

The
FIELD ARTILLERY
Journal



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Celestial Navigation

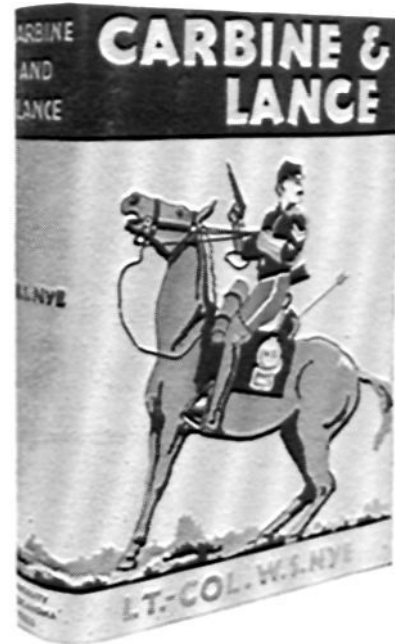
NOVEMBER, 1942

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Celestial Navigation For Field Artillery

By Capt. Robert Amory, Jr., FA

"Every unit which may be called upon to operate independently must have one and preferably two navigators who are trained and equipped to determine position by astronomical means."—FM 31-25, *Desert Operations*, par. 38.

Ability to find your position by observing the sun or a couple of stars may appear a bit superfluous to the practical field artilleryman. So it is if you have adequate maps or air photos.

But suppose you are in the Western Desert, part of a force making a wide turning movement. Sandstorms or Rommel's raiders hit you during the night and after much movement in many directions you find yourself unable to identify any terrain features. "Where do you go from here?" will depend on "Where are you?" Similar circumstances can easily occur in jungle terrain. "Dead reckoning" using odometer readings and hasty compass bearings during the march or engagement will at best give your position only within a half dozen miles.

With a transit, radio, and good watch it is possible to locate your position to within 400 yards. If it is night and the stars can be seen, a *point* position can be determined. In the daytime one shot of the sun will give you only a *line* of position, but two hours later another line can be determined and its intersection with the first or with a line brought forward by dead reckoning from the first will give a point

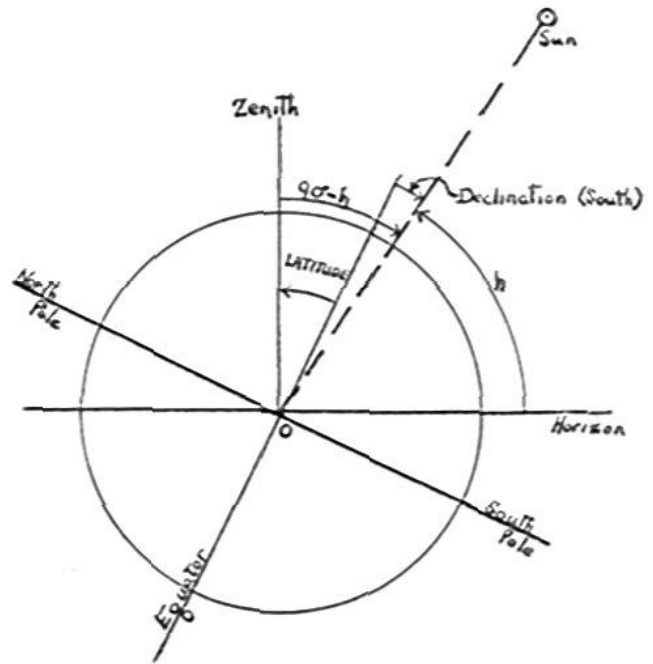


Fig. 2.

position.

This article assumes only that the reader is normally trained in simple field artillery survey. In other words, he is expected to be able to set up a transit and read angles to the maximum accuracy possible on the instrument, use logarithmic tables (interpolating accurately if necessary), understand such terms as azimuth and meridian, add and subtract, and finally possess a modicum of imagination and ability to visualize the relative position of points on the earth and heavenly bodies.

LATITUDE

Meridian Altitude of Sun

Determination of latitude by a noon observation of the sun is the simplest process in celestial navigation because it does not require knowledge of time. Noon at the point of observation is the time the sun reaches its zenith; so if the transit is set up a few minutes before noon and the sun followed until it no longer rises and at that point the vertical angle is read, its apparent meridian altitude is obtained. By watching the sun until it clearly cuts below the horizontal cross hair the observer assures that he has actually observed the sun at its zenith.

If O is the point in the surface of the earth at which the sun's maximum altitude is measured, h is the observed altitude and HH is the horizontal line. Assume that the earth is sliced in a plane that includes the observer's position and the poles or axis of the earth (Fig. 1). We then

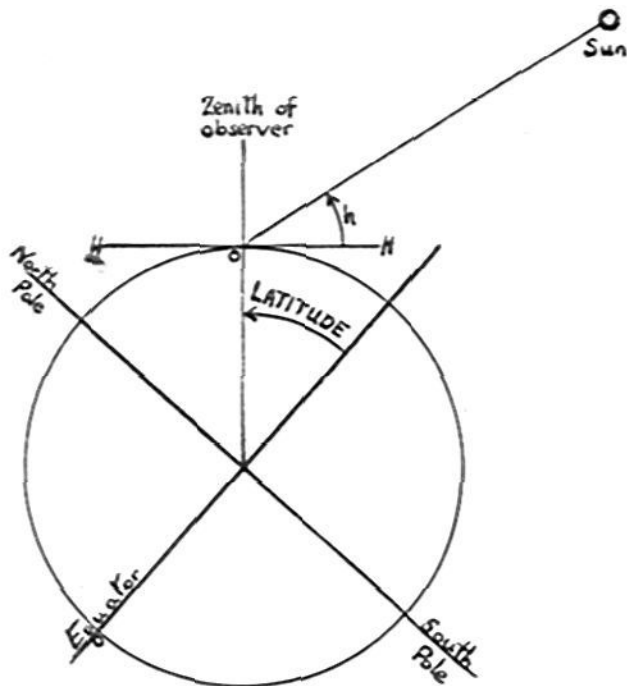


Fig. 1

have a circular plane whose circumference is the meridian of the observer, with the equator, poles, and observer's zenith as indicated. Since latitude is measured in degrees of arc from 0 at the equator to 90 at the poles, the latitude or unknown in this problem is obviously the angle at the earth's center between the equator and the observer's zenith line.

Now transpose the observer to the center of the earth (this, considering the 90,000,000-odd miles to the sun, results in only a tiny parallax which may be corrected for). The diagram now becomes that shown in Fig. 2.

If the sun were right over the equator it is obvious that latitude would equal $90^\circ - h$, since the zenith is by definition perpendicular to the horizontal. But the sun except for a brief moment twice a year is inclined to the plane of the equator by an angle varying between plus and minus 23 degrees. This angle, made between a line connecting the earth's center with any heavenly body and the plane of the equator extended to infinity, is called declination.

It is apparent therefore that except near the equator
 $LATITUDE = 90^\circ - ALTITUDE \pm DECLINATION$

As to whether it is "plus" or "minus," rules can be stated covering all possible situations,* but it is preferable to reason the formula out with a sketch than to try to memorize rules.

To obtain the altitude, set up the transit and level it with the utmost precision. Shade the objective lens with smoked or colored glass so that the sun's image appears a clear but not dazzling disc. Keep the sun visible by means of the horizontal motion, and so manipulate the vertical motion that the horizontal cross hair is tangent to the lower edge ("limb") of the sun. As the sun's rise tapers off toward noon, clamp the vertical motion and with the worm knob keep the cross hair tangent to the sun's lower limb. When the sun ceases to rise above the hair, wait a minute or so until its limb definitely cuts the hair, but of course do not follow it down. The reading of the instrument (assume it to be $60^\circ 36' 10''$) gives the *apparent* altitude of the sun's

lower limb at local *apparent* noon.

To calculate latitude the date and estimated longitude are necessary. The precise form of computation is shown at the bottom of this page.

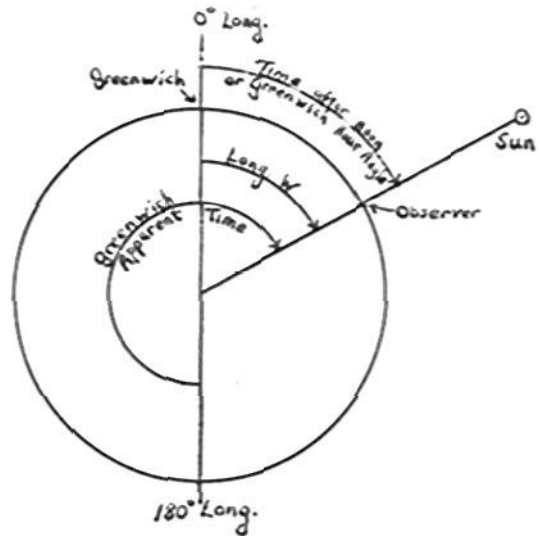


Fig. 3.

Fig. 3 represents the earth sliced on the plane of the equator so the rays represent meridians, and the angle made by any ray with the prime meridian (Greenwich, England) is equal to the longitude. Since the sun was observed on the observer's meridian the Greenwich "Hour Angle" or time after Greenwich apparent noon is obviously equal to the longitude of the observer. Since the earth's path around the sun is not a perfect circle, the apparent time based on the sun's passage of the meridian will not be constant from day to day. This variance is found in the "Sun" table of the Nautical Almanac, in the column headed Equation of Time. Since the correction given in the table is the amount needed to convert civil or uniform time to apparent time, we use it with the *sign reversed* because we have apparent time and want civil time. The computation is shown at the top of the next page:

*If L and D have the same name, and L>D, Latitude = $90 - h + D$. If L and D have different names L = $90 - h - D$. If L and D have the same name but D is greater than L, Latitude = $D - (90 - h)$

Date (April 24th, 1942); Estimated Longitude ($77^\circ 46' W.$).

Instrument Altitude $64^\circ 36' 10''$

Instrument Correction $00 \quad 00 \quad 00$

Apparent Altitude $64^\circ 36' 10''$

Parallax $4''$

Semidiameter $15' 56''$

—Refraction $27''$

True Altitude or h $64^\circ 51' 43''$

Subtract from 90° $89^\circ 59' 60''$

$90^\circ - h$ $25^\circ 08' 17''$

Add Declination $12^\circ 48' 50''$

(L&D same name)

LATITUDE $37^\circ 57' 07''$

{ If any (a quick plunging of the telescope right after noon will disclose any error from poor levelling).

{ From Table XXII, TM 5-236. Always added to adjust data to earth's center.
 { From Nautical Almanac, Sun table for month. Always added to adjust data from lower limb to center of sun.

{ From Table XXI, TM 5-236. Always subtracted to compensate for sun's rays being bent toward earth's center when passing through atmosphere.
 (These three corrections combined can be obtained from Table A, Naut. Alm., or from inside front covers of almost any navigation tables.)

{ To obtain declination, it is first necessary to determine the universal or Greenwich civil time of the observation, explained in paragraph under Fig. 3.

Est. Longitude	77° 46' 00"	W	
Same expressed in time	5h 11m 04s		From table XIX TM 5-236 or computed from ratio $360^\circ = 24h$.
Add 12	12 00 00		12 is added in W. Longitude; Longitude is subtracted from 12 in E. Longitude.
Greenwich apparent time	17h 11m 04s		
Equation of time —	01m 51s		From Sun table in Naut. Alm. Sign reversed to convert apparent time to civil time.
G.C.T.	17h 09m 13s		
Declination for April 24th	16h = 12° 47' 54"		From Sun Table, Naut. Alm.
Correction for 1h 09m		56"	Hourly Diff. (48") \times 1.15.
Declination for time of observation	12° 48' 50"		

Another method of doing the arithmetic and one which permits the navigator to make his computations in advance, thereby giving him his latitude a few seconds after noon, is as follows:

- a) Subtract the Estimated Latitude from 90° .
- b) Combine this figure with Declination—adding the two if of the same name, and subtracting the smaller from the greater if of different names. This gives computed altitude of the sun for that position at local apparent noon.
- c) Apply corrections with sign reversed. This gives Latitude Constant or what the instrument should read for the altitude of the sun if the observer were at the Estimated Latitude.
- d) As soon as altitude is measured, determine difference between Latitude Constant and instrument altitude.
- e) If instrument altitude is greater, Latitude is that many minutes South of Estimated Latitude; if smaller, that many minutes North (conversely in southern hemisphere) (see Figs. 5 and 6).

Example (using same data as before):

	90° 00'	
Estimated Latitude	38° 00'	
$90^\circ - \text{Est. Lat. (N)}$	52° 00'	
Declination (N)	12° 48' 18"	
Hc	64° 48' 18"	} From Table A, Naut. Alm., with sign reversed
Corrections	— 15' 16"	
Latitude Constant	64° 33' 12"	} Note that everything to this point can be computed before noon.
Instrument Altitude	64° 36' 12"	
Difference	3' 10"	} Greater, hence nearer the Sun or South of Est. Lat.
LATITUDE	37° 57' 10"	

Latitude by Polaris

Referring to Fig. 4 (constructed like Fig. 2) and assuming that Polaris sits right over the North Pole, it is clear that $\angle A = 90^\circ - \text{Lat.}$ and that $\angle A = 90^\circ - \text{Altitude of Polaris}$, and therefore that $\text{Alt. of Polaris} = \text{Latitude}$. The problem thus is simply to obtain the observed altitude of Polaris and apply its vertical offset from the Pole, thereby obtaining the latitude of the observer.

Again the date and approximate longitude are necessary, and this time we need also the time of the observation. This is obtainable from a watch which has been set to agree with accurate time signals received by radio. Since we are not interested in maximum altitude, we can insure greater accuracy and eliminate human errors by taking a series of sights and averaging them. By plunging the telescope

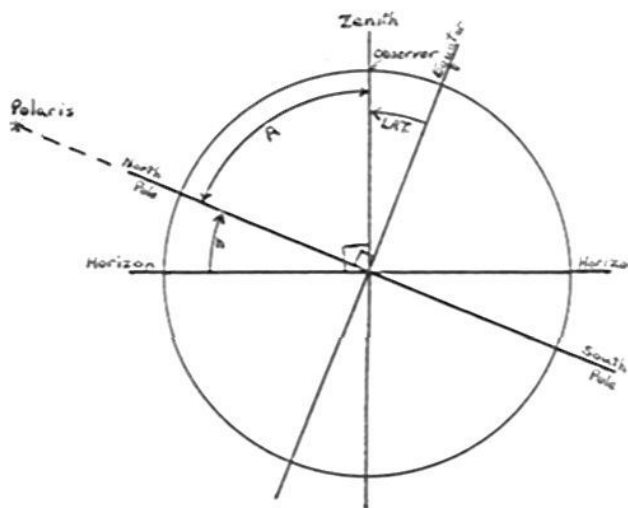


Fig. 4.

between each we also eliminate any error caused by the transit's not being perfectly leveled.

There are many different methods of computing Polaris' vertical offset from the Pole. Most of these, particularly those used by astronomers who need maximum accuracy, require determination of Sidereal Time. This headache can be avoided by the following simple method: the Greenwich Hour Angle of Polaris is determined directly from tables in the Nautical Almanac; it is converted to Local Hour Angle by applying Longitude, and the desired correction to the observed altitude obtained from Table III of the Nautical Almanac on the basis of the L.H.A.

For example see top of next page.

LINE OF POSITION

General Considerations

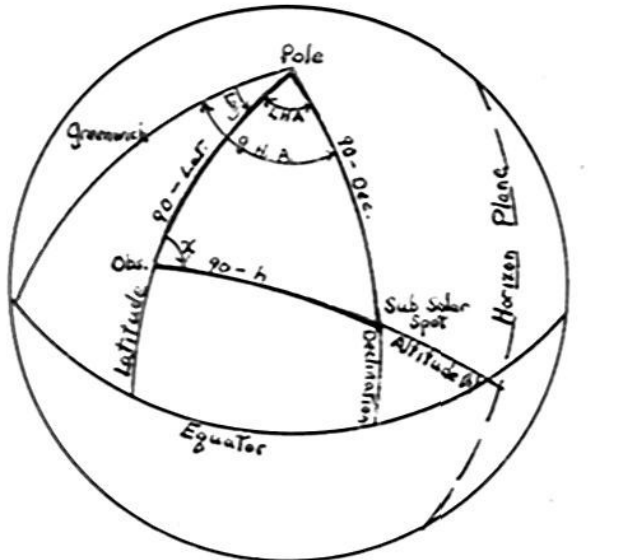
To locate a position other than merely along a given parallel of latitude requires more than simple plane geometry: formulas based on the astronomical spherical triangle must be employed. Though knowledge of the derivations of these formulas is not necessary for simple navigation, it is helpful to consider the elements with which we are working. The "Time Sight" method solved the triangle in Fig. 5 for the angle (L.H.A.) between the sub solar meridian and the observer's meridian, applied the result to the Greenwich Hour Angle, and thus obtained the observer's longitude.

Date May 2, 1942, Estimated Longitude 88° 43' W.

	Observed Altitudes	Times (Standard Time for 90° Long.)	
	38° 46' 30"	4h 00m 30s	
	38° 45' 50"	4h 02m 26s	
	38° 45' 40"	4h 04m 11s	
	38° 45' 20"	4h 05m 55s	
Total	152° 181' 140"	16h 12m 62s	
Average	38° 45' 50"	4h 03m 15s	
Refraction Corr.*	— 1' 12"	6h 00m 00s	Add because Long. W.
True Altitude	38° 44' 38"	10h 03m 15s	
Corr. from Table III	+ 15' 12"	193° 28'4	From table, p. 280, Naut. Alm.
Latitude	38° 59' 50"	151° 09'8	From table, pp. 214-216, Naut. Alm.
		03'18	
		Greenwich Hour Angle at time of observation	344° 42'0
		Subtract Longitude	88° 43'
		Local Hour Angle	255° 59'

*Parallax and Semi-diameter corrections are eliminated because stars are treated as infinitely distant and infinitesimally small.

With this Local Hour Angle enter Table III, p. 284 Naut. Alm. and opposite 256° find correction 15'12



(All lines shown are arcs of great circles)
Fig. 5.

This method was unnecessarily complicated and subject to increasing error as the sun approached the observer's meridian. Instead of determining the meridian, location of any definite *line of position* was found satisfactory. Varying methods of locating this line of position have been worked out during the past century, with the most recent methods based on an assumed* position, with the altitude (h) and azimuth of the sun or star ($\angle X$ in Fig. 5) computed and the intersection of the line of position and the azimuth line determined by comparing the observed altitude of the sun with that computed on the basis of the assumed position.

*This position may either be the estimated ("Dead Reckoning") position or a nearby position arbitrarily selected to facilitate computation.

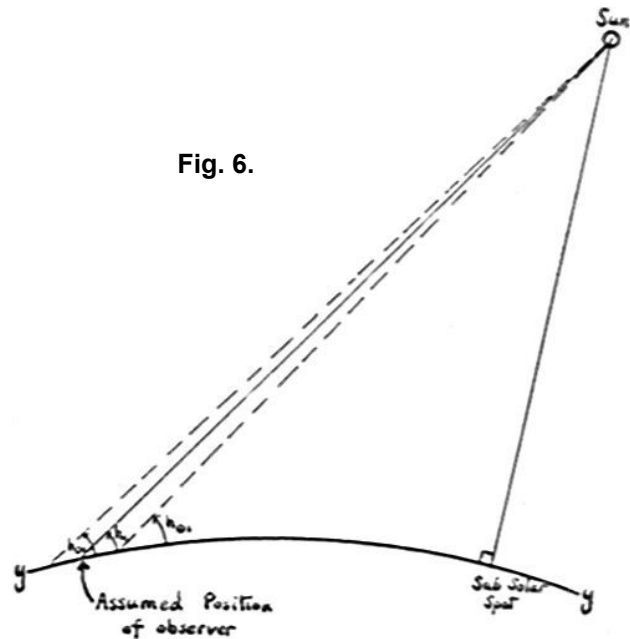


Fig. 6.

Referring to Fig. 6, line yy represents the great circle of the earth's surface connecting the observer's assumed position and the sub solar spot.* Its direction is of course that of the azimuth of the sun from the observer. By trigonometrical formula hc (see Fig. 5), or what the altitude of the sun would be if the observer were at the assumed position, is computed. If the actual observed altitude is greater (h01) the observer is nearer the sun, and if smaller (h02) the observer is further away. Since the sub solar spot, except when the observed altitude is nearly 90°, is many hundreds or thousands of miles distant, the lines of equal altitude can be considered straight lines rather than arcs of a circle. So the line of position is treated as a line perpendicular to the azimuth of the

*Point where line from sun to earth's center penetrates earth's surface.

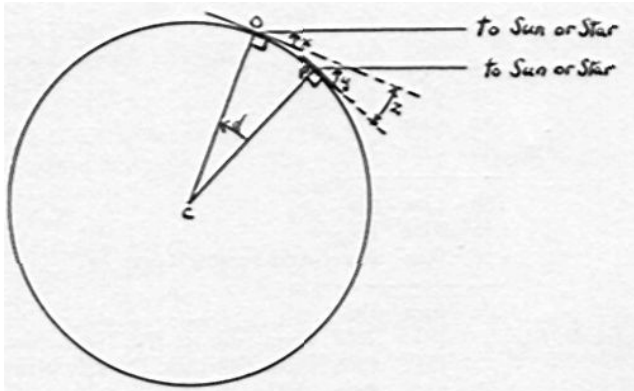


Fig. 7.

sun at the point on the azimuth found by the above comparison of calculated and observed altitudes.


The difference in altitude in minutes of arc is exactly the same as the necessary displacement in minutes of arc on the earth's surface, as will appear from Fig. 7. $\angle x$ and $\angle y$ (representing two altitudes of the sun or star, parallax insignificant) have one side parallel, therefore their difference is equal to the angle between their other sides

extended or angle z ; since the sides of $\angle z$ are by definition tangent to the earth's radii and therefore perpendicular to oc and pc , $\angle ocp$ or $d = \angle z$. Since a minute of arc on the earth's surface equals one nautical mile, d in minutes of arc equals the difference in nautical miles toward or away from the sub solar (or sub stellar) spot. Remember that these are nautical miles, equivalent to 2027 yards.

Ageton's Method

The method suggested for calculating the azimuth and altitude of the heavenly body from the estimated position is that of Commander Arthur A. Ageton, U.S.N., and is selected because of simplicity and flexibility. To avoid plotting difficulties and use only issue tables (Table LI in TM 5-236), the Dead Reckoning solution is used. In this the navigator estimates his position as closely as possible and uses that estimated position—called D.R. Position—as the basis for calculating the true altitude and azimuth of the sun or star for the moment of the observation.

This article is not the place for discussion of the derivation of the formulas used: all Hydrographic Office tables contain such explanations. Those who are interested only in the practical application need only copy the

Local Standard Time		DATA: Date _____ Time _____		
Long. Diff between Gr. & Local Time Meridian		Estimated Position: Lat. _____, Long. _____		
Greenwich Civil Time		Diagram to aid 		
Greenwich Hour Angle for nearest even hour		Average Instrument Altitude _____		
Correction for additional minutes		Corrections _____		
Correction for additional seconds		H _o (True observed altitude) _____		
Greenwich Hour Angle (GHA)				
Est. Longitude		ADD	SUBTRACT	ADD
Local Hour Angle (LHA)		A		
Declination (d)		B	A	
R	 	A	B	B
K			A	
Est. Latitude (L)		(SUBTRACT)		
K ~ L				B
H _c (computed altitude)		B		A
H _o		A		
Difference (near or away)			Azimuth	

form* on page 822 into a blank page of their TM 5-236 and fill it in (with due heed to the rules stated at the top of each double page of Table LI) to obtain the needed azimuth and calculated altitude for the assumed position.

Before running through an example, a word about the tables may be helpful. The "A" column contains log cosecants multiplied by 100,000, and the "B" column log secants multiplied by 100,000. This eliminates characteristics and reduces possible arithmetic errors to a minimum. Interpolation is unnecessary for accuracy within 1/2 mile, and rough interpolation by inspection will give accuracy well within the possible limits of error in reading

*This form is virtually that suggested in the 3rd edition of H.O. 211, being modified only to make use of recent improvements in the Nautical Almanac.

the transit or time. See Examples 1 and 2.

Assumed Position Method

By assuming a position in the vicinity of the estimated position, calculations can be drastically reduced at the expense of slightly more complicated plotting. All that is necessary is to estimate the position and then *assume* for purposes of the problem that you are at the nearest point thereto of which the Latitude is an integral degree and the Longitude is such that when applied to the Greenwich Hour Angle it will give a Local Hour Angle of an integral degree. This last assumption is made during the computation.

This method requires tables other than those in issue manuals. One such set of tables is H.O. 208 developed by Commander Dreisonstok. This system is not explained because the latest Ageton method is identical in

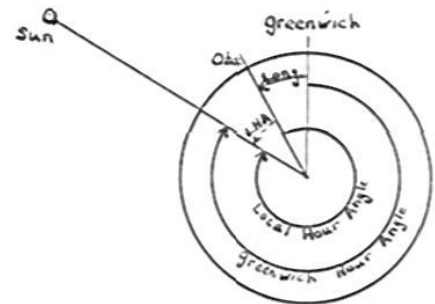
Example 1

May 20, 1942, Local standard time (30th meridian E) when started stop watch, 10 AM. Estimated: Longitude 26° 25' E; Latitude 34° 10' N.

	Watch Time	Transit Reading	
	00h 04m 19s	58° 39' 30"	
	00h 05m 45s	58° 41' 10"	
	00h 07m 15s	58° 44' 35"	
	00h 08m 29s	58° 47' 25"	
Total	24m 108s	232° 172' 40"	
Average	06m 27s	58° 43' 10"	
Clock Time	10h 00m 00s	+ 04"	Parallax
Local Standard Time	10h 06m 27s	— 34"	Refraction
Longitude	2h 00m 00s	+ 15' 50"	Semi diameter
G.C.T.	8h 06m 27s	58° 58' 30"	Ho or true observed altitude

} Longitude from time base meridian, subtract because east of Greenwich.

G.H.A. May 20, 8h	300° 54'15	(From Naut. Alm. Sun Table p. 17)
Corr. for 06m	1° 30'	(Same p. 18)
Corr. for 27s	6'18	(Same)
G.H.A.	302° 31'13	
Longitude	26° 25'	(Add because east of Greenwich)
L.H.A.	328° 56'13	(Measuring to west)
or	31° 03'17	(Subtract from 360° giving L.H.A. measured to east which merely facilitates computation)
L.H.A.	31° 03'17	ADD A 28738Ⓞ
Declination (d) (N)	19° 52'10	B 2665Ⓞ
(for date & G.C.T.)		
R (forget value of this)		A 31403Ⓞ
K (Always same name—N or S—as d)		
(N)	22° 52'13??	
Latitude (N)	34° 10'	
K~L	11° 17'17Ⓞ	(SUBTRACT) B 849Ⓞ
(Add K and L if one is N and other S; otherwise subtract smaller from greater)		
Hc	59° 01'18??	B 28853??
Ho	58° 58'15	A 2550??
Difference	3.3??	miles or 6700 yds away from sun



	ADD		ADD
		A 46873Ⓞ	
		B 5831??	B 5831??
		A 41042Ⓞ	
			B 849Ⓞ
			A 6680Ⓞ
		Azimuth 109° 26'15??	

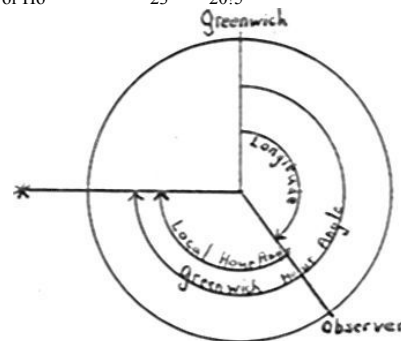
Note: The circled numbers indicate the order of steps once the local hour angle, declination, and estimated latitude are determined and entered. Use of the same number twice indicates that steps are to be taken from same entry into table. Azimuth in Navigation is always measured from North clockwise or counterclockwise in the shortest direction. Thus it is either N so many degrees E or W, and never over 180°. In the Southern Hemisphere, South is the point of reference.

Example 2

July 29, 1942. Local standard time (150° W) when started stop watch, 8:00 AM. Estimated latitude 58° 21' N, Longitude 145° 37' W; star observed: DENEb (*a* Cygni).

Average Watch Time	09m 53s	
Local Standard Time	8h 09m 53s	
Longitude of Time Meridian	10h 00m 00s	Add because west of Greenwich
Greenwich Civil Time	18h 09m 53s	
Greenwich Hour Angle		From Naut. Alm. "Stars," page 193
Deneb for Oh G.C.T.	356° 8!2	
July 29, 1942		From table at end of "Stars," Naut.
Corr. for 18h 09m	272° 59!7	Alm. pages 214-216. This
Corr. for 53s	13!3	takes care of diff. between
		Sidereal and Civil Time

Av. Alt.	23° 22!7	Table XXI
Refraction Corr.	— 2!2	TM 5-236
True Obs. Alt. or Ho	23° 20!5	



G.H.A. Deneb at time of observation	629° 21!2	
or	269° 21!2	Subtracting 360°
Long.	145° 37'	Subtract because west of Greenwich
		ADD
L.H.A.	123° 44!2	A 8009
Declination (N)	45° 04!5	B 15108
R		A 23117
K (N)	118° 59'	
Latitude (N)	58° 21'	
		(SUBTRACT)
K~L	60° 38'	
Hc	23° 23!2	B 3723
Ho	23° 20!5	A 19394
Diff.		2.7 miles or 5500 yds. away from star

SUBTRACT	ADD
A 14995	B 9184
B 9184	B 9184
A 5811	
	B 30945
	B 40129
	Azimuth N 39° 46!4 W

principle, is somewhat simpler, and the required book (*Manual of Celestial Navigation*) is almost as compact—10" × 7" × 3/8".

The main difference between Ageton's assumed position and D.R. methods lies in the additional table

which gives "K" directly and also permits an alternative determination of azimuth without any logarithmic computation. This last short cut is subject to an error of up to 1° in azimuth, so Example 3 (below) uses the slightly longer but most accurate method. For purposes of comparison

Example 3

10:06 AM, 20 May, 1942; D.R. Lat. 34° 10' N, Long. 26° 25' E.			
Local Standard Time	10h 06m 27s	Instr. Alt.	58° 43!1
Long. Time	2h 00m 00s	Corrections	+ 15!4
G.C.T.	8h 06m 27s	Ho	58° 58!5
G.H.A. 20d 8h	300° 54!5		
Corr. for 06m	1° 30'		
Corr. for 27s	6!8		
G.H.A.	302° 31!3		
Long. (assumed)	26° 28!7	(Nearest figure giving L.H.A. to whole degree)	
L.H.A. (t)	329°	or 31°	
Lat. (assumed)	34°	(Nearest whole degree)	
Declination (d)	19° 52'	ADD	
K	38° 12'⊙	B 4371⊙	
K~d	18° 20'??	B 2262??	
Hc	59° 08'??	A 6633??	
Ho	58° 58!5		
Difference	9!5	Away	

SUBTRACT	ADD
A 5023??	Z' 71°.4??
B 28985??	
A 21247??	Z'' 37°.8⊙
	Azimuth 109°.2⊙

Notes:

- ① Taken from the same entry in Table I using column headed by Latitude and line headed by t.
- ② K has same name (North or South) as Latitude. If K and d have different names, add them; if the same, subtract lesser from greater.
- ③ Taken from same entry in Table II using K~d as argument.
- ④ Add.
- ⑤ Taken from same entry in Table II using 6633 as argument in column A.
- ⑥ Subtract.
- ⑦ From Table II using 21247 as argument in column A.
- ⑧ As to whether Z' and Z'' are added or subtracted, rules are given on each page of Table II.

the same data will be used as in Example 1. The short form for this problem eliminates the second logarithmic computation (steps 3, 5, and 6). Otherwise it is the same down to the determination of Z'' . That is done by entering Table I with the altitude to the nearest degree (59°) and B (4371) and reading Z'' in the adjacent Z column. In this instance Z'' is read $38^\circ.2$, which gives an azimuth of $109^\circ.6$ or $^\circ.4$ different from the more accurate method. For a rough location of line of position, particularly if the assumed position is not too far from the estimated position, this error is not serious.

