

The Combat Board

BY CAPTAIN WALLACE M. GREENE, U.S.M.C.

2d Prize Essay

MOST marines are familiar with the electrically operated spotting board employed aboard ship to teach spotters the fundamentals of their game. Having learned the mechanics of spotting, daily practice on the carefully scaled board keeps a spotter's eye "in" and his brain greased. This in turn means more hits per gun and more "E's" for the battery.

Following a tour of sea duty, I came down from Secondary Aft to go ashore. There I found myself in a howitzer outfit which somehow never seemed to be blessed with the time, space or weather to train.

With the memory of the spotting board still fresh in my mind it was but natural that I should experiment with a marine combat board. And I found one which worked. This combat board was designed originally for the training of a howitzer outfit equipped with 3-inch Stokes Trench Mortar and the 37mm. gun. Later on when I joined a rifle company I modified the board, as I will explain later, to train the company in all sorts of combat problems. As I look at it now from the perspective of several years of experiment the value of the board is amply told by its results. Likewise, its flexibility and possibilities seem limited only by the ingenuity of the operator.

The combat board is a method of training in miniature. That is the kernel of the idea. Well, you may say, what's new about that? How about the sand table and miniature mortar range? What advantages does the combat board possess over these systems? There are several answers. Two of them are exact scale and realism at all times. In addition the cost of a combat board is practically nothing. It can be set up anywhere—quickly—and the board is so flexible in idea and operation that it can be used by any Marine Corps outfit.

For instance, let us put a howitzer outfit and the combat board together with a little yeast of inquisitiveness and watch what happens. The combat board is first laid off on any flat surface such as a portion of ground or basement floor as follows. Please look at Diagram No. 1.

Select point A as marking the line of the observer's position. Sufficient space must be left in the rear of this point for the observer to take the prone position. Sufficient width must be available to mount gun or mortar and for crew to service same. At exactly 1,000 inches from A, lay off point B. Along construction line AB lay off BC, CD, BE, and EF equal to 100 inches. Through B draw construction line perpendicular to AB at B. Along this line on either side of B, lay off increments of 5 mils. (Increment of 5 mils at 1,000 inches, using the scale of 1 inch equals 1 yard, is 5 inches). Lay off similar increments on either side of points C, D, E, and F.

At C (900 yds.) 5 mils equals 4.5 inches.

At D (800 yds.) 5 mils equals 4.0 inches.

At E (1,100 yds.) 5 mils equals 5.5 inches.

At F (1,200 yds.) 5 mils equals 6.0 inches.

This completes the board for the 37mm. gun. Proceed now to lay out markings for the 3-inch Stokes Trench Mortar as follows: The scale for the mortar is 1 inch equals $\frac{1}{2}$ yard. Thus, point B is at the range of 500 yards from the observer at point A. On either side of point B and just above the 37mm. gun scale, lay off small white dots at increments of 1 turn each. (Use the field thumb rule of 1 turn equals 8 yards. Each increment will equal 16 inches at B). Lay off similar increments at points C, D, E, and F. (One turn at any of these ranges will likewise be 8 yards which equals 16 inches). A short runway should be left behind point F for use of the operator of the board. Finish the scales by labelling ranges opposite points B, C, D, E, F and data opposite runway and in front of observers line as shown in Diagram No. 1. Construction lines are not marked or painted in. All letters, figures and marking in rear of point D should be distinct but small so as to be easily legible to the operator of the board but invisible to the prone observer at point A. This completes the scaling of the board. It may be used "as is" or if time and material are available a few terrain features carefully scaled may be constructed and placed on the board. Sand for hills, sponges for trees, toys for tanks, etc., are tricks of the trade all of us are familiar with.

Now in addition to scaling the board a *spotting stick* must be constructed. This consists essentially of a small light at the tip of a pointer. The materials used are a broom stick, flashlight, tape and magnet wire. The flashlight bulb is placed at the tip of the pointer, the flashlight case with contact at the other end. Bulb and switch are connected by magnet wire. The tape holds everything in place. On an outdoor board a light is not necessary. The tip of the pointer is simply painted white.

