 feet from station in azimuth $138^{\circ}55'$. *Mississippi-Tennessee boundary monument* (see description thereof) is 1,707.0 feet from station in azimuth $175^{\circ}20'03''.8$.

Horse (Crittenden County, H. W. Hemple, 1929; 1934).—About 22 miles, air line, southwest from Memphis, Tenn., and 9 miles by road south of Neuhardt railroad station. To reach from West Memphis, go west on Route 70 to Arkansas Route 3 and then south on this road to no. 96 corner. Main road turns west at this point. Continue on road leading south to T-branch road, turn left and follow dirt road (keeping to left at all branches) until levee road is reached, and turn left (south) on levee road to Locust Grove Church. Station was on banquette of levee, 123.8 feet southeast of southeast corner of church, 92.6 feet east-southeast of 15-inch locust tree in yard of church, 12 feet east of edge of banquette, and 53.5 feet west of crown of levee. Surface and underground marks were standard disk station marks in concrete, notes 1a and 7a. Reference marks were standard reference disks in concrete, note 11a. No. 1 was on edge of banquette opposite north edge of church, and 50.93 meters (167.1 feet) from station in azimuth $164^{\circ}56'$. No. 2 is in yard southeast of first farmhouse west of levee road, along road which passes just south of church, and 390.346 meters (1,280.66 feet) from station in azimuth $91^{\circ}55'52''$. In February 1934 station mark was dug up and reset as station *Horse 2*.

(see description thereof), 399.014 meters (1,309.10 feet) distant, in azimuth $90^{\circ}57'15''.6$.

Derickson (De Soto County, Miss., H. W. Hemple, 1929).—About 3 miles east and $1\frac{1}{4}$ miles south of Lake Cormorant, a village on railroad $\frac{1}{4}$ mile east of United States Route 61, and about 10 miles south of Lake View post office. To reach from Lake Cormorant go 2.8 miles east on graded dirt road to gravel road leading south, then 1.2 miles south to graded dirt road leading east to hills and Oscar Thomas' house, follow road 0.4 mile southeast around foot of hill to wire gate on north side of road, pass through gate and drive up ridge $\frac{1}{2}$ mile beyond tenant house, through two wire fences to station, which is 100 yards north of Derickson and Thomas fence line, 75 yards east of timber line, and about 50 yards north of head of draw coming in from southwest. Surface and underground marks are standard station disks in concrete, notes 1a and 7a. Reference marks are standard reference disks in concrete, note 11a. No. 1 is down gentle slope to southeast, in angle formed by tree line and ravine, about 50 feet from trees, and 383.6 feet from station in azimuth $331^{\circ}01'37''$. No. 2 is on open ridge, 3 feet north of Derickson and Thomas east-and-west fence line, and 503.4 feet from station in azimuth $22^{\circ}04'39''$.

Cox (Tunica County, Miss., H. W. Hemple, 1929).—About 4.5 miles southeast of Robinsonville, a town on United States Route 61, in corner of cotton field, 30 feet east of center line of Robinsonville-Prichard Road, 42 feet north of center line of Lost Lake Road, and 20.5 feet northeast of northeast corner of cotton-weighing shack. Surface and underground marks are standard station disks in concrete, notes 1a and 7a. Upper mark is 1 foot below surface. Reference marks are standard reference disks in concrete, note 11a. No. 1 is 18 feet north of center line of Lost Lake Road, 35 feet west of northwest corner of wooden bridge, and 423.9 feet from station in azimuth $282^{\circ}55'59''$. No. 2 is 20 feet east of center line of Robinsonville-Prichard Road, 74 feet north of center of east abutment of small concrete culvert, and 816.3 feet from station in azimuth $22^{\circ}45'44''$.

Abbott (Tunica County, Miss., H. W. Hemple, 1929).—About 4.3 miles west of Robinsonville, 0.4 mile east of levee, in cultivated field on Abbott plantation, 1,735 feet east of intersection of road going west from Robinsonville with first north-and-south road east of levee, 111 feet north of center line of east-and-west road, and 62 feet northeast of corner of negro shack. A schoolhouse is at southwest corner of above crossroad. Surface and underground marks are standard station disks in concrete, notes 1a and 7a. Upper mark is 15 inches below surface. Reference marks are standard reference disks in concrete, note 11a. No. 1 is on southeast corner of intersection of east-and-west road with first north-and-south road east of station, 21 feet south of center line of east-and-west road, and 190.3 meters (624 feet) from station in azimuth $281^{\circ}36'30''$. No. 2 is 24 feet south of east-and-west road, and 43.28 meters (142.0 feet) from station in azimuth $17^{\circ}36'$. Station *P.B.M. Commerce (M.R.C.)* (see description thereof) is 530.88 meters (1,741.7 feet) from station in azimuth $88^{\circ}16'02''.0$.

Caulsby (Tunica County, Miss., H. W. Hemple, 1929).—About 3 miles east of Tunica, on land owned by Price Caulsby who lives on north side of gravel road 1.4 miles east of station. To reach from Tunica go south on street on east side of railroad to end of street, turn east and follow gravel road 3 miles to station, which is in southeast corner of timber tract at southwest corner of cotton field, 63 feet north of center line of road. Surface and underground marks are standard station disks in concrete, notes 1a and 7a. Upper mark is flush with ground. Reference marks are standard reference disks in concrete, note 11a. No. 1 is 20 feet north of center of road, opposite negro house, and 463.3 feet from station in azimuth $275^{\circ}11'13''$. No. 2 is in southwest corner of barnyard across road from station, and 203.3 feet from station in azimuth $7^{\circ}15'43''$.

Huston (Tunica County, Miss., H. W. Hemple, 1929; 1932).—About 5.5 miles west of Tunica, on banquettes of levee. To reach from Tunica go $\frac{3}{4}$ mile north on United States Route 61 to road leading west, follow this road to intersection with levee road. Station is 62 feet northeast of junction of roads, 41 feet south of crown of levee, and 24 feet north of levee road. Surface and underground marks are standard station disks in concrete, notes 1a and 7a. Reference marks are standard reference disks in concrete, note 11a. No. 1 is at first house from levee on west side of road to Tunica, 10 feet west of

center line of road, 32.5 feet east of northeast corner of house, and 581.00 feet from station in azimuth $355^{\circ}28'38''$. No. 2 is on banquette, 112 feet south of center line of levee road where it crosses crown of levee, and 306.820 feet from station in azimuth $84^{\circ}37'39''$. Station *B. M. Curry (M.R.C.)* (see description thereof) is 189.62 meters (622.1 feet) from station in azimuth $23^{\circ}29'39''.4$. Station *P.B.M. 13/a (M.R.C.)* (see description thereof) is 859.6 meters (2,820 feet) from station in azimuth $290^{\circ}51'57''.0$. Station *B. M. Bell (M.R.C.)* (see description thereof) is 718.5 meters (2,357 feet) from station in azimuth $309^{\circ}57'30''.8$.

Evansville (Tunica County, Miss., H. W. Hemple, 1929).—About 2 miles east and 1 mile south of Evansville, on land owned by C. M. Wellons, of Tunica. To reach from Evansville go east on gravel road 3 miles, turn south and go 1 mile, then turn west and go 1 mile to station, which is 37 feet north of center line of east-and-west dirt road, and 387 feet west of T intersection of road leading south. Surface and underground marks are standard station disks in concrete, notes 1a and 7a. Reference marks are standard reference disks in concrete, note 11a. No. 1 is 21 feet from southwest corner of shed of farm buildings east of station, 20 feet north of center line of east-and-west road, 480 feet east of road leading south from T intersection, and 868.0 feet from station in azimuth $271^{\circ}59'34''$. No. 2 is near east edge of woods, 30 feet west of center line of east-and-west road, about 695 feet west of road leading south from T intersection, and 308.5 feet from station in azimuth $78^{\circ}25'$.

Dubbs (Tunica County, Miss., H. W. Hemple, 1929).—About 4 miles southeast of Clayton railroad station, and 0.3 mile south of Dubbs, on G. D. Perry's plantation. To reach from Clayton go east along bayou 4 miles on gravel road to Dubbs, turn south along east side of bayou, and follow gravel road 0.4 mile to station, which is in cultivated field, 40 feet east of center line of north-and-south gravel road. Surface and underground marks are standard station disks in concrete, notes 1a and 7a. Upper mark is 14 inches below surface. Reference marks are standard reference disks in concrete, note 11a. No. 1 is outside southwest corner of garden fence south of negro house, 50 feet east of center line of gravel road, 15 feet north of center line of plantation road, and 180.92 meters (593.6 feet) from station in azimuth $213^{\circ}29'38''$. No. 2 is beside fence corner, 28 feet west of center line of gravel road, 66 feet southeast of southeast corner of negro school, and 62.61 meters (205.4 feet) from station in azimuth $56^{\circ}59'$.

Austin (Tunica County, Miss., H. W. Hemple, 1929; 1933).—About 3 miles west and 2 miles south of Evansville, on crown of levee. To reach from Evansville go about 3 miles west on gravel road to levee road, and then about 2 miles south on levee road to station. Surface and underground marks are standard station disks in concrete, notes 1a and 7a. Reference marks are standard reference disks in concrete, note 11a. No. 1 is 13 feet southeast of levee road, 80 feet southeast of crown of levee, and 67.66 meters (222.0 feet) from station in azimuth $225^{\circ}08'$. No. 2 (see description thereof) is on lateral levee, 408.2 feet east of levee road, and 179.183 meters (587.87 feet) from station in azimuth $330^{\circ}26'01''.0$. Levee milestone 45/46, marked by a 4 by 4 inch stone post, is 268.9 feet northeast of station. Station *B. M. Jim (M.R.C.)* (see description thereof) is 350.377 meters (1,149.53 feet) from station in azimuth $310^{\circ}06'53''.3$. Station *B. M. Bud (M.R.C.)* (see description thereof) is 498.0 meters (1,634 feet) from station in azimuth $327^{\circ}28'02''.8$. Elevation of station mark is 62.919 meters (206.427 feet); of reference mark no. 1, 59.480 meters (195.144 feet). In 1933 it was reported that both the station mark and reference mark no. 1 were settling.

Rich (Coahoma County, Miss., H. W. Hemple, 1929).—About 0.6 mile north of Rich, on land owned by T. W. Rainey. To reach from Rich railroad station go 0.6 mile north on United States Route 61 to Rainey's plantation. Station is about 200 yards southeast of Mr. Rainey's house which is on east side of route 61, in south end of wedge-shaped cultivated field bounded by plantation road and railroad. Surface and underground marks are standard station disks in concrete, notes 1a and 7a. Reference marks are standard reference disks in concrete, note 11a. No. 1 is 19 feet northwest of 40-inch elm tree, 55 feet west of center of brick chimney at northwest end of negro tenant house, and 461.0 feet from station in azimuth $358^{\circ}17'29''$. No. 2 is 12.4 feet east of east rail of railroad, in edge of cultivated field, 184.7 feet from station in

azimuth $142^{\circ}13'30''$. Azimuth from station to *Lulu, black water tank, final*, is $144^{\circ}13'36''$.

Jeffries (Tunica County, Miss., H. W. Hemple, 1929; 1934).—About $\frac{1}{2}$ mile northwest of Jeffries, which is reached by going 8 miles southwest on gravel road from intersection with United States Route 61 at Dundee. Station was on top of levee, about 250 meters (820 feet) north of where Yazoo & Mississippi Valley Railroad crosses levee, and 61.41 meters (201.5 feet) south of levee milestone 56/57. Surface and underground marks were standard station disks in concrete, notes 1a and 7a. Reference marks were standard reference disks in concrete, note 11a. No. 1 was on banquette of levee, 2.4 meters (8 feet) east of center of levee road, and 90.0 feet from station in azimuth $279^{\circ}41'$. No. 2 (see description thereof) is 17 meters (56 feet) east of top of levee, 2 meters (7 feet) west of center of levee road, 25.45 meters (83.5 feet) north of north rail of railroad, and 160.752 meters (527.40 feet) from station in azimuth $15^{\circ}28'51''.8$. In February 1934, due to danger of destruction by levee machine, station mark was dug up and reestablished in different location as station *Jeffries 2* (see description thereof). Elevation of station mark was 61.581 meters (202.037 feet); of reference mark no. 1, 58.390 meters (191.568 feet); and of reference mark no. 2, 58.691 meters (192.555 feet).

Rudyard (Coahoma County, Miss., H. W. Hemple, 1929).—About 10 miles north-northwest of Clarksdale, and $\frac{1}{4}$ mile southeast of Rudyard railroad station, on Collins plantation. To reach from Rudyard (town on United States Route 61) go 0.3 mile on gravel road to station, which is 33 feet north of center line of road, and in southeast corner of cultivated field near negro house. Surface and underground marks are standard station disks in concrete, notes 1a and 7a. Reference marks are standard reference disks in concrete, note 11a. No. 1 is 26 feet north of center line of gravel road at curve, 104 feet east of intersection of plantation dirt road, and 229.82 meters (754.0 feet) from station in azimuth $297^{\circ}02'27''$. No. 2 is 20 feet south of center line of gravel road and 72.84 meters (239.0 feet) from station in azimuth $97^{\circ}26'$.

Adeho (Coahoma County, Miss., H. W. Hemple, 1929; 1932).—On banquette of levee at Friars Point, just west of road leading from south over levee to ferry landing, 52 feet east of crown of levee, and 44 feet west of center line of main road. Surface and underground marks are standard station disks in concrete, notes 1a and 7a. Reference marks are standard reference disks in concrete, note 11a. No. 1 (see description thereof) is 21.5 feet east of center line of road where it curves slightly to eastward after passing ferry landing, and 337.402 meters (1,106.96 feet) from station in azimuth $240^{\circ}07'57''.5$. No. 2 is 31 feet east of center line of main road, directly opposite station, and 25.40 meters (83.3 feet) from station in azimuth $158^{\circ}38'$. Station *P.B.M. Friar Point (M.R.C.)* (see description thereof) is 321.66 meters (1,055.3 feet) from station in azimuth $321^{\circ}45'33''.3$. Station *B.M. Lowe (M.R.C.)* (see description thereof) is 205.402 meters (673.89 feet) from station in azimuth $316^{\circ}04'17''.1$. Elevation of station mark is 57.638 meters (189.101 feet); of reference mark no. 1, 58.822 meters (186.424 feet).

Stovall northeast base (Coahoma County, Miss., H. W. Hemple, 1929).—About 9.5 miles northwest of Clarksdale, and 0.2 mile northeast of Stovall railroad station, on east side of Yazoo and Mississippi Valley Railroad. To reach from Clarksdale go on route 1 and gravel road to Stovall, thence north to station which is 34 feet west of highway to Friars Point, and 30.8 feet east of near rail of railroad track. Surface and underground marks are standard station disks in concrete, notes 1a and 7a. Reference marks are standard reference disks in concrete, note 11a. No. 1 is 20 feet east of center line of highway, and 145.84 meters (478.5 feet) from station in azimuth $203^{\circ}10'33''$. No. 2 is 25 feet east of center line of highway, and 34.98 meters (114.8 feet) from station in azimuth $358^{\circ}15'$. Whistle post of railroad is 37.03 meters (121.5 feet) from station in azimuth $184^{\circ}21'$.

Clarksdale (Coahoma County, Miss., H. W. Hemple, 1929).—About 2 miles west of Clarksdale, on land owned by Mrs. Jennie Cooper, of Clarksdale. To reach from Clarksdale go 2 miles west on route 1 to station, which is in cultivated field. Surface and underground marks are standard station disks in concrete, notes 1a and 7a. Reference marks are standard reference disks in concrete, note 11a. No. 1 is 20 feet south of center line of road, beside mile board "Clarksdale 2 mi", and 157.9 feet from station in azimuth $182^{\circ}59'$. No.

For notes in regard to marking of stations see p. 40.

2 is 16 feet south of center line of road, beside telephone pole, and 556.2 feet from station in azimuth $140^{\circ}43'31''$.

McWilliams (Coahoma County, Miss., H. W. Hemple, 1929; 1934).—About 3 miles west of Farrell, on banquette of levee. To reach from Clarksdale, go west 2.9 miles from route 1 to intersection with gravel road, turn right and go 1.8 miles to gravel road leading west, follow this road about 3.3 miles to Farrell, cross railroad tracks, and take road leading west to levee. Station was 20 feet north of intersection of levee road and road from Farrell, 26 feet west of center line of levee road, and 50 feet east of crown of levee. Surface and underground marks were standard station disks in concrete, notes 1a and 7a. Reference marks were standard reference disks in concrete, note 11a. No. 1 is 20 feet south of center line of road to Farrell, 10 feet west of large tree, and 392.416 meters (1,287.45 feet) from station in azimuth $269^{\circ}56'20''$. No. 2 was 15 feet east of center line of levee road, and 60.04 meters (197.0 feet) from station in azimuth $355^{\circ}03'$. Station *P.B.M. 30/a (M.R.C.)* (see description thereof) was 135.075 meters (443.16 feet) from station in azimuth $264^{\circ}41'43''$. In February 1934, station mark was dug up and reset as station *McWilliams 2* (see description thereof), 792.088 meters (2,598.71 feet) distant, in azimuth $267^{\circ}43'48''$.

Stovall southwest base (Coahoma County, Miss., H. W. Hemple, 1929).—In Sherard, about 80 yards north-northwest of railroad station, 39 feet east of center line of State route 1, directly opposite loading platform, and about half-way between large chestnut oak tree and Sherard cotton seed house. Surface and underground marks are standard station disks in concrete, notes 1a and 7a. Reference marks are standard reference disks set in concrete, note 11a. No. 1 is 19 feet east of center line of route 1, 66 feet south of southwest pier of Gotcher and Ratliff store, and 479.3 feet from station in azimuth $210^{\circ}34'54''$. No. 2 is near some trees and cabins at bend in highway, 61 feet east of railroad milepost, "Memphis 82 New Orleans 386", and 591.6 feet from station in azimuth $47^{\circ}28'01''$.

Alligator (Bolivar County, Miss., H. W. Hemple, 1929).—About 2 miles, by road, north of Alligator, in south edge of timber tract, 100 feet north of center line of United States Route 61, opposite cultivated field on south side of road, and about 100 yards northwest of tenant house. To reach from Alligator go north on United States Route 61 to station which is 0.3 mile beyond crossing of Yazoo and Mississippi Valley Railroad. Surface and underground marks are standard station disks in concrete, notes 1a and 7a. Reference marks are standard reference disks in concrete, note 11a. No. 1 is in edge of cotton field, 25 feet south of center line of route 61, and 124.6 feet from station in azimuth $342^{\circ}34'$. No. 2 is in edge of cotton field, 25 feet south of center line of route 61, and 177.9 feet from station in azimuth $64^{\circ}40'$.

Rena (Coahoma County, Miss., H. W. Hemple, 1929).—About $\frac{1}{2}$ mile west of Renalara, 0.2 mile east of Big Eddy Lake, and about 0.2 mile north of Puckena Slough, on Waverly plantation owned by J. O. Baugh and farmed by Cary Janes. To reach from Renalara go west from intersection with route 1 to Janes' farmhouse. Station is 52 feet west of hedge on west side of farmhouse, and 13.9 meters (46 feet) south of center line of road. Surface and underground marks are standard station disks in concrete, notes 1a and 7a. Reference marks are standard reference disks in concrete, note 11a. No. 1 is directly opposite station, 4.69 meters (15.4 feet) north of center line of road, and 19.11 meters (62.7 feet) from station in azimuth $223^{\circ}03'$. No. 2 is at fence corner east of farm, 5.3 meters (17 feet) south of center line of road, and 754 feet from station in azimuth $310^{\circ}23'36''$.

Whilkinson (Bolivar County, Miss., H. W. Hemple, 1929).—About 0.2 mile south of Hushpuckena railroad station, southeast of intersection of Pecan-Bowers gravel road and United States Route 61, in small triangular unplowed area in northwest corner of cultivated field, 45 feet south of Pecan-Bowers Road, and 67 feet east of route 61. Surface and underground marks are standard station disks in concrete, notes 1a and 7a. Reference marks are standard station disks in concrete, note 11a. No. 1 is 32 feet north of center line of Pecan-Bowers Road, 58.5 feet west of southwest corner of negro church, and 245.9 feet from station in azimuth $258^{\circ}23'31''$. No. 2 is 30 feet west of center line of route 61, in east fence line of railroad right-of-way, and 678 feet from station in azimuth $5^{\circ}26'03''$.

Deeson (Bolivar County, Miss., H. W. Hemple, 1929).—On western edge of Deeson, a town on route 1, about 0.1 mile east of where route 1 crosses Yazoo

& Mississippi Valley Railroad tracks west of town, 226.5 feet south of south rail of track, 29 feet south of east-and-west dirt road, and 48.5 feet east of south-east corner of northeast one of four concrete pile foundations (probably of old water tank). Surface and underground marks are standard station disks in concrete, notes 1a and 7a. Reference marks are standard reference disks in concrete, note 11a. No. 1 is on east side of lane (first one west of road leading to railroad cotton loading platform) leading from route 1 across railroad tracks to dirt road referred to above, 50 feet south of south rail of railroad, 105 feet south of center line of route 1, and 69.20 meters (227.0 feet) from station in azimuth $156^{\circ}53'$. No. 2 is 0.2 mile west of where route 1 crosses railroad, 16 feet north of center line of route 1, 55 feet south of south rail of railroad, 56.5 feet east of small pipe culvert under route 1, and about 0.35 mile from station in azimuth $54^{\circ}18'57''$.

Lamb (Bolivar County, Miss., H. W. Hemple, 1929).—About 8.3 miles, by road, southwest of Shelby in a cultivated field on southeast corner of Lamb plantation. To reach from Shelby go 4 miles southwest on gravel road to St. James Church, about 300 yards west of church take gravel road leading south, and follow 4 miles to Mount Olive Church, take left fork 0.3 mile to station, which is 77 feet west of center line of Shelby-Pace gravel road, and 40 feet north of dirt plantation road. Surface and underground marks are standard station disks in concrete, notes 1a and 7a. Reference marks are standard reference disks in concrete, note 11a. No. 1 is 20 feet west of center line of gravel road, 38 feet north of brick chimney at north end of negro house, and 277.9 feet from station in azimuth $322^{\circ}15'$. No. 2 is 100 feet south of old stock barn, 30 feet east of center line of gravel road, 60 feet north of house occupied by William Meyers, and $\frac{3}{4}$ mile from station in azimuth $110^{\circ}36'05''$.