Assumed Position Method—H.O. 214

The ultimate in elimination of computation is accomplished by H.O. 214, *Tables of Computed Altitude and Azimuth*. Its only drawback is bulk and expense: each volume covers only 10 degrees of Latitude both North and South ($0^\circ-9^\circ$, $10^\circ-19^\circ$, etc.), and the volumes measure $9\frac{1}{2}'' \times 11\frac{1}{2}'' \times \frac{3}{4}''$ and weigh about 2 pounds. If you know within a thousand miles where you're going in terms of Latitude, two volumes will suffice and might be worth their bulk. The assumed position method using H.O. 214 is simplicity itself; by adding two more interpolations the tables can be used expeditiously for D.R. position work.

Assumed position work is the same as that using Ageton in that Local Hour Angle is determined to the nearest whole degree by assuming an appropriate Longitude, and Latitude is taken to the nearest degree. With these two factors plus Declination to the nearest minute the tables give directly, without any logarithms, the computed altitude and azimuth.

Referring to the example of Ageton's method, we determined t to be 31° , assumed Latitude 34° and found Declination $19^\circ 52'$. Turning to the pages headed Latitude 34° (L & d of the same name) in the column headed by Declination $19^\circ 30'$ (next lower $30'$) at the line $t 31^\circ$ we find:

Altitude	$58^\circ 55'7$	Diff. for 1' of dec.	156
Corr. for + 22' dec	+ 12'3	(Multiplication done by table on back cover)	
Hc	$59^\circ 08'10$		
Ho	$58^\circ 58'15$		
Difference	9'15	Away	

The estimated or D.R. position—Lat. $34^\circ 10' N$, Long. $26^\circ 25' W$ —gave a t of $31^\circ 03'7$. Using H.O. 214 the solution is as follows:

Altitude	$58^\circ 55'7$	Diff. for 1' d	156
Corr. for + 22' d	+ 12'3	Diff. for 1' t	178
Corr. for + 3'7 t	— 2'8	(from table next to last page of book)	
Corr. for + 10' Lat.	— 3'4		
Hc	$59^\circ 01'18$		
Ho	$58^\circ 58'15$		
Difference	3'13	Away	

The section of a Mercator chart on following page shows the plotting of the above lines of position determined both by the D.R. and by the assumed position methods, using either Ageton or H.O. 214.

Azimuth

In each of the line of position problems the azimuth has been determined concurrently with the altitude difference. This azimuth is essential to fix the direction of the line of position. Frequently a line of known direction is also required. The method is familiar: zero the horizontal motion on a fixed terrestrial mark and record the horizontal reading each time the altitude of the sun or star is measured. These readings when averaged give the angle between the line from the instrument to the marker and the computed azimuth of the heavenly body.

Any of the methods previously described can easily be used to compute the true azimuth even when the observer's location is definitely known. For a party equipped only with issue tables and a nautical almanac, Ageton's method will be found about the most satisfactory when Polaris is not observable, which is of course the case throughout the Southern Hemisphere. It is obviously simpler and quicker than the methods set forth in Section XXIX, TM 5-235.

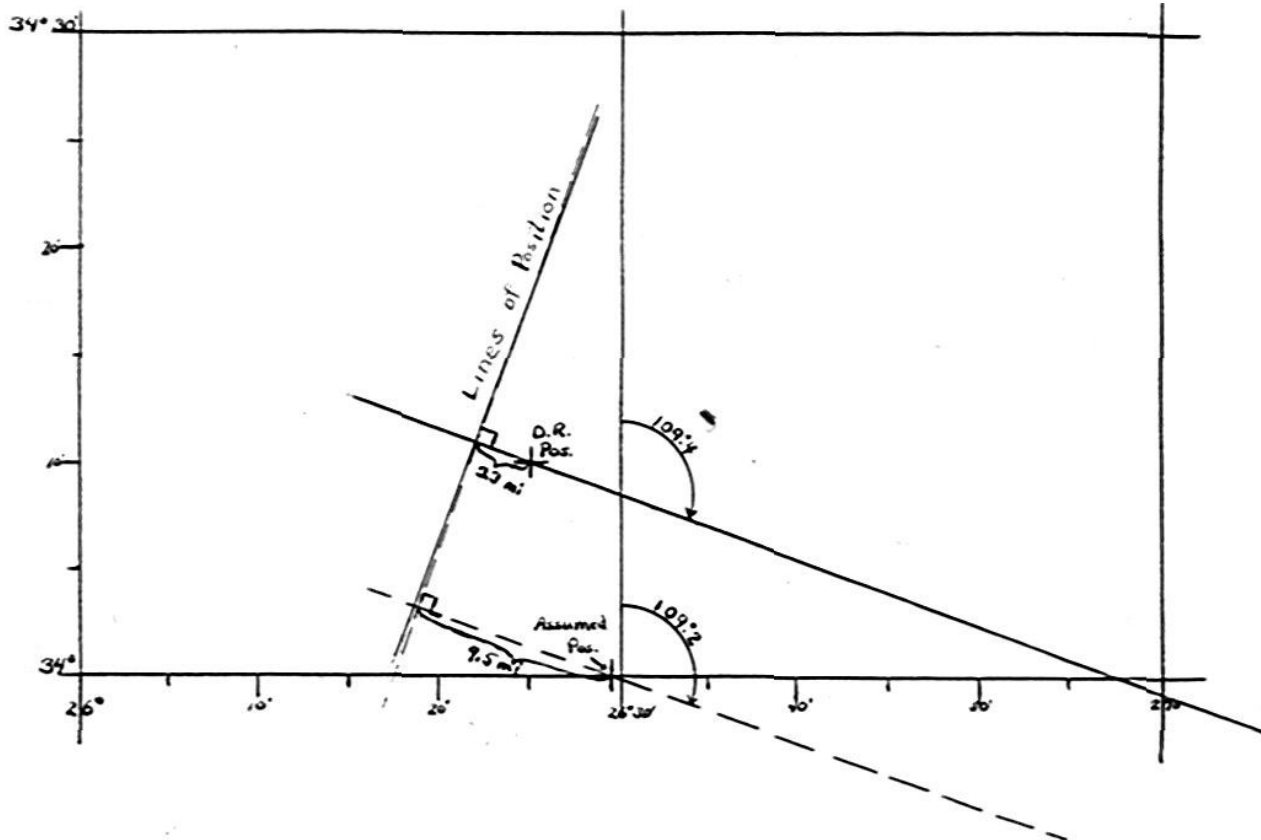
If a unit anticipates having to determine frequently a line of known direction using the sun, purchase of H.O. 71, *Azimuths of the Sun*, is recommended. This table of azimuths for every latitude up to 60° North or South for every possible combination of declination and local time obviates the need for measuring the sun's altitude and eliminates all logarithmic computations. It can also be used for stars whose declinations do not exceed 23° .

All that must be known are Time, Latitude, and Longitude.

Referring back to the first example of line of position, and assuming that the observer knew his position was

Altitude	$58^\circ 55'7$	Diff. for 1' of dec.	156	Azimuth	$109^\circ.8$
Corr. for + 22' dec	+ 12'3	(Multiplication done by table on back cover)		Corr. for + 22' d	— $^\circ.6$
Hc	$59^\circ 08'10$			Azimuth	$109^\circ.2$
Ho	$58^\circ 58'15$				
Difference	9'15	Away			

Altitude	$58^\circ 55'7$	Diff. for 1' d	156	Azimuth	$109^\circ.8$
Corr. for + 22' d	+ 12'3	Diff. for 1' t	178	Corr. for + 22' d	— $^\circ.6$
Corr. for + 3'7 t	— 2'8	(from table next to last page of book)		Corr. for + 3'7 t	0
Corr. for + 10' Lat.	— 3'4			Corr. for + 10' Lat.	+ $^\circ.2$
Hc	$59^\circ 01'18$			Azimuth	$109^\circ.4$
Ho	$58^\circ 58'15$				
Difference	3'13	Away			



Lat. 34° 10' N Long. 26° 25' East and wanted only to know what the azimuth of the sun was at 8h 06m 27s Greenwich Civil Time May 20, 1942:

G.C.T.	8h	06m	27s	Apply with given sign to convert	
Eq. of time		03m	38s	civil to sun time.	
G.A.T.	8h	10m	05s		Declination for
Long. in time	1h	45m	40s	Add because East	May 20, 8h 19° 52'
Local App. Time	9h	55m	45s		

Entering the appropriate section of table and turning to the page headed Latitude 34°, in the column headed Declination 20°, on the line of 10 AM the corresponding azimuth is read:

	110°	03'
Correct by interpolation between columns for 8' less declination	+	12'
Correct by interpolation between pages for 10' more latitude	+	16'
Correct by interpolation between lines for 4¼ less minutes of time	-	1° 05'
Adding algebraically gives Azimuth	109°	26'

Possession of H.O. 214 renders H.O. 71 superfluous. The determination of azimuth without measuring altitude is

accomplished in the same manner as if H.O. 71 were used. A sufficient example is the D.R. example of H.O. 214 (*supra*) with all items on altitude eliminated.

For determining azimuth by Polaris at any hour angle, the Nautical Almanac offers a solution far simpler and less subject to error than those set forth in TM 6-200 and TM 5-235. It is accurate to 1/10 of a degree or 1¾ miles, which is adequate for practical field artillery work. The entire problem involves only the determination of the Local Hour Angle of Polaris and on the basis of this reading from Table IV of the Nautical Almanac the correction to apply to the line Observer—Polaris to determine the True North line. See foot of this page.

Converting true azimuth to grid azimuth can be accomplished adequately by the simple formula: Longitude difference × Sine Latitude. Longitude difference is simply the difference between the observer's Longitude and the nearest grid base meridian. For instance, in the

Example — Azimuth by Polaris

20 May 1942. Lat. 44° N, Long. 75° 35' W.

Horizontal Angle Polaris to line on ground	115° 30'	Eastern War Time Long. Time Diff.	22h 22m 00s
Corr. from Table IV for L.H.A. 172° 10' (-° .16)	- 10'	G.C.T. 20 May or G.C.T. 21 May G.H.A. 21d 0h	4h 00m 00s
True Azimuth of line	115° 20'	G.H.A. 0h 22m	26h 22m 00s
		G.H.A. Long. West L.H.A.	2h 22m
			212° 09!2 (p. 280, Naut. Alm.)
			35° 35!8 (p. 214, Naut. Alm.)
			247° 45'
			75° 35'
			172° 10'

example on page 826, the grid base meridian is 73° , which gives a Long. diff. of $2^\circ 35'$. This multiplied by the sine of 44° (.6947) gives $1^\circ 47'$ which, since Grid North at this longitude is West of True North, is added to the true azimuth, giving a grid azimuth of the line on the ground of $117^\circ 07'$ or 2082 μ .

Note on Technique

So far we have assumed that the navigator had no difficulty with his measurements of time or angles. A few hints as to technique may, however, be helpful:

Time is of vital importance in anything except a meridian altitude shot of the sun. For every 4 seconds a watch is in error, the position may be thrown out as much as one mile. Time signals originate in Arlington, Va., and elsewhere with perfect accuracy. No radio at present issued to the Field Artillery can pick these up directly, but there is no reason why higher echelons' time should not be accurate to a second. And only use of cheap watches or unnecessary carelessness should add errors when unit time signals are broadcast on frequencies of lower units' nets.

All that is necessary is a determined elimination of the King Canute system of military time: "The General's turnip is always right." It's up to the generals to set their watches to *The Time* not only to avoid ruining surveyors' work but also to provide the split second timing that air-ground operations require. The British system in issuing field orders of stating "Time B.B.C." instead of "The time is now . . ." seems eminently sound.

All officers should have watches that will not gain or lose more than a second an hour. Or at worst the average of three officers' watches should be that close. The time keeper in a party taking a sight should do *nothing* else but record the time when the instrument man calls "time."

Using the transit itself is in some ways easier, in others harder than the mariner's sextant. As indicated before, general proficiency with transit is presumed, but here are a few pointers:

Don't fool around with cards in sun sights. Use a colored glass eyepiece or improvise an objective lens shade of smoked glass.

Keep *either* the vertical *or* the horizontal cross hair tangent to the sun by manipulating the appropriate worm and call "time" when the sun's edge first touches the other

cross hair. Early morning or late afternoon sights find the sun moving rapidly in elevation and slowly in azimuth; so it is best to track the sun with the horizontal motion, waiting for the sun to become tangent to the horizontal hair. From 10 AM to 2 PM the opposite prevails.

In taking a group of sights alternate quadrants of the eyepiece may be used to counteract any error in the location of the hairs. This will automatically compensate for semi diameter, the average being the observed altitude of the sun's center. But the writer believes it is best to stick to one quadrant, take four or six sights, plunging the telescope between each and then plotting the altitudes against times on cross section paper. This will disclose, if the curve be other than smooth and virtually straight, any human errors in reading or recording or in leveling the instrument. The possibility of material error in the cross hairs seems relatively insignificant compared to the above chances for mistakes. This last method of course requires that semi diameter be applied in the appropriate direction to both vertical and horizontal angles obtained by averaging the readings. But as this correction is found right beside Declination and Greenwich Hour Angle in the Tables, no time is lost.

These problems may seem involved and difficult to a first reader, but anyone who has mastered short base intersection and meteorological corrections should have no real trouble working out such sights. If every battalion has a few officers and men who can perform this work, that is enough. Purchase of a nautical almanac, preparation of a handful of Ageton's forms, and a few hours' practice should suffice to make a competent survey officer an adequate navigator as well.

EDITOR'S NOTE: *The JOURNAL can supply the books referred to herein, at the following net prices:*

TM 5-235—70c.

TM 5-236—40c.

American Nautical Almanac:

1942—50c.

1943—65c.

H. O. 71—\$1.50.

H. O. 208—\$1.20.

H. O. 211—90c.

H.O. 214 (in 8 volumes: 0 to 9 degrees, etc.) — \$2.25 per volume.

We all realize that there are other functions of the mind besides memory. Some people do not appreciate the difference between remembering and thinking. It is the creative function that is all important, and you can't create without decision.

W. H. D.



There's Many a Man Been Murdered in Luzon

("Presented to the Overseas Club in memory of 'Pappa' Fletcher. G. L. Worcester, Zamboanga, October 12, 1930.")

This poem is framed and is hanging on the wall above the bar of the Overseas Club in Zamboanga where many an oldtimer, like Fletcher, drank. Maj. Kraus copied it during his trip to Sulu on May 27, 1940.



Charlie at the bar of the Overseas Club, Zamboanga

Now Private Alexander Green
Said to his Captain bold,
"They've got more men upon that hill
Than what we have been told.
So from this action we must hike,
Our precious lives to save;
For I want you to be a Captain bold
When I am sleeping in my grave."

Chorus:

For there's many a man been murdered in Luzon,
In Samar, and Mindanao.
There's many a man been murdered in the Philippines,
And he's sleeping in some lonesome grave.

"No! No! brave Green," says the Captain bold;
"Our duty lies right here."
And with his trusty blade in hand,
He led them with a cheer
Up the hill with a hell of a yell,
For he was working for a star.
And the "Ga-Gas" tell how he gave them hell
For he was a U. S. Regular!

Now when that action it was o'er
The wounded strew the sod,
The Doctor came with the hospital corps
And the Chinese litter squad.
They found poor Alec where he lay
A-wallowing in his blood,
And they picked him up and took him where
The dressing station stood.

"O never mind your Captain bold,"
Says Doc to Private Green.
"You've got the worst wound in your head
I believe I've ever seen!"
"O never mind my head," says Green,
"I want to die I do,
For the Captain needs his Alec Green
Beyond that pale of Blue."

Now on that hill the Captain bold
In his last grave does reside,
And Private Alexander Green
Is sleeping by his side.
The wind a-sighing through the trees
Seems to whisper soft and low:
It's the Captain calling, "First Sergeant Green!"
And Alec answering, "Here 'O!!"



BELOW LUZON

By Major Edward Kraus, FA

THE MORO

From Jolo we sailed forty miles south to Siasi, an island which maintains a large constabulary garrison in an old Spanish fort. To my surprise, as we approached Siasi dock I could make out a uniformed figure apparently waiting for us. I had sent no message, and to my knowledge no others had sent notice of our coming. When we landed the officer introduced himself as Lieutenant Tady, a reserve officer on a period of active duty with the constabulary. He said news of the approach of the launch had reached his commanding officer, 1st Lt. Ancheta, who had then ordered him to meet the boat. It was taken for granted that on its infrequent trips to Siasi the launch always brought inspectors and officials, hence they expected the same on this occasion. If we desired, said Lieutenant Tady, he would be glad to lead us to the garrison, where he would introduce us to his commanding officer.

This garrison, although in the midst of a Moro island, was not enclosed in a twenty-foot high barbed wire stockade like the outposts on Jolo. On the contrary, it was maintained in the same state as the Spaniards had left it: stone wall about the whole post, officers' quarters on top of the wall on the inner side, and barracks for the soldiers inside the enclosure. A guard posted at the gate saluted smartly as we entered. Turning to our right we went upstairs to the second floor, landing us on top of the wall. Lieut. Ancheta, a young officer of about 28 years, welcomed us at once with that characteristic Filipino hospitality, for he insisted that we share a room there as long as we wanted to stay and invited us to dinner.

Ancheta showed us our room containing two beds, two tables, and two chairs. What interested me most, however, was the bed: it had no spring nor mattress. In place of a spring was a cane-woven arrangement similar to the seats in the old type chairs with which we are familiar. On this lay a mat closely woven out of coconut palm. I found out later that it felt smooth to the skin and cooler than perhaps any other material. At the foot of the bed a kind of spread lay folded, evidently to be used as cover if needed. At the head of the bed was one pillow, while placed squarely in the middle of the bed was a second pillow whose use I could never positively discover while I was there. As I use but one pillow, I always laid the second one on the chair and left it there

after I got up in the morning, hoping to indicate thereby that I did not use it. But after the bed was made up, that pillow was in the middle again, about where one's stomach would be. Naturally it would have been embarrassing to these Filipinos not accustomed to our way of life to indicate to them they had unknowingly forced one of their customs on us, so we asked no questions about the pillow. However, I was to have a little light thrown on the subject that night as I visited in the home of one of the Moro officials. But at the time I had to leave the problem of the second pillow unsolved while I answered the call to supper.

The table was set for five: for the vice mayor, Arpa, a Moro who carried a revolver as a sign of rank; for Lieutenants Ancheta and Tady (both Filipinos); and for Charlie and myself. Since we sat at a round table big enough for only four, the dishes crowded each other. The food was what I expected it would be when served by Filipinos who tried to cater to American taste. Invariably their idea was to open cans of all kinds, such as in this instance: asparagus, string beans, pork and beans, Libby's Vienna sausage, canned corn, and red beets. For the native taste on the other hand there was roast fish, baked fish, a fish prepared in a stew, and a fish that appeared pickled—judging from the cloves and spices in the sauce. After we seated ourselves I instinctively reached for my silverware, expecting to feel the knife and fork in the usual place; but instead I felt no knife at all and saw only a fork and tablespoon. This was obviously a time to wait and watch so as to "do as the Romans do." Accordingly I helped myself of everything that was passed, taking only an experimental portion from the strange dishes and going heavily on the canned food. As no one had yet demonstrated the use of the silverware, in order to stall for time I helped myself from a heaping dish of unpolished rice which stood just beside my plate, taking what I thought was a generous portion. Our Filipino friends picked up the fork and tablespoon, and using the fork to rake the food toward the spoon they mixed it with a heaping spoonful of rice, piled it all in the spoon and carried the mixture to their mouths. My new acquaintances ate rice in place of bread, and took rice with every mouthful. Before I knew it the heaping plateful which had stood at my side was finished by my dinner partner—I had helped myself from his plate!—for it turned out that such a huge

Part Two: Conclusion

plateful was after all only the normal share per meal which each Filipino expected.

It may appear that I make a distinction between the Filipino and the Moro, a fact which may be new to the reader. The Filipino is the lowlander of the Philippines, characteristic of the type which has settled down to cultivate the soil. The Moro, not far removed from his pirate days, is still the roamer and the fighter. There are Filipinos of the northern Philippine islands who still remember with fear and trepidation the sudden, unexpected raids of the Moros. Even to this day it is impossible to bring a Filipino servant to a family living in the Sulu islands. With the Constabulary it is different, for Americans showed them how to conquer the Moros so that when American officers were gradually replaced by Filipino officers, the latter had the confidence to carry on. The Constabulary soldiers are, therefore, practically the only Filipinos in the Moro islands. The Filipinos and Moros eat the same type of food, but there the likeness ends. They do not wear the same kind of clothes or have the same customs or religion. The Filipino is, of course, a Christian (an "infidel" to the Moro), while the Moro is a Mohammedan.

I did not mention that the vice-mayor, Arpa, had been sitting in the barber's chair when we arrived earlier that afternoon. He was flattered to be introduced to us, for although we wore only white ducks and a sport shirt, we carried firearms which to him, and above all to his friends, meant that we were "big shots." Arpa, better known by his friends as "the vice" for short, was a Moro of medium height and weight with a mouth as big as Joe E. Brown's which was always stretched into a broad grin when he was not actually talking. Although polygamy was not lawful in the Philippines, somehow Arpa had five wives, all living. Imagine what a ticklish assignment it would have been for a Filipino official to come down from Manila into these out-of-the-way islands in the Sulu Archipelago to enforce the law in Arpa's case!

After dinner Arpa promised to lead us to the home of Lakibul Taup, a school teacher who at this time was in Siasi on vacation. Some months ago he had made the first trip of his life to Manila, where he visited his nephew who was studying law at the university and who was a friend of mine. On that occasion Lakibul Taup wore an ordinary business suit and looked much like anyone else. But the clothes belied the man, as was shown by the fact that for protection on this trip he relied on Jakiri's kris which he carried with him. It requires years of practice to develop the skill necessary to use a kris properly, let alone rely on it for protection. Every stroke must be made so that the blade will cut through the body and end in a position suitable to begin another stroke. So when I first saw the kris in Lakibul's possession I knew he was not the commonplace individual he outwardly appeared.

True to his word, Arpa took us to Lakibul's house, where we soon found ourselves seated at a wooden table, on wooden chairs, in the front room of a hut which was otherwise bare. These people don't seem to have many material possessions in their homes, either because of lack of utility of the objects or because of lack of cash with which to buy. As was to be expected, it was not long before Jakiri's kris was set in front of us for us to admire. It was shorter than most kris, being only fourteen inches long over the blade and handle. Like all kris, it was razor sharp, but what made it different from all others was that in spite of its short length it nevertheless had eleven waves in the blade without losing its proportion, whereas most others regardless of length usually had seven to nine. The wave gives the kris a cutting characteristic which a straight blade does not have. We have discovered the same property, for we have put a wavy edge on some bread knives and found that they will, as a result, cut more smoothly. As the Moros explained it to me, because of the stroke they use and the characteristic of the blade they seldom gash anybody: once the blade enters at all, the kris uncannily seems to pull itself right through bone and flesh.

During this explanation I could not help thinking of a native then in the hospital at Jolo, who in order to protect himself when attacked had raised his hands, only to have the same stroke of the kris cut through both wrists like butter. Yes indeed, a Moro with a kris is a formidable opponent to meet at close quarters—the type of fighting which must in part be employed in the jungle to beat the Japs in their infiltration tactics.

During this evening's conversation I learned many outward habits of the Moros and much about their inner thoughts and feelings. They really "opened up" with me, for Lakibul Taup had not forgotten that I had driven him all over Manila in my car when he was there on a visit, and was anxious to do all he could to please me. I suspect, too, that my Moro friend who was studying law in Manila somehow unbeknownst to me had given these people the impression that I was a "big shot" among my fellows in the army. At any rate all this had the net effect of making them relax and be free in their admissions. Arpa, the vice-mayor, in recounting how a Moro sentry killed his commanding officer, an American who was in charge of the Siasi constabulary garrison in the days when the Moros were not yet subjugated, demonstrated dramatically how the sentry was able to fire through the closed door and shoot the resting officer through the heart. "The American does not sleep like us," Arpa went on; "he sleeps straight." And Arpa stiffened to attention. "We sleep curled up, and our head is not always in the same place on the bed. But the American sleeps straight, all stretched out, so it was easy for the sentry to tell where to aim. He waited until he heard the officer snore, then he stood outside the door, aimed where he thought the officer's heart was, and shot him right through it!" Arpa accompanied his talk with

appropriate actions at the right time, ending by pretending to shoot through a closed door.

Does this explanation provide a clue for the use of the pillow placed in the middle of the bed in the guest room?

It was while we were looking at Jakiri's kris that all of them bore each other out in their effort to prove to me that a kind of fate or destiny will bring some safely through all danger, while others are not so fortunate. This protection will extend itself to a man's weapon, so that as long as he has it with him in battle he will come through safely. They had a Moro word which expressed all this and other abstract meanings which they could not express, and that word was as I remember it "seguru." So at this point I thought I would try the effect of a little psychology on them to see what the results would be.

I elaborated in great detail on one rather simple incident: how one night returning to bivouac without a flashlight I sensed where the path was but instead of walking in it for some unaccountable reason I walked just a bit to the right. A few feet behind me came another officer who threw his flashlight beam on the tail of a python stretched full length in the path before him! I had walked the entire length of that snake, missing him only by a hair! One step on him and he would have coiled around me with lightning speed. "Yes," agreed all the Moros as they nodded their heads wisely, "that was 'seguru.'" Well, from then on I was accepted as a blood brother amongst them!

As Arpa and Lakibul Taup insisted that they show us two or three of the interesting sights in these waters before we continued our southerly course, it occurred to us that Lieut. Ancheta might like to go along. He was glad, for he was thereby enabled to take with him an armed escort and make a formal inspection of the islands during the trip.

We passed Tapul, an island just north of Siasi, where, Ancheta said, the Moros were as wild and lawless as any, anywhere. This was because the inhabitants were more successful in resisting the inroads of civilization because of the inaccessibility of the heavily wooded and mountainous interior to which they withdrew. Also, because of the hide-out possibilities the island attracted many outlaws. Ancheta told me that he had to investigate murders there about every two weeks.

A few miles beyond Tapul we reached a small flat island covered with palm trees. The Moros who lived there were an entirely different type from those we had met so far, for they were Samal Moros. They were inclined to be more peaceable than the others and, whereas the others went to sea only occasionally, the Samal Moros lived a sea life. As individuals they appeared more friendly and none of them had that perpetual frown between their eyes; in fact, they looked much like the Filipinos. All of their houses were built on piles over the water—not a single house was built on the island itself. There was one building on the island, however, and that was a newly completed school of

which the inhabitants were very proud. From its tin roof came the entire fresh water supply of the island, for the rain drained from it through pipes into a storage tank. In the dry season water had to be transported from elsewhere by that seaworthy craft, the vinta. The houses crowded each other side by side around the entire island. To each house belonged four to ten of the coconut trees which grew "in the back yard" so that each family had income from a source other than fishing. Although the island was only one block wide and six long, its population was over 4,000! The entire surface of Laminusa was a huge cemetery with stone slabs marking off the family plots. It was the custom for the whole family to camp on one of these plots for days in order to honor the member whom death had taken. The Samal Moros inherit from the ancient Chinese a reverence for their ancestors, and for that reason these people will not leave the island which was the home of their forbears, no



Laminusa

matter how crowded or unsanitary conditions may become.

We stopped at another out-of-the-way island, Manubul, which is still smaller than Laminusa. It has no water supply whatsoever. Its people, also Samal Moros, are the most expert vinta makers, their boats having in times past reached China with heavy loads. Nevertheless it was evident that in spite of the vinta industry—vintas were not produced in quantity—few visited the island and none of the women had occasion to leave it. It was here that Arpa, "the vice," introduced me to his first wife, his oldest. I asked him if the fact that she was his oldest wife had anything to do with her being on this island. He gave me a knowing look as he asked, "What do you think?"

As we still had a hundred miles to go in order to reach Bungao, we lost no time making preparations for an early departure after returning from this trip with our Moro friends. Two days later, therefore, we found ourselves walking from the Bungao pier toward the quarters of the commanding officer of the southernmost Constabulary Outpost in the Philippines, only thirty miles east of Borneo. As we came over a slight rise, beside



Maria Cristina Falls of the Agus River

the walk we beheld two graves lined with gravel into plots, one big and one small, according to the size of the bodies buried there. One man must have been a huge fellow, for his grave seemed unusually broad and long; the other was narrower and shorter. Two wooden crosses marked the graves. The names on them were American and both bore the same date in December, 1902. Killed by Moros probably, I thought.

At an appropriate later time I asked the commanding officer if his records by any chance had some reference to the history of the graves. He said, "Yes, the men were killed on this island just around the point from where they

are now buried." When I asked him if he knew the motive he answered, "They were traders; they had cheated the natives at some time, and on this date they were made to pay for it."

Ever since I had heard about the Moros' reputation for killing, even before I went to the Philippines, I had been wondering what lay behind it all besides revenge, which is a motive common to all peoples. I believe I found the missing details which completed the picture before I left Bungao. From Major Angeles I learned that there are no longer "juramentado" killings; that besides the vengeance motive most murders are the work of "amoks." Major Angeles had laughed at the trepidity with which the average individual regarded travelling amongst the Moros. "Mind your own business," he told us, "and you will be perfectly safe." Mr. A. R. Thompson bore him out and went him one better, making it a little plainer to his young friends when he warned, "Mind your own business, let his women alone, and you won't get in trouble with the Moro." Certainly nothing happened to us; and besides, we ran into several old-timer Americans who had lived safely with the Moros for over forty years. The clinching detail, however, came from a Filipino doctor whom the Philippine Board of Health had placed in a clinic on Tawitawi to serve the needs of the natives in southern Sulu. His patients numbered "amoks" as well as their victims. From the victims there was nothing to learn except what has already been stated, but what the doctor told me about the amoks proved that they were mental cases, not only while they were running amok but afterward as well. No amount of rest and

treatment could restore an amok to normal sanity again—they all remained permanent mental cases.