One other gadget remains to be built. This is the *angle of site reader*. This consists of two upright mil sticks graduated in mils. These sticks are set 1,000 inches apart (using a scale of 1 inch equals 1 yard, this interval is equivalent to 1,000 yards). The observer's station is at the midpoint between the mil sticks, i.e., 500 inches equals 500 yards. Each stick has a scale of mils 0—150 laid out on the side away from the observer (1 mil equals $\frac{1}{2}$ inch since the observer is 500 inches away from each stick). An adjustable white mil marker slides on the mil stick and is visible to the observer.

The board is operated as follows:

(1) Direct Fire—37mm. Gun.

The observer announces, "Ready."

The observer repeats, "Right front. Machine gun. Base of that lone tree."

"Range to target—850. (Note that in this system of training, practice in actual range estimation is given, since distance and objects are to scale and appear as they actually would on the ground).

"2nd. Reference point—House—left of target—20 miles—in front of target—100 yards."

(In firing on stationary targets, the observer is trained



in this system to rapidly select two reference points, one if only one is available, in respect to the target and through binoculars, card or eye to estimate the number of mils to the right or left and the number of yards in front or in rear, each reference point is located in respect to the target. This gives him a vivid mental picture of measurements in the spotting picture before him and enables him to quickly and accurately spot the center of impact onto the target even if the mil scale in binoculars or on range card is lost later during firing.)

"Standby." (Gunner repeats this order of, "Standby," coming from observer.)

"High explosive."

"Zero."

"850."

"Right front. Machine gun at base of lone tree."

"One round."

The gunner repeats the above fire order as it is being given.

The sightsetter repeats, "Zero. 850," and as soon as the sight dials are set announces, "SeT."

No. 1 loads the gun and says, "Ready One."

The gunner lays on the target and orders, "Fire."

No. 1 fires.

(Note. A sightsetter is used at all times on the 37mm. Gun in this training system. On this board and in actual field fire the rate and accuracy of fire is greatly increased by using a sightsetter. This is especially true in fire on a moving target such as an armored car. Observe also the similarity between the service of the 37mm. Gun here and that of the Navy broadside or AA gun.)

The spotting stick operator is standing in the runway behind the board with the spotting stick in hand. He has listened to the observer's fire order and pushes the spotting stick down the board and momentarily flicks on the spotting light to simulate the burst of the shell. Immediately afterwards, he withdraws the stick from the position where the light flashed. As a result, the observer has a momentary flash *only*, which he must spot onto the target. He follows the standard spotting procedure in bringing the point of impact onto the target. The stick can be so operated that the flashing light accurately simulates field conditions pointing out to the observer his errors in range estimation, deflection, estimation of effects of wind, light, time of flight (in case of moving targets) and error of the gunner in firing with his crosswires off the target. The lamp may occasionally be left unlighted even after the stick has been pushed into position, thus simulating a dud or shell burst invisible to the observer which often happens in the field.

Once the point of impact is brought onto the target the observer gives the order, "Five rounds." He is taught to make no spot thereafter unless at least two rounds drift off the target. (This allows for the gunner's error.)

Where room is available, the observer may be moved to a point to the right or left, and fore or aft of the center spotting point and the spotting stick so operated that he will have to calculate offset error.

Having finished his spotting the observer moves to point C (Diagram No. 2). The first sightsetter moves to point A to spot. Corresponding changes are made in the gun crew; each number moves up one place.

It can be seen that each man moves from one position to the next in rotation. All parts and phases of training are continuous; the basic principle of instruction, i.e., the two-man team of instructor and pupil, is employed; all hands are kept active and interested and maximum amount of training in the minimum time is attained. This is of particular value where periods of training are limited and continually interrupted. Once organized, the NCO's run the entire training themselves leaving the officer in charge free to move from point to point to check the operation of the entire system and ability of his men. It will also be found that the operation of the spotting stick teaches each man almost as much about fire control as he learns in the observer's position.

(2) Indirect Fire—37mm. Gun.

In indirect fire the observer takes his position first at point H, Diagram No. 2, where he measures angle of site. This is accomplished as follows. The mil sticks are set 1,000 inches apart. One is designated as the target; the other, the gun. A man is stationed behind each stick to operate the adjustable white marker on the mil scale. The observer takes his position midway between the two mil sticks. The adjustable marker is set at a point on each mil stick. The observer using binoculars, angle of site instrument or mil scale on range card determines the angle of site for the given marker setting. This angle of site is verified by the men operating the mil markers on the mil sticks.