Seaton (Bolivar County, Miss., H. W. Hemple, 1929).—About 2 miles east of Gunnison. To reach from Gunnison go east on route 1 to point where road turns north which is about $\frac{1}{4}$ mile east of slight up-grade of highway. Station is just north of first house on west side of highway after turn, 69 feet west of center line of highway, and 99 feet north of east corner of brick fireplace chimney of negro shack. Surface and underground marks are standard station disks in concrete, notes 1a and 7a. Reference marks are standard reference disks in concrete, note 11a. No. 1 is 18 feet east of center line of highway, and 29.2 meters (96 feet) from station in azimuth $283^{\circ}00'$. No. 2 is at bend in road where road again turns east, 29 feet northwest of center line of road, and 275.5 meters (904 feet) from station in azimuth $171^{\circ}20'01''$.

Pace (Bolivar County, Miss., H. W. Hemple, 1929).—About 2 miles west of Pace, in southeast corner of Peter Rock churchyard (colored). To reach from intersection of State route 1 and Pace-Beulah gravel road. $\frac{1}{2}$ mile north of Beulah, go 5.1 miles east on Pace-Beulah road to Peter Rock Church. To reach from Shelby at intersection of United States route 61 and gravel road to Pace go to Pace and then follow Pace-Beulah Road to church. Station is about 250 feet south of gravel road and 50 feet west of drainage ditch. Surface and underground marks are standard station disks in concrete, notes 1a and 7a. Reference marks are standard reference disks in concrete, note 11a. No. 1 is south of road, 18 feet east of chimney of fifth house west of church, and about 0.7 mile from station in azimuth $92^{\circ}35'13''$. No. 2 is in northwest corner of churchyard, 32 feet south of center line of road, 52 feet northwest of church chimney, and 217.0 feet from station in azimuth $166^{\circ}17'$.

Beulah (Bolivar County, Miss., H. W. Hemple, 1929).—About 0.8 mile northwest of Beulah, on banquette of levee, 92 feet north of 10-inch siphon pipe line which runs over levee, 42 feet east of crown of levee, and 12 feet east of center line of levee road. Surface and underground marks are standard station disks in concrete, notes 1a and 7a. Reference marks are standard reference disks in concrete, note 11a. No. 1 is on edge of levee, 35 feet east of center line of levee road, 70 feet east of crest of levee, and 60.4 meters (198 feet) from station in azimuth $199^{\circ}47'$. No. 2 is on edge of levee, 38 feet east of center line of levee road, 74 feet east of top of levee, and 76.2 meters (250 feet) from station in azimuth $8^{\circ}27'$.

Bogue (Bolivar County, Miss., H. W. Hemple, 1929).—About 8 miles, by road, south-southwest of Pace on the "Bogue", on land owned by Mrs. F. C. Jones of Sherrill, Ark., and leased by J. L. Newman, of Pace. To reach from railroad station in Pace go 0.1 mile southeast on Main Street to gravel road,

turn right and go 5.3 miles along east side of bayou to fork, take left fork (right crosses bridge) and continue along east side of bayou 1.7 miles to another fork, take right fork (dirt plantation road) 0.9 mile to station which is 18 feet south of center line of plantation road, 18 feet southwest of southwest corner of cotton shed at a Y in road. One fork of Y goes west along bayou and other south to negro houses. Surface and underground marks are standard station disks in concrete, notes 1a and 7a. Reference marks are standard reference disks in concrete, note 11a. No. 1 is on east side of road, in northeast corner of negro yard, and 0.4 mile from station in azimuth $8^{\circ}47'09''$. No. 2 is 20 feet north of center line of road on bank of bayou, and 208.49 meters (684.0 feet) from station in azimuth $120^{\circ}20'51''$.

Lobdell (Bolivar County, Miss., H. W. Hemple, 1929).—About 3.5 miles south of Beulah, on land owned by Ben McKry (colored). To reach from Beulah go 3.5 miles south on route 1 to culvert over ditch and dirt road leading west, go $\frac{1}{2}$ mile on this road to McKry's house and station, which is in a cotton field, 24 feet east of dirt farm road, 177 feet west of brick chimney on McKry's house, and 37 feet northeast of 2-foot pecan tree. Surface and underground marks are standard station disks in concrete, notes 1a and 7a. Reference marks are standard reference disks in concrete, note 11a. No. 1 is 18 feet north of 2-foot white oak tree, and 117.1 feet from station in azimuth $8^{\circ}38'$. No. 2 is in fork of dirt farm road, 869.0 feet from station in azimuth $113^{\circ}16'03''$.

Clear (Bolivar County, Miss., H. W. Hemple, 1929).—About 4.0 miles east of Benoit. To reach from Benoit go east 4.0 miles on Benoit-O'Riley Road to plantation road and station which is in northwest corner of alfalfa field, 35 feet south of center line of main road, 36 feet east of center line of north-and-south dirt plantation road, east of house in southwest corner of intersection, and southwest of house on northside of Benoit-O'Riley Road. Surface and underground marks are standard station disks in concrete, notes 1a and 7a. Reference marks are standard reference disks in concrete, note 11a. No. 1 is 18 feet south of center line of road, 27 feet northwest of northwest corner of house known locally as "Shotgun House", and about $\frac{1}{2}$ mile from station in azimuth $269^{\circ}12'15''$. No. 2 is 7 feet east of center line of plantation road, in northwest corner of fence around negro tenant house, and 1,343.0 feet from station in azimuth $3^{\circ}20'37''$.

Benoit (Bolivar County, Miss., H. W. Hemple, 1929).—West of Benoit, 52 meters (171 feet) north of where gravel road runs into levee, 11 meters (36 feet) west of levee road, and 10 meters (33 feet) east of top of new section of levee. Surface and underground marks are standard station disks in concrete, notes 1a and 7a. Reference marks are standard reference disks in concrete, note 11a. No. 1 is on edge of banquettes of levee, 48 meters (151 feet) southeast of top of levee, and 108.5 meters (356 feet) from station in azimuth $237^{\circ}11'26''$. No. 2 is in northwest corner of graveyard, about 10 meters (33 feet) south of road, and about 0.6 mile from station in azimuth $315^{\circ}40'42''$. Station *P.B.M.* 77 (*M.R.C.*) (see description thereof) is 110.96 meters (364.0 feet) from station in azimuth $340^{\circ}45'42''$.

Pricella (Bolivar County, Miss., H. W. Hemple, 1929).—About 8.6 miles southeast of Benoit, and 11 miles northeast of Greenville, on Eastfork plantation. To reach from Greenville go 3.8 miles north on State route 1 to road leading east, go on this road to Metcalfe, then go north of Priscilla post office and M. C. Queen's store and continue 1.5 miles to plantation. To reach from Benoit go 8.6 miles south on gravel road (known as Benoit-Metcalfe-Greenville Road), to Eastfork plantation and station, which is about $\frac{1}{4}$ mile west of gravel road, on south side of small pasture, about 125 paces southwest of Mr. Welbraun's house and 15 paces north of wire fence. Surface and underground marks are standard station disks in concrete, notes 1a and 7a. Reference marks are standard reference disks in concrete, note 11a. No. 1 is in a garden fence corner, about 100 yards northwest of Mr. Welbraun's house, and 552.6 feet from station in approximate azimuth $191^{\circ}03'$. No. 2 is on west side of road to Priscilla, about 100 yards south of road leading to Mr. Welbraun's house, and about $\frac{1}{4}$ mile from station in azimuth $278^{\circ}16'12''$.

Scott (Bolivar County, Miss., H. W. Hemple, 1929).—About $\frac{1}{4}$ mile west of Scott, 49 feet west of center line of route 1 at a point about $\frac{1}{2}$ mile south of where road turns south after crossing small bridge, and about 50 meters (164 feet) south of negro shack on west side of road. Surface and underground

marks are standard station disks in concrete, notes 1a and 7a. Upper mark is 18 inches below surface. Reference marks are standard reference disks in concrete, note 11a. No. 1 is 23 feet east of center line of highway, and 55.92 meters (183.5 feet) from station in azimuth $201^{\circ}09'$. No. 2 is 24 feet east of center line of road, and 24.07 meters (79.0 feet) from station in azimuth $290^{\circ}13'$. Azimuth from station to *Scott, Delta Pine Lands Co., final of larger of two water tanks* is $274^{\circ}19'0''.8$.

Crump (Washington County, Miss., H. W. Hemple, 1929).—North 2.4 miles from Greenville, on State route 1, 49 feet east of edge of concrete, on land owned by Roddy Crump, opposite large sign board reading "H. N. Alexander." Mr. Crump lives 1 mile northeast of station in large brick house. Surface and underground marks are standard station disks in concrete, notes 1a and 7a. Reference marks are standard reference disks in concrete, note 11a. No. 1 is 24 feet west of west edge of concrete, just south of small ditch and drain pipe under road, and 1255.7 feet from station in azimuth $26^{\circ}20'44''$. No. 2 is 30 feet west of west edge of concrete, about 150 yards southwest of gray bungalow on east side of road, and 0.2 mile from station in azimuth $192^{\circ}05'11''$. Station *B.M. Greenville (M.R.C.)* (see description thereof), is 2202.11 meters (7224.8 feet) from station in azimuth $36^{\circ}25'57''.7$.

Winn (Washington County, Miss., H. W. Hemple, 1929).—About 3.5 miles west of Winterville, on banquette of levee, about 0.7 mile south of Mr. Winn's house, and about 0.5 mile south of where dirt road crosses levee. Surface and underground marks are standard station disks in concrete, notes 1a and 7a. Reference marks are standard reference disks in concrete, note 11a. No. 1 is on banquette of levee, 175.4 feet from station in azimuth $342^{\circ}57'$. No. 2 is on edge of levee banquette, about 300 meters (984 feet) from station in azimuth $172^{\circ}38'32''$.

Ferry (Washington County, Miss., H. W. Hemple, 1929).—About 5.3 miles south of Greenville at ferry landing, on State route 10, on levee banquette, 143 feet northeast of gate on levee. Surface and underground marks are standard station disks in concrete, notes 1a and 7a. Reference marks are standard reference disks in concrete, note 11a. No. 1 is 30 feet east of center line of route 10, at north end of "Goyer Service Station" sign, and 1,122.9 feet from station in azimuth $304^{\circ}10'57''$. No. 2 is 20 feet north of center line of route 10, about 100 yards northeast of where road crosses levee, and 283.5 feet from station in azimuth $350^{\circ}11'$.

Luna (Chicot County, H. W. Hemple, 1929).—West 4.6 miles by road from Arkansas ferry landing of the Greenville-Lake Village Ferry Co., 0.4 mile north by road from Luna Corners, on bench of levee, 47 feet south of top of levee, 268 feet west of center line of route 2, where it crosses levee, 96 feet north of center line of levee road, 83 feet north of northeast trestle of old Hamburg & Western Railway where it crosses levee road, and 49 feet east of center line of railway. Surface and underground marks are standard disk station marks in concrete, notes 1a and 7a. Upper mark is 6 inches below surface. Reference marks are standard reference disks in concrete, note 11a. No. 1 is 301.7 feet south of crown of levee, 95.5 feet south of intersection of route 2 and levee road running east, 26 feet east of center line of route 2, and 98.8 meters (324 feet) from station in azimuth $358^{\circ}24'$. No. 2 is 0.1 mile west of Hamburg & Western tracks, 0.15 mile west of route 2, 15 feet north of center line of old levee road, 110 feet south of top of levee, and about 1 mile from station in azimuth $130^{\circ}04'40''$.

Shivers (Chicot County, H. W. Hemple, 1929).—About 9.2 miles by road southeast of Lake Village. To reach from Lake Village go 2 miles south on United States Route 65 to forks of road at store and filling station, follow gravel road along south side of Lake Chicot 7 miles to small store where a dirt road leads south and gravel road north. Follow gravel road 0.2 mile to second turn, go through gate at negro tenant house into lane, and follow lane to levee and station. Station is near eastern end of Lake Chicot, on levee banquette about half-way between top of levee and small mound at foot of levee, and 20 feet north of wire fence along north side of lane leading to levee. Surface and underground marks are standard disk station marks in concrete, notes 1a and 7a. Reference marks are standard reference disks in concrete, note 11a. No. 1 is 7 feet north of iron gate east of negro tenant house, 94 feet west of top of levee, and 447.29 meters (1,467.5 feet) from station in

azimuth $344^{\circ}16'51''$. No. 2 was established but was not located or tied in to station.

Chicot north base (Chicot County, H. W. Hemple, 1929).—About 4.0 miles by road south of the town of Lake Village, 0.3 mile south of where route 65 turns south and runs parallel to tracks of Missouri Pacific Railway, in cultivated land on a slight rise 73 feet east of center line of highway, 145 feet east of east rail of railway, and 166.2 feet south of center of 24-inch oak tree. Surface and underground marks are standard disk station marks in concrete, notes 1a and 7a. Upper mark is 18 inches below surface. Reference marks are standard reference disks in concrete, note 11a. No. 1 is 26 feet west of center line of highway, 48 feet east of near rail of railway, 49 feet northeast of switch post, and 130.9 meters (429 feet) from station in azimuth $12^{\circ}14'24''$. No. 2 is 29 feet west of center line of highway, 43 feet east of near rail of railway, and 46.9 meters (154 feet) from station in azimuth $138^{\circ}25'$. A whistle post of railway is on west side of track, 41 feet south of center of bridge no. 44, and 92 meters (302 feet) from station in azimuth $152^{\circ}36'$.

Chicot south base (Chicot County, H. W. Hemple, 1929).—On the west end of Chicot Grammar School grounds, 69 feet east of near rail of Missouri Pacific Railway, 137 feet south of intersection of route 65 with east-and-west dirt road, 283.2 feet south of south end of bridge on route 65 over Bayou Macon, 305 feet west-southwest of southwest corner of school, and 71.2 feet east of switch post of railway. Surface and underground marks are standard disk station marks in concrete, notes 1a and 7a. Reference marks are standard reference disks in concrete, note 11a. No. 1 is in front (north) of school, 56.9 feet northeast of northwest corner of school, 18.5 feet south of center line of dirt road, 19.8 feet west of center of 12-inch maple tree, and 108.8 meters (357 feet) from station in azimuth $231^{\circ}35'48''$. No. 2 is 19.5 feet northeast of northeast corner of section house no. 41 of Missouri Pacific Railway, 45.8 feet east of near rail, 2 feet west of fence on east side of railway property, and 86.9 meters (285 feet) from station in azimuth $2^{\circ}26'$.

Jenkins (Chicot County, H. W. Hemple, 1929; 1932).—About 10.5 miles by road northeast of Eudora, on levee banquette about 150 yards south of Sally Jenkins' house, at angle in levee. To reach from Eudora go 3.7 miles on route 65 to lake and gravel road turning abruptly to left with filling station in fork of road, follow gravel road 0.8 mile to dirt road just beyond bridge at lone tree, turn left to levee and follow levee road to Sally Jenkins' house and station site. The Jenkins' house is old and dilapidated and stands about 7 feet above the ground. A chimney has been torn away at its south end. Surface and underground marks are standard disk station marks in concrete, notes 1a and 7a. Reference marks are standard reference disks in concrete, note 11a. No. 1 is just inside of fence about 50 feet south of gate on west side of levee road, and 153.37 meters (503.2 feet) from station in azimuth $88^{\circ}03'15''$. No. 2 is 6 feet south and 5 feet west of southwest corner of yard fence in front of house, and 130.72 meters (428.9 feet) from station in azimuth $188^{\circ}45'59''.2$. Reference mark no. 2 has replaced station *B.M. Gage 92 (M.R.C.)* and is stamped: "JENKINS R.M. NO. 2 1929, P.B.M. GAGE 92." In 1931 United States engineers reported levee enlargement would cover station with approximately 4 feet of dirt, and that station mark would be built up with 4-foot iron pipe suitably capped and marked. Reference marks would not be disturbed. In 1932 United States engineers reported that a 4-inch capped iron pipe had been placed directly over original mark. Inspection showed that top of pipe had been disturbed (due probably to weight of levee machines during construction). Third-order measurements from two reference marks indicated that pipe had been moved south 0.002'' in latitude and west 0.002'' in longitude. New measurements showed reference mark no. 1 to be 503.04 feet from pipe in azimuth $88^{\circ}04'16''$; and no. 2 to be 428.96 feet in azimuth $188^{\circ}46'15''$.

Connerly (Chicot County, H. W. Hemple, 1929; 1931).—About 2.7 miles by road north of the town of Eudora, $\frac{1}{2}$ mile east of Highway 65, and about 200 meters (656 feet) east of dirt road, on top of small hill containing a few cedar trees (red) about a farmhouse. It is the highest ground in this vicinity, and land is owned by W. R. Connerly and farmed by T. E. Hans, who lives in above-mentioned house. Station is 89.5 feet southeast of 30-inch chnaberry tree, 76.2 feet east of northeast corner of house, and 280 feet north of 12-inch pear tree in cotton field south of farmhouse. Surface and underground marks are standard disk station marks in concrete, notes 1a and 7a.

Upper mark is 1 foot below surface of ground. Reference marks are standard reference disks in concrete, note 11a. No. 1 is about 350 feet northeast of crossing of dirt road and tracks of Missouri Pacific Railway, 82 feet east of near rail of railway, and 21 feet from center line of dirt road, in azimuth $39^{\circ}28'48''$ from station. No. 2 is in northwest corner of farmyard, 59.5 feet northwest of northwest corner of farmhouse, and 48.2 meters (158 feet) from station in azimuth $120^{\circ}19'$.

Weise (Chicot County, H. W. Hemple, 1929).—About 10.6 miles by road southeast of Eudora. To reach from Eudora go south 9.2 miles on United States Route 65 to point where highway turns sharply to right and dirt road leads straight ahead (filling station is on curve to south). Go straight ahead on dirt road, take first left turn, and follow road parallel to levee to station. Station is 1.2 miles from route 65 and about 40 meters (131 feet) south of dirt road, on levee banquette at right angle in levee, and about 80 meters (262 feet) south of house occupied by Leslie Taylors (colored), manager of the B. Weise plantation. Surface and underground marks are standard disk station marks in concrete, notes 1a and 7a. Reference mark no. 1 is standard reference disk in concrete, note 11a, on north side of road, in edge of cultivated field, about 50 meters (164 feet) west of large cottonwood tree, and 0.4 mile from station in azimuth $84^{\circ}17'32''$. Station *B.M. 83/4 (M.R.C.)* is 82.89 meters (271.9 feet) from station in azimuth $197^{\circ}37'45''.9$.

Hanna (Chicot County, H. W. Hemple, 1929).—About 1 mile south of town of Eudora. To reach from Eudora, take route 59 at junction of routes 65 and 59 and follow for 1.3 miles to road leading across railroad tracks, cross tracks, and take first private road leading north. Station is in pasture, on highest land in vicinity, about 200 meters (656 feet) east of route 65, about 200 meters (656 feet) north of church, 122.4 feet southwest of southwest corner of negro house, 114 feet west of 48-inch oak tree, and 388 feet east of east rail of Missouri Pacific Railway. Surface and underground marks are standard disk station marks in concrete, notes 1a and 7a. Reference marks are standard reference disks in concrete, note 11a. No. 1 is 3 feet east of west fence line of pasture, 60 feet east of east rail of railway, 165 feet north of south fence line, 33 feet northwest of 42-inch oak tree, and 121.9 meters (400 feet) from station in azimuth $74^{\circ}38'18''$. No. 2 is 8 feet east of west fence line, 67 feet east of east rail of railway, 11 feet west of 16-inch locust tree, 400 feet south of railway crossing, and 332.7 meters (1,092 feet) from station in azimuth $186^{\circ}11'05''$.

Gage (East Carroll Parish, La., H. W. Hemple, 1929).—About 16 miles by road southeast of Eudora, 1.6 miles southeast of Millikin on the levee banquette $\frac{1}{4}$ mile northeast of turn in United States Route 65 (where dirt road goes northeast across levee), northeast of small store which is 100 yards south of the turn, $\frac{1}{2}$ mile southwest of Pilcher Point Landing, and just south of wire fence crossing levee. Surface and underground marks are standard station disks in concrete, notes 1a and 7a. Reference marks are standard reference disks in concrete, note 11a. No. 1 is 1 mile south of small store mentioned above, 10 feet east of center line of route 65, and $\frac{3}{8}$ mile from station in azimuth $40^{\circ}03'04''$. No. 2 is 2 feet east of wire fence along west side of dirt road referred to above, and 78.6 meters (257.9 feet) from station in azimuth $106^{\circ}03'$. Station *B.M. Gage 89 (M.R.C.)* (see description thereof), marked by pipe and cap, is 390.33 meters (1,280.6 feet) from station in azimuth $43^{\circ}24'01''.6$.

Kilbourne (East Carroll Parish, La., H. W. Hemple, 1929).—About 1.7 miles southeast of Kilbourne, on land owned by Jes Tullos. To reach from Kilbourne on route 59 go east 1.3 miles along road to Millikin to road leading south, thence south 1.1 miles to station, which is about 200 meters (656 feet) northwest of derrick of dry oil well built by H. L. Hunt Co., of Eldorado, Ark., about 300 feet south of wide gully, at east fence line, 36 feet east of the center line of north-and-south road, and 181 feet south of gate leading into first farmyard south of gully on west side of north-and-south road. Station and underground marks are standard station disks in concrete, notes 1a and 7a. Reference marks are standard reference disks in concrete, note 11a. No. 1 is in southwest corner of John Henderson's farm, at north fence-line of road, 134 feet west of house, 15 feet north of center line of road, 48 feet east of where road turns north at the western end of Henderson's garden, and about $\frac{1}{4}$ mile from station in azimuth $78^{\circ}11'08''$. No. 2 is at west fence-line, 17 feet west of center line of

north-and-south road, 69 feet south of gate to farmyard on the west side of the road, and 37.58 meters (123.3 feet) from station in azimuth $159^{\circ}42'$. Azimuth from station to Hunt Company oil derrick is $339^{\circ}00'19''$.