OLDTIMERS

Oldtimers were everywhere. Besides Thompson in Jolo, there was a German ten miles from Bungao. There were the Americans, Stevens and Sherman, on malaria infested Tawitawi. Farther north, beyond Jolo, they were more numerous of course. For instance, when Charlie and I roamed the streets of Zamboanga one morning with time on our hands we saw the sign "Overseas Club" hanging on a building just outside Pettit Barracks. We recalled that in the bar was the huge

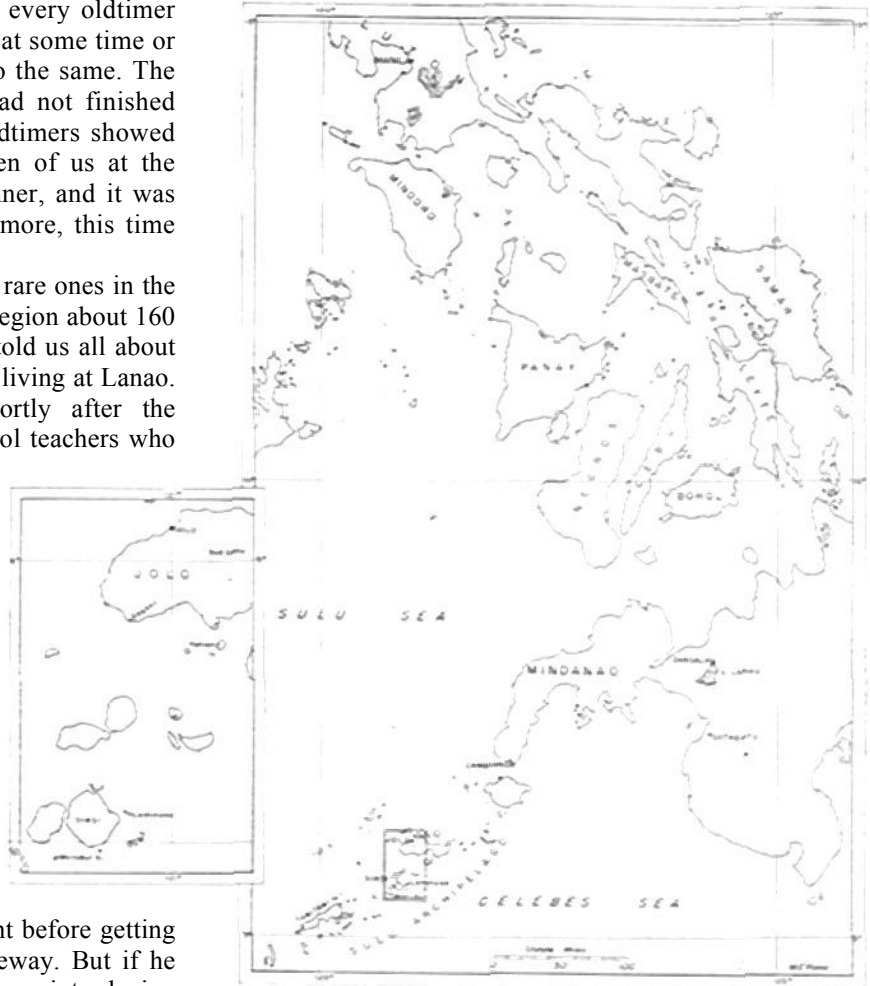
Philippine mahogany round table where every oldtimer of note, including General Pershing, had at some time or other sat. So Charlie and I went in to do the same. The jungle telegraph worked fast, for we had not finished our second drink before two or three oldtimers showed up. Before we realized it there were ten of us at the table, we had sat through lunch and dinner, and it was time for us to board the *El Cano* once more, this time for Cotabato.

Speaking of oldtimers, we found some rare ones in the interior of Mindanao, in the Lake Lanao region about 160 miles north of Cotabato. Thompson had told us all about a John J. Heffington who was retired and living at Lanao. He came over to the Philippines shortly after the Insurrection with the large group of school teachers who came to teach the natives. He later became superintendent of schools in Mindanao. Years later he went to Dansalan on Lake Lanao to retire, but the Moros promptly elected him provincial governor. In those days many political offices were still held by Americans. On the occasion of our visit, however, he really was living in retirement, and still a bachelor. We were out looking for him when we saw in the backyard of a modern looking, two-story frame house a tall, elderly gentleman wearing a white suit and straw hat. He looked as though he was giving last minute instructions to a servant before getting in his car which was nearby in the driveway. But if he had any other plans he gave them up when, introducing ourselves, we informed him that we too were bachelors like himself.

He invited us in, and I remember remarking to him as I entered his large living room that he had a comfortable study. A table in the middle held neat piles of magazines, on top of each of which was either a text book, atlas, or dictionary. Against one wall was his desk which held neatly arranged papers, as well as a shelf displaying an older twenty-four volume set of the Britannica. On the opposite side of the room were several bookshelves holding texts, fiction, biography, travel, a first edition of Mark Twain's autobiography, a Zane Grey, and others, most of which were published in or before the first decade of the twentieth century.

As he had been in the province since 1917 I remarked that he must have known Colonel Allen T. Fletcher personally, the latter being largely responsible for pacifying Mindanao, particularly the region from Cotabato to Lake Lanao. Heffington replied that he had met Fletcher twice, once in 1920 and again in 1930, Fletcher being a lieutenant the first time and a major the second.

"He was a small man, rather slight and very active, weighing about 140 pounds and not over five feet eight inches in height. He had a black mustache. My impression



was that he did not obtain his commission through his education, but that he was appointed from the ranks at a time when they needed officers. I believe he had been a sergeant previously. He was rough in a sort of pleasant way. On one occasion he had invited me to dinner—it was a good dinner—with his outfit. The party included two or three ladies who also enjoyed the food. When everyone had finished eating, there was a minute or two of conversation while the food stayed spread on the table. Suddenly Fletcher called impatiently, 'All right, sergeant, come here and take this blankety-blank blank away!' That was characteristic of him, but he got away with it, as only he could.

"Fletcher was a very capable man, and brilliant, and made the most of breaks. Furthermore, he led sort of a charmed life. On one occasion as he passed a house he stumbled just as a Moro stuck a gun out of the window at his head and fired. Fletcher was a man who made light of such a thing, but he also made the most of it in order to make the natives believe he was charmed.

"Fletcher told me, 'Your education that says you can't do two things at once is all wrong, because when that gun went off I swallowed my cigarette, I stumbled, I

drew my gun, and lastly I turned around and killed the ———— who shot at me!"

As Heffington talked about these oldtimers, little did he realize that as oldtimers go he ranked with the best. It suddenly occurred to him in the midst of one of his tales that it was time to have a drink—I had begun to wonder when he'd get around to it—so he gave us what we asked for: White Label Scotch for Charlie and Golden Wedding Rye for me. After we poured ours, Heffington emptied a bottle of soda into his glass, saying as he did so, "That's my drink before evening." That was a commendable observation, showing our host had character! After Charlie and I polished them off in a manner indicating that we had been expecting a drink for the past hour or two, he politely inquired, "Won't you have another?" We refused, but somehow we poured ourselves two more. There was a short pause—very short—and Heffington poured some rye into his glass, looked at it and said, "That's my drink, but it's not as good as scotch for you over here. In Kentucky, that's their drink" (he was from Kentucky), and tossed it down straight. He puckered up his mouth and quickly poured another while he was still smacking his lips. That one followed the first before he had a chance to remind himself that it was still not evening.

STRATEGIC POTENTIALITIES OF THE SULU ISLANDS

The question might very naturally arise: "Do the Moros and the islands of the Sulu Sea offer any special possibilities for carrying the offensive closer to Japan, and if so, can they be defended?" The answer is yes. A base might be developed which might eventually develop into

the chief stepping stone not only to retake the Philippines but to take Japan itself.

Supposing our High Command did decide to seize Mindanao, could it do so without preparing a major expeditionary force for the purpose? It is my opinion that if made, even if a large force were there, a force of paratroops and airborne troops would be sufficient to seize the air field and Lake Lanao regions. Simultaneously with this action in Mindanao, it would be relatively easy to set up a training center elsewhere for the Moros. I am convinced the Moros will respond to the call for training under American officers, and there they may be trained secretly in a combination of commando and "counter-infiltration" tactics modified so as to make the most of the Moro's natural inclination for jungle fighting and his skill with the kris. After they are trained they can infiltrate, eventually to join their comrades on Mindanao.

Could we retain control against all Japanese onslaughts? Given rifles and sufficient ammunition, a minimum of artillery to help hold a defensive position if necessary against mass attacks—old type mountain guns or the later pack howitzer will do—and adequate anti-tank grenades, the Moros will unequivocally hold the Mindanao air base provided they use what I humbly propose to introduce as "counter-infiltration" tactics. Counter-infiltration would be simply training the soldier to subsist individually for five to ten days, and to fight successfully during that time either alone or as part of a patrol, even though surrounded by the enemy. Whatever the route chosen, the infiltrating soldier must direct himself to, and find, a control station—one of many set up at critical points, which in order to bring

supplies to them, must be reached by the best available routes—a control station which clears the information brought in by the soldier, gives him new information or orders, re-supplies him for another ten-day period, directs him to another station, and otherwise coordinates his efforts with those of the other counter-infiltration patrols. For protection against Jap patrols which may have located them by day, the personnel from these control stations must move to alternate positions at night. Of course the soldier's food supply must be in concentrated form in order to reduce bulk. This system of combing the jungle will search out the Japs that have infiltrated into our areas.



Moro market day at Dansalan, Lanao Province, Mindanco

As to the defense against mechanized forces, the Mindanao terrain is favorable. A fluid defense in depth with slit trenches at most effective points along the probable avenues of approach—the slit trenches concealing men who release antitank grenades when the tank is too close to depress its guns on them or after it has passed by them—will stop tanks using those routes. The roving "counter-infiltration" patrols, amplified if necessary, will effectively stop tanks which may try to leave the more likely avenues of approach.

Antitank guns have not been included in the defensive setup proposed because of the necessity of limiting the invasion for surprise. All in all, the rifles with ammunition, light field guns, and antitank grenades will make loads far lighter than those known to have been flown to Rommel when it was impossible to get heavier equipment to him by sea. If phases of Rommel's campaign were successfully initiated and sustained by airborne equipment in a theater

where much heavier equipment was used against him than could be employed in Mindanao, I have no doubt but that the methods suggested above will be entirely effective. Neither man power nor equipment is the problem, but it is rather the selection of American leaders who believe unshakably that Mindanao can be held in this manner, who are ingenious enough to make timely modifications in details of the plan if occasion warrants, and above all, who execute the plan with vigor. To complete the picture, bombers and fighters would be flown in as soon as runways are built sufficiently far into the jungle to protect them (the Japs build them in two days with native labor), because initially this will be their only protection. At this stage we would have enough for an active base which is between 800 and 1,200 miles from Singapore, Indo-China, the Fukien coast of China, and the Japanese island of Formosa. Heavier equipment including antiaircraft and antitank guns could, if desired, be flown in later, although this is perhaps not necessary.

ADDRESSES MISSING!

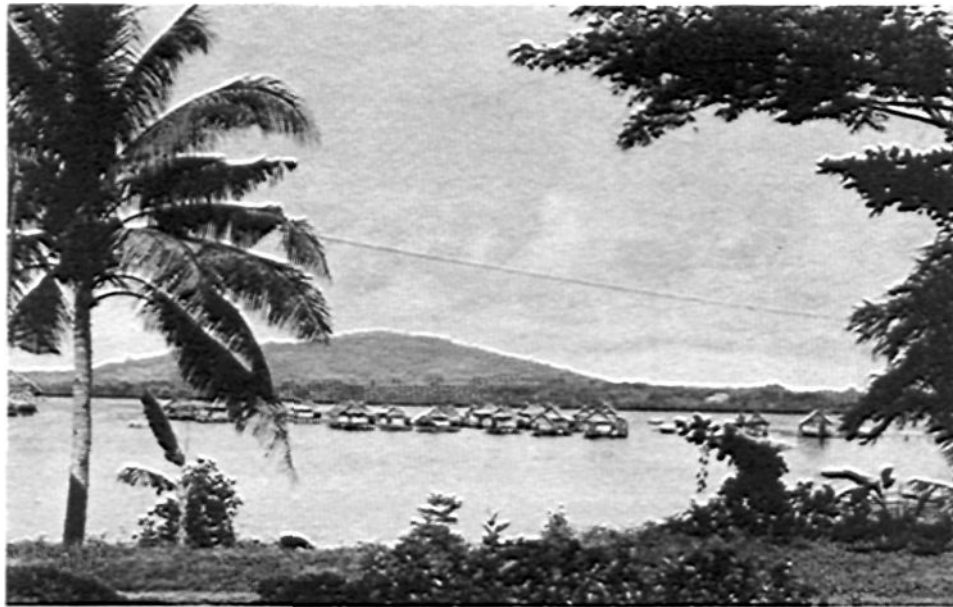
The following are members of the Association or subscribers to the JOURNAL. Most of them are still in good standing, but we do not have their correct addresses.

JOURNALS, sent to the last address they gave, were returned. If you have a friend or acquaintance listed here and you know his address, send it to us so we can correct his records and get his JOURNALS off to him without further delay. See also page 851.

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A Moro village on Siasi

DOWNED IN THE SULU SEA

As told to Cecil Brown

By Lt. (J.G.) Elwyn L. Christman and Ensign William V. Gough, Jr.

On December 26th just one hour before midnight, six American Navy Patrol Bombers took off from Ambon, a Dutch island. Each carried 1,500 pounds of demolition bombs and enough gasoline for a sixteen-hour flight.

The mission: Bomb Japanese warships at Jolo Island, at the eastern end of the Sulu Archipelago in the Philippines.

Only two planes returned, but some of the crews of the four got back.

As they reached Jolo, a red ball of sun was breaking through the hazy clouds. Almost at once they spotted a cruiser at anchor, another under way, and three or four destroyers. Christman, first pilot, was at the controls. Gough was in the co-pilot's seat.

Ack-ack rushed up to meet them. Just as the plane started in for its target, the after-gunner yelled through the communications: "Here comes a fighter!"

They got the first Jap Zero. One of the gunners in the

waist put a pan of a hundred shots into the Zero cockpit. The plane went spinning down, streaming smoke behind. Then six more Zero fighters came toward the PBY's while they were still flying in formation. The antiaircraft fire from the shore bit into the sky. One burst hit not far from Christman's ship.

"It was as if someone dropped a thousand-pound slab of concrete right beside you," Gough said.

As the Jap fighters pulled out to get a new approach on Christman's ship, he broke formation and dove on his target. He had lost his flight leader for the moment, and just as he was about to collide, Gough grabbed the wheel and one PBY hurtling into a dive flew over the other, missing it by just ten feet.

Christman dove from 12,000 feet at 300 miles an hour, racing for a cruiser. A barrage of antiaircraft fire was between his ship and the target. The PBY is not made for dive-bombing. The wings were beginning to wrinkle and fold back, shaking as Christman put it, "like a riveting hammer."

At 6,000 feet, at a sixty-degree angle, three 500-pound bombs spilled out of the PBY and headed for the cruiser.

Christman pulled the ship out in a spiral, and at the same moment a Zero, which had followed the PBY in the dive, was on them. Gough yelled: "That cruiser is on fire!"

Jap bullets poured into the PBY. It was like hail

EDITOR'S NOTE: *Some of Maj. Kraus's predictions of probable reactions of the Moros are strikingly borne out by the experiences of these Navy flyers. Once convinced their visitors were not Japs, the natives did all they could to help them. This outstanding account of Navy heroism is from Suez to Singapore, Mr. Brown's newly-published book for more mention of which see page 888.*

on a tin roof and Christman and Gough watched the shells plowing into the cockpit.

"I'm out of ammunition," the fourth gunner yelled through intercommunication. "Gas tanks punctured."

The gas in the bilges was around six inches deep. About a hundred gallons had leaked out.

On the seventh run, to shoot down the violently twisting PBY, the Jap Zero used his 20-mm. cannon. The shell entered the cockpit a foot over Christman's head. He ducked instinctively.

The Zero pulled away and came in for the last run. Christman began scissoring again. Again the cannon, and this time it came through the mechanics' compartment and exploded in the bulkhead just behind Gough's head.

Immediately the whole plane was afire. Second Radioman P. H. Landers yelled: "Jesus Christ, we're afire!"

Gough twisted his head around. The mechanics' compartment looked like the door of a firebox.

"Chris," he said to the pilot, "we've got to get down before this thing breaks in two." Christman nodded. They were at a thousand feet.

First Radioman Robert Lee Pettit, thirty-five and married, already was burned badly. Second Mechanic Bangust and Landers put on their 'chutes and told Christman:

"The stink is so bad here we can hardly stand it. What do you want us to do?"

"Do what you want," Christman said. "If you want to jump, go ahead, or you can stay and I'll try to get down."

Bangust and Landers leaped out of the plane when it was 300 feet from the water. Their 'chutes blossomed out just a fraction before they hit.

The PBY landed, doing a hundred knots an hour, water-looping both ways, swinging crazily. The ship was burning rapidly. From the aft end of the navigator's compartment (directly behind the cockpit) to the tail was a mass of flames. Third Pilot Don Lurvey was still at his gun in the bow. Pettit, badly burned, came through the flames to reach the navigation compartment.

Christman went back to the navigation hatch and threw it open. He checked to see if anyone had a life jacket—the rubber boat was shot full of holes. Christman crawled up through the navigation hatch, then went forward to pull out Third Pilot Lurvey from the forward pit. Gough clambered hastily through the hatch and hauled out the badly burned Pettit. All the flesh was off his hands and his face was bleached white, streaked with black.

"Guess we might as well get into it," Gough said, and they slid off. Gough turned to see if any men were swimming out from the bulges where the gunners are. First Mechanic Andrew Waterman had been killed in the air or burned in the plane. He was not found.

When they were fifty feet away, Gough looked back and saw the PBY break in two. The right wing broke off,

midway out, then the center section gave way. The engine fell over into the navigation compartment.

Smoke and flames billowed out, but the fire did not spread more than twenty feet from the plane.

As soon as the flames died down, Third Pilot Lurvey swam back to see what he could salvage. He found a boat, but it was so badly burned not one of the compartments would hold water.

It was seven o'clock in the morning and the sun beat down fiercely.

All the men were bundled in the heavy clothing airmen need at 12,000 feet. Gough pulled out a small penknife. He started slicing off Radioman Pettit's coat. The knife slipped and jabbed a hole in Gough's jacket. He had to hold his thumb over that hole for the next thirty hours.

Then they slipped out of their heavy clothes. Gough kept the knife and his wallet. They could see the island of Jolo, where the Japs were, and about twenty-five miles off they saw other islands.

They decided to stay together. Two of them took turns swimming on each side of the radioman. Pettit could only lie on his back and kick his feet, and was suffering intense pain. Every now and then Gough or Christman would nudge Pettit to keep him going in the right direction.

"We'll have to decide," Christman said, "whether we're going to stick together and not change our minds, zigzagging all over the ocean." He looked around and Siasi Island seemed to him to be closest. Gough agreed, and so did the third pilot.

"All right," Christman said. "That's it. There'll be no changes."

At 5 P.M., the going was slow. Radioman Pettit was numb to pain now. He could roll over on his stomach and swim as well as the others, lashing out with his arms as if they were sticks. Christman had a sunburned bottom. Their tongues were swollen and they were excruciatingly thirsty.

They held a pow-wow again. Pettit could see and seemed to be in fair shape. They decided that each had an equal chance and that each man could go as fast as he wanted, as slow, or in whatever direction.

Pettit said, "I'm in a hell of a mess. You guys go on without me."

Gough, the strongest, struck out in the hope of reaching land and bringing help. Christman and Lurvey stayed together. Pettit was behind, within shouting distance.

Around sunset, Christman called out to Pettit: "Are you all right?" There was no answer. Christman swam back. Pettit had disappeared.

That was a long night. Christman was out of his head part of the time. He thought he was swimming in an airplane hangar filled with oil. Once he thought he was swimming past an oil well and wanted to go back and sit on an oil pipe.

They would doze off during the night. Christman fell asleep a number of times. A wave would come along and pour water into his mouth. He would wake up sputtering and start to swim off furiously in the wrong direction. Lurvey would call him back.

At sunrise they were close enough to land to see the waves breaking on the beach. Around noon Gough was picked up in a small vinta, an outrigger canoe, by natives who took him to shore.

Gough tried to induce them to go out to search for Christman and Lurvey, but they refused. Shortly afterward the first and third pilots sighted a sail boat with a few Moro boys handling it. It took the Americans an hour, still in the water while the boat stayed twenty feet away from them, to convince the Moros they were not Japs and wouldn't harm them. Christman used the few words of Tagalog he knew, yelling, "American! U. S. Navy! Friend!"

Finally Christman was able to grab the outrigger. He pulled off his lifebelt and held it up to show the stamp: "U.S.N."

That settled everything to the Moro boys' satisfaction.

Christman asked for a drink, but the boy wanted three centavos. Not having any money Christman traded his precious life jacket for the one drink of water. Then Lurvey, still in the water, was hauled into the boat.

The natives on shore treated them with medication, food, and beds. They found Second Radioman Landers. He had been swimming with Second Mechanic Bangust, but after six hours Bangust had died in the water. Landers said before Bangust died he told him First Mechanic Waterman had been shot in the stomach and died on the plane before it hit the water.

The natives rubbed the airmen with coconut oil, and gave them hot milk, sugar, and water.

For two days they recuperated on the island of Siasi, but it was eight days, hopping from one island to another by canoe launches, vinta, and motor launch, before they got to Terakan in Borneo. The Dutch flew them to Balikpapan, then sent them on a boat to Surabaya. The Navy Department had reported them missing in action, believed killed.

Of the seven men in that PBY of Patrol Wing 10, four got back.

FIELD ARTILLERY GUNS

BY MAJ. FAIRFAX DOWNEY

I

Oh, some prefer machine guns,
And some the rifle's crack,
And some the gun that has to run
Along a railroad track.
Some go for anti-aircraft,
But the only guns for me
Are the wheeled guns, the steeled guns
Of Field Artillery.

II

They may be pulled by tractors,
They may be self-propelled;
Their motive force may still be horse,
When ground is gained and held.
The red guidon will lead them.
Wherever the need may be
Are the wheeled guns, the steeled guns
Of Field Artillery.

Chorus

When you march to the sound of the guns, of the guns,
The guns are sure to be
The wheeled guns, the steeled guns
Of Field Artillery.
Flashes of flame, scream of shell that stuns—
We keep 'em rolling,
Field Artillery guns.
Wreathed by smoke of battle,
Laid for victory,
Our guns stand manned
For land of brave and free.
Smashing the Japs, Pounding the Huns,
On into action,
Field Artillery guns!

The many Field Artillery friends of Mr. Sgt. Burt W. Pierce will regretfully read this notice of his death on September 25, 1942.

Mr. Sgt. Pierce enlisted November 8, 1915, and served in Co. I, 3d Engineers, until February 21, 1919. At that time he transferred to Field Artillery, was assigned to the 15th Field Artillery as Regimental Sergeant Major, and was promoted to Master Sergeant.

He was placed on Detached Service in the Office Chief of Field Artillery in 1919 and was permanently assigned there in March, 1921. When the Office Chief of Field Artillery was dissolved in March, 1942, he was transferred to Headquarters, Army Ground Forces, where he served until his death. Mr. Sgt. Pierce thus was in the Office Chief of Field Artillery under General Snow (first chief) through the term of General Danford (last chief).

When the enlisted personnel of Headquarters, Army Ground Forces, were transferred to Infantry for administrative purposes, Mr. Sgt. Pierce remained in Field Artillery and continued to perform the same duties he had performed while in the Office Chief of Field Artillery.

His character rating upon termination of each enlistment was deservedly "excellent," without exception.



The old . . .

RADIOS



. . . and the new



When this set is off the air its antenna is telescoped into the case. The operator switches from receiving to sending by pressing the push-to-talk button under his fingertips.

RUSSO-GERMAN WAR

PART VI

By Colonel Conrad H. Lanza

Sevastopol, a city of normally some 85,000 people, was the chief naval base of Russia on the Black Sea. It had extensive naval repair facilities, drydocks, and depots. The city lay on the south side of Sevastopol Bay, but part of the naval station was on the north side. This bay extended inland on an east and west line about five miles; it had an average depth of 65 feet. Close around the city were old and massive fortifications belonging to the past century, but modern forts defended the sea approaches. During the winter of 1941 and 1942 the garrison had been employed in constructing defensive works on the land side. These extended along the south side of the Belbek River, then swung south across the high ground of Mangoup-Kaleh (about 20 kilometers east from Sevastopol), thence followed the west side of the Bayadar valley to the sea.

This defense line had been strongly fortified. The sea being open, material and supplies were not wanting to the garrison. Batteries were permanently emplaced; machine guns were in pill boxes; numerous tank ditches and other obstacles had been built; and the foreground, where not in woods, had been plentifully sown with mines. The line was naturally strong, the hills being rugged and having but few roads and paths. Woods abounded and were so thick as to be considered impenetrable to tanks.

The Russian garrison consisted of about 125,000 men commanded by Major General Petrov, with Major General Novikov as second in command. There was an independent naval command under Vice Admiral Oktyabrsky, a very active officer. He commanded a few minor naval vessels, but had quite a number of sailors and marines under his orders, as well as some naval air forces. He led the latter himself, piloting bombers and fighters in person over the lines. These naval forces are included in the total force given above.

After the conclusion of the Kerch campaign, described in the August, 1942, *JOURNAL*, the German 11th Army undertook as its next mission the reduction of Sevastopol. After allowing for necessary detachments to watch the coasts against any possible attempts of the Russians to land elsewhere on the Crimea, the forces available to Colonel General von Mannstein, commanding, appear to have been:

The Siege of Sevastopol

German Divisions

22d
24th
50th
72d
117th
132d

Rumanian Divisions

1st
4th Mountain
18th

At least 1 division more appears to have been in army reserve, giving 10 in all. There was attached the Air Fleet of Colonel General Freiherr von Richthofen, plus strong forces of army artillery. Altogether the Germans had about 200,000 men.

They also had a small naval force, consisting mostly of motor torpedo boats, there being German, Italian, and Rumanian contingents commanded by Vice Admiral Georgescu of the Rumanian Navy. Its mission was to blockade Sevastopol.

It took about two weeks to bring the troops from the Kerch Peninsula to the Sevastopol area. As this was a purely logistical movement, the time required could be closely calculated. Without waiting for its completion, preparations for the initial attack started on 1 June, 1942. This consisted of a carefully planned bombing day and night, directed primarily against CPs, OPs, depots, telephone centrals, bridges, and other sensitive points, with the mission of disrupting the enemy's command and communication system.

On June 6th this program was extended to include a daily artillery preparation. The artillery mission was to clear the foreground south of the Belbek River, which had been selected for the initial attack, and destroy enemy batteries and pill boxes. Three days were allotted to this. As the weather was good and visibility excellent, precision firing was employed, controlled by observation from OPs and from the air.

The German plan was to make two attacks:

- a. on the north, south across the Belbek River toward the Sevastopol Bay;*
- b. on the south, west across the Bayadar valley toward Mt. Sapoun.*

Neither attacks nor feints seem to have been made against the Russian center. The pressure was at the ends, with the expectation that if successful the center would cave in, without requiring attacks against that part of the front where the terrain was exceptionally rugged, high, and difficult.

On June 9th the north attack started, preceded by a strong and efficient air and artillery preparation. The

Air Fleet operated in waves, to give continuous bombing effect on enemy forward areas. Artillery sought to neutralize hostile batteries, destroy machine gun nests, and particularly to silence some very strong points on the ridge line south of the Belbek (from where the Russians had excellent observation of the foreground) and strong permanent works. The Air Fleet assisted the advance of ground troops by constantly intervening to bomb and machine gun resisting enemy points and in advising and directing the fire of the artillery.

The Russians resisted fiercely, but the German attack had been carefully planned, was strongly supported, and succeeded in securing a bridgehead south of the Belbek, in the vicinity of the road and railroad which extend south from Belbek village. Next day the German attack was continued with special attention to widening the front of penetration to afford a reasonably wide base for crossing the Belbek. Many mines in the foreground also had to be removed.

On June 11th, tanks and armored cars having been brought over across the Belbek, a major attack was launched and made considerable progress, always accompanied by a complete air and artillery support. Russian counterattacks failed to drive the enemy back. The Russians claimed to have killed 15,000 Germans in this sector since the 9th. However, the width of the sector (not over three miles) would make this number improbable. On the other hand, the Germans claimed that within the same period they had captured 3,600 prisoners, 41 guns, and 12 tanks, and had removed over 20,000 ground mines. The number of pill boxes and machine gun nests reported captured or destroyed in an area of about 3×2 miles was reported as 645, or over 100 to the square mile.

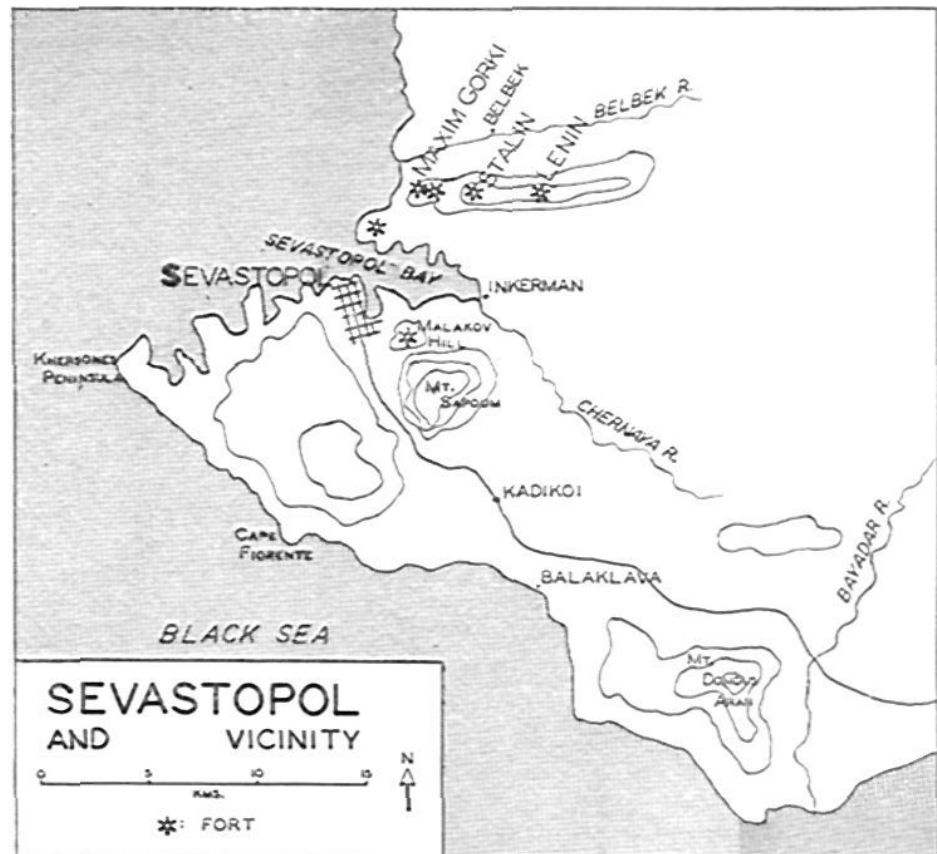
During the two following days the Germans continued their attack, advancing methodically against one set of fortifications after another. During this period, Rumanian troops on the south front conducted minor operations across the Bayadar valley to secure a good line of departure for a main attack to be launched later.

On June 14th the German attack was close to the ridge line, halfway between the Belbek River and the Bay of Sevastopol. On this ridge were modern permanent forts. Of these Fort Stalin, near the center of this sector, was attacked by dive

bombers using the heaviest caliber bombs and by artillery. After this preparation the ground troops attacked and captured the fort before dark. The ridge line was the last defense which the Russians had north of Sevastopol, and its piercing by the unexpected fall of one of their strongest works brought home to the Russian commander the danger of the entire fortress' falling.

The sea route, although subject to blockade by Axis motor torpedo boats, was open. Reinforcements were arriving, and more were called for. Supplies were also coming in, wounded were being evacuated. A start was made on the evacuation of the 80,000 civilians in Sevastopol. As the distance to Russian ports in Caucasia was short, the ships employed were jammed with passengers, both between decks and on deck. There were losses. On this day an Italian MTB sank one of the transports.

On June 15th, the attention of the Russians having been concentrated on the north front, von Richthofen's Air Fleet was assigned to the south sector. With a strong force of artillery, it supported a major attack (mostly by Rumanian troops) launched westward from the Bayadar valley. The Russian front line troops fought valiantly, but the High Command seems to have been taken by surprise, for there was a lack of reserves, and the Rumanians made a deep advance towards Balaklava, astride the road roughly parallel to the coast and about 5 kilometers inland. There was only minor fighting this day on the north front, as the Air Force was absent with the Rumanians.