The gun is set up at point F. The gunner is given range to mark and using line M as the crest of the mask, he determines the minimum range which he announces. The small metal pin painted with alternate red and white stripes and set in the top of the wooden aiming stake at point K is so placed in relation to line M as to appear as an aiming stake on a hill crest. This the gunner uses as his aiming point. A realistic indirect fire picture is thus afforded him.

Following his measurement of angle of site the observer moves to point A where he proceeds to spot the indirect fire of his gun. As in direct fire spotting he may be offset from the line of fire and be drilled in computation for this offset error.

This spotting board system is of especial value in training the 37mm. Gun crew for fire on rapidly moving targets. The car (to scale) used on the board is operated by three black threads. (Attach one thread aft and two threads forward on the car.) The rate of movement is scaled to actual ground speed. The observer is afforded training in time of flight calculation. He encounters a type of spotting most probable of contact in the field. The gunner learns how to train on and stay on a moving target and, in case of casualty to his observer, how to secure hits by offsetting his crosswires in respect to the target with last fire data set on his sights.

(3) 3-inch Stokes Trench Mortar.

The training of the mortar crew is similar but much simpler than that of the 37mm. Gun crew.

The mortar is set up in position F, Diagram No. 2. The aiming stake at point K is used as the aiming point for fire. The scale of 1 inch equals $\frac{1}{2}$ yard and the corresponding graduations on the spotting board in yards and turns are employed for spotting practice. The observer

originally takes his position at point A and moves successively to spotting stick operator at point C (Diagram No. 2), arm and hand signals at points D and E, and last to the gun crew at F.

The observer uses the standard spotting doctrine as outlined in the training pamphlets. In the initial ranging fires he fires two rounds and spots the mean point of impact onto

(Continued on page 73)