Supplementary points

P.B.M. Cottonwood south base (1879) (M.R.C.) (Pemiscot County, Mo., H. W. Hemple, 1929).—On west bank of Mississippi River, about 8 miles south of Caruthersville, about $\frac{1}{4}$ mile east of main part of town of Cottonwood Point, directly east of Cottonwood Gin Mill, 198 feet south of center line of river road running back from landing, 270 meters (886 feet) back of river bank, 93 feet east of angle in top of levee, in borrow pit, and 90 meters (295 feet) back of Dr. Gay's house. Mark is $\frac{1}{2}$ -inch copper bolt, with cross in center, in top of stone post about 10 inches square on top, projecting about 10 inches above surface of ground, and with year "1879" outlined on north face. Station *Cotton* (see description thereof) is 116.51 meters (382.2 feet) distant in azimuth $306^{\circ}41'16''$.

B. M. Barfield (M.R.C.) (Mississippi County, H. W. Hemple, 1929).—On right (west) bank of Mississippi River, in Barfield, 60 meters (197 feet) back from river bank, 35 meters (115 feet) in front of levee at point 220 meters (722 feet) above levee milepost 57/58, about 40 meters (131 feet) west of track of Jefferson, Lake City & Eastern Railroad, and about 13 meters (43 feet) south of center of northwest-and-southeast road that runs through center of town, in center of front dooryard of Mrs. M. A. Robinson, and 13 meters (43 feet) northeast of northeast corner of house. Marked by standard mark of Mississippi River Commission, brass cap on steel pipe above and copper bolt in tile below, as described in note 16, top of pipe 18 inches above surface.

B. M. 45/4 (M.R.C.) (Mississippi County, H. W. Hemple, 1929).—On right bank of Mississippi River, about 1 mile south of Osceola, in cultivated field owned by Mr. Will Poole, 25 yards northeast of 10-inch pear tree, and about 1 mile south of Mr. Poole's house. Azimuth of water tank at Osceola is 3° magnetic. The M.R.C. description places station 1 mile back of river bank back of Osceola Bar, 1,310 meters (4,298 feet) west of levee at point 180 meters (591 feet) below levee milestone 80/81, about $\frac{1}{4}$ mile back of St. Louis-San Francisco Railway, and about 6 meters (20 feet) east of north-and-south fence along second north-and-south road west of levee, this road being line between lands of Fred Keiser and J. D. Driver. To reach mark from Osceola, go south on United States Route 61 from courthouse 0.6 mile, then turn left and follow private road to station. Station mark is stone post with copper bolt in top and projects 6 inches above surface.

B. M. Luxora (M.R.C.) (Mississippi County, C. M. Thomas, 1930).—On right bank of Mississippi River, on land belonging to Bill Hall, opposite head of Island 30, about 650 meters (2,133 feet) below lower schoolhouse at Luxora, 200 meters (656 feet) along north-and-south road back of levee at point 530 meters (1,739 feet) above levee milestone 75/76, 4 meters (13 feet) back of east-and-west lane, and 0.3 meter (1 foot) east of west fence on north-and-south lane. Marked by standard mark of Mississippi River Commission, brass cap on steel pipe above and copper bolt in tile below, as described in note 16, pipe projecting 18 inches above surface.

Hopefield (Crittenden County, E. H. Pagenhart, 1914; 1928).—About 100 meters (328 feet) west of ferry landing at Hopefield Point, in cultivated field about 50 meters (164 feet) west of middle of first bight north of yellow barn on point, and about 70 meters (230 feet) south of spur track of Chicago, Rock Island & Pacific Railway. Ferry landing is north of barn, and is temporary. Surface and underground marks are standard disk station marks in concrete, notes 1a and 7a. Reference marks are standard reference disks in concrete, note 11a. No. 1 is 2 meters (7 feet) west of middle of yellow barn, nearly covered by loose rock piled along barn, 4 meters (13 feet) south of east of well on Hopefield Point, and 80.83 meters (265.2 feet) from station in azimuth $303^{\circ}41'$. No. 2 is in yard about 7 meters (23 feet) northwest of partly hollow and leaning sycamore tree, and 90.18 meters (295.9 feet) from station in azimuth $358^{\circ}23'$. In 1920 station and reference mark no. 1 were stamped with name and dated 1914-16-20, but reference mark no. 2 was not recovered. In 1928 station was not recovered, but was thought to be in place. Elevation of station mark is 66.332 meters (217.624 feet).

Hopefield south base (Crittenden County, C. H. Boyd, 1879; 1914).—In West Memphis, opposite point about $1\frac{3}{4}$ miles below Court Square in Memphis, about 300 meters (984 feet) west of Mississippi River, 50 meters (164 feet) north of road leading west from ferry landing, 170 meters (558 feet) south of railroad bridge approach, 47 meters (154 feet) east of store owned by J. A. Templin, in rear of house and on lot owned by Douglas Owens, 28 meters (92 feet) east of west property line, and 12 meters (39 feet) south of north property line. Upper mark is 1-foot square limestone block, smoothed on sides above ground, projecting about 14 inches above ground, and with sides marked as follows: south, "U.S. Coast Survey"; west, "S. Base"; and east, "1879." Underground mark is earthen pyramid $3\frac{1}{2}$ feet below ground. Surface mark extends down to within 6 inches of pyramid. Witness stone (limestone shaft about 3 feet long, 8 inches square on top, with letter "U.S.C.S." on one face, and cross cut into top) is 90 meters (295 feet) from station in azimuth $211^{\circ}32'30''$.

P.B.M. Vance Senior (M.R.C. & U.S.E.) (Crittenden County, E. H. Pagenhart, 1914).—In cultivated field about $\frac{3}{4}$ mile above Memphis bridge, 300 meters (984 feet) from river, 160 meters (525 feet) from east bank of Hopefield Lake, and about 240 meters (787 feet) southwest of lower of two buildings. Marked by stone post projecting 18 inches above ground. *P.B.M. reference stone A*, projecting 5 inches above ground, is in cultivated field about $\frac{3}{4}$ mile above Memphis bridge, about 370 meters (1,214 feet) from river bank, 60 meters (197 feet) from timber along east bank of Hopefield Lake, and 78.4 meters (257 feet) from station in approximate azimuth 142° . *P.B.M. reference stone B*, slightly inclined and without bolt, projecting about 14 inches above ground, is in cultivated field about $\frac{3}{4}$ mile above Memphis bridge, about 230 meters (755 feet) from river bank, about midway between Hopefield Lake and river bank, and 70.2 meters (230 feet) from station in azimuth $292^{\circ}16'$. *P.B.M. reference stone C*, without bolt and projecting about 6 inches above ground, is in cultivated field about $\frac{3}{4}$ mile above Memphis bridge, about 320 meters (1,050 feet) from river bank, about 60 meters (197 feet) east of timber along east side of Hopefield Lake, $\frac{1}{2}$ meter (2 feet) northwest of fence, and 128 meters (420 feet) southwest of station.

B.M. Hopefield (M.R.C. & U.S.E.) (Crittenden County, E. H. Pagenhart, 1914).—In Hopefield, a little above point opposite customhouse in Memphis, about 350 meters (1,148 feet) below well and yellow barn on Hopefield Point, 2 meters (7 feet) west of pasture fence line, on west side of road running from ferry landing down river, on property line between J. Nelson and Memphis Ferry Co., 196 meters (643 feet) below large white house, about 75 meters (246 feet) south of yellow house, directly behind signboard, and about 90 meters (295 feet) back from bank of river. Marked by standard mark of Mississippi River Commission, brass cap on pipe above and copper bolt in tile below, as described in note 16. Distances and azimuths from station to two blazed trees are: 8-inch pecan, 31.6 meters (104 feet), 10° ; and 12-inch locust, 23.3 meters (76 feet), 330° .

P.B.M. Memphis (U.S.E.) (Shelby County, Tenn., E. H. Pagenhart, 1914).—In Memphis, on west side of main building of customhouse at Front and Madison Streets, and $2\frac{1}{2}$ feet north of southwest corner. Marked by copper bolt set horizontally in water table of building. Elevation of station is 83.408 meters (273.845 feet).

P.B.M. $\frac{2}{3}$ (M.R.C. & U.S.E.) (Crittenden County, E. H. Pagenhart, 1914).—In cultivated field, 350 meters (1,148 feet) northeast of west abutment of west approach to Memphis bridge, 190 meters (623 feet) east of abandoned railroad at point 265 meters (869 feet) above junction of same with bridge approach, about $\frac{3}{8}$ mile from river bank, and about 60 meters (197 feet) southeast of south end of Hopefield Lake. Marked by stone post projecting 12 inches above ground. Distance and azimuths from station to two blazed trees are: 30-inch oak, 33 meters (108 feet), 85° ; and 40-inch oak, 40 meters (131 feet), 168° .

Mississippi-Tennessee boundary monument (De Soto-Shelby Counties, H. W. Hemple, 1929).—On the east side of United States Route 61, 1707.0 feet from station *Lake View* (see description thereof) in azimuth $175^{\circ}20'03''$.8. Mark is an angle iron set in concrete, and is said to mark the State boundary between Mississippi and Tennessee.

Branch (Mississippi County, H. W. Hemple, 1929).—Station is 48.9 feet southwest of southwest corner of first house from levee, and 127 feet west of center line of road. Surface and underground marks are standard disk station marks in concrete, notes 1a and 7a. Reference marks are standard reference disks in concrete, note 11a. No. 1 is on east side of road, and 136.9 feet from station in azimuth $275^{\circ}35'$. No. 2 is on east side of road, approximately 600 feet from station in azimuth $359^{\circ}58'$. Station *P.B.M. 55/3 (M.R.C.)* (see description thereof) is 106.6 feet from station in azimuth $94^{\circ}25'16''.5$.

P.B.M. 55/3 (M.R.C.) (Mississippi County, H. W. Hemple, 1929).—On right bank of Mississippi River, about opposite foot of Island 35, back of head of Barney Clute that runs to Deans Island, about $\frac{1}{2}$ mile below Pecan Point and Black Cat Landing, in cultivated field about 150 meters (492 feet) back of levee at point 830 meters (2,723 feet) above levee milestone 111/112, 10 meters (33 feet) south of east-and-west plantation road separating lands of Emma Wilson and Frank McGavock, and between first and second houses from levee. Station mark is stone post with top 3 inches above surface. Station *Branch* (see description thereof) is 32.49 meters (106.6 feet) distant in azimuth $274^{\circ}25'15''.8$.

B. M. Thresher (M.R.C.) (Crittenden County, H. W. Hemple, 1929).—About 5 miles east of town of Turrell, on right bank of Mississippi River, on bank of old river that runs down behind Centennial Island, about 2 miles back of present main river bank at mouth of Old River Landing, 1 mile west of Lambethville, about 170 meters (558 feet) back of bank of old river, at base of levee, at point about 120 meters (394 feet) above levee milestone 128/129, about 100 meters (328 feet) below store, abeam of old cotton gin on Sanders' plantation, 14 meters (46 feet) north of small house, on land of G. W. Thresher, about 10 feet off levee road toward top of levee, at northeast corner of yard. Marked by standard mark of Mississippi River Commission, brass cap on steel pipe above and copper bolt in tile below, as described in note 18, top of pipe projecting 18 inches above surface. Station *Sanders* (see description thereof) is 1,792.36 meters (5,880.4 feet) distant in azimuth $58^{\circ}08'46''.7$.

Bass (De Soto County, Miss., H. W. Hemple, 1929).—About 5.6 miles southwest of Walls railroad station, and 3 miles north of Lake Cormorant, on Bass plantation. To reach from Walls railroad station go 4.9 miles southwest on United States Route 61 to cotton gin on west side of road, take gravel road 0.7 mile to Bass plantation buildings and station which is in southeast corner of barnyard, 27 feet east of southeast corner of barn, and 34 feet north of center of gravel plantation road. Surface and underground marks are standard station disks in concrete, notes 1a and 7a. Upper mark is flush with ground. Station *P.B.M. Norfolk (M.R.C.)* (see description thereof) is 68.25 meters (223.9 feet) from station in azimuth $75^{\circ}02'28''.0$.

P.B.M. Norfolk (M.R.C.) (De Soto County, Miss., H. W. Hemple, 1929).—On left bank of Mississippi River, 5.6 miles southwest from Walls railroad station, 0.7 mile west of United States Route 61, on Bass plantation (Norfolk P.O.). Best reached by following United States Route 61 to cotton gin on west side of road 4.9 miles from Walls railroad station, and about 3 miles north of Lake Cormorant. Take gravel road leading west at cotton gin 0.7 mile to station site. Station is 1,400 meters (4,593 feet) back of bank of Mississippi River, and 1,200 meters (3,937 feet) back of levee at a point 500 meters (1,640 feet) above levee milestone 11/12, on south side of east-and-west plantation road leading back from landing, in northeast corner of pasture lot. $\frac{1}{2}$ meter (2 feet) south of south barn fence, 2 meters (7 feet) west of fence west of cabin, 30 feet southwest of tenant house, and 10 feet from center of bell tower. Witness marks are at following distances and azimuths: Storehouse, 140 meters (459 feet), 56° ; plantation house, 167 meters (548 feet), 60° ; windmill tower, 15.4 meters (51 feet), 110° ; and tree at fork in road, 35 meters (115 feet), 230° . Station *Bass* (see description thereof) is 68.25 meters (223.9 feet) distant in azimuth $255^{\circ}02'26''.5$.

P.B.M. Commerce (M.R.C.) (Tunica County, Miss., H. W. Hemple, 1929).—On left bank of Mississippi River, about 1 mile southwest of Commerce post office, near intersection of public roads, $\frac{1}{2}$ mile south of where north-and-south road, "Commerce-Austin", crosses levee at point 1,200 meters (3,937 feet) westwardly along levee from Commerce post office, and 700 meters (2,297 feet) west of where east-and-west road, "Abbeys Lane", crosses Fletcher Bayou, 7 meters (23 feet) west of center line of north-and-south road, and 19 meters

(62 feet) north of east-and-west road, at edge of cultivated field just inside fence, on land of Richard Abbott. Marked by stone post 3 feet long and 5 inches square on top, with a copper bolt marking center. Stone projects 6 inches, and is marked "U.S.B.M." Station *Abbott* (see description thereof) is 530.88 meters (1,741.7 feet) distant in azimuth $268^{\circ}15'50''.1$. Elevation of station mark is 59.995 meters (196.834 feet).

B.M. Curry (M.R.C.) (Tunica County, Miss., H. W. Hemple, 1929).—On left bank of Mississippi River, about 5.5 miles west of town of Tunica, on land of F. C. Curry, southwest of junction of levee road and road which leaves main highway (route 61) $\frac{3}{4}$ mile north of Tunica and runs westerly, 175 meters (574 feet) east of levee, midway between two negro shacks on south side of road running into Tunica from levee, about 600 meters (1,969 feet) back of Mhoon Landing, back of angle in levee, 175 meters (574 feet) back of center of levee along Mississippi River, 190 meters (623 feet) below center of levee along old river bank, $\frac{1}{2}$ meter (2 feet) south of garden fence, back of a cabin, and back of road that crosses levee in front of this house. Marked by standard mark of Mississippi River Commission, brass cap on steel pipe above and copper bolt in tile below, as described in note 16. Pipe projects about 15 inches above surface of ground. Cabin is 30 meters (98 feet) distant in azimuth 180° . Station *Huston* (see description thereof) is 189.62 meters (622.1 feet) from station in azimuth $203^{\circ}29'37''.7$.

P.B.M. Friar Point (M.R.C.) (Coahoma County, H. W. Hemple, 1929; 1931).—In upper part of town of Friar Point, 150 meters (492 feet) south and 325 meters (1,066 feet) east of ferry landing, 350 meters (1,148 feet) east of levee, at point about 340 meters (1,115 feet) above levee milestone 69/70, on south side of lane leading to cotton field, about 50 meters (164 feet) west of cotton house, along east bank of slough, on prolongation of east side of north-and-south lane, 0.3 meter (1 foot) east of fence, 1 meter (3 feet) north of peach tree, and nearly due east of red barn and windmill which are back of steamboat landing. Marked by standard mark of Mississippi River Commission, brass cap on steel pipe above and copper bolt in tile below, as described in note 16. Pipe projects about 18 inches above surface of ground. Witness marks are at following distances and azimuths: 24-inch pecan tree, 43 meters (141 feet), 60° ; church, 300 meters (984 feet), 120° ; and house, 150 meters (492 feet), 140° . Station *Adcho* (see description thereof) is 321.66 meters (1,055.3 feet) from station in azimuth $141^{\circ}45'37''.7$. Station *B. M. Loice (M.R.C.)* (see description thereof) is 119.040 meters (390.55 feet) from station in azimuth $151^{\circ}36'25''.5$.

Charles (Coahoma County, Miss., H. W. Hemple, 1929).—On east bank of Mississippi River, across river from mouth of chute of Island 66. To reach from Renalara go 2 miles south on route 1 to gravel road leading west to levee, follow this road to levee road, turn left and go 2 miles to where levee makes distinct bend from east-and-west direction to northwest. Station is 138 feet east of bend, 34 feet north of center line of levee road, and 37 feet south of top of levee. Surface and underground marks are standard station disks in concrete, notes 1a and 7a. Reference mark no. 1 is standard reference disk in concrete, note 11a, 12 feet south of levee road, on prolongation of outer edge of levee road from east and northwest, 59 feet south of top of levee, and 42.367 meters (139.00 feet) from station in azimuth $83^{\circ}43'$. Station *P.B.M. 38/a (M.R.C.)* (see description thereof) is 304.95 meters (1,000.5 feet) from station in azimuth $359^{\circ}19'44''.2$. Levee milepost 20/21 is 449 feet east of station.

P.B.M. 38/a (M.R.C.) (Coahoma County, Miss., H. W. Hemple, 1929).—On left bank of Mississippi River, across river from mouth of chute of Island 66, about $\frac{3}{4}$ mile from river bank, back of where old levee makes semicircle back of old Malone Landing to Lake Charles Landing, about 320 meters (1,050 feet) south of east-and-west levee at point 150 meters (492 feet) below levee milestone 20/21 and 170 meters (558 feet) east of junction of old and new levees, about 650 meters (2,133 feet) east-southeast from junction of levees where new Hushpuckana levee runs south across country, on north bank of small slough or ditch, and on outside of old hedge. Marked by standard mark of Mississippi River Commission, brass cap on steel pipe above and copper bolt in tile below, as described in note 16. Pipe projects about 2 feet above surface of ground. Azimuth of house, about 100 meters (328 feet) distant, is 220° .

Station *Charles* (see description thereof) is distant 304.95 meters (1,000.5 feet) in azimuth 179°19'44".3.

Cooperage (Bolivar County, Miss., H. W. Hemple, 1929).—About 1.3 miles by road south of Rosedale. To reach from courthouse in Rosedale go 1.7 miles south on route 1 to first gravel road leading to levee, and follow this road to station which is 300 meters (984 feet) south of gravel road leading to levee at boat landing, 45 feet east of crown of levee, and 4 feet west of center line of levee road. Surface and underground marks are standard station disks in concrete, notes 1a and 7a. Reference mark no. 1 is standard reference disk in concrete, note 11a, 45 feet northwest of 54-inch tree, 8 feet west of east-and-west woven-wire fence, 164 feet west of gate in same fence, 228 feet west of fence corner, and 0.4 mile from station in azimuth 300°31'30". Station *P.B.M. Cooperage* (M.R.C.) (see description thereof) is 85.54 meters (280.6 feet) from station in azimuth 227°15'17".7.

P.B.M. Cooperage (M.R.C.) (Bolivar County, Miss., H. W. Hemple, 1929).—On left bank of Mississippi River, 1.3 miles south by road from town of Rosedale, about $\frac{1}{4}$ mile directly back of foot of incline at Rosedale Landing, 300 meters (984 feet) below prominent angle in levee within which stands the Rosedale Cooperage Co.'s mill, 300 meters (984 feet) south of gravel road leading to levee at boat landing, 90 meters (295 feet) east of levee, 44 meters (144 feet) west of blazed 60-inch pecan tree, 3.9 meters (13 feet) south of first house south of boat landing, in line with front of gallery, and 3 meters (10 feet) below southeast corner of gallery. Marked by standard mark of Mississippi River Commission, brass cap on steel pipe above and copper bolt in tile below, as described in note 16. Pipe projects about 14 inches above surface of ground. Station *Cooperage* (see description thereof) is 85.54 meters (280.6 feet) from station in azimuth 47°15'19".1.

P.B.M. 77 (M.R.C.) (Bolivar County, Miss., H. W. Hemple, 1929).—On left bank of Mississippi River, back of Island 76, about $1\frac{1}{4}$ miles above Bolivar, about 80 meters (262 feet) east of levee, in lot surrounding house of J. W. Mason at Stormville, 50 meters (164 feet) north of house, about 12 meters (39 feet) south of main road leading west from town of Benoit, and 0.6 meter (2 feet) inside of fence on south side of road. Marked by brass bolt in stone. Stone projects about 4 inches above surface of ground. Station *Benoit* is 110.96 meters (364.0 feet) from station in azimuth 100°45'43".4. Elevation of station mark is 43.385 meters (142.339 feet).