Two days later, after a day's rest, the Rumanians renewed their attack. They cleared out the high ground along the coast, extending west from Mt. Domous Aran, 625 meters high. Two main efforts were made, respectively north and south of the highway to Balaklava. The terrain was very rough and the defense very stubborn. However, it was a passive defense, which could not withstand the combined, coordinated, and well timed assaults from the air, artillery, infantry, and tanks. The Rumanians appear to have reached the general line Tchatal-Kaya—Koutchouk Mouskomia.

On the succeeding day, the 18th, the Air Fleet switched over again to the north sector. To enlarge the breach in the ridge line, a heavy attack was delivered against Fort Maxim Gorki, which was on the sea end of the ridge line. This really consisted of two adjacent forts, each of which had two 305-mm. guns in steel turrets. These had been intended primarily for fire out to sea, but they had a field of fire on the land side. The forts were hewed out of the rock and were completely below ground, in five stories in which the garrison lived and where their ammunition and supplies were kept. This great fort was supposed to be impregnable.

The fall of this double fort was brought about by an interior explosion in one of the lower stories, which set off the magazines. Whether this was caused by a German bomb or shell or was accidental may never be known. The explosion did not completely wreck the fort, but in addition to doing great damage and starting serious fires it made the interior of the fort uninhabitable due to poisonous, acrid vapors, which forced the survivors out into the open and enabled the Germans to occupy the exterior parts of the fort. Three weeks later the fumes within were still strong enough to prevent complete access to the interior.

The capture of Fort Maxim Gorki gave the Germans the necessary front for a further advance. Always with air and artillery support, they moved south on the 18th. There being no further prepared defenses before them, they reached the north side of Sevastopol Bay on a front of about three miles just north of the city. A Russian fort on the cape at the north side of the bay remained intact in Russian hands. A few small Russian detachments held out in other places.

In the south sector, the Rumanians secured the services of the Air Fleet in part and made a further advance toward Balaklava.

On June 19th the Germans consolidated their positions on the north side of Sevastopol Bay by clearing out small enemy nests which had remained there. They occupied those parts of the Russian naval station and docks which were on their side of the bay. The city itself was brought under direct artillery fire, it being less than 2,000 meters from the cliffs on the German side of the bay. The fort on the cape was invested and its reduction begun.

In the south sector the Rumanians, this time assisted by a German division and having the Air Fleet at their disposition, renewed their attack. They met more resistance

than usual, including counterattacks which delayed the advance—which nevertheless made net gains forward.

The Axis blockade force this day reported sinking a transport, a submarine, and two coast guard cutters. The Russians still moved in supplies and moved out wounded and refugees, but they suffered considerable losses in doing so.

On the 20th the Germans renewed operations along the ridge line south of the Belbek, by attacking Fort Lenin, east of the road and railroad leading south from Belbek village. After the usual thorough preparation, Fort Lenin fell. This assured to the Germans freedom to use the main road and the railroad to their new position along Sevastopol Bay. Operations were pushed against the fort on the cape and its outer defenses were pierced.

Sevastopol was brought under intense artillery fire, and the Air Force commenced a regular bombing program. Between them they caused great damage both by direct hits and through resulting fires. The Russian population and troops took shelter in deep rock shelters which fortunately abounded and thus reduced personnel losses to a minimum. One Russian account states that only one casualty was incurred from the dropping of some 800 bombs of all calibers. The city, however, began to disappear quickly in flames, smoke, and dust.

In the south the Russians delivered strong counterattacks against the Rumanians and Germans. They failed to change the situation materially.

On the 21st the Germans captured the fort on the cape at the entrance of Sevastopol Bay. This placed the entire north shore in their hands. Taking advantage of a presumed state of exhaustion of the Russians after their counterattacks of the preceding day, the Rumanians and Germans on this front renewed their advance. The Air Fleet supported them, together with a reenforced and very efficient artillery. The Axis reached the general line through Komary.

The German High Command now had to decide how to proceed with the reduction of that part of the fortress of Sevastopol not yet taken. The city had been rendered unusable, but the Russians were obviously intending to hold out on the high ground surrounding the city and on the Khersones Peninsula. On the north front they were covered by the wide and deep Bay of Sevastopol and its extension, the Chernaya (or Syvernaya) River. The Russians abandoned their positions north of this stream and occupied positions on the south bank. The line then curved around through the already prepared defensive positions on Mt. Sapoum, thence across to Balaklava. Colonel General von Mannstein's decision was to pierce this line near its center by an attack from near Inkerman at the head of the bay, where the valley of the Chernaya was narrowest. A success here would turn Mt. Sapoum and also the very strong Russian defenses on Malakov Hill.

During the next three days the Germans on the north pushed east toward the head of the bay and Inkerman.

There were no important works in this territory, and the advance consisted of the reduction of a succession of machine-gun nests, pill boxes, etc., and in overcoming terrain difficulties due to numerous steep ravines which ran into the bay. Routes of supply had also to be opened up to the intended area of operations to insure sufficient support to the troops which would take part in what was hoped would be the final phase of the siege.

On June 25th the Germans arrived opposite Inkerman. This was strongly defended, but the customary air and artillery preparation enabled German armored cars and tanks to push in. That village fell and, later in the day, so did another further east. While this was going on the Rumanians attacked in their sector and succeeded in pushing their front line through Balaklava and the villages to the north to include Kadikoi, where there was considerable house to house fighting which extended to adjacent forests.

On the 26th the Rumanians, always supported by the Air Fleet and strong artillery, advanced and broke into the forward positions of the Russian main line of resistance on Mt. Sapoum.

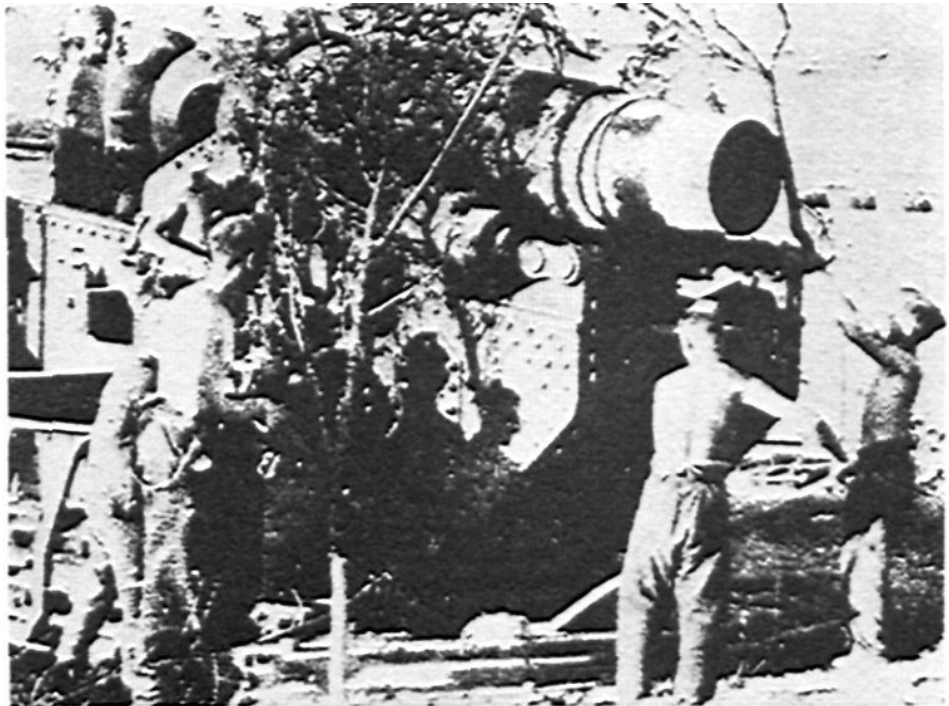
General Petrov, commanding the Sevastopol area, recognized the seriousness of his position. The sailors and marines of the naval station, now destroyed by the bombing and shelling of the Germans, were placed in line to assist the regular army troops. The sea was still open. Russian GHQ intervened by sending reinforcements. Only so many as could be embarked on a single destroyer went to Sevastopol. This destroyer ran the blockade, arrived in the port after nightfall, and within two hours discharged a cargo of ammunition and its passengers and embarked wounded and



News accounts of the siege of Sevastopol speak of a super-powered weapon of around 510-mm. This may be it. Such a piece could use a projectile of around two tons, and be able to throw it some ten miles. This photo shows it immediately after firing, while still partially in recoil.

refugees, who completely filled every bit of space on the vessel. It then got out of the harbor under cover of darkness, again ran the blockade, and arrived safely in its port.

The major part of the Russian reinforcements formed



This close-up is of a somewhat similar but probably slightly smaller weapon. Details of the carriage indicate it is not of new design—at least not entirely. Construction suggests some old Skoda designs.

a special expeditionary force and went to the Kerch Peninsula, where they went through the motions of landing. It was not a very serious attempt and appears to have in no way deceived the Germans. After this demonstration the expeditionary force sailed back whence they came.

On the 27th, German and Rumanian troops advanced further into the Mt. Sapoum position, which was strongly defended by the Russians. On the north side the Germans made their preparations to attack south from the vicinity of Inkerman.

On June 28th a combined attack by the north and south sectors started. It was supported by all the Air Force and artillery the Axis could muster. Following a tremendous artillery and air preparation, which continued uninterruptedly throughout the battle, German troops from the north side of the Chernaya valley, east from Inkerman, attacked across the stream towards the south; Rumanians and Germans attacked the same area from the east. Under the combined assaults, each of which flanked the other, the

Russian lines gave way and the Axis gained a large sector of territory north of Mt. Sapoum and partly overlooking it.

Next day the Axis attacked along the whole front from Inkerman on the north to the Black Sea on the south. The German attack on the north was extended to a new attack from Inkerman and west thereof; this got over the Chernaya and seized and occupied the high ground just east of Malakov Hill. Further south the Rumanians, with German support, stormed and captured all of the Mt. Sapoum positions.

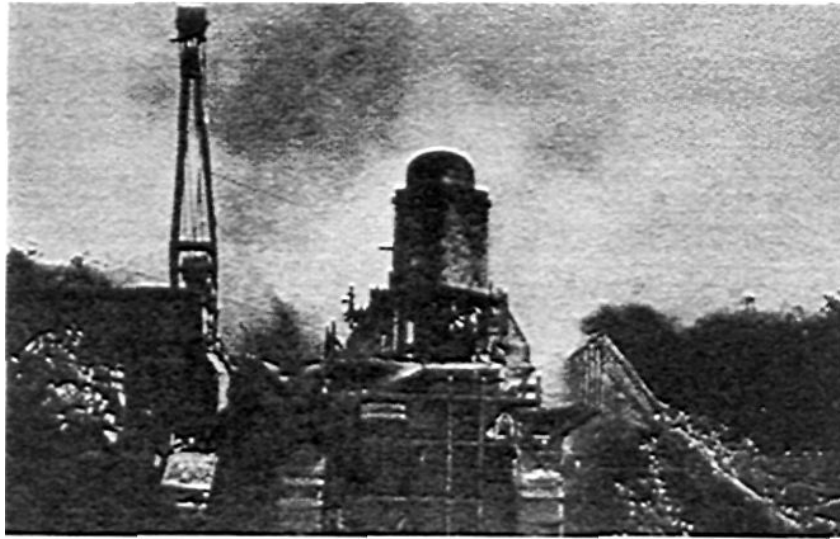
The 30th was the critical day. On the north the Germans were opposite Malakov Hill. It is a flat topped, artificial, ancient mound about 1,150 feet long and 500 feet wide and is the highest point about Sevastopol. Its fall in the year 1855 had then determined the fate of the fortress. The Germans, with artillery support from the north side of Sevastopol bay which enfiladed the Russian lines, assaulted and occupied the Malakov by afternoon. To the south Rumanians and Germans seized the entire remaining defensive line, extending south from



This well-named mortar, however, undoubtedly gave the sledge-hammer blows at Sevastopol.

near Malakov Hill to Cape Fiorente. The Axis was now inside the last Russian defensive line and had no more fortifications to oppose them.

Without delay the Germans and Rumanians, led by their tanks and with an air umbrella protection overhead, moved on a broad front, crossed a great antitank ditch, and arrived on a line



during its original invasion, the Russian recapture of Kerch, and the final reduction of the Kerch Peninsula and of Sevastopol. This gives an indication of the value of the Crimea and of the efforts which Russia expended in trying to save it. As in previous campaigns in this Russo-German war, the Russian mission was to preserve an *area*, the Axis mission was to destroy the enemy forces. In this case the Russians failed. If the large Russian forces employed had been used in the field to defeat the Germans first, the Crimea might have been saved; but the

with the east edge of the ruins of Sevastopol.

During the ensuing night, Major General Petrov, the Russian commander, and Vice Admiral Oktyabrsky, together with other high ranking officers and political commissars, fled in a motor torpedo boat. On the morning of July 1st the next in command, Major General Novikov, hoisted the white flag and then formally surrendered his troops.

The Germans at once entered Sevastopol. The destruction from the artillery and air fire had been so great that they found not one house where human beings could live, and scarcely ten buildings that might be repairable. Of the 80,000 inhabitants present at the beginning of the siege, less than 200 old men, women, and children remained.

A few Russian troops refused to surrender. They held out on the Kherstones Peninsula until the last of them surrendered on July 4th.

The siege of Sevastopol was over.

* * * * *

The casualties at this siege were, so far as now known:

	Killed	Wounded	Missing	Total
German	4,337	18,183	1,591	24,111
Rumanian	1,856*	5,500†		7,356
Aggregate	6,193	23,683	1,591	31,467
*Includes the missing.		†Estimated.		

Russian losses are only partially known. The Germans report that 97,000 prisoners were taken, which presumably included those wounded who were not evacuated by sea. With an original strength of about 125,000, this would leave some 28,000 unaccounted for—killed, missing, and evacuated. German estimates of Russians killed vary from 30,000 to 40,000. So perhaps 28,000 may be a conservative estimate of killed.

COMMENTS

The capture of Sevastopol cleared the Crimea, freeing the German 11th Army, less coast guards, for use in a contemplated new operation involving the invasion of the country behind the lower Don River. During the time this army was in the Crimea, that is from September 21, 1941, its reports indicate that it captured 430,000 prisoners, 1,198 tanks, 2,102 guns, and other booty in proportion,

passive defense of Sevastopol, however bravely fought, was doomed to fail sooner or later.

The German siege method of piercing the defenses of the fortress on a comparatively narrow sector, in this instance the north one, is in accordance with the latest German ideas on siege warfare. The same procedure was followed in World War I at Antwerp and similar fortified places. It seeks to reach the interior of the fortress quickly by concentrating the attack within a narrow channel, requiring the minimum of heavy artillery and other materiel. In this siege it took the attackers just 9 days from the date of the original attack on June 9th to reach the north shore of Sevastopol Bay, a distance averaging about 7 kilometers from the line of departure.

The German artillery commenced its preparation on June 6th, and thereafter fired continuously until the 30th, inclusive, or 25 days in all. Its reports show that during this period 30,000 tons of shells were expended in firing at Sevastopol alone, which averages over 50 tons per hour, day and night. The number of batteries required to fire this amount of ammunition, in addition to what was expended on other targets, has not been ascertained. For the same target, but for the entire month of June, the German Air Force reports only 25 tons of bombs dropped on the city of Sevastopol.

The foregoing figures indicate that the Axis Air Force had for its major mission the attacking of targets which directly opposed the ground troops, leaving to the artillery those targets which were fixed and accurately located on maps.

The amount of ammunition fired by the German artillery, and its constancy, would indicate that it was more than sufficient to interfere severely with command functions and communications, and interrupt circulation on roads. This would explain why the Russian reserves, which seem to have been ample in number judging from the number of prisoners taken, were not always at the right place. In fact on many days no counterattacks were made, notwithstanding the large garrison. When they were made little ingenuity appears to have been exercised; they were straight-out attacks over and against terrain recently lost.

The loss of Inkerman and vicinity was the key to the Russian defeat—this enabled the Axis north and south attacks to combine. No efforts seem to have been made by the Russians to counterattack the German north attack by advancing westward from Inkerman against the German left flank. Again the defense was only passive. After this lack of initiative the end was in sight.

The German Air Fleet, about whose strength information is yet lacking, had an important part in the Axis success. Previous to the capture of Inkerman the Air Fleet devoted its entire effort to assisting alternatively either the north or south attacks, but not both at the same time. It operated continuously, waves of planes regularly relieving preceding waves so as to maintain at all times an air umbrella over the attacking ground troops, reconnoiter for them, direct them, and aid their attacks on centers of resistance. The Russians also had air forces. Except for the personal flights of the Admiral commanding the naval aviation, very few reports mention this force, leading to the conclusion that its numbers were insufficient for it to have an important part in the operations.



Soviet howitzers are frequently employed with protection from the elements to facilitate bad-weather support.

This article was prepared exclusively for The Field Artillery Journal, through the cooperation of the Soviet Embassy, and was received directly by radio from Moscow. Its lessons and suggestions will be useful for all branches and all components.

IMMOBILIZING TANK MANEUVERS

By Maj. Gen. N. Gavrilenko

Defense units' basic task in repelling enemy tank attacks is to destroy the enemy vehicles before they have a chance to wedge into our positions. This is accomplished by all arms working in close coordination. The basic means, however, is *artillery*.

Correct organization of antitank defense requires a perfect knowledge of Nazi Panzer tactics. Moreover, their variations must be mastered, for these tactics often differ—as the following typical examples show.

NAZI TANK ATTACKS

In one of the many attacks launched by the enemy in the Kharkov sector, over eight Nazi tanks approached our position in massed column. At a distance of two kilometers from our front lines they broke up into two columns with a one-kilometer interval between them. Deployment began one kilometer from our position. Having deployed, the Nazi vehicles opened an ill-aimed but steady machine gun fire on our infantry. Their assault was staged in three echelons advancing in checkered formation. Their second assault aimed at wedging into our extended lines, and the attack was launched with vehicles travelling from 10 to 15 kilometers per hour.

On the following day we encountered a larger number of tanks, this time in different formation. Repelled on the previous day by our heavy artillery barrage, the enemy decided to attack our flanks and crush our gun positions. After preliminary reconnoitering by 20 Nazi machines and a prolonged air bombardment of our artillery, Nazi tanks took up the offensive. Again they were in three echelons, but this time with intervals of 40 to 50 meters, each echelon separated from the following one by 400 meters.

Sticking to this formation, the tanks reached their attacking position and opened fire on our batteries at a range of 800 meters. The first echelon made a dash for our gun positions, its place in the field being taken by the second line of tanks which in turn was replaced by the third. Their attack was pressed forward at a speed of 10 to 15 kilometers per hour. Each battery was attacked from three sides in a pincer movement, the distance between pincers being from 500 to 600 meters. The enemy brought in sub-machine gunners on his first echelon of tanks, and made free use of flame throwers to set afire the bushes surrounding our guns.

First to open on those advancing tanks were our heavy guns, whose fire began as soon as the Panzers approached our front line. This barrage produced good results—the enemy's formation was broken, and many machines were halted.

Destruction fire opened at a distance of 200 to 300 meters, and in some cases guns fired at point-blank range. This was true even of the heavy guns. At vulnerable spots batteries had data prepared for mass fire on three or four probable targets. Advanced artillery observation posts were sprinkled through the infantry lines, with artillery commanders keeping close watch of tank movements and directing fire from open and closed positions.*

Our artillery maintained contact throughout the engagement, shifting of positions rarely being permitted: as a rule the guns stuck to their original positions until the tank attack was repelled.

The first assault of a large Panzer group was borne by a howitzer battery under Senior Lieutenant Vlasov. His 152-mm. howitzers centered their fire on German tanks as soon as the latter appeared within range. As

*Direct-laying and defiladed positions. Ed.

tanks drew nearer Vlasov's positions, firing his heavy guns became more difficult. It required supreme coolness and perseverance to shoot down enemy tanks at short range. At distances of 1,500 down to practically 10 meters, this battery destroyed eight German tanks and dispersed the remainder.

The German tank attack petered out before reaching our front lines. Tank concentrations were broken up while they were still approaching our gun positions. Wedge spearheads were destroyed before they had time to break up our fighting formations at any extensive depth. Tank pincer movements were cut short by batteries operating on our flanks. The broken, exhausted Panzer units turned back. The German blow at this sector failed, mainly due to artillery operating in conjunction with our tanks.

A-T ORGANIZATION

Our enemy resorts to tank maneuvers extensively. Finding a formidable defense at one point, he changes direction and searches for vulnerable junctions and unprotected flanks. It is in these cases that well-planned

and carefully organized antitank artillery fire is indispensable. But all such antitank defenses must be combined with natural and artificial obstacles: enemy tank operation can be frustrated, but only after you know what direction it is likely to take. The chief points of probable enemy attack must be detected, and on these powerful antitank weapons concentrated. Enemy tank maneuvers can be immobilized by correctly distributing and using these weapons both at the front line and in depth.

Roads should be intersected by tank traps, and liberally mined. All ravines should be mined, too, and forest roads criss-crossed with obstacles that are not easily removed. This of course requires much time and work, but will inevitably bring the Nazi Panzers to a halt, throw them under mass fire, and destroy them.

Sapper troops must be used to best advantage. Engineers should always be available. The immediate erection of antitank barriers is an immediate law in both offensive and defensive operations.

But above all is required strong artillery, properly placed and served with determination.

USE OF ANTI-AIRCRAFT GUNS AGAINST TANKS

From *Red Star*, June 12, 1942

In the Soviet-German War the Red Army antiaircraft artillery has learned to combat tanks as well as planes. Dual purpose AA guns make good AT guns because of their high muzzle velocity, high cyclic rate of fire, and 360° traverse.

During the first six months of the war, Red Army AAA fired in self-defense at enemy tanks when they broke through to the battery positions. Gradually the AAA became an organic part of the AT defensive system. In numerous instances Soviet AA guns successfully repulsed attacks of large German tank units.

The AA units learned that most tactical operations seem to divide themselves into two phases. In the first, army artillery concentrates heavy fire on enemy tanks before they can jump off. It then lays down a screen of fire to prevent the enemy tanks' approaching our forward line of defense and breaking up our infantry formations. At this time the AA units are busily engaged in repelling the attacks of enemy aircraft, particularly dive bombers, which attempt to open the way for the tanks.

In the second phase, after enemy tanks have broken into the initial line of defense or even deeper, the enemy aviation generally shifts its attack to counterattacking our reserves. In this comparative lull, AA guns fire at the

German tanks by direct laying; the more point-blank the range, the more effective the fire.

It must always be remembered, however, that the prime function of antiaircraft artillery is against planes. In areas where there is insufficient antitank artillery, AA guns must be employed to drive off tanks which approach the battery positions or threaten to break up the battle formations of our troops.

In order to combat enemy mechanized forces successfully, the AAA must prepare its AT defense in advance. When the guns go into position they must be ready to open fire against attacking tanks immediately. To establish such a system it is necessary to:

- 1) make a complete study of the surrounding terrain, particularly as regards possible tank approaches;
- 2) determine the sector of fire for each gun, including ranges to key reference points;
- 3) build the minimum amount of necessary field fortifications; and
- 4) establish special anti-tank observation points.

All AA personnel not working at the guns during a tank attack take up positions in vicinity and use hand grenades, gasoline bottles, or armor-piercing bullets against enemy tanks.

The Development of Soviet Antitank Defense

By Lt. Col. I. I. Alexeyev

One year of the epoch-making battles fought in the western districts of the Soviet Union now permit certain generalizations of the struggle against the panzer divisions, the main striking force of Hitler's armies. Operations in and before 1941 in Poland and France clearly show that the basic form of battle envisaged by the German army is an operation based on the mass application of panzer and motorized units, with deep infantry and powerful air support. The mass utilization of tanks and other fighting vehicles was characteristic of all operations staged by the German army in the period of its advance.

EARLY THOUGHTS

Prior to its war with the Germans, the Red Army had no experience with mass tank attacks. The war in Finland and frontier skirmishes in the Far East gave no opportunity to test theories of antitank defense. The Red Army made a careful study of tank warfare, thoroughly examined the works of Fuller, Eimansberger, and Guderian, and its officers followed closely the debates in foreign military circles on the role and possibilities of mechanized armies in future wars. Particular attention was paid to the tank battles in Western Europe in 1939-40. This investigation led to certain conclusions on basic questions of antitank defense which were embodied in the Red Army's field regulations:

"Basic means of disabling tanks and of repelling tank attacks is artillery fire at pointblank range. Antitank guns are the chief weapon for antitank defense. Their fire is supplemented by the fire of the division and corps artillery, primarily cannon batteries. Large-calibre machine guns supplement antitank artillery at short range. Hand grenades and inflammatory materials are effective means of combatting tanks at short range. Natural and artificial antitank barriers are effective only in combination with the fire of antitank weapons."

In defining the tactics of battle, the field regulations hold that defense is primarily *antitank* defense, prescribe the erection of antitank barriers and areas, and provide that the commander under all conditions maintains a mobile antitank reserve.

GERMAN TACTICS

Before considering the evolution of antitank weapons and the tactics of the Red Army, one should form a clear picture of the offensive tactics employed by the German motorized-mechanized formations, as revealed in the operations between June and December, 1941:

The division (which is the highest mechanized unit of the German Army) consists of a tank regiment, two motorized regiments, an artillery regiment, and sundry auxiliary units. Its striking force is its tanks; all other units support them. Combat formations are echeloned in depth. The first echelon is the assault group, consisting of a tank regiment deployed in wedge-like formation—an advance battalion with two others behind, to right and left. The second echelon is made up of one or two groups intended to develop a break-through—usually motorized regiments. The third consists of reserves.

Suddenness is characteristic of German panzer movements. Mechanized troops as a rule attack in movement and on meeting stiff resistance seek a flank around which to maneuver. The basic method employed in all tank operations is deep penetration of the opponent's defense formations and piecemeal encirclement. Tanks advance by bounds, consecutively destroying antitank defenses. The second echelon helps the infantry mop up any remaining pockets of resistance. Motorized infantry enlarges the breakthrough along the front and towards the flanks. This formation leads to a situation in which the success or failure of the leading tank echelon determines the outcome of the battle for all units involved.

SOVIET DEVELOPMENTS—*Materiel*

With regard to artillery, it should be noted first of all that a radical change has taken place in the conception of antitank guns as a basic means of combating tanks. Actual fighting experience showed that these guns were enveloped in a whole mass of artillery which without exception was drawn into active operations against enemy tanks. At present, the principle that all artillery is antitank artillery prevails unchallenged. A recent example is typical: in the southwestern sector in May, a battery of heavy howitzers of a Guard unit helped repel a mass tank attack, and destroyed eight enemy tanks by firing at pointblank range. At present special antitank guns comprise only a fraction of the solid artillery antitank defense, which continues to be the basic factor in disposing of German panzers.

Single combat with enemy panzers necessitated certain structural modifications in gun designs, principally to increase muzzle velocities and at the same time reduce the general dimensions of artillery installations. Thus,

division artillery guns have been reduced in weight by 25%; as they became smaller they gained in mobility and were less detectable on the battlefield.

The practice of using ordinary shell against tanks has been greatly developed. Small and medium caliber antiaircraft guns have also been employed against tanks, with excellent results. Consequently the whole of the artillery serves as an antitank weapon.

The part played by the infantry antitank rifle has grown tremendously. With a caliber twice that of the ordinary rifle, it is carried by one man and operated by two. Rapid firing and with tremendous muzzle velocity, this weapon pierces armor plate up to 40-mm. thick. Provision of rifle regiments with antitank rifles has increased 416% since the outbreak of war. Replacement of bundles of hand grenades by a special antitank grenade, and the introduction of antitank bottles containing inflammatory fluid, have produced a new type of soldier, namely, the tank destroyer. These measures applied in combination have made the infantry independent in antitank defense.

The caliber of tank artillery has been increased and the radius of tank movement extended. Stronger armor plate has been supplied for front, sides, and turret. Last but not least, the war has produced a new type of weapon—antitank aircraft. The armorplate protection of the vital parts and their powerful guns have made these planes a distinct menace to enemy tank columns.

Tactics

Parallel with qualitative and quantitative changes in antitank equipment were the development of new tactical methods, adaptation of fighting formations to combatting tanks, and organizational changes in various branches of the service. As already pointed out, one characteristic feature of German panzer operations is suddenness. Antitank reserves at the disposal of the unit commander have proved insufficient to offset the sudden threat of breakthrough, of the menacing situation at the flanks; maneuvering of weapons already deployed in a certain direction required much time and usually came too late. Some other solution was required and it was found necessary to organize special tank destroyer units, either purely artillery units or composite ones representing several arms. They are provided with powerful weapons and are highly mobile. Destroyer units come under the headquarters of a given sector of the front and are capable of rapidly strengthening antitank defense at vulnerable spots, blocking a tank advance in case of a breakthrough, or quickly building up antitank defense.

The tendency of German panzers to strike deep into the defenders' formations and encircle his units piecemeal necessitated organization of deep antitank defense to deprive enemy tanks of their maneuvering possibilities. The antitank defense center and antitank area have become the basis of antitank defense. The antitank defense center is built around the artillery formation which forms its

backbone. Dislocation of antitank rifles and squads of antitank destroyers is adapted to the position of guns and batteries; rifle units too adapt their formation with a view to having artillery as the center and cover. Antitank defense centers are skirted by natural and artificial tank



Although rather high in silhouette, this type of self-propelled AT gun has given the Russians excellent service. This crew scorns helmets, but has rifles ready for use if needed.

barriers and provide defense in all directions. Along both front and flanks, these centers coordinate their fires so that all unoccupied corridors are covered. Having thus extended the antitank defense in depth and reliably covered their flanks, these defense centers break up any mass tank attack into a series of isolated wedges. By inflicting casualties on the enemy and destroying his formations, these defense centers pave the way for a counter-stroke by the antitank reserve.

Such in its basic elements was the evolution of practical methods of antitank defense. Faced with barriers and the heavy fire of the first line antitank defenses, the formation of the enemy panzers is broken into isolated parts. Panzers usually try to infiltrate into the depth of the defense through the unoccupied spaces between defense centers, but here they are subjected to terrific fire from the flanks while the second line defense centers open up artillery fire from the front. Dispersed in a virtual labyrinth of antitank defense centers and subjected to attack by all antitank weapons, the enemy attack loses its striking force, spends its momentum and, when counterattacked by our tanks supported by mobile antitank artillery, is hurled back with heavy losses.

The effectiveness of this defense scheme can be seen from recent fighting in the southern sector. At a point held by one unit, the Germans lost 93 tanks in two attacks—destroyed by the co-ordinated action of all antitank defenses. Naturally, the basic defense centers must have adequate protection from the air, which should be provided by antiaircraft defenses throughout the battle position.

Repulsing Tank Attack by Fire from Open Positions

By Ovady Savich

A Soviet rifle battalion, augmented by a 4-gun battery of divisional artillery, had taken up a defense position. Scouts reported that the enemy was massing tanks, evidently in preparation for an attack.

Tanks were first sighted on a ridge a little over a mile from the battery. There were thirteen of them. They approached slowly, as though feeling out the ground. The commander at once had one of the guns moved into the open. Five shots were fired and the tanks beat a retreat. The commander left the gun in its new position. Soon two more tanks appeared on the ridge, followed by six others. They opened random fire.