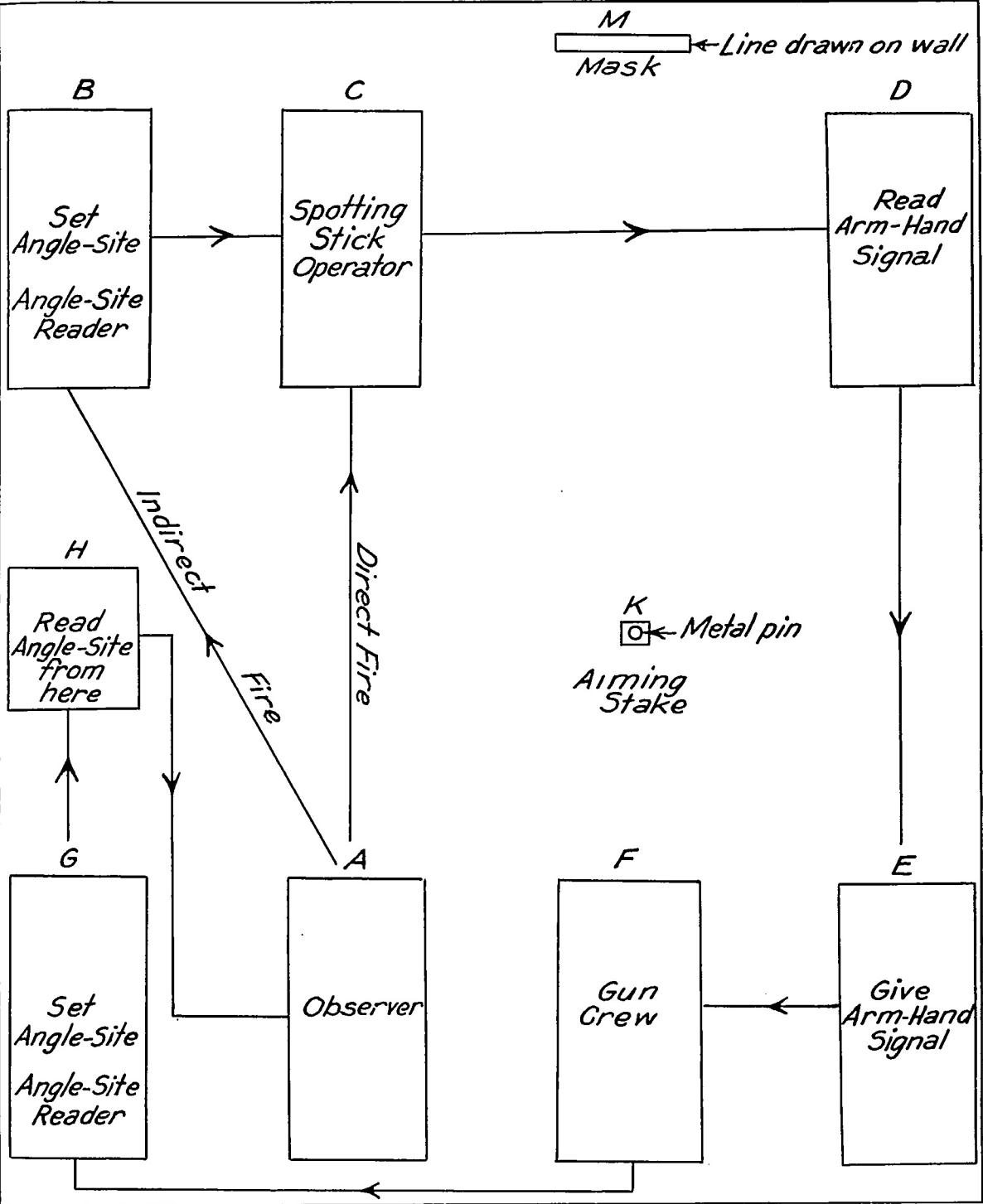


Diagram 2

THE COMBAT BOARD

(Continued from page 21)

the target. Despite the high and erratic dispersion value of Stokes mortar shell this method was found to work better in field firing than the spotting of single rounds. Rapidity of fire and quick changes of firing position are emphasized in mortar training.

The spotting stick serves most realistically to portray the dispersion, wind effect, rapidity of fire value and vulnerability of the mortar and to quickly and thoroughly teach the crew proper spotting control and service of the weapon.

Sufficient sand loaded cases and dummy fuses with pins are made available to simulate actual firing. No. 2 pulls pin and No. 1 carries the shell forward into loading position but, instead of dropping the shell into the barrel, No. 1 swings the shell slightly to his right rear where it is grasped by an extra number and passed quickly back to the rear of the mortar where a pin is replaced and the shell moves forward again to No. 1. No. 1 meanwhile follows through with his simulated loading operation and takes the next shell from No. 2.

After a short time mortar drill usually grows extremely tiresome for the men but when worked in this manner in conjunction with other features of the spotting board, marines remain interested in the work.

Several minor modifications from the drill regulations are made in servicing the mortar. No. 3 is taught to call out cartridge and number of rings on every shell passing forward from his hands. No. 1 calls out, "Ready One; Ready Two, etc.," and the gunner orders, "Fire One; Fire Two, etc." "Cease Firing." This knits the movement of the gun crew into smooth team work.

The observer and gunner are taught to make and repeat all hand signals slowly and distinctly. Several auxiliary hand signals are devised for orders in the field in order to secure continuous operation of the mortar with the observer away from the mortar position.

The combat board has been described above as laid out on a large floor. Emphasis should be stressed, however, on the fact that a similar but modified system may be quickly laid out on the ground or on a ship's deck. Distances may be paced, varied in length, and approximately to scale. An aiming stake, a stick or cleaning rod may be used as a pointer in lieu of the spotting stick lamp. In any case the purpose of giving each individual man a picture of what actually takes place in the field firing of howitzer weapons and of training him to spot as well as to service the gun or mortar will be accomplished. It should also be noted that this system teaches the individual marine not only how to spot howitzer weapons but also gives him a working knowledge of the fundamentals of fire control for field artillery and Navy broadside guns. As for mobility, this method of teaching goes where the gun goes, which is something no sand table or miniature mortar range can do.

Infantry units can also be trained on the combat board. The only addition required is that of *training blocks*. These blocks are square pieces of wood, two inches on a side. Each block represents a man. On the head of each block



THE RUBEROID CO., 500 Fifth Avenue, N. Y. C.

Emblem Manufacturing Co.

ANGOLA, N. Y.

Manufacturers of the well known GREYHOUND bicycles used by the United States Government.