B.M. Greenville (M.R.C.) (Washington County, Miss., H. W. Hemple, 1929).—On left bank of Mississippi River, about 1 mile above Main Street in Greenville, about 400 meters (1,312 feet) above tramway crossing levee at Greenville Gravel Co. plant, 80 meters (262 feet) back of levee, 300 meters (984 feet) back of river bank, about 250 meters (820 feet) above sawmill, about 300 feet north of Greenville Insulating Board Corporation, 60 feet north of center line of dirt road leading from Highway 1 to and across levee. Marked by standard mark of Mississippi River Commission, brass cap on steel pipe above and copper bolt in tile below, as described in note 16. Pipe leans slightly northward but is fairly solid. Following distances and azimuths are from station: 36-inch blazed pecan tree, 38.3 meters (126 feet), 155°; and 33-inch blazed pecan tree, 32.5 meters (107 feet), 30°.

B.M. Gage 92 (M.R.C.) (Chicot County, H. W. Hemple, 1929).—On right bank of Mississippi River, about 10.5 miles by road northeast of Eudora, about $\frac{1}{2}$ mile below Brooks Mill Landing, and about $1\frac{1}{4}$ miles above Mosswood Landing. To reach from Eudora go 3.7 miles on route 65 to lake where gravel road turns abruptly to left at filling station in fork of road, follow gravel road 0.8 mile to dirt road just beyond bridge at lone tree, turn left to levee and follow levee road to Sally Jenkins' house and station site. The Jenkins' house is old and dilapidated and stands about 7 feet above ground. Chimney has been torn away at its south end. Station is 6 feet south and 5 feet west of southwest corner of yard fence in front of house, about 550 meters (1,804 feet) back of old main river bank which is back of wide willow bar, 120 meters (394 feet) back of main levee, 65 meters (213 feet) above lower of two abrupt angles in levee, and 225 meters (738 feet) northwest of where old and new levees form an "X." Originally marked by standard mark of Mississippi River Commission, brass cap on steel pipe above and copper bolt in tile below, as described in note 16. In 1929 iron pipe was found rusted off at top of ground. A standard U. S. C. & G. S. reference disk was set in concrete over

underground mark, and stamped "JENKINS R.M. No. 2 1929, B.M. GAGE 92." Following distances and azimuths are from station: Southwest corner of cabin, 12.4 meters (41 feet), 190°; and 6-inch cedar tree, 4 meters (13 feet), 270°. Station *Jenkins* (see description thereof), is distant 130.72 meters (428.9 feet) in azimuth 8°45'59".6.

B.M. 83/4 (M.R.C.) (Chicot County, H. W. Hemple, 1929).—On right bank of Mississippi River, in Sterling, about 700 meters (2,297 feet) from river bank at point $\frac{1}{4}$ mile above Sterling Landing, 76 meters (249 feet) back of center of levee at point 50 meters (164 feet) above angle in levee, 180 meters (591 feet) below prominent angle in levee, 26 meters (85 feet) west of bank of bayou and 17 meters (56 feet) north of same bayou below bend, about 40 meters (131 feet) north of dirt road along foot of levee, 50 meters (164 feet) east of Leslie Taylor's house, and 8 meters (26 feet) west of old cabin now being used as barn. Marked by stone post, 6 inches square, with top broken off, projecting 12 inches above surface. Stone is solid and has small hole drilled in center of top. Station *Weise* (see description thereof) is distant 82.89 meters (271.9 feet) in azimuth 17°37'46".4. Witness marks are: Locust tree, 30 meters (98 feet) distant in azimuth 85°; and pipe well, 7.2 meters (24 feet), 345°.

B.M. Gage 89 (M.R.C.) (East Carroll Parish, La., H. W. Hemple, 1929).—On right bank of Mississippi River, about 16 miles by road south of Eudora, $\frac{3}{4}$ mile directly back of Pilcher Point Landing, 400 meters (1,312 feet) below prominent angle in levee near junction of old and new levees, 83 meters (272 feet) back of center of levee, in corner of yard of plantation residence, and 4 meters (13 feet) south of southwest corner of small store which is about 100 yards south of turn in United States Route 65. Marked by standard mark of Mississippi River Commission, brass cap on steel pipe above and copper bolt in tile below, as described in note 16. Pipe projects 6 inches above ground. Station *Gage* (see description thereof) is 300.33 meters (1,280.6 feet) from station in azimuth 223°23'56".0. Distances and azimuths to objects are as follows: Northeast corner of large brick house, 141 meters (463 feet), 250°; leaning stone monument of Gen. W. Gazo, 43 meters (141 feet), 290°; blazed 24-inch cottonwood, 55 meters (180 feet), 270°; and blazed 36-inch elm, 42.5 meters (139 feet), 320°.

B.M. 42/4 (M.R.C.) (Mississippi County, U.S. Engineers, 1906; 1933).—On right bank of Mississippi River, 5 miles northeast of Luxora, about 530 meters (1,739 feet) northwest of gin at Rosa, 218 meters (715 feet) back of angle in levee, 510 meters (1,673 feet) below levee milestone 69/70, in field, about 30 meters (98 feet) out from edge of timber, about 85 meters (279 feet) southwest of building in corner of field, 200 meters (656 feet) north of levee at first angle below Rosa, 30 meters (98 feet) north of tenant house which is 50 meters (164 feet) west of road, and 75 meters (246 feet) west of small house which is 75 meters (246 feet) west of large barn. Marked by standard mark of Mississippi River Commission, brass cap on steel pipe above and copper bolt in tile below, as described in note 16. Distances and azimuths from station to various objects are: *B.M. 42/3 (M.R.C.)*, 729 meters (2,392 feet), 349°34'; 5-inch ash, 3.7 meters (12 feet), 30°; 6-inch mulberry, 1.8 meters (6 feet), 50°; 14-inch thorn, 7.7 meters (25 feet), 180°; 10-inch pecan, 4.7 meters (15 feet), 218°; and 12-inch pecan, 5.8 meters (19 feet), 310°. Station *Cooper* (see description thereof) was 2,256.52 feet from station in azimuth 321°27'56".8. Station *Cooper 2* (see description thereof) is 1,866.70 feet from station in azimuth 316°07'19".4.

Cooper 2 (Mississippi County, U.S. Engineers, 1933).—On right bank of Mississippi River, 5 miles northeast of Luxora, in town of Rosa, 250 feet northwest of center line of proposed setback levee, 8 feet west of center line of dirt road to levee, 63 feet west of northwest corner of house occupied by J. T. Cooper. 40 feet north of corner of tenant house, and 2 feet northeast of corner of garden fence. Surface and underground marks are standard disk station marks in concrete, notes 1a and 7a, established in 1929 for station *Cooper* (see description thereof), and reset in above position in 1933. Marks are stamped "Cooper 1929." Station *Cooper*, which was destroyed by levee construction, was 434.25 feet from station in azimuth 345°04'03".2. Reference marks are standard reference disks in concrete, note 11a, in same position as established in 1929. No. 1 is 357 feet north of M.E. Church, on fence line southeast of levee road, 9 feet from center line of levee road, 35 feet (slope) northwest of top of levee, and 860.30 feet from station in azimuth 277°43'25". No. 2 is 155 feet northwest

of levee road, just west of private road leading north from levee road, and 331.35 feet from station in azimuth $351^{\circ}46'53''$. Station *B.M. 42/4 (M.R.C.)* (see description thereof) is 1,866.70 feet from station in azimuth $136^{\circ}07'28''.5$

Martine 2 (Crittenden County, U.S. Engineers, 1933).—On right bank of Mississippi River, about 8 miles southwest of West Memphis, about 1,000 feet to land side of Lower St. Francis Levee, at point 1,300 feet below levee milestone 161/162, about 700 feet south of Fetic Martine plantation house and store, 3 feet west of north-and-south wire fence, and 30 feet east of north-and-south plantation road to levee. To reach from West Memphis, go west on United States Route 70 to first gravel road leading south, follow this to gravel road which turns west at point directly south of Hulbert railway station, and follow 7.3 miles to sharp turn to right and station site. Surface and underground marks are standard disk station marks in concrete, notes 1a and 7a, established in 1929 for station *Martine* (see description thereof), and reset in above position in 1933. Marks are stamped "Martine 1929." Station *Martine*, which was destroyed by levee construction, was 968.97 feet from station in azimuth $2^{\circ}07'51''.7$. Reference marks are standard reference disks in concrete, note 11a, in same position as established in 1929. No. 1 is in southeast corner of yard about Waverly schoolhouse, 16 feet west of centerline of road, 25 feet south of 20-inch deciduous tree, and 784.80 feet from station in azimuth $358^{\circ}32'36''$. No. 2 is on banquette of levee and 1,295.55 feet from station in azimuth $36^{\circ}18'59''$. Station *B. M. Kurr (U.S.E.)* (see description thereof) is 591.05 feet from station in azimuth $180^{\circ}48'59''.0$, and 1,809.58 feet from reference mark no. 2 in azimuth $205^{\circ}22'53''.1$.

B.M. Kurr (U.S.E.) (Crittenden County, U.S. Engineers, 1931).—On right bank of Mississippi River, $\frac{1}{4}$ mile below levee milestone 161/162 in Lower St. Francis Levee, about 1,500 feet back of levee, near schoolhouse, 400 feet north of farmhouse, in yard of tenant house, 30 feet east of gravel road, 20 feet south of 30-inch maple, and 20 feet north of 24-inch maple. Marked by standard mark of Mississippi River Commission, brass cap on steel pipe above and copper bolt in tile below, as described in note 16. Station *Martine 2* (see description thereof) is 591.05 feet from station in azimuth $0^{\circ}48'59''.1$; and reference mark no. 2 of station *Martine 2* is 1,809.58 feet from station in azimuth $25^{\circ}22'58''.5$.

Horse reference mark no. 2 (Crittenden County, H. W. Hemple, 1929; 1934).—About 22 miles, airline, southwest of Memphis, Tenn., 9 miles by road south of Neuhardt railroad station, in yard southeast of first farmhouse west of levee road, and along road which passes just south of Locust Grove church. Marked by standard reference disk in concrete, note 11a. Station *Horse* (see description thereof) was 390.346 meters (1,280.66 feet) distant in azimuth $271^{\circ}55'43''.2$. Station *B. M. Brock (M.R.C.)* (see description thereof) is 401.4 meters (1,317 feet) distant in azimuth $350^{\circ}09'59''.9$. Station *Horse 2* (see description thereof) is 10.973 meters (36.00 feet) distant in azimuth $53^{\circ}37'11''.8$.

B.M. Brock (M.R.C.) (Crittenden County, U.S. Engineers, 1931; 1934).—Three-fourths mile below levee milestone 175/176 in Lower St. Francis Levee District, 2,000 feet southwest of Locust Grove Church, 1,400 feet back of levee, 100 feet south of east-and-west road, in northeast corner of tenant house yard, on land of T. Keith (colored). Marked by brass cap on iron pipe and concrete tile. Top of pipe projects 14 inches. Station *Horse* (see description thereof) was 499.629 meters (1,639.20 feet) from station in azimuth $220^{\circ}03'44.2''$. Station *Horse reference mark no. 2* (see description thereof) is 401.4 meters (1,317 feet) from station in azimuth $170^{\circ}10'01''.4$. Station *Horse 2* (see description thereof) is 396.643 meters (1,301.32 feet) from station in azimuth $168^{\circ}44'56.3''$. Station *B.M. E-2-2-1 (M.R.C.)* (see description thereof) is 511.568 meters (1,678.37 feet) from station in azimuth $340^{\circ}57'53''.4$.

Horse 2 (Crittenden County, U.S. Engineers, 1934).—About 22 miles, airline, southwest of Memphis, Tenn., about 3 miles below Pinckney, 1,360 feet back of Lower St. Francis Levee at point 1,500 feet below milestone 175/176, about 1,000 feet directly back (west) of Locust Grove colored church and cemetery, and 3 feet north of northeast corner of tenant house. Marked by standard disk station mark in concrete, stamped "Horse 1929." Station mark of station *Horse* (see description thereof), which was 399.014 meters (1,309.10 feet) distant in azimuth $270^{\circ}57'06''.6$, was dug up in February 1934 and reset in above position. Station *Horse reference mark no. 2* (see description thereof) is 10.973 meters (36.00 feet) from station in azimuth $233^{\circ}37'11''.6$. Station

B.M. Brock (M.R.C.) (see description thereof) is 396.643 meters (1,301.32 feet) from station in azimuth $348^{\circ}44'54''.6$.

B.M. R-92-2-1 (M.R.C.) (Crittenden County, U.S. Engineers, 1931; 1934).—About 3,000 feet south of Locust Grove church, 1,300 feet (azimuth 90°) from angle in levee, 314 feet above milepost 176, 1,319.5 feet (azimuth $104^{\circ}16'$) from center of levee at milepost 176, and 3 feet north of northeast corner of small garage. Marked by brass cap on iron pipe and concrete tile. Station *Horse* (see description thereof) was 879.697 meters (2,886.14 feet) from station in azimuth $190^{\circ}07'52''.0$. Station *B.M. Brock (M.R.C.)* (see description thereof) is 511.568 meters (1,678.37 feet) from station in azimuth $160^{\circ}57'57''.2$.

P.B.M. 13/a (M.R.C.) (Tunica County, Miss., Mississippi River Commission, 1910; 1932).—About 1,400 meters (4,593 feet) back of Mhoon Landing, 970 meters (3,182 feet) back of levee along Mississippi River, 325 meters (1,066 feet) south of levee along bank of old river, 150 meters (492 feet) south of east-and-west lane, on northwest bank of ditch at southeast side of field, and 33 meters (108 feet) south of northeast corner of field. A six-inch blazed huckleberry tree is 6.2 meters (20 feet) from station in azimuth 10° , and a 24-inch blazed cottonwood is 13.4 meters (44 feet) from station in azimuth 220° . Station *Huston* (see description thereof) is 859.6 meters (2,820 feet) from station in azimuth $119^{\circ}52'13''.7$. Station *B.M. Bell (M.R.C.)* (see description thereof) is 197.608 meters (648.32 feet) from station in azimuth $80^{\circ}17'30''.9$.

B.M. Bell (M.R.C.) (Tunica County, Miss., U.S. Engineers, 1931).—About $\frac{3}{4}$ mile back from Mhoon Landing, $\frac{1}{4}$ mile below levee milestone 33/34 in Upper Yazoo Levee District, 485 feet south of road intersection, 490 feet southwest of southwest corner of barn, and 45 feet west of north-and-south road. Marked by brass cap on iron pipe and concrete tile. Station *Huston* (see description thereof) is 718.5 meters (2,357 feet) from station in azimuth $129^{\circ}57'43''.1$. Station *P. B. M. 13/a (M.R.C.)* (see description thereof) is 197.608 meters (648.32 feet) from station in azimuth $260^{\circ}17'26''.5$.

Austin reference mark no. 2 (Tunica County, Miss., H. W. Hemple, 1929; 1931).—About 3 miles west and 2 miles south of Evansville, on lateral levee, 408.2 feet east of levee road. Marked by standard reference disk in concrete, note 11a. Station *Austin* (see description thereof) is 179.183 meters (587.87 feet) distant in azimuth $150^{\circ}26'03''.0$.

B.M. Bud (M.R.C.) (Tunica County, Miss., U.S. Engineers, 1931).—Three miles below Austin, $\frac{1}{4}$ mile below levee milestone 45/46 in Upper Yazoo Levee District, 1,500 feet east of levee, 85 feet west of cotton house, 20 feet north of east-and-west road, 15 feet east of path, and 15 feet west of 16-inch pecan tree. Marked by brass cap on iron pipe and concrete tile. Station *Austin* (see description thereof) is 498.0 meters (1,634 feet) from station in azimuth $147^{\circ}28'08''.7$. Station *B. M. Jim (M.R.C.)* (see description thereof) is 194.131 meters (636.91 feet) from station in azimuth $180^{\circ}02'13''.0$.

B.M. Jim (M.R.C.) (Tunica County, Miss., U.S. Engineers, 1931).—One-fourth mile below levee milestone 45/46 in Upper Yazoo Levee District, 3 miles below Austin, 1,200 feet east of levee, and 125 feet west of path, in yard of small house. Marked by brass cap on iron pipe and concrete tile. Station *Austin* (see description thereof) is 350.377 meters (1,149.53 feet) from station in azimuth $130^{\circ}06'59''.2$. Station *B. M. Bud (M.R.C.)* (see description thereof) is 194.131 meters (636.91 feet) from station in azimuth $0^{\circ}02'13''.0$.

Jeffries reference mark no. 2 (Tunica County, Miss., H. W. Hemple, 1929; 1934).—About $\frac{1}{2}$ mile northwest of Jeffries, 17 meters (56 feet) east of top of levee, 25.45 meters (83.5 feet) north of north rail of Yazoo & Mississippi Valley Railroad, and 2 meters (7 feet) west of center of levee road. Marked by standard reference disk in concrete, note 11a. Station *Jeffries* (see description thereof) is 160.752 meters (527.40 feet) distant in azimuth $195^{\circ}28'50''.8$. Elevation of Jeffries mark no. 2 is 58.691 meters (192.555 feet).

B.M. Sayre no. 2 (M.R.C.) (Coahoma County, Miss., U.S. Engineers, 1931; 1934).—Nine hundred feet northwest of Jeffries, 1,300 feet back of levee, 1,000 feet below levee milestone 56/57 in Upper Yazoo Levee District, 75 feet east of Yazoo & Mississippi Valley Railroad, and 25 feet west of gravel road. Marked by brass cap on iron pipe and concrete tile. Original mark was destroyed and station was remarked in 1934 by same type of marks in same position. Station *B. M. Sayre no. 1 (M.R.C.)* (see description thereof) is 423.252 meters (1,388.62 feet) from station in azimuth $183^{\circ}13'22''.5$. Station *Jeffries* (see description thereof) was 492.695 meters (1,616.45 feet) from

station in azimuth $154^{\circ}47'37''.2$. Station *Jeffries 2* (see description thereof) is 504.604 meters (1,655.52 feet) from station in azimuth $227^{\circ}02'12''.1$.

B.M. Sayre no. 1 (M.R.C.) (Tunica County, Miss., U.S. Engineers, 1931; 1934).—Near *Jeffries*, 750 feet back of levee, 1/4 mile north of Yazoo & Mississippi Valley Railroad, and 200 feet below levee milestone 58/57 in Upper Yazoo Levee District, on east side of gravel road. Marked by brass cap on iron pipe and concrete tile. Station *B. M. Sayre no. 2 (M.R.C.)* (see description thereof) is 423.252 meters (1,388.62 feet) from station in azimuth $3^{\circ}13'23''.0$. Station *Jeffries* (see description thereof) was 234.773 meters (770.25 feet) from station in azimuth $95^{\circ}40'14''.8$. Station *Jeffries 2* (see description thereof) is 354.315 meters (1,162.45 feet) from station in azimuth $282^{\circ}49'49''.0$.

Jeffries 2 (Tunica County, Miss., U.S. Engineers, 1934).—About $2\frac{3}{4}$ miles east, airline, from Helena, Ark., about 2,000 feet north of railroad station at *Jeffries*, about 1,800 feet east of Upper Yazoo Levee at milepost 58/57, about 1,500 feet east of levee board house occupied by Mr. Wright, on land of T. M. Turner, in front of small tenant house, and 5 feet west of large stump. Marked by standard disk station mark in concrete, stamped "Jeffries 1929." Station mark of station *Jeffries* (see description thereof), which was in danger of destruction by levee machine, was dug up and reestablished in above position in February 1934. Station *B. M. Sayre no. 1 (M.R.C.)* (see description thereof) is 354.315 meters (1,162.45 feet) from station in azimuth $102^{\circ}49'56''.7$. Station *B. M. Sayre no. 2 (M.R.C.)* (see description thereof) is 504.604 meters (1,655.52 feet) from station in azimuth $47^{\circ}02'20''.3$.

B.M. Lowe (M.R.C.) (Coahoma County, Miss., U.S. Engineers, 1931).—In northern part of town of Friar Point, 900 feet back of levee at crossing of ferry road, $\frac{1}{2}$ mile below levee milestone 68/69 in Upper Yazoo Levee District, 225 feet south of east-and-west path, and 100 feet east of north-and-south path, in northwest corner of yard of shack. Marked by brass cap on iron pipe and concrete tile. Station *Adcho* (see description thereof) is 205.402 meters (673.89 feet) from station in azimuth $136^{\circ}04'20''.2$. Station *Adcho reference mark no. 1* (see description thereof) is 349.792 meters (1,147.61 feet) from station in azimuth $205^{\circ}24'36''.0$. Station *P. B. M. Friar Point (M.R.C.)* (see description thereof) is 119.040 meters (390.55 feet) from station in azimuth $331^{\circ}36'24''.2$.

Adcho reference mark no. 1 (Coahoma County, Miss., H. W. Hemple, 1929; 1931).—On banquette of levee north of ferry landing at Friar Point, 21.5 feet east of center line of road where it curves slightly to eastward after passing ferry landing. Marked by standard reference disk in concrete, note 11a. Station *Adcho* (see description thereof) is 337.402 meters (1,106.96 feet) distant in azimuth $60^{\circ}08'04''.0$. Station *B. M. Lowe (M.R.C.)* (see description thereof) is 349.792 meters (1,147.61 feet) distant in azimuth $25^{\circ}24'30''.4$. The elevation of *Adcho reference mark no. 1* is 56.822 meters (186.424 feet).

P.B.M. 30/a (M.R.C.) (Coahoma County, Miss., H. W. Hemple, 1929; 1934).—On Neal Plantation, 3.4 miles by road west of town of Farrell, 0.3 mile west of Neal Plantation store, back of chute behind Island 63 and back from extreme bend, about $\frac{3}{8}$ mile below head of said island, about 550 meters (1,804 feet) from river bank at point $\frac{1}{4}$ mile above McCloud Landing, 140 meters (459 feet) east of new levee at point 380 meters (1,247 feet) above levee milestone 81/82, 150 meters (492 feet) north of junction of old and new levees (north-and-south levee running to Sherard), 500 feet east of angle in levee, 75 feet north of east-and-west road, and 10 meters (33 feet) north of small levee forming part of loop and used as road from levee to plantation building, in borrow pit. Marked by standard mark of Mississippi River Commission, brass cap on steel pipe above and copper bolt in tile below, as described in note 16. Pipe projects about 2 feet. Witness marks are at following distances and azimuths from station: House, 70 meters (230 feet), 70° ; and 8-inch persimmon tree, 7.5 meters (25 feet), 180° . Station *McWilliams* (see description thereof) was 135.075 meters (443.16 feet) from station in azimuth $84^{\circ}41'46''.5$. Station *B. M. Conway (M.R.C.)* (see description thereof) is 895.6 meters (2,938 feet) from station in azimuth $268^{\circ}11'15''.0$.