Nazi tactics were obvious. A mass tank attack was to be expected and these sorties of a few machines were intended to ascertain the disposition of our antitank defenses. First a gun shelled the tanks from an open position, others from concealment. One tank was shattered, the rest vanished. It was now clear that the enemy intended to strike at the battalion's left flank. This had been the conclusion of observers and scouts, and now it was confirmed by tank sorties. But the battalion commander did not have time to transfer his antitank guns and rifles to the menaced sector. Moreover, he was afraid to weaken his right flank, in expectation of a pincer movement. The battery would have to face the tanks single-handed.

The battery commander ordered two more guns to be rolled out into open positions. The fourth and last gun was left in its original place, in case the tanks should appear on the right flank. The battery commander bore in mind that

all-round fire was the safest guarantee against surprise. Scarcely had new firing positions been prepared when 14 tanks appeared on the ridge. Instantly the three guns opened intense fire. Three tanks burst into flames, the remainder again turned back.

There was a 40-minute interval before the next attack. The artillerymen took advantage of it to deepen trenches, mask guns, and bring up ammunition. They worked with a will, for it was now clear that the next attack would be no trial of strength, no reconnaissance skirmish, but a grim downright battle. Keen, all-round observation was not relaxed for a moment. Sure enough, a large force of tanks duly appeared on the ridge. They fired several volleys and without slackening speed moved down on the battery. They advanced in three echelons, each about 18 to 20 tanks strong. The battery gave no sign of life. It was more advantageous to allow the enemy to approach as closely as possible.

When the tanks were within a distance of a thousand yards, having reached certain landmarks whose range had been previously ascertained to an inch, the guns opened well-directed fire. Within a few minutes three tanks were enveloped in flames, two others damaged. A certain confusion was to be observed in the enemy's tanks. Only part of them continued to advance, the rest came to a standstill and fired from stationary positions. The battery's fire grew more intense. The gunlayers were so well acquainted with the range and the targets were so close that the loaders could scarcely keep pace. The tanks had now approached within 500 yards, the most vulnerable range for them.

But at this juncture in the duel between 50 tanks and three guns, enemy automatic riflemen intervened—they had filtered into a nearly wood from which they opened frantic fire with the object of killing the gun crews. Simultaneously one of the guns was damaged by a direct shell hit. Thereupon the commander of the fourth gun instantly turned its muzzle toward the woods and began to bombard the forest with shrapnel. The automatic riflemen scattered. The two remaining guns in open positions continued to fire, aiming at the tanks' sides. Shells pierced their armor and tore off their tracks. A black cloud of smoke shrouded the battlefield, pierced by the flames of seven burning tanks.

Men of the rifle battalion in the trenches prepared to sally out with grenades. The incendiary



Until needed, Russian AT guns are often not only concealed, but protected in dugouts as well. In every evergreen country, natural camouflage is easier to install and not so subject to wilting. Note again the ever-present rifles, and boots rather than shoes and leggins.

bottles crew also dashed forward to meet the enemy with grenades, and the two guns kept up the firing, both for themselves and their silent friend. The German tanks, unable to withstand the reception they had met, turned tail and retired full speed.

This unsuccessful attack cost the enemy 16 tanks,

burned and battered. Had the battery remained in a concealed position, had its commander lost his head for an instant and failed to organize all-round fire and intrench himself in new positions in the forty minutes at his disposal, the enemy's losses would have been much slighter and perhaps the attack would have ended differently.

Incendiary Bottle Fields and Fire-Belts

By Major N. Chirkunov

Such simple means as fire-belts and fields of incendiary bottles have been applied against enemy tanks. They are constructed and planned in a system of antitank and anti-infantry obstacles.

Lieutenant Colonel Govorov described the effect of one of these obstacles. A barrier about a quarter of a mile in length of burning hay, straw, brushwood, and other materials was put in the way of fascist tanks. In some places the fiery bulwark reached the height of ten feet and burned fiercely for about two and a half hours. Coming against this wall of fire, the enemy armored machines changed their route, thus exposing themselves broadside to the Soviet antitank guns; 25 of 40 enemy tanks were fastened to the spot.

Any material at hand is used to build a fire-belt: straw, dry reeds, brushwood, wood, turf, etc. The construction should be from 15 to 20 feet wide and six feet high. Stop-logs or poles laid out cage-like may serve as a support for a compact layer of straw and brushwood. The support is made to increase the draft. The bulwark is set on fire either by incendiary bottles or electricity. In order to increase ignition and combustion some combustible liquid—black mineral oil, oil plus kerosene or benzine—is poured over the bulwark.

Fire obstacles should be built on ground which is passable for tanks, but the flanks should border upon impassable ground. Antitank guns should be placed directly behind the bulwark.

Fields of incendiary bottles are another kind of simple fire obstruction, based upon the principle that enemy tanks passing over the section crush the bottles, which contain some combustible fluid, with their weight. Their caterpillars throw the fluid onto the upper part of the machine, from which, through the ventilating system, it penetrates the motor and sets the whole tank on fire.

The bottles are laid out in groups, with four or five bottles in each group. The distance between the groups is about three feet. The whole depth of the field is usually not less than 175 feet, depending upon the locality and obtainable materials. To decrease the expenditure of bottles it is necessary sometimes to lay out the fields in a few echelon-like strips in depth, so that the caterpillars of the tank are unable to make more than one revolution on clear ground.

These fields are constructed where there is a possibility of enemy tanks attempting to attack, and they are combined with other antitank constructions.

MORE MISSING ADDRESSES

Those on the following list have been "missing" for an even longer period than those named on page 835. Can you help us find them?

Lt. Rufus G. Acuff
 Lt. Joseph M. Ambrose
 Lt. W. H. Arthur
 Lt. Mason R. Bagley
 Capt. Richard H. Baker
 Maj. H. S. P. Barstow
 Lt. Frank S. Bell
 Lt. Telmo Vargas Benalcazar
 Major Joseph R. Bibb
 Capt. George M. Bisher
 Capt. Harry H. Bittner
 Capt. John H. Bragg
 Maj. Floyd R. Brisack
 Capt. L. H. Carter
 Lt. Gerald T. Clarke
 Maj. Hugh F. Conrey
 Lt. Miles E. Cutler
 Lt. Thomas W. Donnell
 Lt. Col. H. S. Douglass
 Maj. George A. Duerr

Maj. F. M. Fleming
 Mr. F. Leon Footer, Jr.
 Maj. James C. Frank
 Lt. Boardman N. Frey
 Lt. Col. John C. Fritsthler
 Mr. L. W. Fuller
 Lt. Robert P. Gardner
 Maj. A. A. Greene
 Lt. Theatus E. Greeson
 Lt. Carl V. Hansen
 Maj. Kiernan Harford
 Lt. W. Reginald Harrison
 Mr. Blair Hawley
 Capt. John C. Hayden
 Col. Philip Hayes
 Lt. H. E. Hesselberg
 Lt. W. W. Hill, Jr.
 Sgt. R. E. Holley, Jr.
 Lt. Fred E. Jones
 Lt. Wade D. Jones

Lt. George H. Keck
 Lt. Col. Roy W. Kenny
 Lt. Col. R. H. Knapp
 Maj. Randell Lanon
 Lt. Edward H. La Salle
 Col. Charles A. Liebst
 Pvt. Archibald Lobb, Jr.
 Lt. William A. Lucas
 Lt. Arthur A. Lundin
 Capt. Clyde R. McBride
 Lt. Francis E. P. McCarter
 Maj. John C. McCawley
 Col. N. E. McCluer
 Col. Percy S. McClung
 Capt. Homer C. McDaniel
 Lt. William S. McLean
 Lt. Col. W. F. MacMilan
 Brig. Gen. John Magruder
 Lt. J. H. Melton
 Lt. Paul V. Miller
 Lt. L. M. Morehead
 Major Lucien J. Moret
 Lt. Robert S. Park
 Sgt. Lawrence M. Quilty
 Maj. J. B. Rasbach

Lt. Col. J. P. Ratay
 Capt. S. C. Redfield
 Lt. Wilson R. Reed
 Lt. Col. O. T. Roberts
 Lt. Herbert A. Robertson
 Maj. C. M. Rodgers
 Lt. Charles J. Rosenblatt
 Lt. Col. Harry M. Schwarz
 Lt. Col. Albert C. Searle
 Maj. T. L. Sherburne
 Lt. Col. V. E. Shipp
 Sgt. Harry H. Simpson
 Lt. Edward M. Sirhal
 Mr. Francis Smith
 Maj. Stanhope C. Smith
 Lt. John T. Stone
 Lt. John G. Tillman
 Lt. Erwin E. Valmore
 Lt. William S. Ward
 Lt. Col. Ben H. Watt
 Lt. Harlan H. Wendt
 Col. J. Wallace West
 Capt. Roger M. Wicks
 Lt. James R. Wilson

German Background for Practicing S-2's

By Lt. Col. John R. Lovell, CA

The G-2 or S-2 is the Commander's expert consultant on the enemy. It is the duty of the intelligence officer to be familiar with all things of the enemy and to think in terms of the enemy. When the enemy is about to initiate an operation or take on military action, the intelligence officer should be the first to give timely warning to the commander concerned.

The purpose of this article is to present an outline of the essential information, the background that the combat intelligence officer should have when on the battlefield with German forces. The strategic and tactical principles described in this article apply also to the Japanese, who have modeled their military employment after the Germans. Japan and Germany exchanged military missions many months before the Japanese attacked the United States last December. The Japanese, who have modeled their military employment after simple and, at the same time, quite flexible. They must be simple in order that the mass development and training of military leaders be possible; and they must be flexible in order that a satisfactory solution can be had for all the situations they have encountered. The entire German military system is quite confusing unless their organization and command methods, as well as their tactical and strategical principles, are understood.

German military organization is based on the Einheit System. By this method, pools of basic units are mobilized. In a larger sense these basic units are the various types of divisions and GHQ organizations. According to estimated needs, units are taken from the pools to form task forces. They are assembled and trained in areas resembling as closely as possible those in which they are expected to engage in combat. They are molded into smoothly-functioning, hard-hitting combat teams for the accomplishment of specific tasks.

When units from the pools are allotted to a task force, they are placed under one commander. Elements from all branches of the service (that is, Army, Navy, and Air Force) function together in the same task force under one commander as if they all wore the same uniform. Rivalry between the components of the task forces is discouraged rather than encouraged. All leaders encourage and inspire every individual with the idea that all must work for the common good of the entire combat team.

The term "task force" is frequently used to designate many different kinds of forces. To the German, a task force has a very definite meaning. To him the task force is a military force composed of the necessary arms and services under one commander for the accomplishment of a single specified mission.

German task forces vary in size from a squad to a group of armies. Examples of task forces are Oberst (Colonel) Mikosch's reinforced pioneer battalion which captured Fort Eben Emael in Belgium and later broke through the Maginot Line near Saarbruecken; Rommel's corps in North Africa; von Falkenhorst's command in Norway; and von Brauchitsch's army groups in Poland, the West, and the East.

With regard to the manner in which the Germans employ task forces, there are several important features to point out.

Almost every German organization in combat is reinforced by GHQ units. This is shown graphically on the organization chart which follows.

These units are trained together so they will function well in the confusion of modern combat.

All forces engaged on any specific mission are under one commander.

Two or more task forces are never assigned to the accomplishment of an identical mission. This explains why defensive aviation, antiaircraft artillery, civilian air raid defense organizations, and the warning services engaged in the antiaircraft defense of a specific objective, are all under one commander. It also explains why the coast defense artillery is organically a part of the German Navy.

A military commander charged with a definite mission is in absolute control of all the means to accomplish that mission. He is responsible only to one authority for the outcome and can have no excuse for failure.

A last word about unity of command. American observers on European battlefields have noted that unity of command is a weapon in itself, the same as terrain, weather conditions, and other factors. With a unified command on the offensive, an enemy weakness can be exploited in the shortest time with all of the resources of the command. On the defense, every resource can be used to meet a military emergency until the time can be gained to resume the attack.

German divisions, corps, and armies are the command frameworks around which task forces are formed.

The division is a unit of all arms and services under one commander containing the minimum means for the accomplishment of certain types of missions. When the need arises for a new type of division the German High Command forms it, thus we find numerous kinds of combat divisions: panzer, infantry, light, motorized, mountain, border, police, line of communications, and fortress divisions. There may be others. These combat divisions are organized, trained, and equipped for special types of missions. They contain only the minimum needs to sustain themselves in combat under normal conditions.

Corps and armies are merely command skeletons around which larger task forces are built. Organically, these units contain only commanders, staffs, and signal units. The practice of holding to the minimum the size

of the subordinate units of the different arms in a standard organization is economical as well as effective. It enables the maximum combat power to be applied at the selected vital points while holding units have the minimum needs to perform their missions.

A good example to illustrate the German method of military organization is the way the Luftwaffe handles its air fleets. Germany has organized air fleets in all of the active theaters of war: France and the Low Countries, Denmark and Norway, the Mediterranean and North Africa, on the East Front behind each group of armies, and in Germany proper. These air fleets are administrative and tactical organizations. In each air fleet area there are ground crews and facilities for handling a large number of combat aircraft. Germany's air power is shuttled among these air fleets according to the situation. If a serious air threat loomed in the west, combat aviation could be transferred from the other air fleets to the west on short notice. Antiaircraft organization and employment are based on this same principle. There is usually an antiaircraft corps in each air fleet.

COMMAND

A German principle of command is enunciated as follows:

"Select the commander, assign him to the mission, give him the means, and permit him to accomplish the task unhampered."

This is merely another way of phrasing the unity of command and responsibility and the task force principles.

After a commander has been assigned a mission, he selects his staff (which may include members of the Army, Navy, and Air Force General Staffs), adopts a general plan, and from it prepares a list of means with which to accomplish his task. The main considerations in the preparation of the list of means are:

- | | |
|---|---|
| 1. The Mission | (Offensive or defensive) |
| 2. The Enemy | Organization (Analyses for weaknesses)
Strength (Particularly in various arms)
Composition (Air power and tanks)
Morale (Can propaganda be used?)
Leadership (Higher, field, and company grades)
Dispositions (Where can traps be formed and enemy destroyed?) |
| 3. The Terrain | (Desert, swampy, normal, or mountainous) |
| 4. The Climate, Season, and Weather | (Russia in winter or North Africa in summer) |
| 5. The Time Element | (When must the task be accomplished so it may be timed with other operations?) |
| 6. The Theater of War | (Long lines of communications, supply and evacuation problems, transportation) |
| 7. The Means Available | (There is never enough air power) |
| 8. The General Plan | |
| 9. The Judgment of the Commander and his Staff. | |

The German High Command allots the means to the task force commander after a similar consideration of the foregoing factors.

When the means are made available, they resemble a college football squad which reports to the coach in the first week of September: they are a squad but not a team. A German task force prepared for combat is like an Army football team prepared for the Navy game: it is organized, drilled and trained for the task at hand—to defeat a particular opponent. As a matter of fact, the same considerations outlined earlier for the composition of a German task force may apply equally well for the football team.

When the means are allotted to a task force commander, all or part of them are reallocated to subordinate echelons in accordance with their estimated needs. Thus any standard German unit in combat will normally be reinforced. Intelligence officers can readily understand why the composition of practically every German unit with which they come in contact will be different. The problem then is to probe by aggressive reconnaissance methods to determine what units are opposite, how they are organized, and of what they are composed.

The diagram on page 854 illustrates the method by which large German task forces are formed.

IDENTIFICATION

Just a word about the designation of units. The method of allotting numerical designations is without pattern—it is different in almost every case encountered. No deduction based on numerical designations is justified without other supporting evidence.

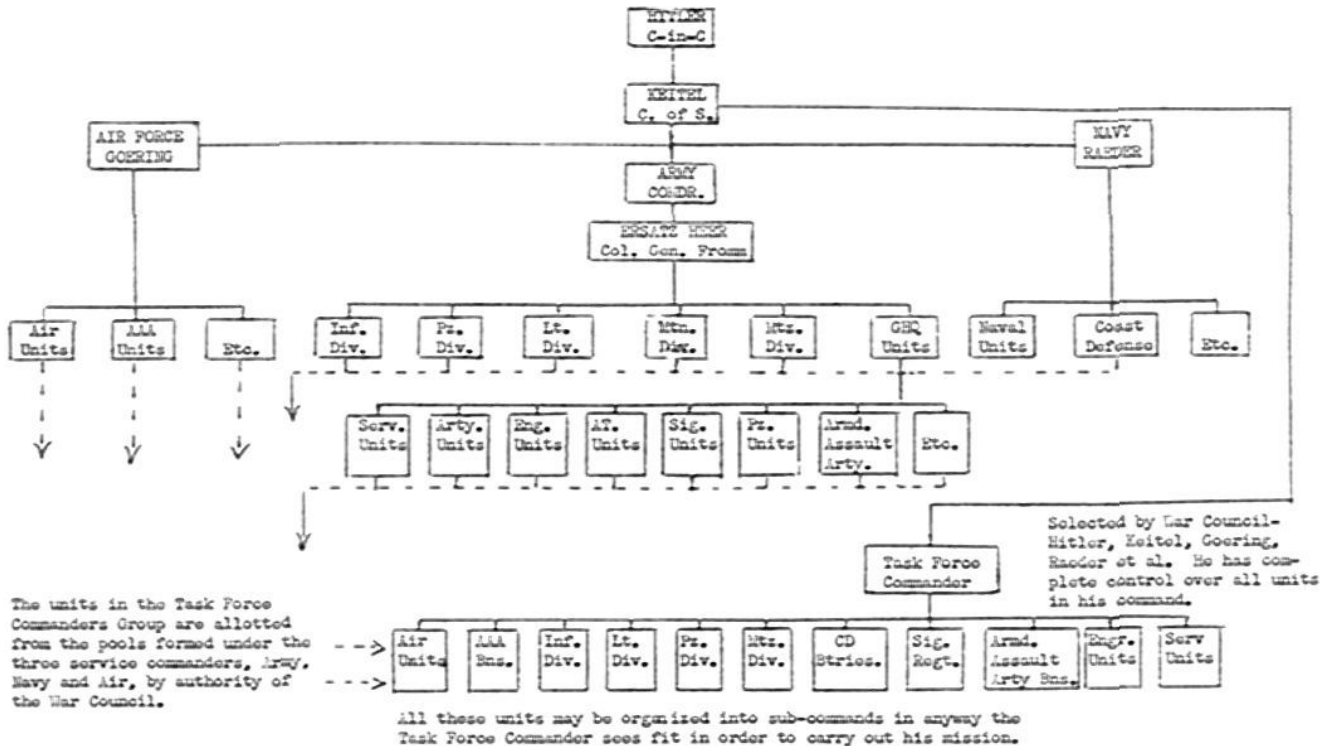
When a standard organization such as a regiment, division, or a corps is not used as the nucleus of a task force, the cluster of units is often called a "Gruppe" (Group (of units)). Often the name of the commander is attached to identify it.

COMBAT PRINCIPLES

German strategical and tactical principles are similar. They are based on the principles of annihilation as evolved by von Clausewitz, and as carried into execution by Graf von Schlieffen in his military text book *Cannae*.

The principles of war, according to the German conception, are unchanged; the methods whereby they are realized are different.

During World War I, the Germans used the supporting arms to advance the infantry to where it could come to grips with the enemy infantry and destroy it or drive it from the field. In this war, the German supporting arms are used to destroy the enemy without forcing the infantry to engage in combat. The breakthroughs are made by special troops (usually pioneers); air—panzer—motorized infantry teams powerfully supported by artillery blast their way through to make the encirclements; and the annihilations in the traps are accomplished largely by the fire power of the supporting arms. The infantry



follows up, holds the ground, and takes charge of the prisoners. Large masses of infantry do not come in contact with each other with the resulting mass slaughter reminiscent of Verdun in the first World War.

No description of German tactics and strategy is complete without special mention of the Principle of Surprise. Measures to achieve surprise are taken in every German military action.

German military texts state that surprise is accomplished

- By secrecy
- By deception
- By speed of execution

Secrecy and speed of execution are self-explanatory. It is with regard to deception that intelligence officers must be most careful. There is no fixed pattern for deception, and it will be different in almost every instance. Suffice it to say that German commanders take great pains to deceive their opponents in an effort to achieve the maximum surprise effect in conjunction with a later operation.

The German commander utilizes deception to a wide extent in neutralizing his enemy's combat power by diverting it to dummy or unimportant objectives.

The German objective is to destroy the enemy's military force. Every action is directed toward that end. Victory is never a fact until the enemy is destroyed.

Information of the enemy is vital. Based on this intelligence, decisions are made, plans are formulated, and task forces are organized, equipped, and trained.

Consequently, the Germans place great stress on the functions of their military intelligence service and, in the field, on their reconnaissance agencies.

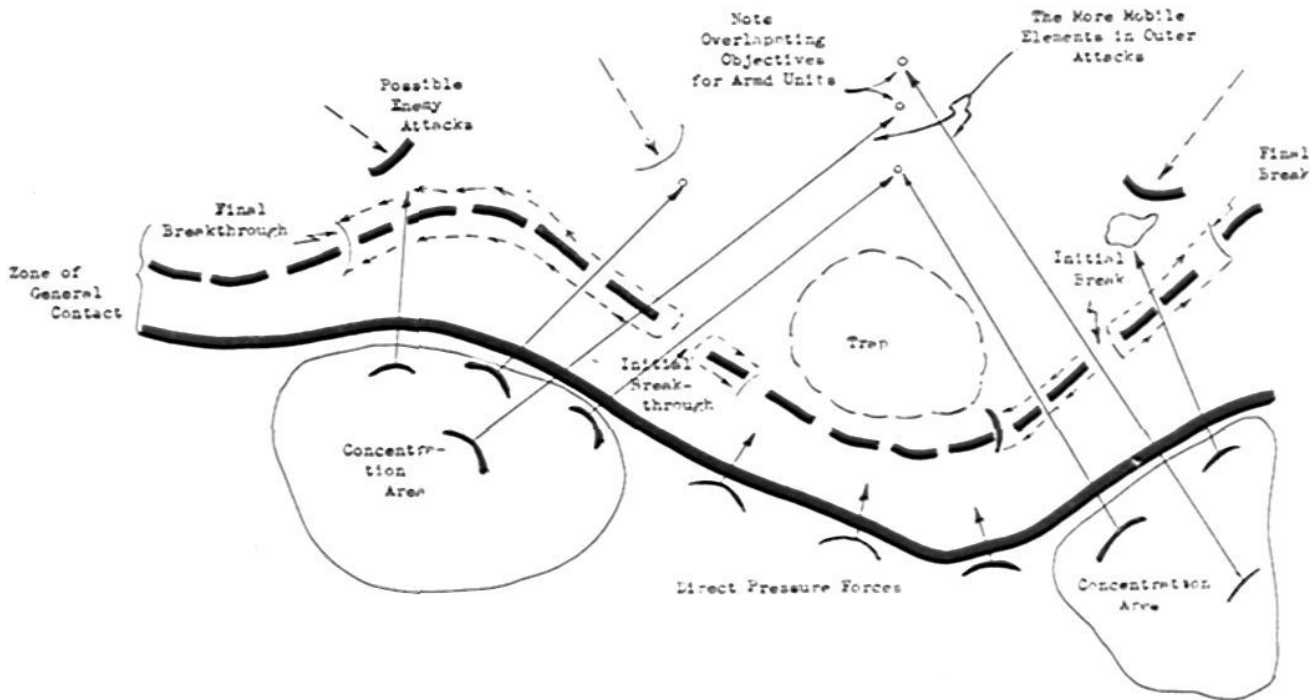
German reconnaissance units are very aggressive. They are trained to be aggressive in order to obtain specific information and in order to deny information to their opponents (preserve secrecy). These reconnaissance units are often reinforced and will usually attack as soon as contact is established. If the opposition is too strong, they will utilize their mobility—withdraw and go around the position. They habitually report to the higher commanders not only all details as to the enemy, but also as to the terrain or any special conditions they encounter.

German leaders of all grades are always well forward where they get the first hand accounts of reconnaissance, where they can get the "feel" of the situation, and where they can issue timely orders to their subordinates for the rapid employment of their units. There is no need to have fast-striking combat commands unless their mobility and shock action are utilized.

As a result of intelligence and reconnaissance activities, the enemy's weaknesses are developed. Deceptive measures are invoked while overwhelming concentrations of combat power are made at vital points. At the right moment the breakthrough is made, the encirclement is achieved, and the annihilation is accomplished in the shortest possible time.

The description just made of German combat methods is the basis of all of their strategical and tactical doctrines. Those doctrines are practiced in all echelons of command. They may be summarized as follows:

1. Obtain all possible information of the enemy, especially his detailed dispositions.
2. Select weak points where breakthroughs may be accomplished and large enemy forces may be trapped.



Schematic diagram of a German attack

3. Concentrate combat power opposite the weak points.
4. Hold the enemy in his position by containing his forces, or draw him out of position as desired by deceptive operations.
5. Breakthrough.
6. Encirclement.
7. Annihilation.

The German commander places great emphasis on the use of terrain. He studies it in great detail in order that he can use it to his advantage. Every effort is made to attack down hill, to employ obstacles to assist in the achievement of his objectives, to obtain the observation required for the effective employment of the supporting arms, and to develop the scheme of maneuver so that his opponent is placed at the maximum disadvantage from a terrain standpoint. Terrain appreciation is an important subject in every German military school.

The breakthrough is usually made by special assault troops. The point of breakthrough is thoroughly neutralized by large concentrations of artillery and air power. The initial breakthrough is normally only 1,000 yards to a mile wide but is immediately widened by

attacks from the rear.

The encirclement is composed of two spearhead attacks advancing parallel to each other. The outer spearhead is composed of the more mobile elements. Each spearhead is preceded by an air-panzer-motorized infantry team to break the way. The direction of attack is usually a straight line even though the operation is termed an "encirclement." See schematic diagram.

When one flank is an obstacle, as at Dunkirk, the encirclement operation is over one flank only.

The timing of the attacks depends entirely on the situation. In Holland and Belgium, the holding attack was launched first to draw mobile elements into the trap. At Kiev, the holding attack was not launched until the encircling forces had reached their objectives.

The principles outlined in the preceding explanation and diagram hold for all task force organizations in a particular operation. Every unit has its objective, its mission. The method: infiltrate, surround, and destroy.



Operations around Kharkov May 12-25, 1942

Our intelligence officers should be cautioned that if their unit is heavily engaged toward the front, they should be on the alert, because an attack is most certain to come from a flank or even from the rear. They should follow the operations of their own command, study the terrain, and watch for traps.

CONCLUSION

The word "defense" has almost a lost meaning in the German military vocabulary. The German commander thinks only in terms of attack. Above all, the German recognizes that a well coordinated attack with modern weapons cannot be stopped by any line, no matter how well fortified it may be.

During the year 1941, the initiative was taken from the Germans for the first time in any campaign. When faced by superior odds they withdrew, and when their opponents overextended themselves they launched a counteroffensive. In other cases, German staff officers have explained that they allowed the enemy to advance into a trap before launching their attack. This was particularly noteworthy at Kharkov in May of this year.

In the past the Germans have had the advantage because of their tremendous superiority of combat power, that is, aviation, tanks, signal communications, and trained manpower. The organization of their entire nation into one vast war machine has enabled them to wage a total war against a group of uncoordinated poorly prepared nations.

The year 1942 is the 1917 of this war. We shall see the turning point of German military achievement this year. Hitler will lose the initiative and in 1943 will be forced on the defensive.

Americans take to this type of war naturally. It is more like our game of football than any other comparison. It is every man for himself in the execution of the task in a large team. In this game the rules are few, and they may be changed at any moment. American forces require only the right tools, the training, and the experience. They are getting the tools and the training, and they will soon acquire the experience.

When American forces clash with German forces, there will be a loud bang. Later, there will be ups and downs, but of the final outcome there will never be any doubt.

THE TEN COMMANDMENTS OF THE CHINESE ARMY

By LT. M. H. LIU, *Chinese Army*

Since 1937 China has fought against an enemy much stronger than herself, for five years the nation as a whole has struggled on. Land has been lost, people have been killed, yet the Chinese Army is forever more active, causing the Japanese to fight everywhere at once. What seems to be the magic strength behind such a people?

Some may say the history of that nation inspires her people to bravery and endurance, others that the vast Chinese manpower make possible the fighting of such a long war, but I would say the spirit of the "Ten Commandments of the Chinese Army" drives Chinese officers and men onward toward victory or death.

Every night before an officer or a man retires to bed he repeats the following:

1. **Enforce the Three Principles of People,* and protect the nation without any opposition and negligence.**
2. **Support the National Government, and obey your superior officers without any falsity or disobedience.**
3. **Love your comrades, and protect the people without any sign of proudness and rudeness.**
4. **Be loyal to your duty, and obey all commands without any delay and cowardice.**
5. **Be brave and resolute in strictly obeying the laws without any laxity or insincerity.**
6. **Cultivate the spirit of cooperation and unity without incoherence or irresponsibility.**
7. **Keep your sense of honor and uphold all military virtues, without any reproach or greediness.**
8. **Be simple and frugal, and be ever ready to endure hardships without being luxurious and frivolous.**
9. **Always attend to proper rituals and keep neat and clean.**
10. **Be honest and behave right, keeping strict adherence to faithfulness and justice without any dishonor or deception.**

Then he carefully thinks over what he has done throughout the day and makes private corrections. Such actions have so given strength to us in times of trial, and may we sincerely share our precious guardian light with fellow brothers in arms.

*The bequeathed teaching of Dr. Sun Yat-Sen: "Nationalism, Democracy, and Livelihood."

AIR DEFENSE BY DISPERSAL

By Capt. James W. Bellah, G.S.C.

This is an academic discussion of a subject the actuality of which will be unbelievably unacademic.

Those of you who have been subjected to an attack from hostile air need not have this pointed out. To those of you who haven't, I suggest you study civilians just back from the war zone and watch their faces when they hear a plane motor overhead. I suggest you watch refugee children in their sleep and notice how their dream fragments cause them to shudder and cry out. The confusion that results from sudden surprise enemy air attack is unbelievable, and the macabre results of such an attack never erase themselves from men's minds. Suffice it to say that a single .50 caliber bullet will tear off a leg, or an arm, and that a convoy or troop group under surprise attack met with improper discipline, in a very few seconds becomes a screaming, running confused shambles.

For the purpose of bringing some order to this inevitable temporary chaos which will result from surprise attack, the following discussion is offered in the hope that by prior planning casualties may be lessened.

CAPABILITIES OF AIR ATTACK

Capability 1—The Planned Attack

This attack may be launched against cities (Cologne), troop installations and concentrations, or any other military or non-military target. The primary objective is the destruction of materiel, and any casualties inflicted on personnel are incidental to that main objective. The characteristics of such an attack are secrecy in planning and diversion by sustaining attacks in other and sometimes quite distant areas, the main purpose of which is to pin interceptor Air to the ground. Further characteristics are vast plane concentrations on the main objective in succeeding waves which cause the action to be continuous over periods of 90 minutes or more, with the result that the targets and vast areas adjacent thereto are completely devastated.

Defense against such an attack by an infantry division, or components thereof, bivouacked in or passing through the target area, is limited almost entirely to dependence on emplaced and mobile antiaircraft artillery, our own interceptor planes, and the utilization of whatever cover the area affords, supplemented of course by small arm weapon fire when targets of opportunity offer. Commanders must realize that they must be eternally on the alert when the division is moving through, or when it is bivouacked in or adjacent to cities or installations which may be subject to such a planned attack, so that adequate measures may be

taken quickly for getting personnel under cover at the first warning.

There is no part of the world that is not vulnerable to such an attack by enemy Air at the present time. The first casualties inflicted on any unit of the United States Army will undoubtedly be inflicted by enemy Air. Therefore, active and passive defense against it must always have first priority in any commander's plan for his unit's security.