UNITED STATES GAUGE COMPANY

Indicating and Recording Pressure Gauges
All Sizes and Types for Every Purpose

44 BEAVER STREET, NEW YORK

Compliments of

THE CLAIBORNE-ANNAPOLIS FERRY CO.

ANNAPOLIS, MD.

THOMAS J. FANNON & SONS

Alexandria, Va.

COAL—FUEL OIL—BUILDING SUPPLIES

Compliments of

THE ALLIANCE MACHINE CO.

ALLIANCE, OHIO

Aircraft Radio Corporation

Designers and Manufacturers of
Naval Aircraft Radio Equipment

BOONTON, N. J., U. S. A.

U. S. HAMMERED PISTON RING CO., Inc.

Ultra-Precise Piston Rings for
Aircraft Engines

STIRLING, N. J.

BAL-CUT LEADED STEEL

The "Tops in Screw Stocks" . . . 30% to 60% greater production on automatic screw machines.
Write for information.

BLISS & LAUGHLIN, INC.
HARVEY, ILL. Sales Offices in all Principal Cities BUFFALO, N.Y.

Cold Drawn Bars
and Shafting
Leaded Steels
Alloy Steels

Compliments of NANCO INCORPORATED

1208 West Ocean Blvd.,
Crystal Palace Bldg.,
2510 Broadway

Long Beach, Calif.
San Diego, Calif.
New York, N. Y.

POST EXCHANGE AND SHIP SERVICE SUPPLIES

H. M. NEWHALL & CO.

Established 1852

*Importers — Exporters
Insurance*

SAN FRANCISCO, CALIFORNIA

BILLIARD and POCKET TABLES
BILLIARD and BOWLING SUPPLIES
PING PONG TABLES and ACCESSORIES
BOWLING SHOES INDIVIDUAL BOWLING BALLS

CONN BILLIARD & BOWLING SUPPLY CO.

810 - 9th St., N. W.

Washington, D. C.

Muskegon Motor Specialties Company

Division of Houdaille-Hershey Corporation

Machining of Camshafts and Crankshafts
also Tocco Hardened Crankshafts

MUSKEGON, MICHIGAN

JACKSON, MICHIGAN

B. C. HOLWICK
ELECTRIC COFFEE MILLS
AND
MEAT CHOPPERS

CANTON - - - - - OHIO

RALEIGH SMOKELESS FUEL CO.
BECKLEY, WEST VIRGINIA

Miners and Shippers of New River Pocahontas Navy Standard Coal;
Island Creek and Chilton Seams—Prepared Sizes, and
Nut and Slack

NORFOLK

Foreign Sales Office
NEW YORK

CHICAGO

THE STAMP & STENCIL CO.
RUBBER STAMPS — STENCILS — SEALS

Name Stamps for Marking Clothing

SAVANNAH, GA.

may be painted a designation, e.g., BARman, rifle grenadier, etc. In problems on the combat board the training blocks are placed in positions corresponding to those actually occupied by men on the real terrain. Each man taking part in the problem is assigned a training block which represents himself. During the development of the problem each man moves his block as he himself would move over the actual terrain represented.

To illustrate the operation of the combat board in the training of infantry units, a group of five problems covering night patrol operations is now presented. The sequence of the problems follows TACTICS AND TECHNIQUE OF INFANTRY; the situation and operation are that of the combat board. The board has been laid off to represent two opposing trench systems complete with wire. Additional equipment required: 3 marching compasses, pencil and paper.

Problem No. 1.—(First Night)—CHECKING YOUR OWN WIRE.

Situation: Co. "E" has relieved Co. "F" in the 2nd Battalion sector. It is the first night after the relief has been made. You are a sergeant in the 1st platoon. During the afternoon the platoon leader has assigned you the job of checking the protective wire in front of your platoon sector. Seven men besides yourself are to compose the patrol. You will move out and return after darkness.

Requirements: (1) Assemble your patrol. State your job, explain how you intend to accomplish it; assign each man his position and duties in the patrol, state the set of signals to be used and give the equipment each man is to carry. Dismiss your patrol.

(2) Assemble and inspect your patrol. In inspecting what do you look for? Give each man his training block which he is to move on the combat board.

(3) Execute your mission. (Each man moves his own block on the combat board. He executes the signals by tapping the board with the block.)