McWilliams reference mark no. 1 (Coahoma County, Miss., H. W. Hemple, 1929; 1931).—About 3 miles west of Farrell, 20 feet south of center line of road to Farrell and 10 feet west of large tree. Marked by standard reference disk in concrete, note 11a. Station *McWilliams* (see description thereof) was 392.418 meters (1,287.45 feet) distant in azimuth $89^{\circ}56'28''.7$.

B.M. Conway (M.R.C.) (Coahoma County, Miss., U.S. Engineers, 1931; 1934).—Back of chute of Island 63, 3,000 feet east of levee, $\frac{3}{4}$ mile below levee milestone 80/81 in Upper Yazoo Levee District, 80 feet north of east-and-west road, in churchyard, and 40 feet north of southwest corner of church. Marked by brass cap on iron pipe and concrete tile. Station *P. B. M. 30/a* (*M.R.C.*) (see description thereof) is 895.6 meters (2,938 feet) from station in azimuth $88^{\circ}11'34''.7$. Station *McWilliams* (see description thereof) was 1,030.506 meters (3,380.92 feet) from station in azimuth $87^{\circ}44'11''.3$. Station *McWilliams 2* (see description thereof) is 238.418 meters (782.21 feet) from station in azimuth $87^{\circ}44'11''.3$.

McWilliams 2 (Coahoma County, Miss., U.S. Engineers, 1934).—About $2\frac{1}{2}$ miles west of Farrell, 64 feet north of intersection of north-and-south and east-and-west roads, 785 feet west of Zion Church, and 859 feet east of center line of new levee, on land of John West (negro). Marked by standard disk station mark in concrete, stamped "McWilliams 1929." Station mark of station *McWilliams* (see description thereof), which was 792.088 meters (2,598.71 feet) distant in azimuth $87^{\circ}44'06''.0$, was dug up in February 1934, and reset in above position. Station *B.M. Conway* (*M.R.C.*) (see description thereof) is 238.418 meters (782.21 feet) from station in azimuth $267^{\circ}44'06''.0$.

MEMPHIS TO LITTLE ROCK TRAVERSE

Principal points

Organ (Crittenden County, J. S. Bilby, 1916; 1920).—On west bank of Mississippi River, at extreme eastern end of old main line of track of Chicago, Rock Island & Pacific Railway at Hopefield, at southeast end of small peninsula which projects in easterly direction and is protected by breakwater on all sides, 5.8 meters (19 feet) from east-side breakwater, and 33.6 meters (110 feet) from north-side breakwater. Surface and underground marks are standard disk station marks in concrete, notes 1a and 7a. Triangulation station *Hopefield* (see description thereof) is 98.09 meters (321.8 feet) from station in azimuth $28^{\circ}12'18''.5$. In 1920 it was reported that peninsula had been washed away, and station destroyed. Measurements from stations *Crossing* and *Hopefield* (see descriptions thereof) located position of *Organ* about 9 feet from low-water mark.

Crossing (Crittenden County, J. S. Bilby, 1916; 1928).—On right-of-way of Chicago, Rock Island & Pacific Railway, just east of point where this road crosses St. Louis-San Francisco Railway tracks north of Bridge Junction, 1.68 meters (5.5 feet) south of south rail of old main line of former company leading to Hopefield, and 7.68 meters (25.2 feet) west of west abutment of railway bridge. Surface and underground marks are standard station disks in concrete, notes 1a and 7a. Intersection of east rail of St. Louis-San Francisco Railway and south rail of Chicago, Rock Island & Pacific Railway leading to Hopefield is 75.84 meters (248.8 feet) from station in azimuth $78^{\circ}03'$. Mark is stamped with name and dates "1916 and 1920." Station reported not recoverable in 1928.

Levee (Crittenden County, J. S. Bilby, 1916; 1928).—On right-of-way of Chicago, Rock Island & Pacific Railway, about 2.5 miles east of Hulbert railway station, on new levee which will be used as subgrade for main track, 4.31 meters (14.1 feet) north of north rail of main track. Mark is standard disk station mark in concrete, note 1a. Milepost 7 is 44.25 meters (145.2 feet) from station in azimuth $277^{\circ}53'$. In 1920 it was reported that fill had been widened out; station was dug for but not found. In 1928 it was again reported that station is believed to be under fill. Elevation of station mark is 69.275 meters (227.280 feet).

Hulbert (Crittenden County, J. S. Bilby, 1916; 1928).—On right-of-way of Chicago, Rock Island & Pacific Railway, at Hulbert railway station, 120 meters (394 feet) east of switch at west end of passing track, 3.52 meters (11.5 feet) south of south rail of main track, and 9.28 meters (30.4 feet) northeast of twenty-sixth telegraph pole west of milepost 9. Surface and underground marks are standard station disks in concrete, notes 1a and 7a. Standard reference disk in concrete, note 11a, is 7.11 meters (23.3 feet) east of twenty-sixth telegraph pole west of milepost 9, and 5.914 meters (19.40 feet) from station in azimuth $348^{\circ}00'$. Station and reference marks are stamped

For notes in regard to marking of stations see p. 40.

with name and dates "1916, 1920." In 1928 station mark was reported found out on top of ground and reference mark lost.

Riceville (Crittenden County, J. S. Bilby, 1916; 1928).—On right-of-way of Chicago, Rock Island & Pacific Railway, at Riceville railway station, 94 meters (308 feet) west of station board, 4.33 meters (14.2 feet) south of south rail of main track, and 6.2 meters (20 feet) northeast of twelfth telegraph pole west of milepost 11. Surface and underground marks are standard station disks in concrete, notes 1a and 7a. Standard reference disk in concrete, note 11a, is 26.57 meters (87.2 feet) south of south rail of main track, and 22.240 meters (72.97 feet) from station in azimuth $341^{\circ}13'$. Station and reference marks are stamped with name and dates "1916, 1920." In 1928 station mark was found out on top of ground. Reference mark was reported destroyed.

Mounds (Crittenden County, J. S. Bilby, 1916; 1928).—On right-of-way of Chicago, Rock Island & Pacific Railway, at Mounds railway station, 110 meters (361 feet) west of switch at east end of passing track, 4.96 meters (16.3 feet) south of south rail of main track, and 6.19 meters (20.3 feet) west of twenty-first telegraph pole west of milepost 13. Surface and underground marks are standard station disks in concrete, notes 1a and 7a. Standard reference disk in concrete, note 11a, is 12.86 meters (42.2 feet) north of north rail of main track, and 19.355 meters (63.43 feet) from station in azimuth $167^{\circ}51'$. Station and reference marks are stamped with name and dates "1916, 1920." In 1928 station and reference marks were found in good condition. Elevation of station is 63.817 meters (209.373 feet); of reference mark, 63.857 meters (209.504 feet).

Edmondson (Crittenden County, J. S. Bilby, 1916; 1928).—On right-of-way of Chicago, Rock Island & Pacific Railway, at Edmondson railway station, 42.05 meters (138.0 feet) west of northwest corner of depot, 47.84 meters (157.0 feet) west of semaphore pole, and 2.96 meters (9.7 feet) south of south rail of main track. Marked by standard disk station mark set in large concrete block which once formed north foundation pier of railway water tank. Mark is 12 centimeters from south edge and 24 centimeters from west edge of concrete block. Standard disk reference mark is set in center of square block of concrete which formed the southwest foundation pier of same tank, 8.96 meters (29.4 feet) south of south rail of main track, and 6.002 meters (19.69 feet) from station in azimuth $347^{\circ}33'$. In 1920 reference mark was recovered and stamped with name and dates "1916; 1920." Station was reported buried under fill. In 1928 station and reference mark were both recovered. Station mark is about 1 foot underground. Elevation of station is 63.929 meters (209.740 feet); of reference mark, 62.548 meters (205.210 feet).

Proctor (Crittenden County, J. S. Bilby, 1916; 1928).—On right-of-way of Chicago, Rock Island & Pacific Railway, 7.58 meters (24.9 feet) south of mile board east of Proctor railway station, 2.86 meters (9.4 feet) south of south rail of main track, 8.8 meters (26 feet) east of east abutment of bridge no. 189, and 7.79 meters (25.6 feet) northwest of thirty-fourth telegraph pole west of milepost 18. Surface and underground marks are standard station disks in concrete, notes 1a and 7a. Standard reference disk in concrete, note 11a, is 5 meters (16 feet) southwest of the thirty-fourth telegraph pole west of milepost 18, and 9.730 meters (31.92 feet) from station in azimuth $346^{\circ}27'$. Station and reference marks are stamped with name and dates "1916, 1920." In 1928 it was reported that station mark was found out in ditch; reference mark was found in good condition at surface of ground. Elevation of reference mark, 61.753 meters (202.601 feet).

Browns (Crittenden County, J. S. Bilby, 1916; 1928).—On right-of-way of Chicago, Rock Island & Pacific Railway, at Browns railway station, 12.21 meters (40.1 feet) north of west station board, 25.41 meters (83.4 feet) east of switch stand at east end of spur track leading to sawmill, and 32.78 meters (107.5 feet) northeast of twenty-fourth telegraph pole west of milepost 20. Surface and underground marks are standard station disks in concrete, notes 1a and 7a. Standard reference disk in concrete, note 11a, is 5.05 meters (16.6 feet) southwest of twenty-fourth telegraph pole west of milepost 20, and 37.227 meters (122.14 feet) from station in azimuth $46^{\circ}14'$. In 1920 it was reported that large fill had been made over station and it was not recovered. Name and dates "1916-1920" were stamped on reference mark which was reported to be partly uncovered on edge of small stream. In 1928 reference mark was found out in ditch. Station mark was not found, but may be under new fill. Elevation of station is 63.785 meters (209.268 feet); of reference mark, 62.575 meters (205.298 feet).

Curve (St. Francis County, J. S. Bilby, 1916; 1928).—On right-of-way of Chicago, Rock Island & Pacific Railway, at curve 2 miles west of Browns railway station, about 60 meters (197 feet) from each end of curve, 7.49 meters (24.6 feet) south of south rail of main track, and 16.40 meters (53.8 feet) east of twenty-fourth telegraph pole west of milepost 22. Surface and underground marks are standard station disks in concrete, notes 1a and 7a. Standard reference disk in concrete, note 11a, is 3.62 meters (11.9 feet) north of north rail of main track, and 16.179 meters (53.08 feet) from station in azimuth $207^{\circ}55'$. In 1920 dates "1916, 1920" were stamped on surface mark. Reference mark was not found. In 1928 it was reported that station and reference marks were in solid ground, but all indications showed that marks had been moved and replanted. Elevation of station is 62.741 meters (205.843 feet); of reference mark, 62.640 meters (205.511 feet).

Jonquil (St. Francis County, J. S. Bilby, 1916; 1928).—On right-of-way of Chicago, Rock Island & Pacific Railway at Jonquil railway station, 12.23 meters (63.1 feet) west of station board, 3.03 meters (9.9 feet) south of south rail of main track, about 175 meters (574 feet) west of switch stand at east end of side track, and 39.08 meters (128.2 feet) east of fifteenth telegraph pole west of milepost 24. Surface and underground marks are standard station disks in concrete, notes 1a and 7a. Standard reference disk in concrete, note 11a, is 7.63 meters (25.0 feet) south of south rail of main track, and 22.569 meters (74.05 feet) from station in azimuth $71^{\circ}13'$. In 1920 name and date were stamped on reference mark; surface mark was found down in ditch; underground mark was not found. In 1928 neither reference mark nor station mark were found, though it was stated that station may possibly be under fill. Elevation of station is 63.946 meters (209.796 feet); of reference mark, 62.144 meters (203.884 feet).

Cicalla (St. Francis County, J. S. Bilby, 1916; 1930).—On right-of-way of Chicago, Rock Island & Pacific Railway, at Cicalla railway station, 18.71 meters (61.4 feet) north of thirty-fourth telegraph pole west of milepost 28, 6.15 meters (20.2 feet) north of north rail of main track, about 1.5 meters (5 feet) below rail, and originally 10.41 meters (34.2 feet) west of switch stand at east end of passing track. In 1920 it was reported that switch stand was no longer there, passing track having been extended about 300 meters (984 feet) to east. Surface and underground marks are standard station disks in concrete, notes 1a and 7a. Standard reference disk in concrete, note 11a, is 4.1 meters (13 feet) east of thirty-fifth telegraph pole west of milepost 28, about 2 meters (7 feet) below track, 10.65 meters (34.9 feet) south of south rail of main track, and 35.368 meters (116.04 feet) from station in azimuth $51^{\circ}32'$. Station and reference marks are stamped with name and dates "1916, 1920." In 1930 attempt to recover station and reference mark was unsuccessful. Elevation of station is 61.583 meters (202.044 feet); of reference mark, 61.266 meters (201.004 feet).

Blackfish (St. Francis County, J. S. Bilby, 1916; 1920).—Just north of Chicago, Rock Island & Pacific Railway right-of-way, about 0.9 mile east of Round Pond railway station, 31.71 meters (104.0 feet) north of north rail of main track, 48.99 meters (160.7 feet) northwest of second telegraph pole west of milepost 33, and 9.7 meters (31.8 feet) north of middle of public road which lies between station and railway. Surface and underground marks are standard station disks in concrete, notes 1a and 7a. Standard reference disk in concrete, note 11a, is between public road and railway, 1.5 meters (5 feet) east of American Bell Telephone Co.'s pole no. 1486, and 33.183 meters (108.87 feet) from station in azimuth $285^{\circ}21'$. In 1920 station and reference marks were stamped with name and dates "1916, 1920." Elevation of station is 61.298 meters (201.108 feet); of reference mark, 61.798 meters (202.749 feet).

Round Pond (St. Francis County, J. S. Bilby, 1916; 1920).—On right-of-way of Chicago, Rock Island & Pacific Railway, about $\frac{1}{2}$ mile east of Round Pond railway station, on prolongation of westward tangent to curve of north rail of main track, about 280 meters (919 feet) east of point of tangency, 55.1 meters (181 feet) northwest of twenty-fifth telegraph pole west of milepost 33, 14.57 meters (47.8 feet) north of north rail of main track, and about 1.7 meters (6 feet) below rail. Surface and underground marks are standard station disks in concrete, notes 1a and 7a. Standard reference disk in concrete, note 11a, is 1.9 meters (6 feet) north of small oak tree, 7.6 meters (25 feet) west of small maple tree, and 23.511 meters (77.14 feet) from station in azimuth $129^{\circ}55'$. In 1920 name and dates "1916, 1920" were stamped on

station mark. Reference mark could not be found. New highway had been constructed across reference mark site. Elevation of station is 60.578 meters (198.746 feet); of reference mark, 59.639 meters (195.666 feet).

Widener (St. Francis County, J. S. Bilby, 1916; 1930).—On right-of-way of Chicago, Rock Island & Pacific Railway, at curve about $\frac{3}{8}$ mile east of Widener railway station, on prolongation of eastward tangent to curve of north rail of main track, 170 meters (558 feet) west of point of tangency, 38.70 meters (127.0 feet) northeast of thirtieth telegraph pole west of milepost 37, 161 meters (528 feet) west of west abutment of bridge no. 376, 4.98 meters (16.3 feet) south of south rail of main track, and about 2 meters (7 feet) below rail. Surface and underground marks are standard station disks in concrete, notes 1a and 7a. Standard reference disk in concrete, note 11a, is 0.5 meter (1.6 feet) north of south fence line of right-of-way, about 4 meters (13 feet) below station, and 11.091 meters (36.39 feet) distant in azimuth $304^{\circ}37'$. In 1920 station mark was stamped with name and dates "1916, 1920", but reference mark could not be found. In 1930 it was reported that station mark was probably covered by enlargement of fill. Elevation of station is 62.097 meters (203.730 feet); of reference mark, 60.585 meters (198.769 feet).

Creek (St. Francis County, J. S. Bilby, 1916; 1920).—On right-of-way of Chicago, Rock Island & Pacific Railway, at curve near railway station Crow Creek, 13.02 meters (42.7 feet) south of south rail of main track, 85 meters (279 feet) west of station board, 3.31 meters (10.9 feet) east of fifth telegraph pole east of milepost 42, and 14.8 meters (49 feet) south of east abutment of bridge no. 419 over Crow Creek, at intersection on prolongations of tangents to curve of south rail of main track. Surface and underground marks are standard station disks in concrete, notes 1a and 7a. Standard reference disk in concrete, note 11a, is 4.37 meters (14.3 feet) north of south fence line of right-of-way, and 14.248 meters (46.75 feet) from station in azimuth $10^{\circ}54'$. In 1920 station mark was stamped with name and dates "1916, 1920." Reference mark was stamped "Ref. Creek 1916 B.M. 1920." In 1920 reference mark was at edge of small stream and in danger of being washed out. Elevation of station is 68.619 meters (225.128 feet); of reference mark, 68.561 meters (224.937 feet).

Crow (St. Francis County, J. S. Bilby, 1916; 1933).—Just south of right-of-way of Chicago, Rock Island & Pacific Railway, at curve about 1.25 miles east of Forrest City railway station, 28.875 meters (94.73 feet) south of south rail of main track, 5.6 meters (18.4 feet) north of center of public road, 65 meters (213 feet) east of public-road crossing, and on prolongation of eastward tangent to curve of south rail of main track. Surface and underground marks are standard station disks in concrete, notes 1a and 7a. Standard reference disk in concrete, note 11a, is 0.7 meter (2 feet) north of south fence line of public road, and 12.943 meters (42.46 feet) from station in azimuth $4^{\circ}10'$. In 1920 dates "1916, 1920" were stamped on station mark, which was observed to be very near edge of bank of small stream, which is liable to cave in. Reference mark could not be located, public road having been graded where it had been located. In 1933 station and reference marks were reported destroyed. Elevation of station is 82.176 meters (269.606 feet); of reference mark, 82.390 meters (270.308 feet).

Little (St. Francis County, J. S. Bilby, 1916; 1933).—On right-of-way of Chicago, Rock Island & Pacific Railway, at curve about $\frac{3}{4}$ mile east of Forrest City railway station, 1.3 meters (4 feet) west of twenty-fifth telegraph pole west of milepost 43, and 8.76 meters (28.7 feet) south of south rail of main track. Surface and underground marks are standard station disks in concrete, notes 1a and 7a. Standard reference disk in concrete, note 11a, is 9.00 meters (29.5 feet) north of north rail of main track, and 41.445 meters (135.97 feet) from station in azimuth $273^{\circ}56'$. Station and reference marks are stamped "Little 1916 B.M. 1920." Elevation of station is 92.079 meters (302.096 feet); of reference mark, 91.472 meters (300.104 feet). In 1933 reference mark was reported destroyed.

Forrest (St. Francis County, J. S. Bilby, 1916; 1933).—In town of Forrest City, about 325 meters (1,066 feet) north of right-of-way of Chicago, Rock Island & Pacific Railway, in pasture lot, about 60 meters (197 feet) southeast of Dr. H. P. Dooley's residence, and 20.7 meters (68 feet) south of north fence line of pasture. Surface and underground marks are standard station disks in concrete, notes 1a and 7a. Standard reference disk in concrete, note 11a, is 0.5 meter (1.6 feet) south of north fence line of same lot, and 20.184 meters (66.22 feet) from station in azimuth $171^{\circ}50'$. Station mark is stamped "For-

rest 1916 B.M. 1920." Elevation of station is 113.622 meters (372.775 feet); of reference mark, 114.409 meters (375.357 feet). Reference mark is stamped with name and dates "1916-1920." Reference mark was searched for but not recovered in 1933.

Becks (St. Francis County, J. S. Bilby, 1916; 1933).—On right-of-way of Chicago, Rock Island & Pacific Railway, 120 meters (394 feet) west of road crossing, about $\frac{3}{4}$ mile west of Becks railway station, near twenty-first telegraph pole west of milepost 49, 6 meters (20 feet) south of north fence line of right-of-way, and 8.02 meters (26.3 feet) north of north rail of main track. Surface and underground marks are standard station disks in concrete, notes 1a and 7a. Standard reference disk in concrete, note 11a, is about 0.5 meter (1.6 feet) south of north fence line of right-of-way, and 17.220 meters (56.50 feet) from station in azimuth $93^{\circ}19'$. Station and reference marks are stamped "Becks 1916 B.M. 1920." Elevation of station is 67.031 meters (219.918 feet). In 1933 the reference mark was reported destroyed.

Palestine (St. Francis County, J. S. Bilby, 1916; 1933).—On right-of-way of Chicago, Rock Island & Pacific Railway, about 870 meters (2,854 feet) west of Palestine railway station, 6.15 meters (20.18 feet) north of north rail of main track, 5.20 meters (17.1 feet) south of north fence line of right-of-way, and 12.89 meters (42.3 feet) east of switch stand at west end of passing track. Surface and underground marks are standard station disks in concrete, notes 1a and 7a. Standard reference disk in concrete, note 11a, is 0.6 meter (2 feet) north of south fence line of right-of-way, and 19.195 meters (62.98 feet) from station in azimuth $348^{\circ}37'$. Station and reference marks are stamped with name and dates "1916-1920." In 1933 station and reference marks were reported destroyed.