Capability 2—The Aerial Counterattack

During the recent raid on Dieppe an aerial umbrella was maintained over the transport area and the landing boats for the better part of nine hours. This umbrella consisted of succeeding waves of planes with a primary mission of keeping enemy planes from attacking the boats. In effect, the umbrella established localized air supremacy, but it must be remembered that air superiority, like morale, is never quite static. It is temporary and localized and subject to piece-meal disruption, wherein the enemy gains localized ability to act offensively.

This umbrella was subjected to aerial counterattack by the Germans more or less continuously during the entire nine hours. Counterattacks were local and in comparatively small force, and although they never succeeded in destroying the entire umbrella they did tear rents in it. Through these holes enemy planes were able to dive-bomb transports and landing boats, and subject personnel therein to automatic weapon fire.

All officers in all operations wherein our own air superiority is contemplated, planned, and temporarily maintained, must be continually on the alert for the enemy aerial counterattack which will allow enemy planes in small groups to dive in and inflict casualties on personnel and materiel. Defense against this subsequent development of the aerial counterattack is strongly limited.

A. In the heat of any ground operation, only hasty temporary cover and concealment can be taken and only limited and local dispersal can be allowed, lest the success of the entire ground operation be jeopardized.

B. As to active defense, the same situation will pertain. Small arms and automatic weapon fire can be delivered against the attacking Air, and the results of such fire, according to recent reports from theaters of operation, are surprisingly effective. But again all must realize that the delivery of such fire may jeopardize the ground operation.

In other words, there will always be a question in some officers' minds, at some crucial point when aerial fire is being received, whether that fire is to be returned, or ignored and the ground operation continued in spite of it.

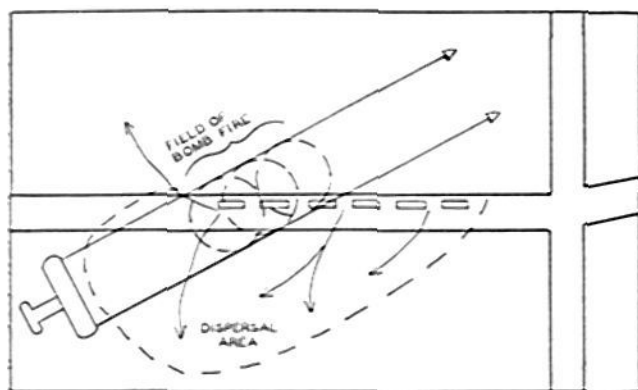
Capability 3—Piece-Meal Harassing of Targets of Opportunity

This type of attack will be delivered at any time and in any place by lone enemy planes or small groups which surprise targets of opportunity. It is the type of attack that we are most concerned with personally and which we must train to meet. Our units—no matter how large or small—may be subjected to such harassing attacks even conceivably in their training areas—which might possibly be indicated as a secondary target to a main coastal objective of a planned over-seas aerial attack.

DEFENSE

Quick and extensive dispersal of personnel, and small arms and automatic weapons fire, are the essentials of defense.

Let us make an academic approach to such an harassing attack on a small convoy. The first fire received will be automatic weapon fire from planes at some distance, followed by bomb fire (as illustrated by the diagram) immediately the Air comes over the vehicles. The following dispersal method is suggested: All troops to leave vehicles at first warning and to disperse widely at



angles *toward* the plane or planes, thereby reducing the length of time that plane automatic weapon fire can be delivered; doing exactly the opposite of what the pilot expects, this causes him to turn sharply if he is to continue the attack and renders his weapons unable to bear during the turn. The unexpected maneuver of running at angles *toward* him may even cause him to miscalculate his bomb attack on the vehicles. The dispersal must be continued with the ideal objective of placing 100 yards between each man but must cease momentarily at the first bomb detonation, when all personnel hits the ground to avoid splash.

By running away from the vehicles and toward the plane, bomb detonations will be at successively increasing distances *behind* personnel. Between dropping flat with each detonation, dispersal can be continued. This maneuver is contrary to all human instinct and has a surprise effect on pilots, thus it may work beautifully.

General Notes on Active and Passive Defense

1. To take cover in roadside ditches is suicidal except at road bends, because straight-away or gently curved ditches are tantamount to aiming stakes for low-flying planes; also, ditches can be gutted by automatic weapon fire from the air.

2. In dropping flat interpose the hands between the chest and the ground, palms downward, and keep the head and tin hat free of the ground by about an inch, thus protecting yourself from being knocked out by concussion. This is vitally important as it keeps you conscious to make the next move for cover.

3. In hugging the surface of the ground, spread the legs wide as in prone firing. This is contrary to instinct but will often save one leg.

4. When leaping to cover, take the first hole rather than continuing the search for a better hole. A ten-inch depression will give you cover from splash, although it is hard to believe and doesn't feel as safe. However, many a man has been clipped looking for the "better 'ole."

5. In cities and built up areas, remember that bomb blast is cruciform at street intersections, and that gutters and lying flat do not give the same protection that standing up in a recessed doorway will offer.

6. Each man under aerial attack must be taught to shun all other men by as great a distance as possible. Where two or three are gathered together, they will usually be buried together.

7. Small arms and automatic weapons fire must always be secondary to dispersal in case of surprise attack.

8. Where concealment is believed to be perfect, all officers must realize that a return of fire from the ground will give away their position.

9. However, reports from theatres of operation show surprising results from ground small arms and automatic weapons fire, and it must not be ignored as a means of counterattack against Air.

10. Remember that in convoy the primary objective is generally the destruction of materiel, and that casualties among personnel are a by-product of it. Remember also that to accomplish this destruction, sticks of bombs are laid *along roadsides* rather than directly on the vehicles whenever there is a possibility of the enemy acquiring use of the roads, as he did in the Battle of France and in practically every campaign that has followed it.

11. And finally, remember that fire from any individual plane, either automatic weapon or bomb fire, is delivered in a straight line along the line of the plane's flight. Dispersal to right or left out of the field of fire or the fragmentation area offers temporary safety, and dispersal in a general direction *toward* the plane reduces by the speed of running the length of time that the fire from the plane can be brought to bear.



PERIMETERS in PARAGRAPHS



By Colonel Conrad H. Lanza

THE SOUTHWEST PACIFIC

NEW GUINEA

The north side of this great island is held by the Japanese, the south by the Australians, whose base is at Port Moresby. On August 25th Japanese forces appeared at Milne Bay at the southeast end of New Guinea. American engineer troops were already there, constructing an air field under protection of Australian combat troops. In the afternoon a sentinel discovered the Japs approaching and gave the alarm. The guard turned out promptly, but it was necessary to call on all the Australian troops around the air field. As the fight developed, the Americans dropped their picks, shovels, and other tools, abandoned their tractors and trucks, and turning out as infantry joined in the fight. Darkness ended the engagement.

During the night a new Japanese force arrived by sea and debarked. Notwithstanding air and ground resistance, these Japs succeeded in joining their comrades on shore. A considerable Australian force had been posted at Milne Bay, but not at the places where the enemy actually arrived; they also came up during the night. On the morning of the 26th a very warm fight started, in which the American and Australian troops gradually overcame the Japs. Most of the latter were withdrawn by sea on the night of the 30th. Some small detachments left on shore have been subsequently mopped up.

The main Japanese base appears to be at Buna, 100 miles north of Port Moresby, across the Owen Stanley Mountains. A trail connects the two places, its high point being at elevation 6,000. The trail is so steep in places that travelers have to hold onto rocks and trees to climb it. The country is densely wooded, trees meeting overhead and preventing sunlight from reaching the ground. At this season it rains every afternoon, and the trail is reported as deep in mud. The underbrush is thick but it is not a jungle and is passable to tough mountaineers.

Until August 28th the Australians had an outpost near Kokoda, 6 miles north of the summit and about 55 miles from Port Moresby. On this day Japanese forces attacked from three points. They worked around through the forest to back of the Australian lines and surrounded several posts. It was necessary for the Australians to fall back. It

was found impracticable to establish in time a new line at the summit, so on the 31st it was formed near Efogi, south of the summit and about 10 miles from Kokoda.

This Australian advance force is hard to supply. On account of the difficult trail the only transportation available is Papuan carriers, who carry only 40 lbs., including their own rations. When bombed, or near bombed, they sometimes desert and go home, abandoning their loads. So far no artillery has been brought forward.

The Japanese paint themselves green and wear green uniforms too. Their steel helmets are covered with green cloth—there is no metallic noise if the helmet accidentally hits a tree or rock. Men, as at Singapore, are equipped with head and shoulder nets in which leaves and branches can be inserted for camouflage purposes. These Japs are reported to be specially selected men, very sturdily built and apparently trained mountaineers. Their rifles are .256 caliber, lighter and smaller than ours. Their ration (which is mostly rice) is small and is cooked individually. Soldiers themselves can carry 6-8 days' supply.

The Australians wear khaki uniforms, with packs of the same color. The men are now painting themselves green, but they have not been so successful in recoloring their equipment. Everything about them is bigger than with the enemy: their rifles are of larger caliber, ammunition weighs more, and so do their ration and the other things they carry and need. Difficulty is experienced in maintaining kitchens and serving hot food, as the kitchens emit smoke and invite attack. In the dark, unlit forest, the small green Jap with his lighter equipment has been hard to locate. Although this may be but a minor campaign in the great World War, it is a difficult one.

THE SOLOMON ISLANDS

These islands, about 800 miles northeast of Australia, were under British rule. The white inhabitants, less missionaries, numbering in all about 500, abandoned the islands this last spring, and the Japanese occupied them about May 1st. The natives are some 95,000 Melanesians, of whom 34,000 are reported as belonging to the Catholic missions administered by Americans. It is not known what became of these Americans.

On August 6th the Japanese spokesman in Tokio stated regarding Australia:

"With supplies from England and the United States completely cut off, Australia has indeed become the orphan of the Pacific. . . . If Australia does not break off relations with Great Britain and the United States it will be necessary for Japan to intervene with her armed forces."

The spokesman did not know it, but the United States had recognized the situation. With a view to breaking the Japanese menace to communications with Australia, Vice Admiral R. L. Ghormley, U.S.N., commanding in the South Pacific, had at the time an expeditionary force under way to overthrow enemy bases in the south part of the Solomon Islands. It was composed of surface war



ships, transports containing Marine units, and air forces based on aircraft carriers. They had support from land-based planes from General MacArthur's command in Australia.

The approach of the expedition was favored by an overcast sky, with ceiling so low that the Japanese failed to discover it. After dark on August 6th the weather cleared and the ships separated to proceed to their assigned positions. Before dawn on the 7th, fire was opened on enemy positions on Tulagi and Guadalcanal Islands. Surprise was complete, and by evening the Marines were solidly established on shore. Eighteen Jap seaplanes were destroyed at their moorings before they could get away. Although unprepared, the Japanese, except on Guadalcanal, resisted with ferocity and fought until the 9th, when the last man had been killed. On Guadalcanal there was little resistance, the enemy abandoning an airfield and considerable supplies. The Japanese withdrew to the mountains. More than a month later they were still there, having received reinforcements and supplies from time to time by sea or air.

In the meantime Japanese dive bombers arrived on the 7th and again on the 8th and attacked American ships and

troops. They were repulsed with a loss of another 18 planes. Late on the 8th approaching Japanese surface ships were intercepted after dark by American warships, and a violent sea action followed. The enemy seems to have fired first, sunk the 10,000-ton Australian cruiser *Canberra*, and inflicted some damage to other ships. What losses the Japanese had was concealed by darkness.

American activity in the Southwest Pacific was accompanied at the same time by a naval shelling of Kiska in the Aleutian Islands and an increased American air activity in China. Thereupon the Japanese spokesman announced on August 16th that he now believed that the United States intended to attack Japan by an offensive from Australia and the Solomon Islands on the south, from the Aleutian Islands on the north, by air from China on the west, and from aircraft carriers on the east.

On the night of August 20th a Japanese force of about 700 landed on Guadalcanal Island. Next morning a battalion of Marines attacked from the front, while another battalion attacked their flank. By night none of these Japs remained. They died to the last man.

On August 24th numerous enemy ships were reported by planes as approaching from the north and northeast. American sea forces immediately went after these Japs. The surface ships do not appear to have come into contact, but their respective air forces contacted the other side's ships. We seem to have had much the best of this fight. Our reports indicate that our planes hit, set afire, and left in a sinking condition 1 aircraft carrier, probably damaged 2 others, and sank a cruiser, a destroyer, and 4 or 5 other ships. We lost 1 destroyer and 1 small transport. At about the same time Japanese planes which attacked our shore installations were repulsed with the loss of nearly a hundred planes, as

against a reported "few" American planes.

On August 27th our planes sank another enemy destroyer and the Marines shot down 7 out of 24 Japanese planes who again raided Guadalcanal. Our planes brought down another 7 Japanese planes on September 2.

September 3d, American planes attacked a Japanese party in the act of landing on San Jorge Island, about 65 miles from Guadalcanal, and two days later still another party landing this time on Guadalcanal itself. Serious casualties were inflicted, but the landings were not altogether stopped. Some Japanese troops still are maintaining themselves on Guadalcanal Island.

THE RUSSIAN SECOND FRONT

With a view to reducing the Axis pressure in the south, on August 2d the Russians opened a local second front by violently attacking Rzhev. Since last December the Russians had had Rzhev encircled on the north, east, and west, and on the north side were only four miles away. The attack was soon extended about 100 miles southward to opposite Vyazma. It was pushed with great vigor for a while, but its intensity noticeably fell off in the last days of August. Since then attacks have been continuing sporadically. Some minor advances have been made, but neither Rzhev nor Vyazma was taken.

The territory in which this offensive has been waged contains large forests and swamps. Much of the fighting has consequently been limited to the relatively few roads, as tanks were unable to go across country in many sectors. The Russians have done an enormous amount of work in opening new roads, corduroyed with timber cut locally, in order to maintain the supply of the augmented forces they have brought to this area.

Axis forces in this sector appear to be all Germans. They have had to call upon their reserves, but no ground troops were taken from the south: the reserves were air troops. Great waves of planes arrived within a few hours and savagely bombed and machine gunned attacking forces

with apparently considerable success. German reports attribute the inability of the Russians to have made any substantial progress in over a month as due primarily to the immediate intervention of the German Air Force whenever danger appeared. Whether these Air Forces were in addition to those employed in the south or whether some air troops did come from the south is not known.

Another Russian offensive was launched at the middle of August just south of Lake Ladoga. In this sector the Germans have two lines, parallel to each other and from 10 to 12 miles apart. One line extends along the Volkhov River facing east, to keep Russians out of Leningrad. The other line, facing west, starts near Schlüsselburg on the Neva River and is charged with keeping those Russians who are in Leningrad from getting out. The Russian mission was to break the German salient and open the road and railroad into Leningrad, last reported as badly off for lack of supplies. Simultaneous attacks have been made by the Leningrad Russians to cross the Neva and proceed eastward and by the outside Russians to cross the Volkhov and proceed westward. Neither Russian attack has been able to cross either river, although the outside Russians have made minor advances against a German bridgehead on the east side of the Volkhov.

EGYPT

As the result of an inspection made early in August by the British Chief of the Imperial Staff jointly with the Prime Minister, Mr. Winston Churchill, a reorganization of the British forces in Egypt was accomplished before the end of the month. A new C-in-C for the Middle East, General Sir Harold R. L. G. Alexander, was appointed with CP at Cairo, and a new commander was appointed for the Eighth Army—Lieut. Gen. B. L. Montgomery. More important, an additional new army was organized with primary mission of defending the naval base at Alexandria, the Delta, and the Suez Canal; it is posted on the edge of the Delta. The Eighth Army has been relieved from responsibility for covering the foregoing bases, and has as its mission the defeat of the Axis forces in Egypt. To accomplish this it is now free to maneuver without regard to its bases, covered by the new army. This change is of prime strategic importance.

The Eighth Army and the Axis confront one another just west of El Alamein, on a 45-mile front extending from the Mediterranean Sea on the north to the supposedly impassable Qattara Depression on the south. They have been there since the beginning of July.

Late on 31 August and during the next day the German Afrika Corps advanced in the south sector about 8 miles through the British mine fields. In the next three days there was considerable fighting between this Corps and counter-attacking British (and some American) armored forces. The Germans gradually withdrew, nearly to their original lines. Each side claimed to have destroyed over 100 armored vehicles of the other. The air forces were very active in these engagements, supporting their respective ground forces. Except for this isolated action, the principal activity on this front has been the efforts of the air forces to cripple the motor transportation of their opponent. No reliable reports as to the results of this are yet available.

The War Department Bureau of Public Relations advises that:

"Contributors to THE FIELD ARTILLERY JOURNAL are not prohibited by the provisions of Section I, Circular 311, War Department 1942, from submitting professional articles as heretofore."

PRACTICE PANORAMIC SIGHT

By Lt. Col. D. Q. Harris, FA



Due to the lack of field pieces and sights for the field pieces issued, a need was felt for some device to teach the newly joined soldier the operation of the panoramic sights. He and his fellow soldiers must know of the component parts of the sights, their interrelation, the manipulation of the various parts, and what effect the various sight settings have on the direction (the line of metal) of the field piece.

It being impractical to construct a device with elaborate gears, it was decided to make a wooden model. The points considered in the designing were:

- The relationship of the azimuth scale to the micrometer scale.
- The use of gunner's aid.
- The designing of a sight to lay on an aiming point.
- The laying of the piece in the proper direction.

The whole apparatus was to be durable yet easily portable, and capable of being used while sitting or kneeling. It had to be of such design as to be easily duplicated from salvage material on hand in all units.

As a result of the try-and-discard method of designing,

ITEM—Wooden Model Panoramic Sight.

UTILIZATION—To train individuals in the use and manipulation of the panoramic sight, to practice laying for direction.

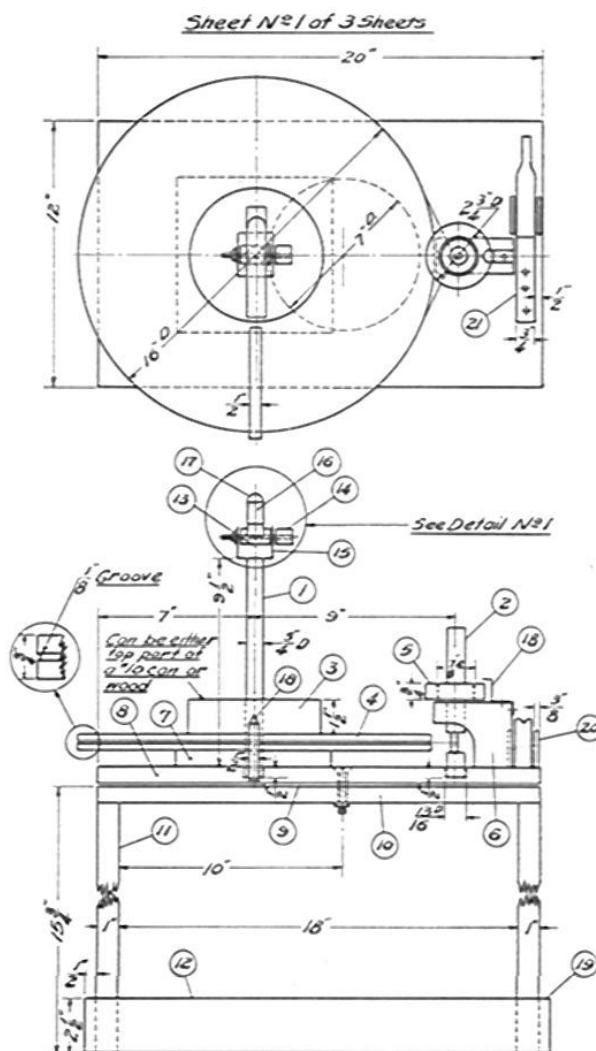
BILL OF MATERIAL—See drawing.

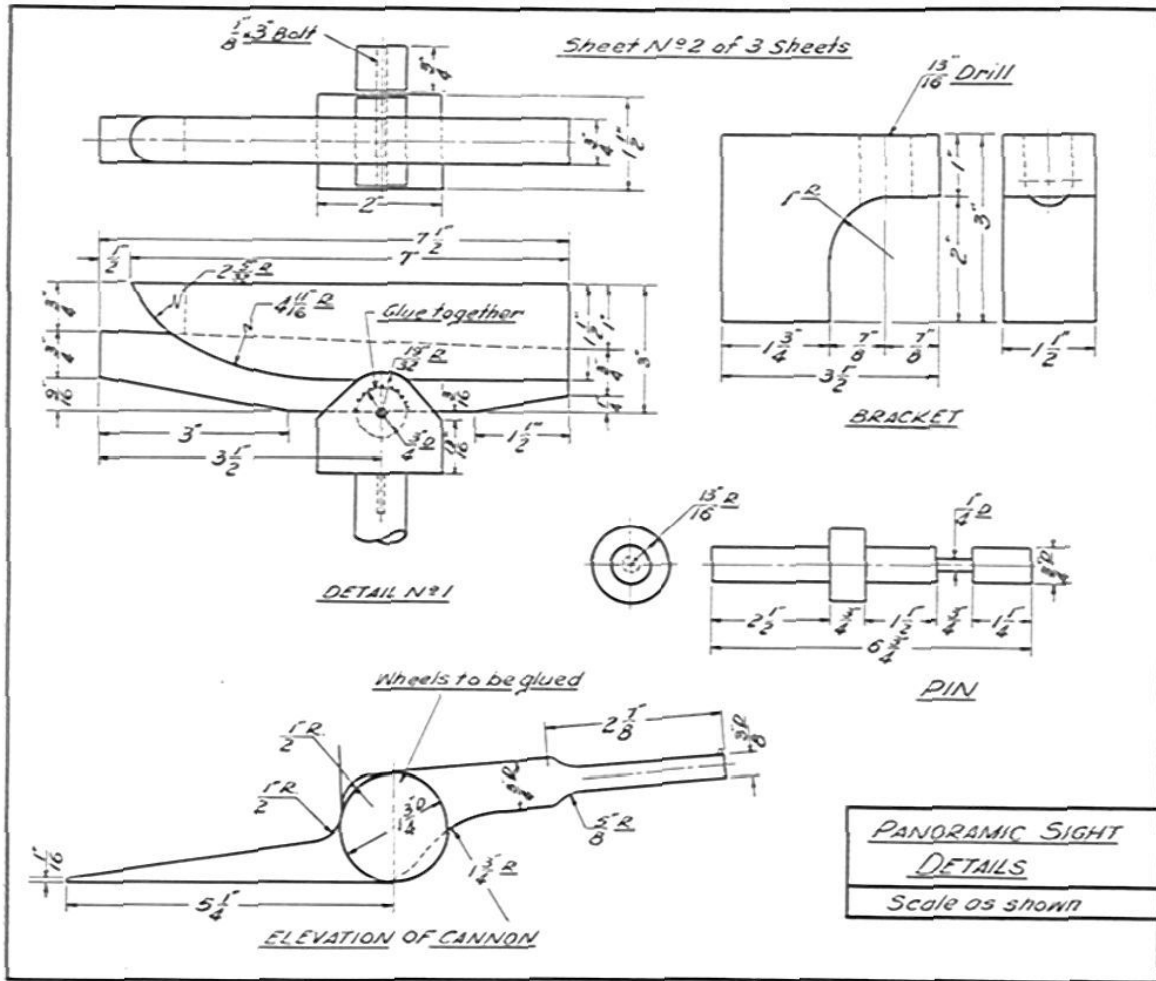
COST OF ONE—Salvage material.

NUMBER NEEDED—2 per howitzer section, total 36 per battalion.

TOTAL COST—None.

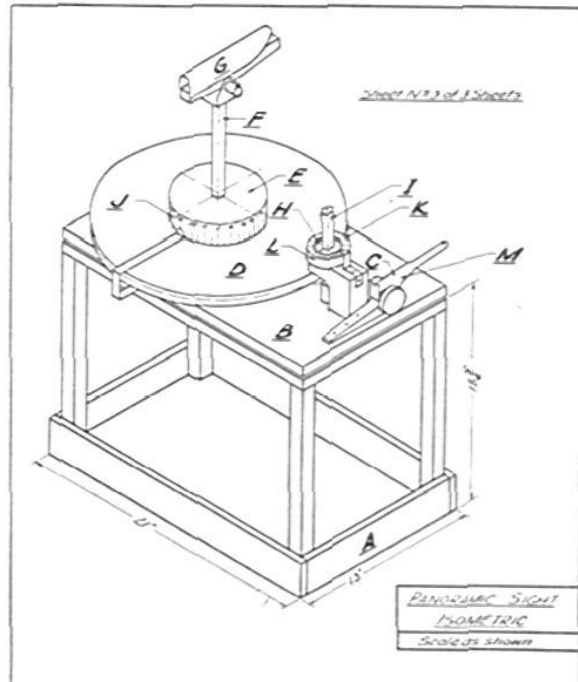
TO BE CONSTRUCTED BY—Organization carpenters.

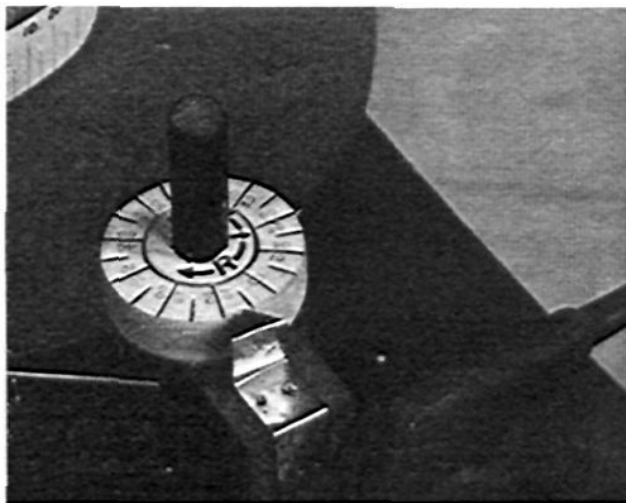
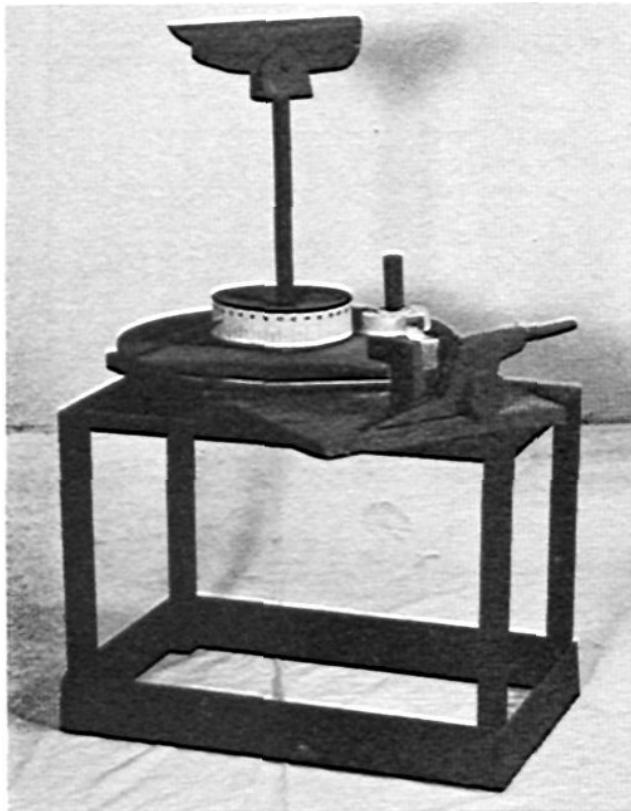




BILL OF MATERIAL

Nº	Size	Quantity	Description
1	3/4 x 10"	1	Wood
2	2 x 6 3/4"	1	"
3	1/2 x 6 D	1	Tin or Wood
4	3/4 x 16 x 16"	1	Wood
5	3/4 x 2 1/2 x 2 1/2"	1	"
6	1/2 x 3 x 3 1/2"	1	"
7	3/4 x 7 x 7"	1	"
8	3/4 x 12 x 20"	1	"
9	1/8 x 7 D	1	Fiber
10	3/4 x 12 x 20"	1	Wood
11	1" x 1" x 15"	4	"
12	1/2 x 2 1/2 x 2 1/2"	2	"
13	3/4 x 3/4 x 1 1/2"	1	"
14	3/4 x 3/4 x 3/4"	1	"
15	2 x 5 App.	1	Tin
16	3/4 x 1 1/8 x 7 1/2"	1	Wood
17	4 x 7 App.	1	Tin
18	1/2 x 14 App.	1	"
19	1/2 x 2 1/2 x 12"	2	Wood
20	3/8 x 1 3/4 x 1 3/4"	2	"
21	3/4 x 3 x 10 1/2"	1	"





the device described below was developed. It is capable of doing all required of it and, in addition, six of these mockup sights can be combined into a battery laid by an aiming circle or other of the usual means of laying a battery, and thus used for battery drill.

The detailed description and construction of the apparatus is shown in the scale drawing, sheet 1. This scale drawing may be utilized in planning the construction of the sighting device. Sheet 3 illustrates the operation. In general the device consists of a small table (A), on top of which is a turntable (B). This turntable enables the operator to lay on the target with his line of metal (C) after the proper deflection has been set off. Pivoted on the turntable is a circular disk (D) 16 inches in diameter, to which are fastened the azimuth scale (E), a shaft (F), and the sight

(G) whose line of sighting is on the 0-3200 line of the azimuth scale. Also on the turntable is the micrometer scale (H), on a shaft (I) of which a part is machined to $\frac{1}{4}$ -in. diameter. The micrometer is activated by the shaft (I) to which is fastened non-slip cord which moves the circular disk. The ratio, 16 inches to $\frac{1}{4}$ inch (64 to 1), enables the operator to move the azimuth scale one graduation for each complete turn of the micrometer scale. The proper reading is indicated by the index (J) for the azimuth and the index (K) for the micrometer. Surrounding the micrometer scale is the gunner's aid (L). Also on the turntable is the miniature cannon (M).

To operate, set up the table so that the miniature cannon points in the approximate direction of fire. Give firing data to the gunner. He sets off the proper deflection by rotating the spindle (I). Having completed this operation, he moves the gunner's aid until the zero of the aid is opposite the index indicator. By rotating the turntable while looking through the sight (G), he lays back on the aiming point and the miniature cannon is laid for direction in the same manner as the real field piece is laid.

By combining these sighting devices into firing batteries, the operator can be taught to open, close, and make individual shifts in addition to setting off announced deflections and deflection shifts.

NOTICE OF ANNUAL MEETING, U. S. FIELD ARTILLERY ASSOCIATION

In compliance with Article VII, Section 1, of the Constitution, notice is hereby given that the Executive Council has fixed 5:30 PM, Monday, December 14, 1942, as the time of the annual meeting of the Association to be held at the Army and Navy Club, 1627 Eye St., N. W., Washington, D. C.

The business to be disposed of will be the election of three members of the Executive Council (two Regular Army and one Organized Reserve), and the transaction of such other business as may properly come before the meeting. Nominations may be made by proxy, or from the floor of the meeting.

BRAZIL



HALF A CONTINENT

By Capt. Edward A. Raymond, FA

Brazil is almost half of South America. She is the fourth-largest country in the world, and larger than the United States. She dominates South America from the strategic standpoint.

Everybody knows of Dakar, whose name has become a symbol, a word written on the wall of Africa for each to read. If fresh drives materialize in Africa, Dakar is generally expected to become a jumping-off place for Axis attacks on South America. But what about the landing place, 1,600 miles across the South Atlantic? What of Natal? Could Brazil oppose the Axis, if Hitler started gaining the upper hand? Or, if American aid were mandatory, what would be the nature of warfare in Brazil?



BRAZIL AND THE AXIS

Brazilians have felt depression in a land of plenty. Their attitude toward other nations is not the complacent one of wealth. The government has a budget of less than a quarter of a billion dollars, and must meet the needs of a population of 45,000,000 people. The immediate present is of importance, for long range planning is a luxury.