Problem No. 2.—(Second Night)—LOCATING ENEMY OUTGUARD.

Situation: Two scouts from the 2nd platoon of Co. "E" have been assigned the job of determining enemy outguards. You are the scout leader.

Requirements: (1) Select the equipment which you will take with you.

(2) State the system of regular signals you will use.

(3) Using the training blocks proceed with the other scout through your own wire to a listening post.

(4) The instructor will indicate by cough, voice, light, etc., two or more enemy outguards. Locate and record. Return to your own trench.

Problem No. 3.—(Third Night)—INSPECTING ENEMY WIRE.

Situation: Your platoon leader has designated you as patrol leader of an eight-man patrol with the mission of inspecting the enemy wire opposite your sector for possible gaps.

Requirements: (1) Assemble your patrol. State your job, explain how you expect to accomplish it, assign each man his position and duties in the patrol, state the set of

signals to be employed and give the equipment each man is to carry. Dismiss your patrol.

(2) Assemble and inspect your patrol. Give each man his training block.

(3) Execute your mission. Show how you locate and record any data regarding gaps in the enemy wire. Return to your own trench.

Problem No. 4. — (Fourth Night) — RAIDING PARTY.

Situation: From the data obtained in problem No. 3 you are assigned eighteen men beside yourself as a raiding party with the mission of raiding the enemy line and capturing and bringing back an enemy prisoner.

Requirement: (1) Assemble and instruct your party. Dismiss.

(2) Assemble and inspect your party. Assign each man his training block.

(3) Execute your mission and return to your own lines. Problem No. 5.—(Fifth Night)—AMBUSH.

Situation: From the data obtained in problem No. 3 and from other information available it is determined that enemy night patrols of approximately eight to ten men are habitually using the gaps which were discovered in their wire. You, with nineteen of your men, are assigned the job of ambushing an enemy patrol which is expected to pass through a designated gap tonight.

Requirements: (1) Assemble your patrol and issue the necessary instructions. Dismiss.

(2) Assemble and inspect your party. Assign each man his training block.

(3) Execute your mission and return to your own lines.

A series of combat problems has been outlined above but a parade, guard mount, orderly duty and a thousand and one other things that marines are supposed to know and do well can be worked out on this board.

The "picture works the prob." On the combat board a howitzer man actually sees and does what he will see and do in the field. A private in the rear rank of an infantry squad figuratively grabs himself by the neck when he grasps his training block. Looking at the picture on the board he says and does what he will say and do in the actual situation on real ground.

SOME CAUSES OF ANCIENT AND MODERN WARS

(Continued from page 17)

in creating a religious movement among the Arabs which gained so rapidly in momentum that, in a comparatively short period, his fanatical followers were able to conquer and to proselyte nearly all of Asia. They also carried the "Crescent" in triumph to northern Africa and across the straits of Gibraltar into Spain and Portugal. After bringing nearly all the people of that Peninsula under subjection, a powerful Saracen army invaded France and reached the great plain south of Tours, where they were overwhelmed in battle by the hosts of Christendom under the leadership of Charles Martel, the illegitimate half brother of the King of the Franks.



**Your Car and Your
Dollar Go Farther
with**

PENNZOIL



BRICK for the Finer Homes

LOCHER & CO., INC.

Glasgow

Virginia

Compliments of

E. B. BADGER & SONS COMPANY

Boston, Massachusetts

Compliments of

BERKSHIRE WOOLEN CO.

Pittsfield, Mass.

**CHICAGO STEEL BRAKES
DREIS & KRUMP MFG. COMPANY**

**7400 SO. LOOMIS BLVD.
CHICAGO, ILLINOIS**

Courtesy of the

**C. O. JELLIFF MFG. CORP.
SOUTHPORT, CONN.**

Compliments of

**POSTINDEX COMPANY DIVISION
ART METAL
CONSTRUCTION COMPANY**

JAMESTOWN,

NEW YORK

LUTZ AND COMPANY, Incorporated

Established 1804

**TRUNKS AND LEATHER GOODS
"OF THE BETTER GRADE"**

1325 G STREET

WASHINGTON, D. C.

Ladies' and Men's Gloves

Telephone National 0244

London Saddlery, Dog Collars