Moon (St. Francis County, J. S. Bilby, 1916; 1930).—On right-of-way of Chicago, Rock Island & Pacific Railway, just east of Moon Lake, 9.41 meters (30.9 feet) north of north rail of main track, 3.21 meters (10.5 feet) south of north fence line of right-of-way, 22.00 meters (72.2 feet) east of milepost 55, and 90 meters (295 feet) west of private road which crosses track and leads to J. H. Stevens' house. Surface and underground marks are standard station disks in concrete, notes 1a and 7a. Standard reference disk in concrete, note 11a, is 0.5 meter (1.6 feet) north of south fence line of right-of-way, and 22.343 meters (73.30 feet) from station in azimuth $340^{\circ}10'$. Station and reference mark are stamped "Moon 1916 B.M. 1920." Elevation of station is 64.305 meters (210.974 feet). Reference mark was not found when station was recovered in 1930.

Goodwin (St. Francis County, J. S. Bilby, 1916; 1933).—On right-of-way of Chicago, Rock Island & Pacific Railway, about $1\frac{1}{2}$ miles east of Goodwin railway station, 6.98 meters (22.9 feet) south of south rail of main track, 70 meters (230 feet) east of public-road crossing, and 26.9 meters (88 feet) south-east of fifteenth telegraph pole west of fifty-seventh milepost. Surface and underground marks are standard station disks in concrete, notes 1a and 7a. Standard reference disk in concrete, note 11 a, is 0.5 meter (1.6 feet) north of south fence line of right-of-way, and 21.195 meters (69.54 feet) from station in azimuth $340^{\circ}10'$. Station and reference marks are stamped with name and dates "1916-1920." In 1933 station disk was reported broken off; stem was still in drill hole. Reference mark was not found when station was recovered in 1930, and it has been reported to have been destroyed. Elevation of station is 63.602 meters (208.963 feet).

Blossom (St. Francis County, J. S. Bilby, 1916; 1933).—On right-of-way of Chicago, Rock Island & Pacific Railway, at Blossom railway station, 8.36 meters (27.4 feet) north of north rail of main track, 65 meters (213 feet) west of switch stand at east end of side track, 40 meters (131 feet) east of public-road crossing, and 11.73 meters (38.5 feet) west of station board. Surface and underground marks are standard station disks in concrete, notes 1a and 7a. Standard reference disk in concrete, note 11a, is 0.6 meter (2 feet) south of north fence line of right-of-way and 20.341 meters (66.74 feet) from station in azimuth $158^{\circ}25'$. Station and reference marks are stamped "Blossom B.M. 1916-1920." Elevation of station is 63.270 meters (207.578 feet). In 1933 reference mark was reported destroyed.

Wheatley (St. Francis County, J. S. Bilby, 1916; 1933).—On right-of-way of Chicago, Rock Island & Pacific Railway, 2 miles east of Wheatley railway station, 22.75 meters (74.6 feet) north of south fence line of right-of-way, 5.66

meters (18.56 feet) south of south rail of main track, 25.00 meters (82.0 feet) southwest of milepost 63, and 40 meters (131 feet) east of private road crossing at Wm. Fisher's house. Surface and underground marks are standard station disks in concrete, notes 1a and 7a. Standard reference disk in concrete, note 11a, is 5.05 meters (16.6 feet) north of south fence line of right-of-way, 10 meters (33 feet) east of middle of private road, and 31.872 meters (104.57 feet) from station in azimuth $36^{\circ}38'$. Station and reference marks are stamped "Wheatley B.M. 1916-1920." Elevation of station is 63.725 meters (209.071 feet); elevation of reference mark is 63.519 meters (208.395 feet). In 1933 it was reported that the station mark was loose in the ground and had probably been disturbed.

Junction (Monroe County, J. S. Bilby, 1916; 1933).—On right-of-way of Chicago, Rock Island & Pacific Railway, about 2 miles east of Brinkley railway station, 180 meters (591 feet) east of private road crossing at Carol Bledsoe's house, 8.36 meters (27.4 feet) north of north rail of track, and 5.16 meters (16.9 feet) southwest of second telegraph pole west of sixty-seventh milepost. Surface and underground marks are standard station disks in concrete, notes 1a and 7a. Standard reference disk in concrete, note 11a, is 0.4 meter (1 foot) south of north fence line of right-of-way and 10.015 meters (32.86 feet) from station in azimuth $143^{\circ}49'$. Station and reference marks are stamped "Junction B.M. 1916-1920." Elevation of station is 58.358 meters (191.463 feet). In 1933 reference mark was reported destroyed.

Brinkley (Monroe County, J. S. Bilby, 1916; 1930).—In town of Brinkley, at corner of Main and Cypress Streets, on right-of-way of Chicago, Rock Island & Pacific Railway, 5.25 meters (17.2 feet) south of south rail of main track, and 3.98 meters (13.1 feet) east of east edge of cement sidewalk on east side of Main Street. Surface and underground marks are standard station disks in concrete, notes 1a and 7a. Standard reference disk in concrete, note 11a, is 1.5 meters (5 feet) east of east edge of cement sidewalk on east side of Main Street, and 21.144 meters (69.37 feet) from station in azimuth $173^{\circ}48'$. Station and reference marks are stamped "Brinkley B.M. 1916-1920." Elevation of station is 63.257 meters (207.536 feet). Reference mark is reported destroyed.

Eden (Monroe County, J. S. Bilby, 1916; 1933).—On right-of-way of Chicago, Rock Island & Pacific Railway, about 2 miles west of Brinkley railway station, 240 meters (787 feet) east of public road crossing at Alfred Hunt's house, 103 meters (338 feet) west of railway bridge no. 719, 4.28 meters (14.0 feet) south of south rail of main track, and 20.3 meters (67 feet) south of fence line of right-of-way. Surface and underground marks are standard station disks in concrete, notes 1a and 7a. Standard reference disk in concrete, note 11a, is 1 meter (3 feet) south of north fence line of right-of-way, and 19.334 meters (63.43 feet) from station in azimuth $165^{\circ}46'$. Station is stamped with name and dates "1916-1920." Reference mark is stamped "Eden 1916 B.M. 1920." Its elevation is 57.042 meters (187.145 feet). In 1933 it was reported station mark is probably covered by hand-car set-off.

Brasfield (Prairie County, J. S. Bilby, 1916; 1920).—On right-of-way of Chicago, Rock Island & Pacific Railway, at first curve about 0.2 mile west of Brasfield railway station, 23.0 meters (75 feet) west of seventh telegraph pole north of track from depot, 7.02 meters (23.0 feet) south of north fence line of right-of-way, and 6.57 meters (21.6 feet) north of north rail of main track, at intersection of prolongation of eastward tangent to curve of north rail of main track and prolongation of westward tangent to curve of south rail, about 130 meters (427 feet) west of eastward point of tangency and 150 meters (492 feet) east of westward point of tangency. Surface and underground marks are standard station disks in concrete, notes 1a and 7a. Standard reference disk in concrete, note 11a, is 0.5 meter (1.6 feet) south of north fence line of right-of-way, 2.1 meters (7 feet) below station, and 7.580 meters (24.87 feet) distant in azimuth $123^{\circ}33'$. Station and reference marks are stamped "Brasfield 1916 B.M. 1920." Elevation of station is 57.946 meters (190.111 feet).

Biscoe (Prairie County, J. S. Bilby, 1916; 1933).—Near right-of-way of Chicago, Rock Island & Pacific Railway, at east end of first curve about 2 miles west of Biscoe railway station, about 12 meters (39 feet) north of north fence line of right-of-way, 25.50 meters (83.7 feet) north of north rail of main track, on prolongation of eastward tangent to curve of south rail, and about 300

meters (984 feet) west of point of tangency. Surface and underground marks are standard station disks in concrete, notes 1a and 7a. Standard reference disk in concrete, note 11a, is 2 meters (7 feet) south of north fence line of right-of-way, and 16.540 meters (54.26 feet) from station in azimuth $282^{\circ}30'$. Station and reference marks are stamped with name and dates "1916-1920." In 1933 station mark was reported destroyed.

Tank (Prairie County, J. S. Bilby, 1916; 1920).—Twenty-one meters (69 feet) south of south fence line of right-of-way of Chicago, Rock Island & Pacific Railway, 1.5 miles east of De Valls Bluff railway station, 36.08 meters (118.4 feet) south of south rail of main track, on prolongation of eastward tangent to curve of north rail of main track, and about 170 meters (558 feet) west of point of tangency. Surface and underground marks are standard station disks in concrete, notes 1a and 7a. Standard reference disk in concrete, note 11a, is 0.3 meter (1 foot) north of south fence line of right-of-way, and 21.681 meters (71.13 feet) from station in azimuth $135^{\circ}32'$. Drill hole in concrete base of southeast pier of railway water tank is 58.210 meters (190.98 feet) from station in azimuth $82^{\circ}27'$. Station and reference marks are stamped "Tank 1916 B.M. 1920." Elevation of station is 55.983 meters (183.671 feet).

Odum (Prairie County, J. S. Bilby, 1916; 1920).—On right-of-way of Chicago, Rock Island & Pacific Railway, at west end of first curve about 2 miles west of Biscoe railway station, 75.4 meters (247 feet) south of Dr. Odum's tenant house, 160 meters (525 feet) east of railway bridge no. 842, 6.25 meters (20.5 feet) south of north fence line of right-of-way, and 8.02 meters (26.3 feet) north of north rail of main track, on prolongation of westward tangent to curve of north rail and about 110 meters (361 feet) east of point of tangency. Surface and underground marks are standard station disks in concrete, notes 1a and 7a. Standard reference disk in concrete, note 11a, is 0.5 meter (2 feet) north of south fence line of right-of-way, and 23.810 meters (78.12 feet) from station in azimuth $308^{\circ}11'$. Station and reference marks are stamped "Odum 1916 B.M. 1920." Elevation of station is 56.273 meters (184.622 feet).

Bridge (Prairie County, J. S. Bilby, 1916; 1920).—On trestle which forms east approach to steel bridge of Chicago, Rock Island & Pacific Railway, 1 mile east of De Valls Bluff railway station, on prolongation of westward tangent to curve of south rail of main track, on south end of cap of thirty-first bent of trestle from east abutment of bridge, 1.52 meters (5.0 feet) south of south rail, and 0.98 meter (3.2 feet) below it. Marked by a twentypenny nail in center of triangle of eightpenny nails driven in cap.

River (Prairie County, J. S. Bilby, 1916; 1920).—On trestle which forms west approach to steel bridge of Chicago, Rock Island & Pacific Railway across White River, 1 mile east of De Valls Bluff railway station, on prolongation of eastward tangent to curve of south rail, on north end of cap of thirty-sixth bent of trestle from west abutment of bridge, 1.71 meters (5.6 feet) north of north rail of main track, and 1 meter (3 feet) below it. Marked by a twentypenny nail in center of triangle of eightpenny nails driven in cap.

White (Prairie County, J. S. Bilby, 1916; 1933).—About 1.25 meters (4.1 feet) north of north fence line of right-of-way of Chicago, Rock Island & Pacific Railway, at second curve about 1,200 meters (3,937 feet) east of De Valls Bluff railway station, on east slope of small hill north of tracks, 16.90 meters (55.4 feet) north of north rail of main track, and about 1.2 meters (4 feet) above rail. Surface and underground marks are standard station disks in concrete, notes 1a and 7a. Standard reference disk in concrete, note 11a, is 0.4 meter (1 foot) south of north fence line of right-of-way, and 14.385 meters (47.19 feet) from station in azimuth $44^{\circ}47'$. Station and reference marks are stamped "White 1916 B.M. 1920." Elevation of station is 58.251 meters (191.112 feet). In 1933 reference mark was reported destroyed.

De Vall (Prairie County, J. S. Bilby, 1916; 1929).—In village of De Valls Bluff, on right-of-way of Chicago, Rock Island & Pacific Railway, on east end of hill south of depot. Surface and underground marks are standard station disks in concrete, notes 1a and 7a. Standard reference disk in concrete, note 11a, is on same hill, 19.902 meters (65.30 feet) from station in azimuth $176^{\circ}05'$. Following distances and azimuths were from station: Semaphore pole at depot, about 70 meters (230 feet), $162^{\circ}40'$; northwest corner of lighting plant, De Valls Bluff, 11.16 meters (36.6 feet), $323^{\circ}27'$; and center of well pipe under center of lighting plant water tank, 12.91 meters (42.4 feet), $36^{\circ}51'$. Station and reference marks are stamped with name and dates "1916-1920." In 1929 it was

reported that hill behind the electric-light plant had been cut away, and station and reference marks destroyed.

Bluff (Prairie County, J. S. Bilby, 1916; 1933).—On right-of-way of Chicago, Rock Island & Pacific Railway, 4.7 meters (15 feet) south from south edge of cut on north side of hill, about 0.6 mile west of De Valls Bluff railway station, about 40 meters (131 feet) east of yard limit board, 80 meters (262 feet) east of concrete culvert which passes under tracks, 1.88 meters (6.2 feet) north of south fence line of right-of-way, 15.07 meters (49.4 feet) south of south rail of main track, and about 3.4 meters (11 feet) above rail. Surface and underground marks are standard station disks in concrete, notes 1a and 7a. Standard reference disk in concrete note 11a, is about 0.7 meter (2 feet) north of south fence line of right-of-way, and 27.265 meters (89.45 feet) from station in azimuth $82^{\circ}45'$. Station and reference marks are stamped "Bluff 1916 B.M. 1920." Elevation of station is 64.698 meters (212.263 feet). In 1933 it was reported reference mark had been destroyed.

Mesa (Prairie County, J. S. Bilby, 1916; 1933).—On right-of-way of Chicago, Rock Island & Pacific Railway, at first curve about 0.5 mile east of Mesa railway station, 145 meters (476 feet) east of switch stand at extreme east end of railway yards, 18.94 meters (62.1 feet) south of south rail of main track, on prolongation of westward tangent to curve of south rail of main track, and about 240 meters (787 feet) east of point where curve begins. Surface and underground marks are standard station disks in concrete, notes 1a and 7a. Standard reference disk in concrete, note 11a, is 0.5 meter (1.6 feet) north of south fence line of right-of-way, and 14.622 meters (47.97 feet) from station in azimuth $29^{\circ}52'$. Brick foundation pier of southeast corner of Mr. Henderman's house is 61.70 meters (202.4 feet) from station in azimuth $160^{\circ}42'$. In 1920 it was reported that brick foundation pier had been destroyed. Station and reference marks are stamped "Mesa 1916 B.M. 1920." Elevation of station is 67.990 meters (223.064 feet). In 1933 it was reported reference mark had been destroyed.

Weckerle (Prairie County, J. S. Bilby, 1916; 1933).—On right-of-way of Chicago, Rock Island & Pacific Railway, at first curve 2.5 miles west of Mesa railway station, 47 meters (154 feet) west of center line of public road which crosses tracks at curve, 7.17 meters (23.5 feet) south of south rail of main track, on prolongation of eastward tangent to curve of south rail, 6.97 meters (22.9 feet) south of prolongation of westward tangent to curve of same rail, and 33.60 meters (110.2 feet) from southwest corner of concrete abutment of cattle guard on west side of public road. Surface and underground marks are standard station disks in concrete, notes 1a and 7a. Standard reference disk in concrete, note 11a, is 0.5 meter (1.6 feet) north of south fence line of right-of-way, 0.5 meter (1.6 feet) west of west fence line of public road, and 35.150 meters (115.32 feet) from station in azimuth $281^{\circ}37'$. Station and reference marks are stamped "Weckerle 1916, B.M. 1920." Elevation of station is 70.050 meters (229.822 feet). In 1933 reference mark was reported destroyed.

Hazen (Prairie County, J. S. Bilby, 1916; 1920).—On right-of-way of Chicago, Rock Island & Pacific Railway, 43.6 meters (143 feet) west of mile board west of Hazen railway station, and 5.053 meters (16.58 feet) north of north rail of main track. Surface and underground marks are standard station disks in concrete, notes 1a and 7a. Standard reference disk in concrete, note 11a, is 9.328 meters (30.60 feet) from station in azimuth $175^{\circ}05'$. Station and reference marks are stamped "Hazen 1916 B.M. 1920." Elevation of station is 70.686 meters (231.909 feet); of reference mark, 70.398 meters (230.964 feet).

Cuneo (Prairie County, J. S. Bilby, 1916; 1920).—On right-of-way of Chicago, Rock Island & Pacific Railway, about 675 meters (2,215 feet) east of mile board west of Cuneo railway station, 15 meters (49 feet) west of iron whistling post, and 9.00 meters (29.5 feet) north of north rail of main track. Surface and underground marks are standard station disks in concrete, notes 1a and 7a. Upper mark is stamped "Cuneo B.M." Standard reference disk in concrete, note 11a, marked "B.M.", is on north fence line of right-of-way, 20.010 meters (65.65 feet) from station in azimuth $185^{\circ}53'$. In 1920 station and reference mark were stamped with dates "1916-1920", and name added to reference mark. Elevation of station is 72.105 meters (236.564 feet); of reference mark 72.195 meters (236.860 feet).

Prairie (Prairie County, J. S. Bilby, 1916; 1920).—On right-of-way of Chicago, Rock Island & Pacific Railway, 250 meters (820 feet) east of mile board east of Prairie Center railway station, and 9.23 meters (30.3 feet) north of

north rail of main track. Surface and underground marks are standard station disks in concrete, notes 1a and 7a, stamped with name "Prairie." Standard reference disk in concrete, marked "B.M." is on north fence line of right-of-way, 20.830 meters (68.34 feet) from station in azimuth $181^{\circ}04'$. In 1920 station and reference mark were stamped with dates "1916-1920", and name added to reference mark. Elevation of station is 73.071 meters (239.734 feet); of reference mark, 72.475 meters (237.778 feet).

Carlisle (Lonoke County, J. S. Bilby, 1916; 1934).—On right-of-way of Chicago, Rock Island & Pacific Railway, at first public road crossing about 0.75 mile east of Carlisle railway station, 4.55 meters (14.9 feet) south of south rail of main track, and 11.00 meters (36.1 feet) east of east fence line of public road. To reach from Carlisle, go east on United States Route 70 about $\frac{3}{4}$ mile to Peterson's warehouse and station north of warehouse. Surface and underground marks are standard station disks in concrete, notes 1a and 7a, stamped "Carlisle." Standard reference disk in concrete, note 11a, marked "B.M.", is 0.5 meter (1.6 feet) north of south fence line of right-of-way, 9.13 meters (30.0 feet) east of east fence of public road, and 9.800 meters (32.35 feet) from station in azimuth $20^{\circ}04'$. Station mark is stamped with dates "1916-1920." Elevation of station is 71.631 meters (235.009 feet); of reference mark, 71.310 meters (233.956 feet). Reference mark was not recovered, and in 1933 it was reported that it had been destroyed by construction of warehouse and loading track along south side of main-line track. In 1934 the station mark was found as described and in good condition, but the bank is gradually leaving it exposed, which will probably render it useless unless dirt is filled in around the north side. It is 4.54 meters (14.9 feet) south of the south rail of the Chicago, Rock Island & Pacific Railway, 1.95 meters (6.4 feet) north of the fence line, and 29.88 meters (98.02 feet) south of triangulation station *Lonoke east base*, which is on a new arc of triangulation not included in this publication.

McCreanor (Lonoke County, J. S. Bilby, 1916; 1933).—On right-of-way of Chicago, Rock Island & Pacific Railway, at railway station McCreanor, 24.70 meters (81.0 feet) east of station board, 6.63 meters (21.9 feet) north of north rail of main track, and 68.60 meters (225.1 feet) east of switch stand at west end of passing track. To reach from Lonoke, go east on United States Route 70, 5.4 miles to dirt T-road north, thence northeast on T-road 0.5 miles to station. Surface and underground marks are standard station disks in concrete, notes 1a and 7a. In 1933 it was reported that earth had eroded slightly away from one side of mark. Station was recovered in 1920, and stamped with name and dates "1916-1920." Elevation of station is 70.081 meters (229.924 feet).

Sisemore (Lonoke County, J. S. Bilby, 1916; 1933).—On right-of-way of Chicago, Rock Island & Pacific Railway, 1,157 meters (3,796 feet) east of station board at Sisemore railway station, 55.30 meters (181.4 feet) west of private road which crosses tracks and leads to Grover Hick's house, and 8.23 meters (27.0 feet) north of north rail. To reach from Lonoke, go east on United States Route 70, 3.0 miles to T-road north, and north on T-road 50 yards to railway crossing, thence east along track 0.5 mile to station. Surface and underground marks are standard station disks in concrete, notes 1a and 7a. Standard reference disk in concrete, note 11a, is on railway fence line north of tracks, and 6.995 meters (22.95 feet) from station in azimuth $163^{\circ}41'$. Southeast corner of base of brick chimney on east end of Grover Hick's house is 78.43 meters (257.3 feet) from station in azimuth $144^{\circ}21'$. In 1929 it was reported that station mark had been moved, and that railway had made larger cut leaving post sticking out of ground and loose. In 1933 it was reported that station mark was found as described, but that earth had eroded from bank exposing station mark for about 18 inches on one side. Reference mark was probably covered by dirt washed over it. Hick's house was no longer in existence. Crossroad which at one time led to his house is still in use. In 1920 dates "1916-1920" were stamped on both station and reference mark and station name was stamped on reference mark. Elevation of station is 71.762 meters (235.439 feet).

Lonoke (Lonoke County, J. S. Bilby, 1916; 1934).—On right-of-way of Chicago, Rock Island & Pacific Railway, in town of Lonoke, 364 meters (1,194 feet) east of railway station, and 5.42 meters (17.8 feet) south of south rail of main track. Surface and underground marks are standard station disks in concrete, notes 1a and 7a. Standard reference disk in concrete, note 11a, marked "Lonoke B.M." is 0.73 meter (2.4 feet) west of southwest corner of

yard fence of R. M. Griffin's house, 0.39 meter (1.3 feet) north of north edge of public sidewalk, and 36.550 meters (119.91 feet) from station in azimuth $182^{\circ}45'$. In 1920 mark was stamped with name and dated "1916-1920." In 1933 both marks were found in good condition about 2 inches below surface. Elevation of station is 73.692 meters (241.771 feet); of reference mark, 73.694 meters (241.778 feet). In 1934 the station was recovered as described and all marks were found in good condition. It is 29.848 meters (97.93 feet) south of triangulation station *Lonoke west base*, which is on a new arc of triangulation not included in this publication.