It is difficult for the central government to maintain the national equilibrium. Brazil is what economists call an immature economy: it produces raw materials which it sells cheaply and imports manufactured goods for which it must pay stiff prices. The economy suffers from great reliance upon coffee and cotton growing. Wealth, furthermore, is

unevenly distributed. Great fazendeiros own most of the arable land, with the bulk of the agricultural population living as tenants in peonage. The middle class in most of Brazil is small and lacks political significance. The literary, health, and social outlook of the proletariat is gradually improving. Under these circumstances it is not surprising to find that the one or two exceptional states with nearly homogeneous populations, can dominate the rest.

The southern state of São Paulo is watched attentively by the administration. According to Hubert Herring (*Good Neighbors*, Yale, 1941) she has but one-fourth of the national population, pays about 65% of all federal taxes, has over a quarter of the railroad mileage, ships 40% of the total exports, and produces a third of all Brazil's industrial goods. Of the 3,000,000 Italians in Brazil, most are in this state.

A further concentration of economic and political power is found south of São Paulo, in the states of Rio Grande do Sul, Santa Catharina, and Parana. Here are most of the 800,000 German-born Brazilians and 1,400,000 Brazilians of German descent. The Germans have followed their familiar pattern of "marching clubs" and "sports bunden," with at least ten thousand reported to be drilled and armed until discouraged by wholesale internment in concentration camps. The Vargas administration is doing all in its power to keep Brazil Brazilian.

It was under pressure from the South that the Brazilian Government agreed with the Nazis to an extensive program of barter and blocked exchange. Trade with Germany more than doubled in 1938. The "Hindenburg," on regular flights to Berlin, inaugurated the first transatlantic air service. Even after September, 1940, German blockade runners called at Brazilian ports. The Reich has spent large sums on propaganda in Brazil. If Portugal should follow Spain into the Axis orbit, Brazilian sentiment might be influenced. These and other arguments are used by those who would stir up ill feeling in this hemisphere, to indicate that Brazil is a reluctant friend.

The Axis submarine campaign has backfired in Brazil. Several sinkings of her ships occurred without loss of life and were partially explained as "accidental." The sinking of the "Cayru" in early March, however, was accompanied by many Brazilian deaths. President Vargas had taken an anti-Axis stand at the Pan-American Conference in Rio in January, recommending severance of Axis relations by all

American republics and setting an example himself. His first measure of reprisal against sinkings, however, was amendment of the constitution to permit seizure of property of nationals of countries carrying out acts of aggression against Brazil or Brazilians, and to empower himself to declare war without a vote of parliament. Spurred on by the sinking of thirteen Brazilian ships, the Brazilian Air Force and Brazilian Navy scoured the seas off Brazil without remission and are credited officially with sinking a solid number of U-boats.

To these thirteen sinkings were added, in the space of a few days, six additional losses of a particularly outrageous kind. These six vessels were not engaged in foreign trade, but were on coastwise runs. One was a troop ship, sunk with the loss of a hundred and sixty-nine officers and men.

Demonstrations among the civil population indicated that the Brazilian people would stand no more. In the last World War Brazil was the only South American nation to declare war on Germany. In this war she is the first.

BRAZIL AND THE UNITED STATES

Before they were allies the United States and Brazil had every reason for being good friends. Ever since the last war we have been the best customer of Brazil and have furnished more of her imports than any other country. We have bought so much coffee that Brazil has had a large favorable balance of payments in her trade with us. In the days of Coolidge Prosperity we lent Brazil over

\$300,000,000. Now Brazil has lost the European market, probably for the duration of this war. She must keep on buying manufactured goods although her trade balance is running heavily against her. We have offered credits, markets, and priorities.

Brazilian friendship for the United States is best seen in her actions. Long ago Brazil declared her sympathy with our cause, and invited naval and military missions from North America. She broke off relations with the Axis powers and championed the United Nations' cause at the Rio Conference. Now, in the words of President Roosevelt, her courageous action in entering the war "adds power and strength, moral and material, to the armies of Liberty."

THE BRAZILIAN FORCES

Brazil's ability to protect herself against Axis attack should not be measured in terms of her manpower—which



approximates that of pre-war France—as legislation requiring all between twenty-one and forty-five to serve one year in the line and eight years in the reserve, has not been placed in full effect. Brazil in normal times afforded but \$40,000,000 a year for her army and \$17,000,000 for her navy. Not all who were subject to conscription were called. Her normal peacetime army and organized reserves are comparable in numbers to our own army before the emergency. Her navy has battleships and submarines, as well as cruisers and destroyers. She has a limited number of planes, many of them purchased in recent years from the United States.

Organization of the army is of some interest, reflecting as it does the strategic conditions of Brazil. Supply and planning are concentrated at *Río de Janeiro*, a seaport. The country is divided into nine military districts, and training varies widely with tactical considerations peculiar to the districts. In addition to regiments of the line, with three battalions each, the Brazilian infantry has a number of separate rifle battalions fashioned after the German World War jaeger battalions, which are considered particularly well adapted to forest and jungle combat conditions with poor communications and control.

About one-sixth of the Brazilian artillery strength lies in mountain guns useful where there are no roads, and there is a similar proportion of horse batteries. There are also batteries of siege artillery, regiments of engineers, and transport units. The rifle is a modified Mauser; artillery is chiefly French. Aviation is a separate branch.

The question of combat value of these troops is hard to answer by reference to history. Brazil last fought a war in 1870, when she united with Argentina and Uruguay against Paraguay and overwhelmed that nation. A better historical hint can perhaps be drawn from the Great War, in which a couple of divisions from European Portugal fought on the western front.

Officers of the Brazilian army are generally well groomed. Until recently the predominant military influence in Brazil has been French. General Gamelin once headed a military mission in Brazil, and General Mangin of World

War fame has written interestingly of his tour of duty in *Río*. Officers do not hold themselves aloof from matters of government in Brazil, but are trained to set an example of citizenship to the nation. They vote regularly and have often expressed themselves freely on public issues. Without doubt Axis agents have attempted to make advances to the officer class as a whole and to scores of key officers individually. There is no indication that such efforts will ever succeed.

Arms, ammunition, and implements of war must be imported, although there are moderate stocks on hand. If the Nazis have to be beaten back from the shores or airports of Brazil, our assistance will probably be of the greatest importance.

THE BRAZILIAN THEATER

There is little that is neat about Brazil's geography, as her terrain divisions sprawl all over one another; it can be said, however, that there are three more or less distinct areas. Most famous is the miasmatic jungle of the Amazon Valley. Most important is the central plateau, where an altitude of from two to four thousand feet pinch-hits for latitude and affords most of the population of Brazil a temperate climate. Finally, there is a coastal plain running southward from the Atlantic bulge to *Río* and, after a couple hundred miles of hilly coast, fanning out from Santos to the frontier of Uruguay.

The Amazon is a hundred and fifty miles wide at its mouth, and at the narrows of Obidos is about a mile and a quarter wide but in places over four hundred feet deep. One of the northern tributaries, the *Río Negro*, attains

a width of eighteen miles. The Peruvian port of Iquitos, 2,300 miles up the Amazon, is served by ocean-going steamships. The width of the river would permit a considerable freedom of maneuver for a flotilla or convoy making the ascent, either for deployment or the massing of anti-aircraft fire. It would make defense by air-borne mines a matter of great difficulty. Iquitos, where Brazil, Peru, Colombia, and Ecuador all come together, is a strategic point. The Amazon lowlands continue beyond it to a gorge, the Pongo de Manseriche, less than 300 miles from the Pacific.

During much of the year the Amazon and its tributaries flow in great sweeps through sodden, steaming lowlands piled with exasperating growth and alive with biting and stinging insects. During the remainder of



Para, Brazil

the year much of the Amazon Valley is subject to floods. Huts of the inhabitants are on stilts. Natives tour their wet world in dugout canoes in search of food. Away from the northern tributaries of the Amazon itself, only lone rubber collectors and hunters force their way. The country drained by the southern tributaries is higher and drier. In the Matto Grosso are some of the finest forests in the world, protected from exploitation by their great isolation.

The central highlands, of nearly a million square miles, extend from the bottom of the bulge west half-way to the Andes and south to Paraguay. Here are mines and cattle country and plantations of coffee.

The Serra do Mar, with the systems which it overlaps, separates it from the central plateau.

The coastal plain is fertile and populous.

The eastern slopes of the Andes, which Brazil shares with Peru, and the southern rim of the Guiana Plateau, are land features belonging also to neighbors. The country itself does not possess any majestic ranges, and her highest peaks do not exceed 10,000 feet.

Whereas many of the South American countries are famous for mountains, Brazil can boast that no other country in the world is as well endowed with rivers. The incredible Amazon, largest river in the world, and its huge tributaries are lifeways for the most extensive part of Brazil. The southern part of the country is drained by the Paraguay and Parana Rivers, and the eastern part by such streams as the São Francisco and Parahyba. All in all, Brazil has 40,000 miles of navigable inland waterways. River transportation is one of the key strategic factors in Brazil. The importance of the rivers is heightened by lack of railroads.

Including mining, coffee, cotton, and similar private lines, Brazil has only 20,571 miles of railroad, less than a tenth of the mileage which webs the far smaller United States. Northern Brazil is badly lacking in railroads, and these are short feeder lines to seaports on the Atlantic Coast. As they are interconnected to only a slight extent, they would be of limited use to an enemy moving away from the bulge.

From the port of Victoria there are four separate connections southward with the Plate system of Uruguay



Rio de Janeiro

and Argentina. The populous, thriving states of Minas Geraes and São Paulo have a complete rail system. From São Paulo one extension runs across southern Matto Grosso to the Paraguay River. It is proposed that this long, inland line be linked with the Bolivian network which now is joined to Pacific Coast lines.

The highway mileage of Brazil (119,226 miles in 1938) sounds imposing; as a matter of fact, however,

many roads are in no better condition than they were when Portugal ruled Brazil. Most of the roads have been built by various of the twenty separate states, with no attempt at central planning. In the northeast particularly, long roads have a way of paralleling one another for great distances and then stopping deep in the hinterland. The state of São Paulo in the vicinity of Río has good all-weather roads, and a number penetrate inland from the southeastern coast.

The east coast of Brazil is well endowed with harbors, as the profusion of her rivers would suggest. Principal ports, with modern wharves and heavy cranes, are few. The first Brazilian port of call for American and European vessels is usually Recife (or Pernambuco; principal cities in northern Brazil are sometimes called by the name of their state). Recife is about 4,000 miles from New York and approximately the same distance from Hamburg. It boasts new docks and harbor works, and up-to-date buildings. São Salvador (Bahía) has had a port expansion program. Río de Janeiro vies with Naples, the Golden Gate, and Capetown for the title of loveliest harbor in the world, and is a leading shipping center. Santos, further south, is the chief coffee port; this and Río Grande do Sul would be accounted important by comparison with European and American ports. These principal sea gates are reached by the most important railway lines. Other harbors, also having railroad connections with the interior but visited only by small vessels, are, from north to south, Manãos on the Amazon; Belém (Pará) at its mouth; São Luiz (Maranhão); Fortaleza (Ceará); Natal; Cabedello (Parahyba); Maceio; Aracaju; Victoria; and Paranaguá. The Patos lagoon, a formation similar to Pimlico and Albemarle Sounds off North Carolina, contains not only the major port of Río Grande do Sul, but Pelotas and Porto Alegre as well.

Since Brazil has suffered from lack of land communications, air travel and air express services have benefited a number of lines: German, French, Italian, and (now predominantly) Panair do Brazil. This subsidiary of Pan-American Airways is developing several modern airports. Some are integral parts of a very extensive airline system which includes an Amazon River service, a transandean service in about the latitude of Río de Janeiro, and a north-south run inside the bulge, all in addition to the principal route along the coast.

Natural landing places are found for miles along firm beaches beside the coastal plain. Many more are available in the open cattle country, the campos which are found in many places in Brazil. The largest, the Campos Geraes of Río Branco, are thousands of square miles in extent. So vast is Brazil that large fleets of planes could very probably be landed and supplied on improvised airports without being detected.

Because Brazil is so large its airports are a long way from the Panama Canal. The bulge is much nearer to Africa than it is to Panama, and our Caribbean bases bar the way north. Pan-air schedules use about ten hours to Trinidad and another ten to Panama City. Planes are modern and fast. A non-stop, round-trip flight would be beyond the range of fighter aircraft and would seem to be too great for large fleets of heavy planes delivering bombs by the ton. Brazil holds an abundance of undeveloped fields as well as many with good runways and repair shops.

Attack by air with a view to moving forward to knock out the Panama Canal or with a view to covering a landing at Brazilian ports, is not beyond the demonstrated means of Hitler's Luftwaffe.

Hitler might attack South America. A word as to the stopping of this invasion. The southeastern half of Brazil could be called conventional country, except that lack of roads would cut down the usefulness of mechanized troops. True, track-laying vehicles can move off roads, but the immense quantities of fuel, ammunition, and supplies required to keep them going must be moved up over a good communications net or the attack loses headway. The northern portion of Brazil is as hostile to man as any region on the globe. Recently in Siam and the Malay States the Japanese had specially trained and equipped jungle troops; the British did not. This permitted the Japanese to make a wide envelopment of the defense of Singapore. Of similar strategic value might be the Amazon waterway in South America. There conventional infantry would find it hard to oppose troops from Africa, fighting for the Axis and well seasoned in tropical warfare.

The United Nations are attacking Hitler in Africa right now. Brazil is helping to expedite movement by air to this front. Now that she is in the war, development of offensive bases on "the bulge" will probably go faster. Brazil will guard these bases and, if her public opinion is any indication, will participate in action from them by land, sea, and air.



Passenger wharves at Rio

TRAVELING?

"What to Take" and "Personal Problems: Iceland" in the September *Journal* brought numerous questions from prospective voyagers. The Travel Bureau of the Adjutant General's Office furnishes this additional information.

In general, officers ordered overseas by air may take up to 77 pounds of baggage on the plane. This weight may be cut down in certain instances, however, depending on the destination and the number of passengers on the plane. In addition to this 77 pounds, the officer may ship up to 175 pounds to follow by boat. If the total poundage to be shipped by boat exceeds the allowance by 10 or 15 pounds the excess weight is usually allowed, but such permission should not be counted on, and every effort should be made to adhere strictly to the weight limitation.

Officers ordered overseas by boat may take 175 pounds of baggage which will be placed in the hold of the ship. Additional baggage up to 75 pounds may be taken also, to be placed in cabin or stateroom.

It should be borne in mind that sometimes the journey will be partly by boat and partly by air. In such cases the 75 pounds stay with the officer. The remainder, however, may be considerably delayed in reaching him, so all items which may be needed immediately should be included in the 75-pound baggage.

An overcoat, topcoat, or raincoat carried by the officer or worn by him are considered items to be worn and are not counted in computing weight of baggage. On most planes the following are excluded from weight computations: side arms, gas masks, helmets, and musette bag.

There is no limitation as to the size of the baggage or individual pieces thereof, as long as the weight is within the allowable limit. It is left to the officer as to whether he takes foot locker, steamer trunk, wooden box, duffle bag, or what-not, as long as the weight limitations are adhered to.

There is no limitation on the number of packages or pieces of baggage that may be taken overseas, provided the total weight of all-containers-plus-contents does not exceed the weight allowed.

CLOTHING AND EQUIPMENT

The following lists of clothing and equipment recommended by the Travel Bureau, AGO, differ somewhat from those published in the September JOURNAL. Allocation of your allowable weight naturally depends on your personal preferences and probable destination, but it would be well to check all available suggested lists against your own tentative thoughts on the subject. It should be noted that the summer uniform has not been authorized for use in England, but of course it is too early to state next summer's situation.

CLOTHING AND EQUIPMENT—GENERAL

- 1 cap, service, wool
- 1 cap, garrison (overseas), wool
- 2 caps, garrison (overseas), cotton, khaki
- 1 short coat (preferable to overcoat)
- 1 field jacket
- 1 blouse, wool, elastique
- 2 complete extra sets of insignia
- 2 pair slacks, wool (1 pink, 1 dark)
- 1 pair slacks, wool (enlisted OD)
- 4 pair slacks, cotton, khaki
- 1 belt, waist, khaki
- 2 shirts, field, wool
- 4 shirts, cotton, heavy khaki
- 4 shirts, cotton, light khaki
- 4 wool tan ties
- 4 cotton tan ties
- 1 pair leggings, canvas
- 1 pair shoes, service, high
- 2 pair shoes, low
- 1 pair slippers
- 12 pair socks, cotton, tan
- 2 pair garters
- 8 pair shorts, underwear
- 8 undershirts
- 24 handkerchiefs
- 1 set toilet articles
- 6 bars soap; supply of towels
- 1 cigarette lighter, spare flints, and 2 cans fluid. Don't overlook these! Matches are almost unobtainable.

CLOTHING—EXTRA FOR IRAN, IRAQ, EGYPT, INDIA, AUSTRALIA

- 1 blouse and slacks, tropical worsted (merely suggested, as blouses are worn by the British after working hours)
- 3 pair shorts, cotton, khaki (buy them here as they are hard to get overseas)
- 3 shirts, cotton, short sleeves, khaki (for wear with khaki shorts)
- 3 pair socks, wool, long (for wear with khaki shorts)
- 1 sun helmet
- 1 pair sun glasses, best quality

CLOTHING—EXTRA FOR ARCTIC REGIONS

Obtain the following from the Quartermaster at Port of Embarkation:

- 1 overcoat, parka type
- 1 hat, rubberized
- 1 parka, double texture, rubberized
- 1 pair trousers, double texture, rubberized
- 1 jacket, field, arctic
- 1 sweater, worsted, turtle neck
- 1 sweater, sleeveless
- 1 toque, face
- 1 pair goggles, polarized
- 1 pair trousers, jersey lined
- 1 pair shoe pacs, 16 inch, rubberized bottom, leather top
- 4 pair socks, wool, arctic
- 2 pair drawers, wool, knit, arctic
- 2 undershirts, wool, knit, arctic
- 1 pair gloves, wool, OD, arctic
- 1 pair mittens, horsehide, lambskin lined

EQUIPMENT TO BE DRAWN FROM QUARTERMASTER

- 1 (NS) 74-H Helmet, Bodies, M1
- 1 (NS) 74-L Liner, Helmet, M1
- 1 (NS) 74-H Headband, Helmet, M1
- 1 (NS) 74-N Neckband, Helmet, M1
- 1 74-B-53 Bag, canvas
- 1 74-B-265 Belt, pistol
- 1 74-S-389 Suspenders, belt, M-1936
- 1 Pistol, auto. cal. .45
- 1 Holster for cal. .45 auto.
- 2 Clips, extra, for cal. .45
- 21 Rounds ammunition, cal. .45
- 1 74-P-260 Pouch, first aid packet
- 1 74-P Packet, first aid
- 1 74-C-80 Canteen, M-1910
- 1 74-C-300 Cover, canteen
- 1 74-C-354 Cup, canteen, M-1910
- 1 74-C-62 Can, meat, M-1932
- 1 74-K-60 Knife, M-1926
- 1 74-F-63 Fork, M-1926
- 1 74-S-312 Spoon, M-1926
- 1 37-M-1505 Mask, gas, diaphragm
- 1 24-R-110 Roll, bedding, waterproof
- 2 27-B-678 Blankets, wool, OD
- 2 74-T-100 Tent, shelter half
- 2 74-P-225 Poles, tent, shelter half
- 2 74-L-70 Line, tent, shelter half
- 10 74-P-125 Pins, tent, shelter, wood

FINANCIAL ARRANGEMENTS

Not more than ten pounds (£10 British currency) may be taken into the British Isles, Egypt, or any British possession. This restriction is based on the fact that sterling has a considerably higher "pegged" rate in these areas than it has in other countries.

There are no restrictions on the amount of United States currency which may be taken into the various countries. No United States currency can be obtained while there. Travelers' checks can be cashed in foreign countries, but the most negotiable form of money (other than the local currency) is American currency. One and five dollar notes are the most convenient denominations.

While in foreign countries pay, mileage, and per diem vouchers will be paid by the nearest Finance Officer. Payments will be made in the currency of the country in which the vouchers are presented.

MISCELLANEOUS

Use of cameras is restricted in all countries. If a camera is taken, it must be packed in the baggage.

Many hotels in foreign countries (like many of them here) give reduced rates to military personnel. Such rates should be requested.



"Don't forget to look up Aunt Jenny in Melbourne, or
Cousin Michael in Dublin, or Uncle Carl in Reykjavik"

COLIN ALLEN

CONGO INTERLUDE

By Alexander Clifford

American officers and men should familiarize themselves with all theaters in which they conceivably might fight. With Central Africa increasingly in the news, this bird's-eye view of that region has special interest. It is from *Crusader*, forthcoming book by the Cairo correspondent of the London *Daily Mail*.

When Colonel Lionel de Marmier, a famous French pilot, invited me to make a quick flight with him down to the French Congo and back, I didn't hesitate to ask my paper's permission to go. De Marmier was planning a Free French air-line linking Beyrout with Brazzaville, the capital of French Equatorial Africa, and his machine was a Farman which had been built for the trans-Atlantic service—an ugly looking thing with two engines facing forwards and two backwards, and excessively noisy. We left Cairo in the dawn and flew straight through to Khartoum. The whole journey is telescoped in my memory into a flat beige landscape crudely bisected by the chocolate colored Nile with its narrow green cultivated banks. With some vague idea of re-acclimatizing my mind to the language I was going to speak for the next ten days, I ready a willfully obscure French novel.

Khartoum—you can see its Union-Jack layout from the air—was breathlessly, steamily hot. I lunched, siesta-ed, shopped, and got myself inoculated against the yellow fever. The Abyssinian campaign had finished and Khartoum was no longer an important headquarters. I found it sinking back into its normal regime of a perfectly-run, rather snobbish country club. Most of the friends I had hoped to see there had already left for other fronts.

Next morning, after an utterly improbable breakfast of stewed prunes, porridge, fried fish, bacon and eggs, toast, and marmalade, we took off for Fort Lamy, capital of the Tchad territory. We stopped once at El Fasher, where I made friends with an enchanting lion cub about the size of an Alsatian.

Fort Lamy is like any film of darkest Africa you have ever seen. It has everything: ebony-black women whose elaborate coiffures are fixed in place with low-grade butter; a sprawl of mushroomlike mud-and-thatch huts; a dried fish market; a leper colony; and an abbatoir where they hire special guards to keep off vultures and hyenas. In the middle of it all lie half a dozen streets tunnelled among huge thick tropical trees where five hundred white men live and work.

But Fort Lamy was important. It was a war-capital—the smallest, remotest and most exotic in the world, no doubt, but nevertheless a war capital. It had been the first place in the French Empire where de Gaulle's standard was raised. It governed Tchad, which had Free France's only land-front

with the enemy (the southern border of Libya). Tchad was the only place in the world where Free and Vichy French faced one another across a common frontier. Above all it was a key-link in the Allied East-West route across Africa. By joining Nigeria with the Sudan it provided a vital shortcut for the British and American aircraft which were day by day streaming through to the Middle East.

Tchad's Commander-in-Chief, Colonel Leclerc, was away, but his Chief of Staff asked me to lunch. He lived in one of the rather charming peasant-type houses of local architecture—very steep-pitched barn-like roofs of thatch on top of long low one-story bungalows with brick balconies all round. The lunch was a masterpiece—course after course prepared with an intricate cunning that quite concealed Fort Lamy's almost complete lack of culinary raw materials. The secret was that he paid his cook almost no salary at all but gave him lavish rewards every time the meal was good. That seemed to me really rational housekeeping.

During this meal I heard details of Tchad's share in the war. I heard about Colonel Leclerc's astounding thousand-mile dash across the desert to capture Kufra, the remote Libyan oasis which the Italians used as a refuelling station for their secret air service to Abyssinia. Few travellers had ever attempted the journey to Kufra. But Leclerc led his expedition straight across the Libyan sand-sea and into Kufra before the Italians knew anything about it. Then, still weary and travel-worn, he and his men fought the enemy and beat them.

Almost equally fantastic was the Free French raid on Murzuk, the only sizable place in southwest Libya. Here again the raiders set a compass course across a pathless, waterless wilderness and scared the Italians into utter panic. It was only a raid, so they came home again by the way they went. But it was firmly believed locally that from Vichy-controlled French Sahara had come a secret message of congratulations on this exploit.

We had to spend a whole day at Fort Lamy. I prowled round the market, fascinated because it was all so absurdly true to type. I had seen it all before on films and in pictures. Only here there were the extra dimensions of colour and smell and sound—the shrill clattering language, the scolding, the screeching laughter. Hideous old men and women squatted under wattle shelters and

sold horrible cheap tinware and baskets full of unidentifiable nuts and seeds and barks and roots. One presumed they were largely for medicinal purposes. I looked hard for something to explain the lure of Africa, this irresistible fascination which the Continent is said to exercise, but I didn't believe I would ever feel it. I wondered whether I looked as repulsive to these people as they looked to me. It was hard to understand those Frenchmen who took temporary wives from among the natives, leaving a deposit with their parents which they could reclaim if the women were returned in good condition.

I went round trying to photograph the women but they turned away their faces, fearing that the taking-away of a likeness would somehow diminish them personally. Often fifty centimes—it was strange to be using francs again—was adequate compensation. But the more sophisticated children with their pathetic pot bellies came running to earn a few sous by posing.

In the evening we went to the "Cercle" and sat on a terrace by the broad milky river, watching the pelicans fly by in formation against a gaudy sunset. The insects almost blotted out the electric lights and we sat scraping off incrustations of living things from our arms and knees and faces. Bloating toads sat on the tables and devoured the insects with a steady non-stop rhythm.

I dined with the Governor, M. Lapie, who was at Narvik and wrote a book about it. He had made use of primitive native productions to give a modernist flavor to his house—a chessboard carpet of black and white goatskins, grotesquely distorted carvings in ebony, crazy leather cushions. A man came round selling leather, and I bought a snakeskin about fifteen feet long for a few shillings.

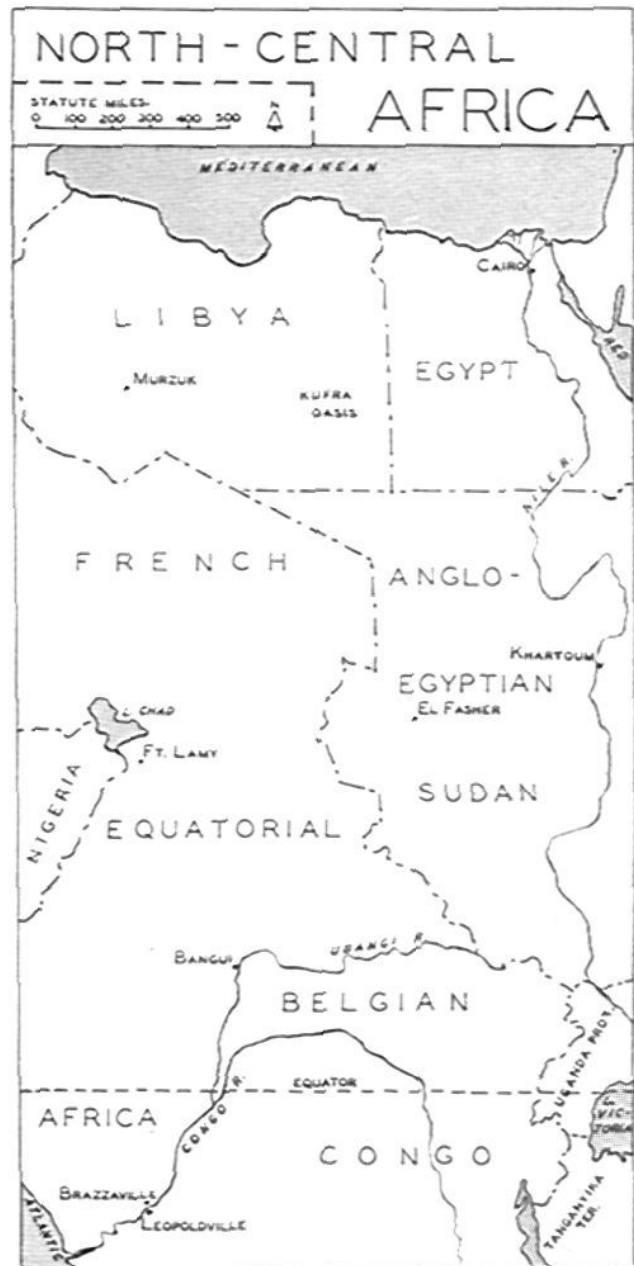
At dinner a great punkah fan moved lazily above us until the little boy operating it outside fell asleep and the cord shot through the hole in the wall and coiled round my neck. M. Lapie told me about his colony and its war effort. It was a primitive place, he said, with barely 200 miles of proper roads in the whole country. The only telegraph line was constantly being destroyed by tornadoes and giraffes. Even Fort Lamy itself had no church and no drainage at all. But the territory was more than self-supporting. Freed from the over-centralized Paris administration, it had a chance of great development. And there had been a surprising response to the Governor's war fund appeal, especially from districts which had once been part of the German Cameroons.

Out in the garden afterward we sat and made a nostalgic gastronomic tour of Europe. The insects twittered and hummed and whirred about us, bats swooped round our heads, nightbirds cried weirdly in the great black trees above us, innumerable frogs croaked, hyenas barked and snarled. But we were eating oysters in Amsterdam, and tripe at the Bar Basque in St. Jean de Luz. We tasted the fish in the Copenhagen fish-market, the chickens at a village in the Vosges where they poach the bird in white

wine with mushrooms, the caramel ices at the Rey Noble in Pamplona. We matched the Bouillabaisse of Marseilles against the Sopa de Pescado of Bilbao, and confessed weaknesses for peasant dishes like the Berlin sausages cooked in beer, and the Swiss cabbage, cheese and bacon pie. We remembered heavenly meals in Macon, Dijon, all over France. Then we sighed and went to bed.

I slept in the open under a double mosquito-net. In the morning the little pygmy servant with teeth filed for eating human flesh left the side of his 150 francs bride—she was really more costly than he could afford—and woke me with tea. Some one fetched me to the airfield and we flew on to Bangui.

They told me I should see some big game, so I peered



down for hours, watching the country change from desert to savannah and from savannah to jungle. But I never saw a thing. Only brown rivers writhing among the impenetrable forest and occasionally a thin spiral of smoke from a fire.

Bangui, spread round gentle green hills by the wide Ubangi River, was charming. The soil was startlingly red and the roads were lined with fruits I had never seen — pawpaws, alligator-pears, breadfruit, mangoes. The natives strode about carrying bows and arrows, and the women's dress was often just a piece of string supporting a brief fringe fore and aft. In pools along the road men and boys were bathing unashamedly naked.

There was a Free French air squadron training at Bangui, and it was here that I thought I found Free France at its best. Every man in the squadron had an incredible personal story to tell of adventures and escapes. They had burned their boats, staking all or nothing on Britain's victory. In this savage land of jungle and desert, deadly beasts and insects, sunstroke and tornadoes, fever and death, they had come to hang up France's national cap while the homeland was in pawn. I found you had to talk warily about family matters down here. Most of them had had tragic news from home. Many had had what was even worse—no news at all. Their lives had been cut clean in half and here, stewing in these jungle outposts, they were beginning anew. Their friends told me how they had been stiffened and hardened beyond belief by what they had been through. And everywhere I listened to complicated schemes for getting transferred to somewhere where there might be a chance of fighting the Germans. They had chosen to fight for freedom, and they desperately wanted to do so.