Daniel (Lonoke County, J. S. Bilby, 1916; 1920).—On right-of-way of Chicago, Rock Island & Pacific Railway, about 2.5 miles west of Lonoke railway station, 12.8 meters (42 feet) west of private road on W. M. Daniels' plantation, 1.95 meters (6.4 feet) north of first telegraph pole west of private road and south of tracks, 9.05 meters (29.7 feet) north of railway fence line south of tracks, and 5.70 meters (18.7 feet) south of south rail. Surface and underground marks are standard station disks in concrete, notes 1a and 7a. Standard reference disk in concrete, note 11a, is on right-of-way about 1 foot north of south fence, 30.8 meters (101 feet) north of northeast corner of W. M. Daniels' tenant house, 5.10 meters (16.7 feet) west of lane gate, and 9.581 meters (31.43 feet) from station in azimuth $335^{\circ}37'$. In 1920 mark was stamped with name and dates "1916-1920." Reference mark was not recovered in 1920 and was probably torn out by travel over old log road which passes over site of mark. Elevation of station is 73.230 meters (240.255 feet). Elevation of reference mark is 73.103 meters (239.839 feet).

Meto (Lonoke County, J. S. Bilby, 1916; 1920).—On right-of-way of Chicago, Rock Island & Pacific Railway, 24 meters (79 feet) west of eighth telegraph pole west of Meto railway station and north of track, 45 paces south of southwest corner of Joe Davis' house, 320 meters (1,050 feet) east of switch stand at west end of passing track, and 3.32 meters (10.9 feet) north of north rail of main track. Surface and underground marks are standard station disks in concrete, notes 1a and 7a. In 1920 mark was stamped with name and dates "1916-1920." Elevation of station is 73.192 meters (240.131 feet).

Kerr (Lonoke County, J. S. Bilby, 1916; 1920).—On right-of-way of Chicago, Rock Island & Pacific Railway, at first curve about 0.9 mile west of Kerr railway station, at intersection of tangents to curve of south rail of track, 2.45 meters (8.0 feet) north of north rail, and about 200 meters (656 feet) east of mile board. Surface and underground marks are standard station disks in concrete, notes 1a and 7a. In 1920 mark was stamped with name and dates "1916-1920." Elevation of station is 74.936 meters (245.853 feet).

Galloway (Pulaski County, J. S. Bilby, 1916; 1920).—On right-of-way of Chicago, Rock Island & Pacific Railway, 45 paces west of twelfth telegraph pole west of Galloway railway station and north of track, 3.92 meters (12.9 feet) north of north rail, and about 200 meters (656 feet) east of switch stand at west end of passing track. Surface and underground marks are standard station disks in concrete, notes 1a and 7a. In 1920 mark was stamped with name and dates "1916-1920." Elevation of station is 76.993 meters (252.601 feet).

Plant (Pulaski County, J. S. Bilby, 1916; 1920).—On right-of-way of Chicago, Rock Island & Pacific Railway, at first curve about 1.6 miles east of railway station Tie Plant, at intersection of tangents to curve of south rail of main track, and 13.64 meters (44.8 feet) north of north rail. Surface and underground marks are standard station disks in concrete, notes 1a and 7a. Drill hole in coping at north end of concrete culvert which passes under tracks southwest of station is 21.697 meters (71.18 feet) from station in azimuth $46^{\circ}06'$. In 1920 mark was stamped with name and dates "1916-1920." Elevation of station is 76.705 meters (251.656 feet). Elevation of drill hole is 76.976 meters (252.545 feet).

Tie (Pulaski County, J. S. Bilby, 1916; 1920).—On right-of-way of Chicago, Rock Island & Pacific Railway, at Tie Plant railway station, 9.41 meters (30.9 feet) north of nearest point of north rail of main track, 13.35 meters (43.8 feet) north of Tie Plant mail crane. Surface and underground marks are standard station disks in concrete, notes 1a and 7a. Following distances and azimuths are from the station: Drill hole in concrete pier at south side base of sewer tank, 23.37 meters (76.7 feet), $135^{\circ}44'$; Tie Plant station board, 26.87 meters (88.2 feet), $32^{\circ}30'$; and mail crane, 13.35 meters (43.8 feet), $336^{\circ}10'$. In 1920 station mark was stamped with name and dates "1916-1920." Elevation of station is 77.926 meters (255.662 feet).

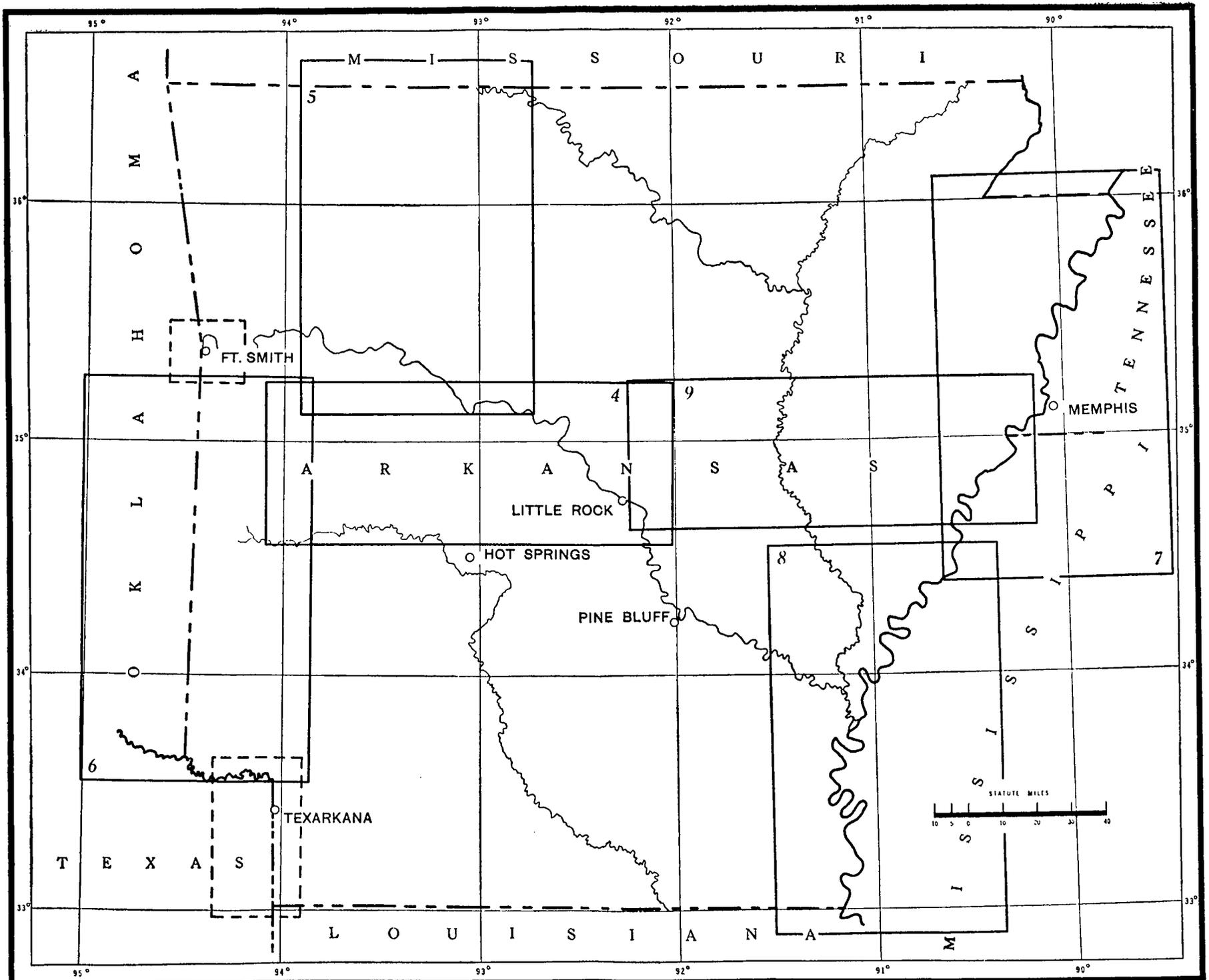


FIGURE 3.—Index map of Arkansas showing areas covered by each of the following sketches, figures 4 to 9.

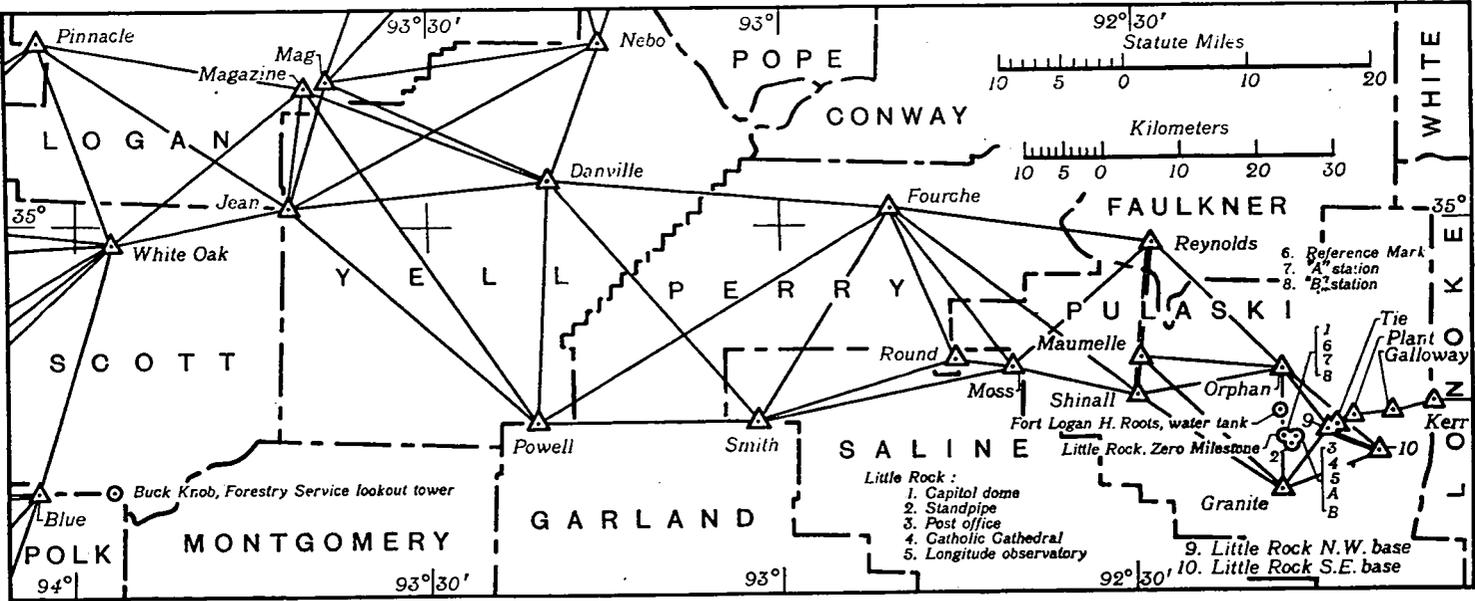


FIGURE 4.—Triangulation, thirty-fifth parallel.

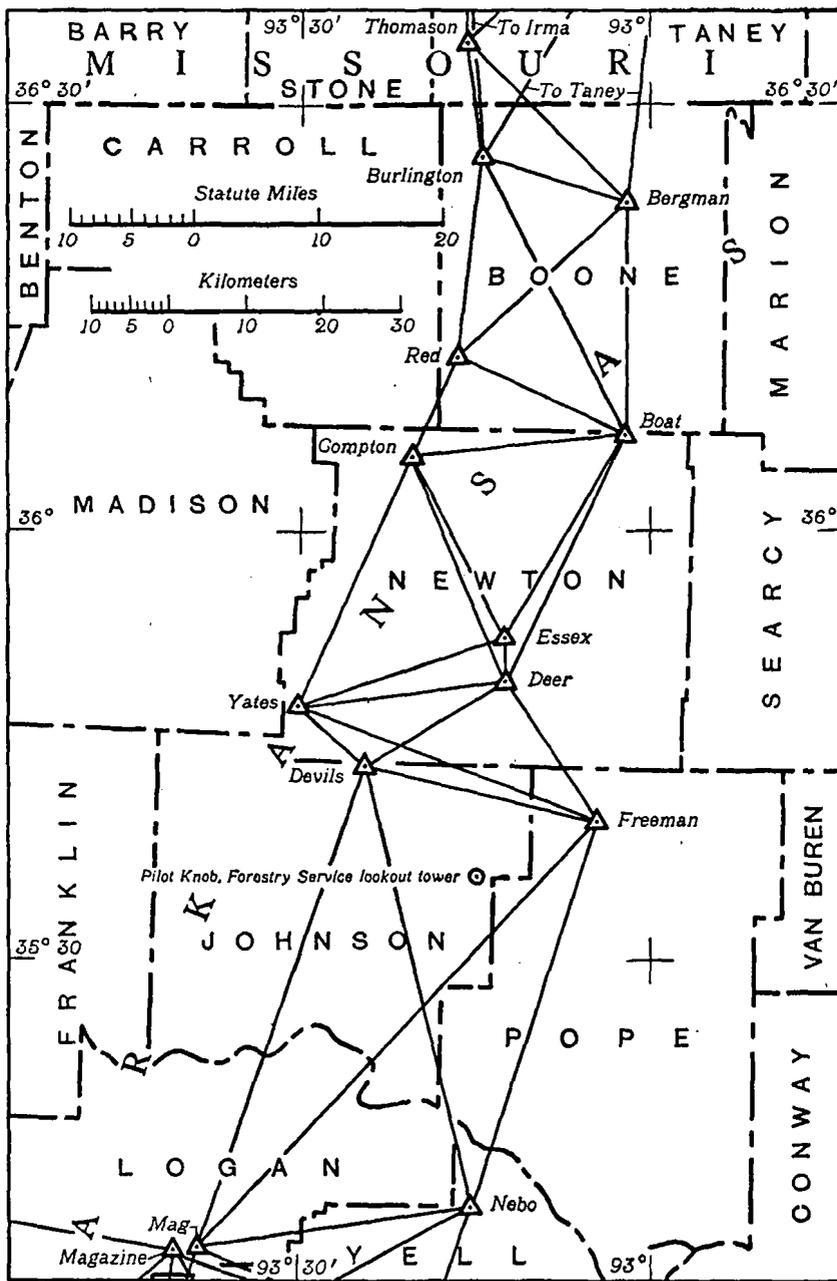


FIGURE 5.—Triangulation, ninety-third meridian.

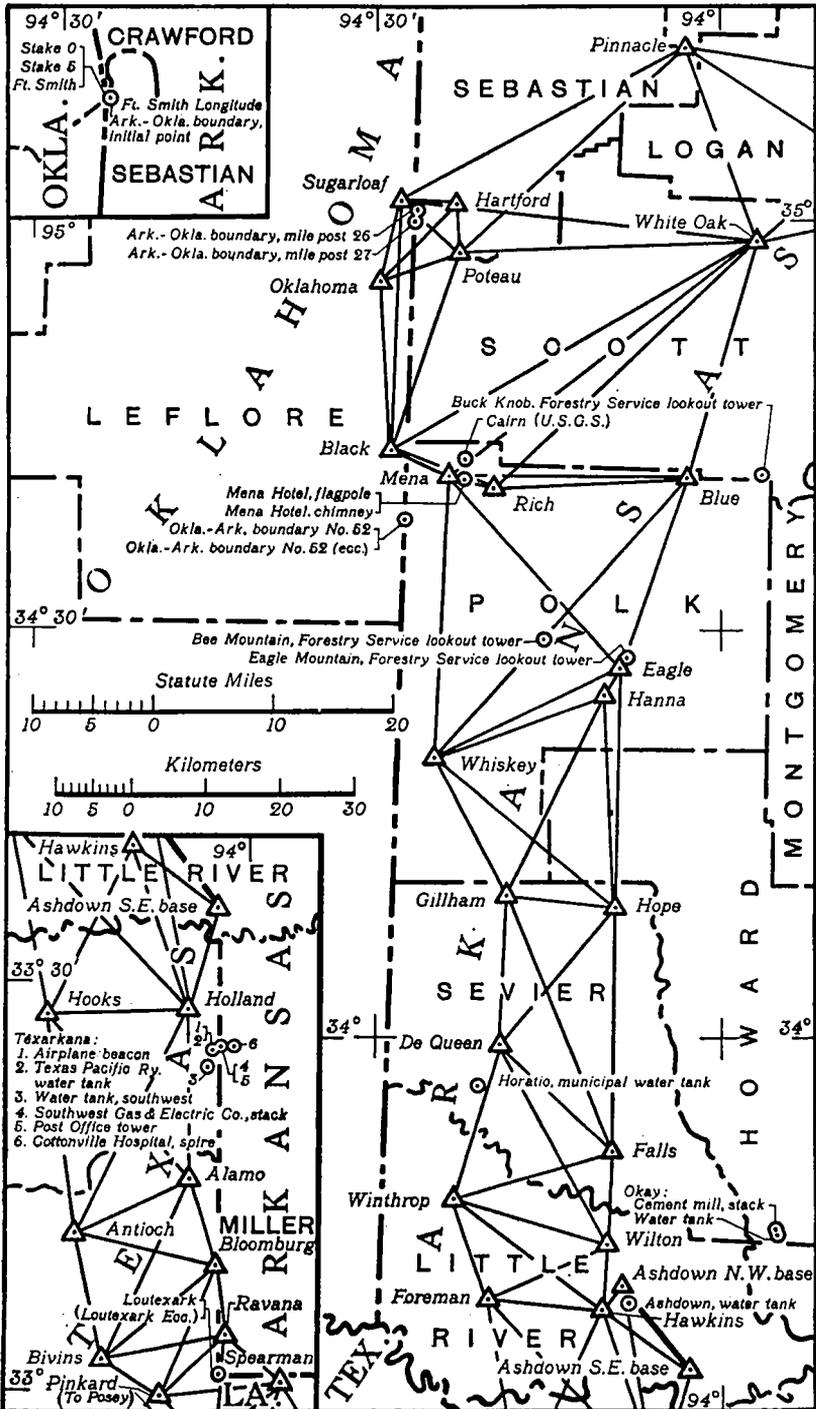


FIGURE 6.—Triangulation, ninety-fourth meridian.

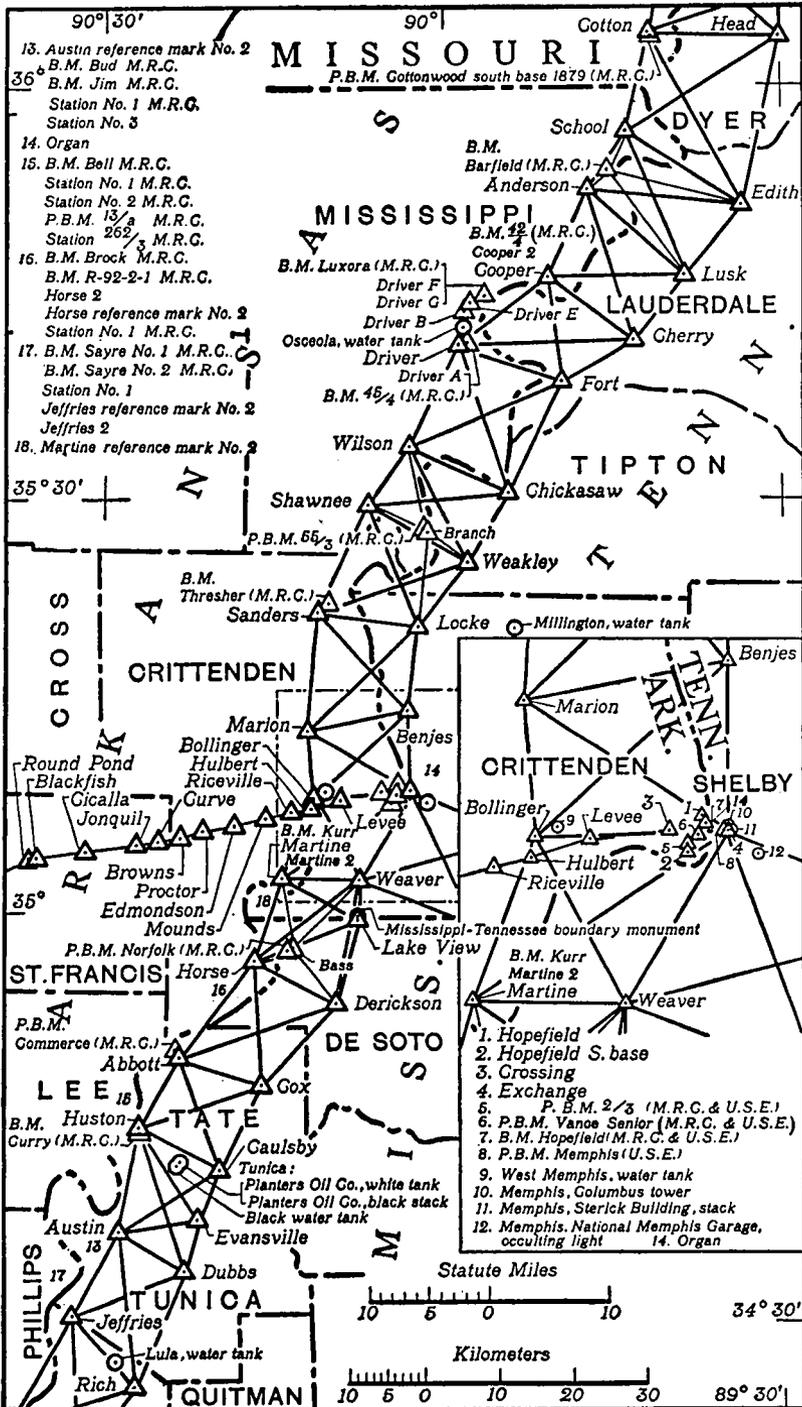


FIGURE 7.—Triangulation, Mississippi River, north section.

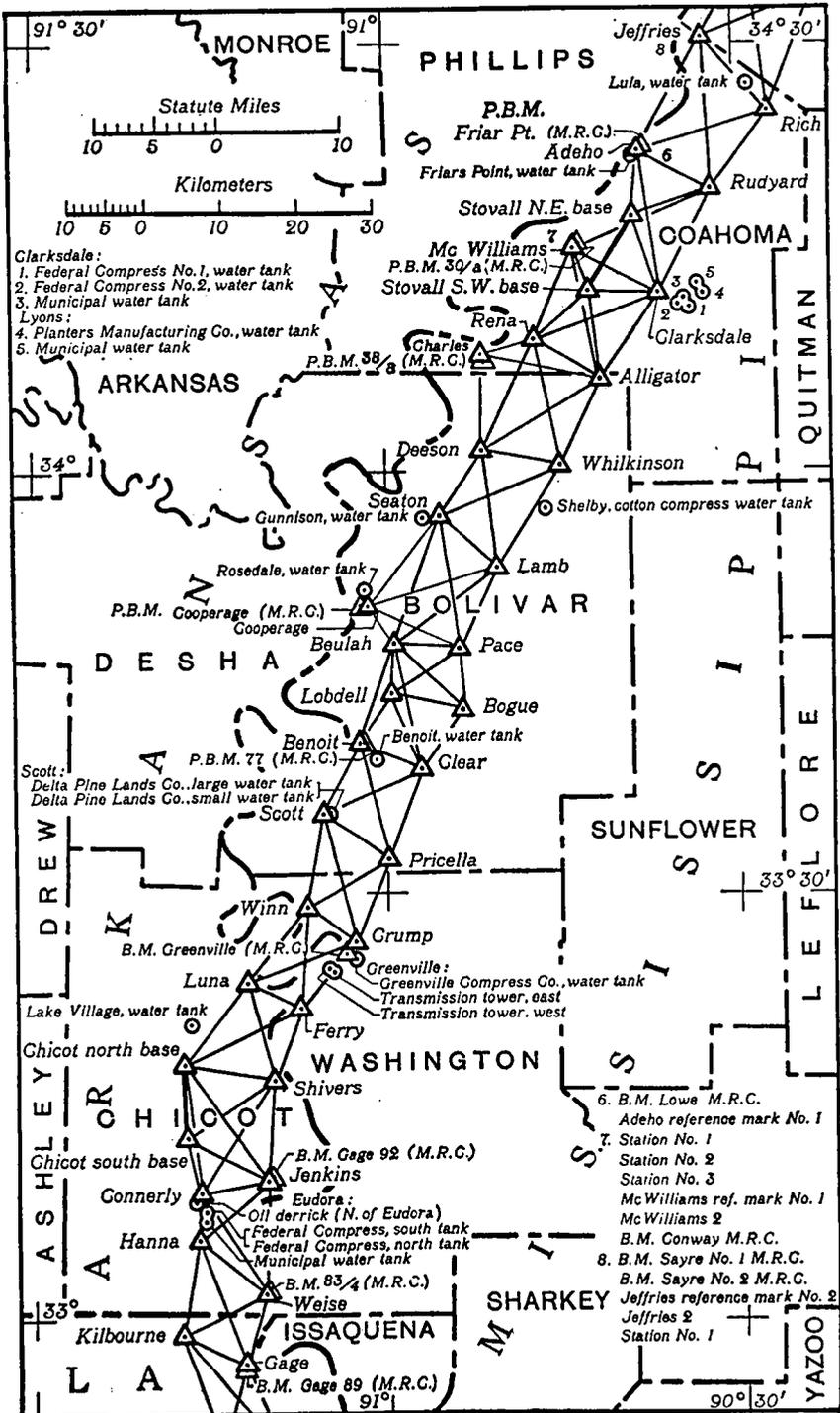


FIGURE 8.—Triangulation, Mississippi River, south section.

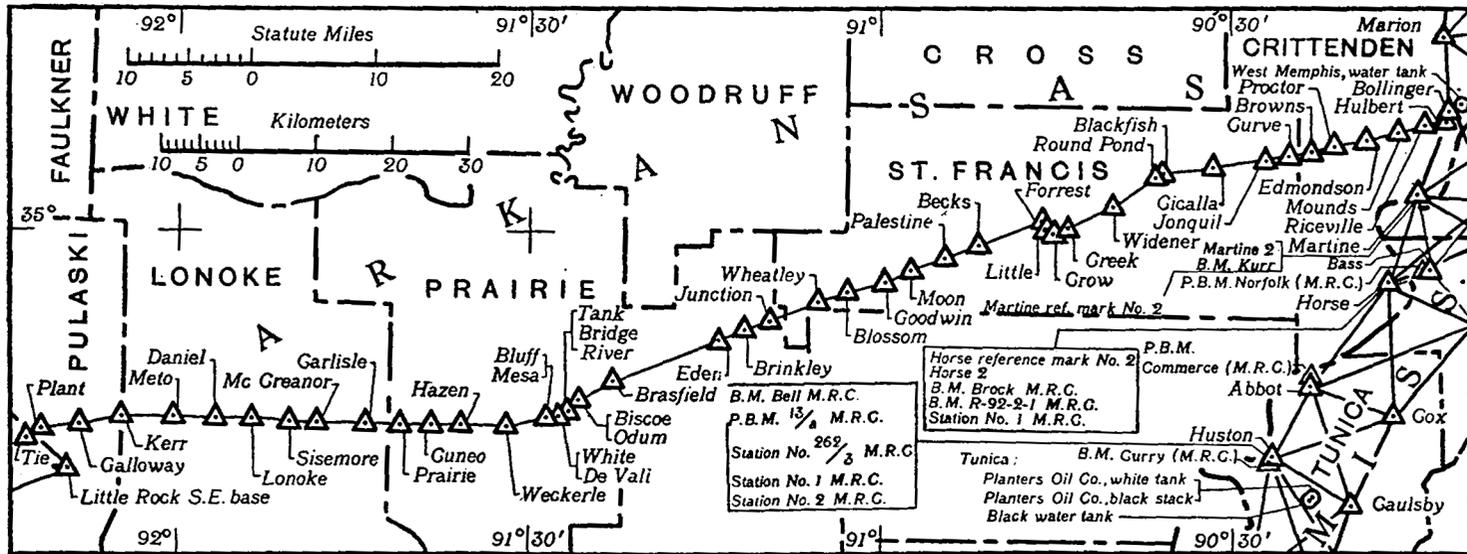


FIGURE 9.—Traverse, Memphis to Little Rock.

INDEX TO POSITIONS, DESCRIPTIONS, ELEVATIONS, AND SKETCHES

Station	Position	Description	Elevation	Sketch	Station	Position	Description	Elevation	Sketch
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Beulah (Miss.).....	25	65		8	Chicot north base.....	23	58		7
Bischoe.....	36	84		9	Chicot north base.....	26	68		8
Bivins (Tex.).....	19	54		6	Chicot south base.....	26	68		8
Black (Okla.).....	13	42	42	6	Cicalla.....	35	81	81	7, 9
Black stack, Planters Oil Co., Tunica (Miss.).....	32			7, 9	Clarksdale (Miss.).....	25	63		8
Blackfish.....	35	81	81	7, 9	Clarksdale:				
Bloomburg (Tex.).....	19	54		6	Federal compress no. 1, water tank (Miss.).....	33			8
Blossom.....	36	83	83	9	Federal compress no. 2, water tank (Miss.).....	33			8
Blue.....	18	50		4, 6	Municipal water tank (Miss.).....	33			8
Bluff.....	37	86	86	0	Clear (Miss.).....	25	66		8
B.M.:					Columbus Tower, flagpole, Memphis (Tenn.).....	32			7
42/4 (M.R.C.).....	29	75		7	Compton.....	17	48		5
45/4 (M.R.C.).....	27	70		7	Concrete stack, cement mill, Okay.....	20			6
83/4 (M.R.C.).....	29	75		8	Concrete stack, Southwest Gas & Electric Co., Texarkana.....	21			6
Barfield (M.R.C.).....	27	70		7	Connerly.....	27	69		8
Bell (M.R.C.) (Miss.).....	30	77		7, 9	Cooper.....	22	57		7
Brook (M.R.C.).....	30	70		7, 9	Cooper 2.....	29	75		7
Bud (M.R.C.) (Miss.).....	31	77		7	Cooperage (Miss.).....	29	74		8
Conway (M.R.C.) (Miss.).....	32	70		8	Cotton (Mo.).....	22	55		7
Curry (M.R.C.) (Miss.).....	29	73		7, 9	Cottonville Hospital spire, Texarkana.....	21			6
Gage 89 (M.R.C.) (La.).....	29	75		8					
Gage 92 (M.R.C.).....	29	74		8					
Greenville (M.R.C.) (Miss.).....	29	74		8					
Hopfield (M.R.C. & U.S.E.).....	28	71		7					
Jim (M.R.C.) (Miss.).....	31	77		7					

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Creek	35	82	82	9	Hazen	37	86	86	9
Crossing	35	79		7	Head (Tenn.)	22	56		7
Crow	36	82	82	9	Holland (Tex.)	19	52		6
Crump (Miss.)	26	67		8	Hooks (Tex.)	19	53		6
Cuneo	37	86	86	0	Hope	18	51		6
Curve	35	81	81	7, 9	Hopefield	27	70	70	7
					Hopefield south base	28	71		7
Daniel	37	88	88	9	Horatio, municipal water tank	20			6
Danville	13	41	41	4	Horse	23	60		7, 9
De Queen	18	51		6	Horse 2	30	76		7, 9
De Vall	37	85		9	Horse reference mark no. 2	30	76		7, 9
Deer	17	49	49	5	Hulbert	35	79		7, 9
Deeson (Miss.)	25	64		8	Huston (Miss.)	24	61		7, 9
Derickson (Miss.)	23	61		7					
Devils	17	49		5	Irma (Mo.)	16	47		5
Driver	22	57		7					
Driver A	27			7	Jean	13	41	41	4
Driver B	27			7	Jeffries (Miss.)	24	63	63	7, 8
Driver E	27			7	Jeffries 2 (Miss.)	31	78		7, 8
Driver F	27			7	Jeffries reference mark no. 2 (Miss.)	31	77	77	7, 8
Driver G	27			7	Jenkins	26	68		8
Dubbs (Miss.)	24	62		7	Jonquil	35	81	81	7, 9
					Junction	36	84	84	9
Eagle	18	50		6	Kerr	38	88	88	4, 9
Eagle Mountain, U.S. Forest Service lookout tower	20			6	Kilbourne (La.)	27	69		8
East Chmney, Mena Hotel	20			6					
Eden	38	84	84	9	Lake View (Miss.)	23	60		7
Edith (Tenn.)	22	56		7	Lake Village, water tank	34			8
Edmondson	35	80	80	7, 9	Lamb (Miss.)	25	65		8
Essex	17	48		5	Lovee	35	79	79	7
Eudora:					Little	36	82	82	9
Federal Compress Co., north water tank	34			8	Little Rock:				
Federal Compress Co., south water tank	34			8	A	15			4
Municipal water tank	34			8	A station	16	46		4
Oil derrick north of	34			8	B	16			4
Evansville (Miss.)	24	62		7	B station	16			4
Exchange (Tenn.)	23	59		7	Capitol dome, ball on top	15			4
					Catholic Cathedral, cross	15			4
Falls	18	51		6	Longitude	16	40		
Ferry (Miss.)	26	67		8	Longitude observatory pier	15			4
Flagpole, north side Mena Hotel	20			6	Northwest base	14	45	45	4
Foreman	19	52		6	Post-office roof, pole	15			4
Forrest	36	82	83	9	Reference mark	10	46		4
Fort (Tenn.)	22	57		7	Southeast base	14	45	45	4, 9
Fort Logan H. Roots, water tank	15			4	Standpipe	15			4
Fort Smith	15	45	45	0	Zero milestone	16	46	40	4
Fort Smith longitude	15	45		0	Lobdell (Miss.)	25	66		8
Fourche	14	43	43	4	Locke (Tenn.)	23	59		7
Freeman	17	49		5	Longitude, Fort Smith	15	45		6
Friars Point, water tank (Miss.)	33			8	Longitude, Little Rock	16	40		
					Longitude observatory pier, Little Rock	15			4
Gage (La.)	27	69		8	Lonoke	37	87	88	9
Galloway	38	88	88	4, 9	Lookout tower, U.S. Forest Service:				
Gillham	18	51		6	Bee Mountain	20			6
Goodwin	36	83	83	9	Buck Knob	20			4, 6
Granite	14	44	45	4	Eagle Mountain	20			6
Greenville:					Pilot Knob	17			5
East transmission tower (Miss.)	34			8	Loutexark	21	55		6
Greenville Compress Co., water tank (Miss.)	34			8	Loutexark (ecc.) (Tex.)	21	55		6
West transmission tower (Miss.)	34			8	Lula, black water tank, final (Miss.)	33			7, 8
Gunnison, water tank (Miss.)	33			8	Luna	26	67		8
					Lusk (Tenn.)	22	57		7
Hanna (Chicot County)	27	69		8	Lyons:				
Hanna (Polk County)	18	61		6	Municipal water tank (Miss.)	33			8
Hartford	13	43	43	0	Planters Manufacturing Co., water tank (Miss.)	33			8

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McWilliams 2 (Miss.)	32	79		8	(near station Huston)	30			7, 9
McWilliams reference mark no. 1 (Miss.)	31	78		8	Station no. 2 (Miss.)				
Mag	17	49		4, 5	(near station Huston)	30			7, 9
Magazine	13	41	42	4, 5	Station 262/3 (Miss.)	30			7, 9
Marlon	23	59		7, 9	Nebo	17	50		4, 5
Martina	23	60		7, 9	Occulting light				
Martins 2	30	76		7, 9	Memphis Garage, Memphis (Tenn.)	32			7
Martins reference mark no. 2	29			7, 9	Odum	37	85	85	9
Maumelle	14	44	44	4	Oil derrick north of Eudora	34			8
Memphis:					Okay:				
Columbus Tower, flagpole (Tenn.)	32			7	Cement mill, concrete stack	20			6
National Memphis Garage, occulting light, (Tenn.)	32			7	Water tank	21			6
Sterick Building, stack (Tenn.)	32			7	Oklahoma (Okla.)	13	43	43	6
Mena	18	50		6	Oklahoma-Arkansas boundary monument:				
Mena Hotel, east chimney	20			6	Initial point	15	45		6
Mena Hotel, flagpole, north side	20			6	Milepost 20	15	46		6
Mesa	37	86	86	9	Milepost 27	15	46		6
Meto	38	88	88	9	No. 52 (1877)	20	55		6
Millington, water tank (Tenn.)	32			7	No. 52 (ecc.)	20	55		6
Mississippi-Tennessee boundary monument	28	71		7	Organ	35	79		7
Moon	36	83	83	9	Orphan	14	44	44	4
Moss	14	44	44	4	Osceola, water tank	32			7
Mounds	35	80	80	7, 9	Pace (Miss.)	25	65		8
M.R.C. stations:					Palestine	36	83		9
B.M. 42/4	29	75		7	P.B.M. 2/3 (M.R.C. & U.S.E.)	28	71		7
B.M. 45/4	27	70		7	P.B.M. 13/a (M.R.C.) (Miss.)	30	77		7, 9
B.M. 83/4	29	75		8	P.B.M. 30/a (M.R.C.) (Miss.)	31	78		8
B.M. Barfield	27	70		7	P.B.M. 38/a (M.R.C.) (Miss.)	29	73		8
B.M. Bell (Miss.)	30	77		7, 9	P.B.M. 55/3 (M.R.C.)	28	72		7
B.M. Brock	30	76		7, 9	P.B.M. 77 (M.R.C.) (Miss.)	29	74	74	8
B.M. Bud (Miss.)	31	77		7	P.B.M. Commerce (M.R.C.) (Miss.)	20	72	73	7, 9
B.M. Conway (Miss.)	32	79		8	P.B.M. Cooperage (M.R.C.) (Miss.)	29	74		8
B.M. Curry (Miss.)	29	73		7, 9	P.B.M. Cottonwood south base (1879) (M.R.C.) (Mo.)	27	70		7
B.M. Gage 89 (La.)	29	75		8	P.B.M. Friar Point (M.R.C.) (Miss.)	20	73		8
B.M. Gage 92	29	74		8	P.B.M. Memphis (U.S.E.) (Tenn.)	28	71	71	7
B.M. Greenville (Miss.)	29	74		8	P.B.M. Norfolk (M.R.C.) (Miss.)	29	72		7, 9
B.M. Hopefield (U.S.E.)	28	71		7	P.B.M. Vance Senior (M.R.C. & U.S.E.)	28	71		7
B.M. Jim (Miss.)	31	77		7	Pilot Knob, U.S. Forest Service lookout tower	17			5
B.M. Lowe (Miss.)	31	78		8	Pinkard (Tex.)	19	54		6
B.M. Luxora	27	70		7	Pinnacle	13	42	42	4, 6
B.M. R-92-2-1	30	77		7, 9	Plant	38	88	88	4, 9
B.M. Sayre no. 1 (Miss.)	31	78		7, 8	Posey (Tex.)	19	54		6
B.M. Sayre no. 2 (Miss.)	31	77		7, 8	Post office roof, pole, Little Rock	15			4
B.M. Thresher	28	72		7	Poteau	13	42	42	6
P.B.M. 2/3 (U.S.E.)	28	71		7	Powell	13	41	41	4
P.B.M. 13/a (Miss.)	30	77		7, 9	Pratris	37	86	87	9
P.B.M. 30/a (Miss.)	31	78		8	Pricella (Miss.)	26	66		8
P.B.M. 38/a (Miss.)	29	73		8	Proctor	35	80	80	7, 9
P.B.M. 55/3	28	72		8	Ravans	19	54		6
P.B.M. 77 (Miss.)	29	74	74	8	Red	17	48		5
P.B.M. Commerce (Miss.)	29	72	73	7, 9	Reference mark, Little Rock	16	46		4
P.B.M. Cooperage (Miss.)	29	74		8	Rena (Miss.)	25	64		8
P.B.M. Cottonwood south base (1879) (Mo.)	27	70		7	Reynolds	14	44	44	4
P.B.M. Friar Point (Miss.)	29	73		8					
P.B.M. Norfolk (Miss.)	29	72		7, 9					
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Rich (Miss.).....	24	62		7, 8	flat top (Tex.).....	21			6
River.....	37	85		9	Texas Pacific Railway,				
Rosedale, water tank					water tank (Tex.).....	21			6
(Miss.).....	33			8	Thomason (Mo.).....	16	47		5
Round.....	14	43	44	4	Tle.....	38	88	88	4, 9
Round Pond.....	35	81	82	7, 9	Transmission tower, east,				
Rudyard (Miss.).....	24	63		8	Greenville (Miss.).....	34			8
					Transmission tower, west,				
Sanders.....	23	58		7	Greenville (Miss.).....	34			8
School.....	22	56		7	Tunica:				
Scott (Miss.).....	26	66		8	Black water tank				
Scott:					(Miss.).....	32			7, 9
Delta Pine Lands Co.,					Planters Oil Co., black				
final of larger of two					stack (Miss.).....	32			7, 9
water tanks (Miss.).....	33			8	Planters Oil Co., white				
Delta Pine Lands Co.,					tank (Miss.).....	33			7, 9
small water tank									
(Miss.).....	34			8	U. S. E. stations:				
Seaton (Miss.).....	25	65		8	B. M. Hopefield (M.				
Shawnee.....	23	58		7	R. C.).....	28	71		7
Shelby, cotton compress,					B. M. Kurr.....	30	76		7
water tank (Miss.).....	33			8	P. B. M. 33 (M. R. C.).....	28	71		7
Shinal.....	14	44	44	4	P. B. M. Memphis				
Shivers.....	26	67		8	(Tenn.).....	28	71	71	7
Sisemore.....	37	87	87	9	P. B. M. Vance Senior				
Smith.....	14	43	43	4	(M. R. C.).....	28	71		7
Spearmen (La.).....	19	55		6	Water tank:				
Square brick tower, post					Benoit (Miss.).....	33			8
office, Texarkana (Tex.).....	21			6	Black, final of, Lula				
Stake 0.....	15			6	(Miss.).....	33			7, 8
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station Jeffries).....	31			7, 8	by (Miss.).....	33			8
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(Miss.) (near station					Delta Pine Lands				
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Station no. 3 (Miss.) (near					Municipal, Eudora.....	34			8
station McWilliams).....	31			8	Municipal, Horatio.....	20			6
Station 262/3 (M. R. C.)					Municipal, Lyons				
(Miss.).....	30			7, 9	(Miss.).....	33			8
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Memphis (Tenn.).....	32			7	press Co., Eudora.....	34			8
Stovall, northeast base					Okay.....	21			6
(Miss.).....	24	63		8	Osceola.....	32			7
Stovall, southwest base					Planters Manufactur-				
(Miss.).....	25	61		8	ing Co., Lyons (Miss.).....	33			8
Sugarloaf (Okla.).....	13	42	43	6	Rosedale (Miss.).....	33			8
					Small, Delta Pine				
Taney (Mo.).....	16	46		5	Lands Co., Scott				
Tank.....	37	85	85	9	(Miss.).....	34			8
Tennessee-Mississippi					South, Federal Com-				
boundary monument.....	28	71		7	press Co., Eudora.....	34			8
Texarkana:					Southwest, flat top,				
Airplane beacon (Tex.).....	21			0	Texarkana (Tex.).....	21			6
Cottonville Hospital,					Texas Pacific Railway,				
spire.....	21			6	Texarkana (Tex.).....	21			6
Post office, square brick					West Memphis.....	21			6
tower (Tex.).....	21			0	Weakley (Tenn.).....	32	58		7
Southwest Gas & Elec-					Weaver (Tenn.).....	23	60		7
tric Co., concrete					Weckerle.....	37	86	86	9
stack.....	21			6					

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