That night the acting-Governor of Ubangi-Shari territory invited me to dinner and General le Gentilhomme was there. It was a completely civilized dinner. The food and the wine were perfect, and the conversation dazzling. We discussed, among many other things, the interplay of the British and French national characters, and le Gentilhomme talked with an insight and intelligence which seemed to me brilliant. In his beautiful French the simplest statements sounded like sparkling epigrams. Before I went to bed my host warned me that a large black panther usually came prowling round into bedrooms at about 4 AM. He told me to keep still under my mosquito-net and it wouldn't touch me. As a matter of fact I never woke up.

The next morning we flew to Brazzaville. On the way I crossed the equator for the first time and they came and anointed my head with whisky. Some one said it was very good for the hair.

Brazzaville, capital of French Equatorial Africa, is a great sprawling village beside the Congo, with hedge-lined streets and villas set among green lawns and trees. It is, in fact, the capital of the Free French Empire, with a British Mission, a General Headquarters, a Governor-

General, a Propaganda Ministry, and a war material factory. An American Mission had just arrived to study the facilities for sending war material and other goods into French Equatorial Africa. The place was full of unwonted bustle and uniforms and conferences. The great social event of the day was lunch at the Cercle Militaire.

I spent a couple of days presenting my credentials, calling on people, seeing the sights, gathering information. I saw the war equipment factory where the only ingredients used were cloth, wood, and wire. They made uniforms, caps, camp-beds, dozens of little items which every army needs. The buttons were wooden, turned on small lathes. The wire was used to fashion buckles for belts. The cloth came from home-grown raw materials which had been sent across the river to Leopoldville, where there is the biggest textile factory in Africa. Deft black fingers cut the stuff out and every sewing-machine in the colony had been rallied for making it up into uniforms. It looked more like a missionary's sewing class than a factory—dozens of grinning black workers treading away at their machines. But it was supplying the entire colonial armed forces.

I called on M. Félix Eboué, the Governor-General. He is coal-black but so cultured, so charming that you forget his color in the first three minutes. He told me his colony had always been the Cinderella of the French Empire. There is raw material everywhere, but little has ever been done to exploit it. Gold, diamonds, lead, and copper lie close to the surface. Almost anything will grow. Now at last, since France herself was out of reach, the colonists themselves were turning with new eyes to the possibilities lying at their feet. People were buying up estates and planning to supervise the cultivation personally. They were building houses and thinking of Africa as their home. The French Congo, M. Eboué insisted, had a great future.

I took the motorboat across the Congo River to Leopoldville on the Belgian side. It is an older, bigger town than Brazzaville. There is an enormous hotel and much evidence of the great wealth that has been extracted from the Belgian Congo, but I found the atmosphere much unhealthier than in Brazzaville. This rich colonial empire needed to be given a bigger share in the war. The people were beginning to feel that they weren't doing a single thing to help their martyred homeland. They were richer than ever before—Britain had guaranteed them markets for their products and the profits were remaining in the colony instead of going to Europe. Leopoldville was full of new American cars and the shops were stuffed with American, South African, and Portuguese goods. The people couldn't make sacrifices if they tried. And they couldn't do anything at all to help their starving friends and relatives in Belgium.

The political and military authorities there suggested to me two solutions. First, that the Belgian troops stationed in Britain and Canada be sent out to the colony.

Second, that Belgian troops be sent into action on some front or other.

"We could easily raise an army of a hundred thousand men if we had enough officers and non-commissioned officers," they assured me; "that's why we need our fellow-countrymen from Britain. We feel that Belgian soldiers should be trained and based on Belgian soil. It would help us to realize we were really taking part in the war." As regards fighting, the Free Belgian army had promised to fight anywhere in the world, but so far it had only been permitted a minor role in the Abyssinian campaign. There it had fought with great gallantry. It had had to take its shipping overland from the Congo River to the Nile. Its convoys had slithered through floods and mud across almost unexplored country, often taking twenty days to do a twenty-hour trip. And it wound up the campaign by capturing three Generals and the remains of an army of 15,000 men. But that was against Italians, and it was against Germans that the Belgians really wanted to fight.

I found the Congo wholeheartedly pro-Leopold. When Belgium surrendered they tore down his pictures and expunged his name. Then, at a military review, someone suddenly shouted "Vive le Roi." Others took up the cry, and gradually he became their martyred king. They threw his picture on the screen at the end of every cinema performance and hung up his photo everywhere. He

became the symbol of enslaved Belgium.

In Leopoldville I saw the first drop of rain I had seen since the Greek campaign. It was a torrential downpour which steamed back clammy from the heat-sodden earth. But when I crossed the river back to Brazzaville they knew nothing about it at all.

My last evening in Brazzaville I spent at a party which the men of the British Military Mission gave for their officers, an English public-house evening with beer and darts and ping pong. It was incongruous to come out of that familiar atmosphere into the rich tropical night and hire a "pousse"—a sort of one-wheel rickshaw pushed by a native—to take me home through the streets burrowed into thick grotesque foliage.

The journey home was like a film run backwards. Bangui was the same but for a few extra flags and a battalion of infantry which had paraded to welcome the American Mission. A mongoose travelled with us for one stage of the run, scuttling about the cabin and trying to climb people's legs. Khartoum was fuller than ever of bomber and fighter squadrons on their way through to the Middle East. I found I was developing an almost permanent headache from the noise of the 'plane and the amount of quinine I was having to take. The final stage back to Cairo, seen for the second time, was even duller than before, and I got out my typewriter and wrote letters.

USE OF WRENCHES



The misuse of wrenches has caused many a skinned knuckle, mashed finger, strained back and serious fall. The ways of preventing these injuries are so simple and so easy to apply that it is a wonder so many occur.

Here are some of the ways to avoid injury:

1. Use wrenches that are the proper kind and size for the job.
2. Use only wrenches having jaws in good condition.
3. Never use a shim to make the wrong size wrench fit the nut.
4. Do not use a wrench as a hammer. It weakens it.
5. Always place the wrench on the nut in such a position that the pull on the handle tends to force the jaws farther onto the nut.
6. Think twice, before you push on a wrench. Ten chances to one, you will find it safer to pull.
7. See that your footing is good before you pull. Get the habit of figuring out what is going to take place if the wrench slips, the bolt breaks, or the threads slip.
8. Keep the jaws of pipe wrenches sharp.
9. Never use a piece of pipe to extend the wrench handle for leverage.

The Maintenance Engineer

THROUGH THE MILL

Last of Series

Sometime before my first year in the Army was complete, I heard rumors that we would go to the great war games in Arkansas, Louisiana and Texas.

Having suffered through a rather harsh few days in the Minnesota wars of the previous summer, I felt no great surge of joy at the announcement; but rather looked pityingly on those who lauded our good fortune, particularly selectees of very short service. They had no idea of what had to be done—I had several.

When things first began to happen, I was Munitions Officer for the battalion and had (on paper) a command of six 2½-ton cargo trucks, with trailers, and a total of 18 men. We were told that ammunition would be carried to the maneuver area—not live rounds, mind you, but simulated ammunition. Shortly afterward in a switch of officers, it fell my lot to command the Service and Ammunition Battery: an outfit with paper strength of 63, a war strength of 54, and an actual strength of 37. Three officers, each with five weeks' training to his credit, were to assist me—and they did. However, one was immediately sent away to school; that left two—one of them actually my senior.

I made one Munitions Officer and turned him loose. The other was made battalion Motor Officer on battalion order, so that was that.

A division order announced that you had to be a Field Officer in order to take a cot along. My battery mechanic immediately turned out 7 hammocks of unknown patent and unusual design. They could be suspended between trucks, he said. He failed to provide, however, that trucks must remain perfectly still and not chase about for forage, etc. The 1st Sergeant decided they would work. I was skeptical but willing.

Day after day my Munitions Officer had a detail of about five men searching the wooded areas of the reservation for such fallen saplings as would approximate the size of a 75-mm. howitzer shell. They found many of them and by constructing temporary "Arkansas Sawhorses" on the spot, finally succeeded in furnishing the battalion with a formidable supply of good ammunition—makes good firewood, too.

We prepared rather rapidly for the prospective trip. Everyone wrote home giving his APO No. Rolls were made and remade, inspections were almost incessant, and amid the general orderly turmoil a few of the younger lads thought it would be entirely unethical to go away for 6 weeks without first paying a goodbye visit home. They, of course, were sorely hurt that their BC was too dense to see their way, but on the whole managed a sickly grin and kept soldiering.

By Capt. John Hughes, FA



Moving van or personnel carrier?

THE QUARTERMASTER PRODUCES

Every vehicle we took was carefully checked. The 6,000-mile going-over was completed in every instance. Some spare parts were not available. For instance a weapons carrier had been running for some weeks without a front axle. We failed to reach first base in repeated attempts to procure one before we had to leave; but little worry, we knew the carrier would run the first day in its state of disrepair, and we had the Quartermaster's word of honor that an axle would be readily available, at no extra cost, at the first overnight camp site. We hit camp that afternoon and the motor sergeant at once set out for the Quartermaster camp. Forty miles away they were, but they made good their promise and even supplemented it with a few spark plugs and perhaps an inner-tube.

After working most of the night we were ready for anything, but not what we had to endure. Hour after hour we were jammed on the highway between two other columns, bounced like a ping pong ball, telescoped to distraction. By watch and speedometer I ascertained that sometimes we made as much as 5 miles in one hour. At other times our top limit of 35 MPH left us reading road signs for directions, troopers ahead gone.

Our camp sites were well selected, and civilians were more than courteous: they stood in groups of hundreds along the roads cheering and waving. Girls with cigarettes, candy, etc., stood on the streets and threw those tokens into trucks and cars as they passed. I heard of columns being stopped by police while civilians passed down among the vehicles giving fruit, candies, cigarettes to the men. That did not happen to us. Oklahoma was almost over-zealous in attempts to help. You were stopped on all sides to answer innumerable questions, cars picked you up around towns and gave rides back to camps.

'Twas heavenly.

Each night I had to send a detail, usually accompanied by an officer, to the Quartermaster depot for our allowance of supplies. Sometimes that was as far as 50 miles,

and usually meant an all-night trip for there were long waits before supplies might be had.

Some nights I didn't go along. Those were pleasant evenings of radio, old soldiers reminiscing, poker games, a jaunt to investigate the possibilities of the small town.

We were up and away early. After the second day I went ahead with other advance details to spot camp sites, arrange for bathing facilities, get rates to theaters, and the like. That ordinarily put me into camp about 4 hours ahead of the column though our maximum speed was the same as its.

IN THE MANEUVER AREA

We saw the Indians dance at Pawhuska, Oklahoma, ran through the Seminole country, spent a night at Greenville, Texas, crossed to Shreveport, and from there travelled a long, hard day across the maneuver area to our bivouac site at Crossett, Arkansas, having traveled 1,138 miles without loss of man or vehicle.

At Crossett we went into a base camp for a few days. Field Artillery and Engineer units filled the woods about us. Having reached the place after nightfall we camped without laying-out our areas. Next day early we started—like pioneers—cutting roads, putting up telephone communication, establishing a loudspeaker address system, digging latrines, pitching picket lines, setting up water troughs and hauling supplies, getting ready for our two trains of horses.

Meanwhile I roamed the nearby countryside in search of a laundry lady. I found one—an old colored man who took in washing for his young wife. I admired his sagacity, his bland impertinence, his willingness to take any amount of washing, and his equal willingness to set a price that would startle a metropolitan laundryman. We made a deal at last, and I delivered the clothes, most of which had been worn about five successive days.

After a short period of semi-rest, during which time we went through an otherwise normal payday, we started the war. It seemed strange, very strange, to set a table out under a tree far, far in the woods and drag out bales of currency and heavy bags of silver to dole out to a line of eager men. That's the only payday I've seen outside barracks. Then there were the vouchers to make up. Some day some interested person will search me out to decipher them—we had no typewriter and the Battery Clerk's writing was little better than mine.

WE GO TO WAR

But to the war.

At 1:00 AM Monday we had a warning order to move. A hurried meeting of BC's in the colonel's tent gave me fragmentary orders and a general idea of where we were going and what was happening. I learned that supply trains would follow all fighting elements, so did not alert my men.

So after some units had moved out and many others were shouting, working to get under way, I called a guard

and had him quietly wake the 1st Sergeant. The Motor Officer and Munitions Officer were with me when the 1st Sergeant arrived from his nearby hammock.

"Sergeant, the battery moves in 30 minutes. All men, vehicles, equipment, and supplies will go. 'A' and 'C' batteries left an unknown quantity of supplies. We will carry as much as can be loaded on one truck. Overload vehicles when and if necessary.

"I'll be right here if you need me.

"Munitions Officer and Motor Officer will supervise work of their sections, you handle the remainder of the battery.

"There will be no shouting or loud talking; blackout restrictions will be observed; no racing of motors.

"Are there any questions?"

"Yes, sir. Which way do we move?"

"Vehicles, except one to pick up 'A' and 'C' supplies, will remain stationary. When ready to move, drivers of vehicles and all NCO's will report to me here with their maps."

A little less than half an hour later I showed every driver and NCO our route for the movement. Every man marked turns and destination. In case a vehicle fell out, there would be at least two men on it who knew the route and next stop.

"Move out in normal* order."

We were on the road on time and in shipshape condition. In 30 minutes the men had gone from a semipermanent camp to a compact unit on the march.

IN HIGH GEAR

I remember well enough that earlier in my service when I was in a horse firing battery, the 1st Sergeant was a tough, efficient old soldier who loved speed and hard work. Out on a problem one day, the men had just completed cleaning harness, when *march order* came down. The 1st Sergeant blew his whistle. Everyone listened intently.

"You have 15 minutes to get out of camp and I don't want to see any slipping blankets. I'll time you and GOD HELP THE MAN WHO ISN'T READY."

*Normal for my battery meant according to the number—from 1 to 37—which was painted on the bumper.



Simulated ammunition: makes good firewood, too.

A few minutes later when we were on the road I went over to the grinning sergeant.

"How long did it take, sergeant?"

"Thirteen and one-half minutes, sir. They can move right along when they have to."

DELAY ON THE ROAD

That night the war started. The rain started, too. We moved out of camp through a dense forest to little-used dirt roads. We traveled slowly for hour after hour, halting frequently when we jammed into the tail of a leading echelon. Invariably at those halts, I slogged along toward the lead of the columns ahead to ascertain "Why the delay?" Without fail I found that the column had stopped for a few minutes, then moved on—leaving behind sleeping drivers. There was no officer from their unit to herd up the stragglers and keep the column closed up. I murmured a vote of thanks for the responsible young officer in the wrecker at the end of my column.

I spent weary hours trudging from one halted vehicle to the next, thumping on doors and finally shouting to drivers who would not remain awake long enough to move their trucks with their columns.

In the darkness I stumbled over a motorcycle lying on its side in the mud just outside the main ruts. I searched for its rider and found him limp and wet in the grass at the roadside. Feeling sure that he had been killed, I used a flashlight and discovered he was asleep, just like so many of his fellow soldiers. I left him there in the mist and rain, sleeping heavily with his face turned from the mud and weeds.

About 6 AM the column stopped again, and through the fog I could see a large truck partly off the road but blocking all passage. My mess sergeant sent word that breakfast was ready, so I told the mess officer to feed the battery while I investigated the problem ahead. The Battalion Motor Officer and Motor Sergeant went forward with me.

There we found a large QM cargo truck, heavily loaded, its rear off a 4-foot drop and against a small tree. It looked bad but not impossible. The occupants were asleep. Their unit wrecker was there but its cargo of soldiers was sleeping too. I aroused a squint-eyed NCO who claimed he was in charge and questioned him.

"Have you made any attempt to get out, Sergeant?"

"Nope, we're waitin' for the lieutenant to come after us. He's the Maintenance Officer."

"And where is this lieutenant?"

"He's at the head of our column."

"Have you sent him word of your accident?"

"Nope, he'll know it when we don't show up."

"How do you think my column is going to pass this place if you leave the truck there?"

"Well, there ain't much room. I reckon you'll just have to take another route."

"Sergeant, I'll give you 2 minutes to start getting that truck back on the road and 20 minutes to get out of the way. At that time I'm going through here, even if I have to push that truck into the woods."

At that he "gave" a little and started rousing his men.

"Lieutenant," he asked, "have you any suggestions on how to get 'er out?"

"Take half the load off the truck. Give it all the power it has. Use the power of the winch on your wrecker. It'll come out, easy."

Finally I learned that there wasn't a man in the wrecker crew who had ever used a winch or had seen one in operation.

My motor sergeant handled that job and the truck was moving in a few minutes.

[In post, camp, and station duty it is highly important to train drivers to be proficient in the use of the winch. It saved me many hours of labor and the waste of needed time.]

After that first day things eased up a bit, or I wouldn't have made it. The splendid and willing cooperation of my battery officers and the efficiency of the NCO's kept the battery functioning at killing pace day after night after day.

AMMUNITION SUPPLY—AND MEN

During one phase of the fight, one of our firing batteries was detached and sent off on an antitank errand. My ammunition section was to supply them, in addition to the batteries which remained with the battalion.

At dark one evening the ammunition train left camp to resupply the detached battery. That night those men drove 175 miles without lights, found an obscure D.P., then located a still more obscure battery and returned to camp without accident. Ten minutes later every man in the group asked to be sent on a supply mission that involved more sleepless hours and dusty miles, plus hard work. It was imperative that an officer accompany the mission.

"Sure, I'll go," the harried Munitions Officer answered my anxious query.

"But aren't you about finished?"

"I am, but I want to go. And when or if I come back I'm going to write my folk, 'I'm a man'."

Officers and men like him make intolerable situations tolerable. They keep the chin up and the temper down.

There was only one man in my battery who couldn't take it. After five days of "fighting" he disappeared. We searched a nearby river for him, but he had "gone over."

We finished the maneuvers a hardened, trained unit ready on short notice to take the field for a real fight.

ON DISCIPLINE

To me discipline is somewhat more than standing stiffly at attention, heels clicking, saying "Yes, sir" every breath; and it is much more than a forced performance of duty.

If you want to find whether a unit is disciplined, is good, efficient, watch them on a day's march and see how they make camp, live in it, and take their leave.

Numerous times I've seen units roll into camp late in the day, feed the men (a little), and drop off to sleep. No guards were posted, no attempt was made to establish an orderly camp, no preparations were made to leave on short notice.

An inflexible camp rule should be: *Be ready to move before you stop work.*

In order to be prepared to move out, every driver must pick an *out* route for his vehicle. There must be no time lost in route reconnaissance in early morning darkness. Have every man sleep near the vehicle on which he will ride. Make the senior NCO on that vehicle responsible that every man is accounted for.

[I remember that one night at Zwolle, Louisiana, we went into a dense forest about midnight. There were about 3,000 men in those woods and traffic looked like the "Loop" at rush hour. I saw unit after unit directed off the single trail of a road to the right or the left. One after another, with few exceptions, they moved as far as possible, straight away from the road. When the trucks could go no further, every one simply went to sleep. At 2:00 AM "March Order" came through. The enemy was close. We had to get out in a hurry. Three hours later some of those outfits still had vehicles and men trying to find a road out of the woods.]

My limited experience teaches strongly, *never lie down to rest until you are ready for the next move. Always be ready.*

G-2ING THINGS

That being ready reminds me of our battalion executive and his "G-2ing" things. A lieutenant colonel, he was a hard-working, efficient officer; he liked to speculate on our next move and often assembled all the young officers before a large map. He would then point out our position and give us "the dope" on the known enemy situation; then he would start digging deeply into the possibilities of our near future. He spoke knowingly of the very real chances of our moving to any one of a dozen points around the perimeter of a circle, the center of which was our position. The colonel seldom missed a bet—if there had been sufficient time he would have covered every point in the neighboring states, just to make sure he didn't miss.

That session usually broke up when orders reached us to move out. He'd listen for the destination, then, "By God, I shore G-2ed that one. I knew we were going there." (I'm sure that if any one knew for certain, it was only God Himself.)

OVERLOADED OFFICER

I've always been highly amused at officers who insisted on carrying on themselves sufficient field equipment to start a small supply store. Field belt with suspenders, canteen, pistol, map case, glasses—those are some of the items they carry.

Aside from being uncomfortable when riding along, the field belt with suspenders and the canteen aren't bad. Very few officers have fired the pistol sufficiently to make it a reliable weapon for them. A map case is nearly always in the way. (Officers waste more time trying to fold their

maps to fit an expensive case than they should have to consume in their entire map reconnaissance.) It may be that all this equipment is essential to some operations, but I have found it mostly a source of discomfort.

PERSONAL APPEARANCE

Be particular about the appearance of your men and yourself—even when apparently far from civilization. I recall a few times when orders from battalion prescribed that "All men will bathe and shave during this



Soldiers' home laundry: strange foliage

encampment." Sometimes on maneuvers it is difficult to find time to wash and shave. Be sure that, if it is possible, your men find that time at regular intervals.

Then too, watch the garbage pit, the latrine, or any other waste disposal facilities you may use. Usually it takes hard work to dig a garbage pit large enough and deep enough for a day's halt. Watch that your men dig it plenty deep or that a new one is ready when needed.

One other very important item: check mess kits for cleanliness. A dirty mess kit means a sick soldier. More than that it means that some man has to double up on the work, for a sick soldier's job must be done. Still more, morale and efficiency of a sick unit drops alarmingly. At all times see that your men have a chance to clean the mess kits and never hesitate to have a man "Wash it and fall in at the rear of the line."

I did not feel badly when I told my Mess Sergeant and the cooks, "You will at no time put food into a dirty mess kit. If any man in this battery or any other battery is in your chow line and you see his unclean kit, refuse to feed him until he cleans it satisfactorily." My Mess Sergeant followed those orders to the letter. We didn't have a sick man—some other batteries did.

ARMY MEDICS

And now the Medics, God bless 'em.
My experiences with the Medics started 'way back in



I look back and tremble

college when the Army first tried to take me apart. Except for numerous tiresome "physicals" and the inevitable "shots," there was little to it.

The last shot had been fired in the Minnesota maneuvers when the cooks set us out a feast to celebrate the occasion. It wasn't long before some of the men began complaining of feeling bad. Then presently the Lieutenant Colonel, Medic, and his tent were swamped with sick men. "Food poisoning," the Doc diagnosed. A little later cramps struck me, and presently I joined the others with the Medics. Fourteen of us went to the base hospital that night. I was sick—as sick as I dare to be. In the hospital I was given every attention I could want. Officers from the battalion dropped by to see me occasionally. One time when several were around, the Colonel, Medic, who had sent me in came by.

After the accepted procedure of "How are you feeling, Hughes, you look fine," and all that, I asked the colonel, "What made me sick?"

"Oh," he said, and cleared his throat. "We have made a careful and exhaustive investigation. Beyond question or doubt it was the fruit salad."

"That sounds good, sir, but I didn't eat any fruit salad."

"Oh," he said, looking wise. "I see. I see."

One other time I was sick in the field. It was night, very dark, when I awoke. My forehead was burning intensely. I noticed a strange sensation moving down my face, so half-dressed I struck out to find the Doc. By the time I found his cot I was suffering painfully. I woke him by shining my

flashlight in his face. Of course he couldn't see anything for a bit; but when he did see, he immediately jumped into action. Two veterinarians were sleeping nearby. He roused both of them. They held a short—very short—consultation about how many cc's of something I should have, then the Vets started mixing medicine and the Doc started giving shots. Several hours later when I opened my eyes, they were standing around me. One of the Vets grinned wryly, "Hell, Hughes, I guess you're going to make it."

The Lieutenant, Medic, refused to send me to the hospital, and kept me with him in his ambulance and tent for several days. There he waited on me, making me comfortable. After that experience, I can't say anything bad about the Medics. They're mighty nice to have around.

ON LOOKING BACK

Once in a while I talk with one of the young officers who entered the service in the same battalion with me. Very naturally, we get onto the subject of the mistakes we've made and the narrow escapes we've had. We recall when a runaway team halted quite abruptly only a few feet from a 50-foot gorge, we remember hard falls when learning to jump, we think of the smash-ups in polo games, we talk of a muzzle burst, shell fragments from a nearby burst, trying to tame an outlaw horse, test-driving a jeep 40 MPH across rough terrain. We talk of a lot of things and as we point out to each other the blunders and narrow escapes of the past two years, I look back and tremble to think what might have happened but didn't.

MY FINAL TALE

Just one more tale of my woes, and I'll leave you to learn it your own rough way.

I had not been in the service long until I was made Mess Officer. I liked the job all right (as if that made a difference), and really set about to learn how to run a good mess. I had made menus, altered menus, changed menus, recommended, prescribed, and memorized menus until I thought I could pull a full meal out of a hat like the magicians do it.

One day the BC sent for me. I entered his office, saluted smartly, and stood there at attention.

"Hughes," he said with his sly grin, "what is a delectable meal?"

No eminent college professor, no questioned-filled youngster ever asked me one that I couldn't sorta garble over in some manner. But here was one that had me. WHAT IS A DELECTABLE MEAL?

"I—. A—. Oh, a— ah *delectable* meal, hummm."

Steaks and chicken dinners, roast turkey and apple pie chased each other about in my mind.

"Well, Hughes," he said, still grinning, "think it over and give me an answer by 12 noon. The colonel has ordered us to prepare a delectable meal. That is your job."

In the Army, that's the way you get your jobs. They're given to you.

OFFICERS' TESTS-I

Prepared by the Fort Bragg Provisional Field Artillery Brigade

As a yardstick of its officers' combat efficiency, the Fort Bragg Provisional Field Artillery Brigade (now the 22d FA Brig) recently gave a comprehensive series of tests. Each battery-grade officer (except S-1's, Personnel Adjutants, and officers of the Medical Department) underwent three examinations: one on his principal duty, another in either Gunnery or Sound and Flash Ranging, and the third on Motor Transportation or Animal Management, depending on his assignment. The only references used during the tests were: for the gunnery examination, Abbreviated Firing Tables; for S-4's, FM 101-10. "Approved solutions" were not announced, as in many cases there could be several suitable answers. To help its readers check up on themselves, the JOURNAL is publishing the bulk of these tests.

PRINCIPAL DUTY EXAMINATION

PART A (for all officers)—Value 35%

Section I—Value 25%

Answer *all* questions in this section.

Wt. No.

- 1.5 1. What information should a prisoner of war give the enemy, if questioned? (Par. 7 c, FM 30-25)
 - 5.0 2. You are Officer of the Day. A fixed post system of sentinels is in effect. It is during the hours for challenging. You are inspecting (talking to) the sentry on Post No. 4. The sentry hears some persons marching near his post, challenges them, and receives the answer, "Relief." List in the chronological order what should take place on Post No. 4 from this moment until the sentry now on post marches off with the relief. (Pars. 27 j, and Pars. 1 and 2 of Appendix II, FM 26-5)
 - 2.5 3. List the *simple* rules which, if followed by your mess personnel, will almost invariably insure good coffee. (Par. 13, TM 10-205)
 - 3.0 4. Describe, in detail, the position of the soldier, dismounted and without arms, at ATTENTION. (Par. 16, FM 22-5)
 - 8.0 5. Define, or explain, or identify *any eight* of the following:
 - a. Ration. (Par. 4, TM 10-205)
 - b. Vitamin C ("anti-scurvy" vitamin). (Par. 2 g, TM 10-205)
 - c. Normal Interval (as used with reference to dismounted drill). (Pars. 115 and 120, FM 22-5)
 - d. Blue Envelopes (as used in connection with censorship). (Par. 49, FM 30-25)
 - e. (Terrain) Corridor. (Par. 5, Appendix II, FM 101-5)
 - f. GHQ Reserve Artillery. (Par. 9, FM 6-5)
 - g. Order in Line. (Pars. 71 a, and 122 a, FM 6-5)
 - h. Test for Gas. (Par 28 b 5, FM 21-40)
 - i. Advance Guard. (Par. 234, FM 21-100)
 - j. Compound Fracture. (Par. 259 b, FM 21-100)
- 5.0 6. You are 1st Lt. A. R. Roe, 1st FA Bn. Your battalion is attached to the 37th Inf Div, and is in action against a German force near HOFFMAN, N. C. You happen to be the only officer present at your battalion CP at 6:30 AM, Monday, 26 August, 1942. You have noted from the battalion Journal that the latest G-2 bulletin from the 37th Inf Div states that the German 123d Div has been identified as being directly opposite the 37th Inf Div. At 6:35 AM you get a telephone call from Capt. C. H. Doe, now commanding Btry C, 1st FA Bn. Capt. Doe tells you that he talked, within an hour, to a glib-talking but bedraggled-looking civilian who represented himself as being a ROCKINGHAM business man, and who said that he had made his way through the lines last night. This man said that he had seen a large number of armored vehicles move into concealed locations in and around ROCKINGHAM last night between 11:00 PM and 3:00 AM; someone told him that it was the German 43d Armored Division. Capt. Doe admitted that the man talked with a noticeable guttural, possibly German, accent, but he said the man seemed sincere and that he claimed to be a loyal American citizen. Capt. Doe released the civilian.
- Requirement:* Write the message that you would write, under the circumstances described, on the attached message blank. On the blank state how many copies you would make, and what you would do with them. (Msg Bk M-105-A)

Section II—Value 10%

Note: Prepare a set of notes in outline form, *in sufficient detail to show the essential facts of the material to*

be presented, for a short talk on any one of the following subjects. Organization of material, completeness and nicety of sentence structure, etc., are not important—*accurate factual matter and personal ideas are expected.*

Wt. No.

- 10.0 7. a. Military Discipline (meaning, necessity for, and how obtained). (Section I, FM 21-50)
 b. Decontamination of Gassed Areas & Equipment. (Par. 25, FM 21-40)
 c. First Aid for Gas Casualties. (Section VI, FM 21-40)
 d. The Elements of Nutrition and the Balanced Diet. (Pars. 1-3, TM 10-205)
 e. Selecting, Making, and Breaking Bivouacs. (Chapt. 2, Part Three, FM 6-5)
 f. How to Keep Healthy (essential rules, habits, and precautions to be followed in garrison and in the field). (Pars. 237-253, FM 21-100)
 g. First Aid Treatment for Fractures, Poisoned Wounds, and Burns. (Pars. 259, 260, 261, and 263, FM 21-100)

BATTERY COMMANDERS

PART B—Value 65%

Section I—Value 10%

Answer *all* questions, do *not* guess. Grading is as follows: minus one point if question is not answered, minus two points if answered incorrectly. Answer each question by circling "T" if the statement is true, or circling "F" if it is false.

- T F 8. Control of the battery fund rests in the battery commander. (Par. 55, TM 12-250)
 T F 9. The names of sick officers are not entered on the Daily Sick Report. (Par. 103, TM 12-250)
 T F 10. At the left of the Duty Roster are listed the men of the organization, arranged alphabetically within each grade. (Par. 112, TM 12-250)
 T F 11. The Morning Report entries for June 1st are made on the morning of June 2d, and cover the twenty-four hour period from midnight May 31st to midnight June 1st. (Par. 93, TM 12-250)
 T F 12. A summary court-martial cannot confine a soldier for more than one month. (Par. 17, MCM)
 T F 13. A battery commander cannot delegate authority to arrest or confine enlisted men of his own battery (in the absence of the BC and other officers) to his first sergeant. (Par. 20, MCM)
 T F 14. A member of the military service cannot prefer charges against any person senior to himself. (Par. 25, MCM)
 T F 15. "Battery punishment" for minor offenses may be imposed under the authority of the 104th AW. (Page 225, MCM)

- T F 16. A soldier who is facing "battery punishment" may demand trial, but must in the meantime undergo the punishment adjudged. (Page 226, MCM)
 T F 17. Nothing that the accused says at an investigation can be used against him if he is later brought to trial. (Par. 35, MCM)

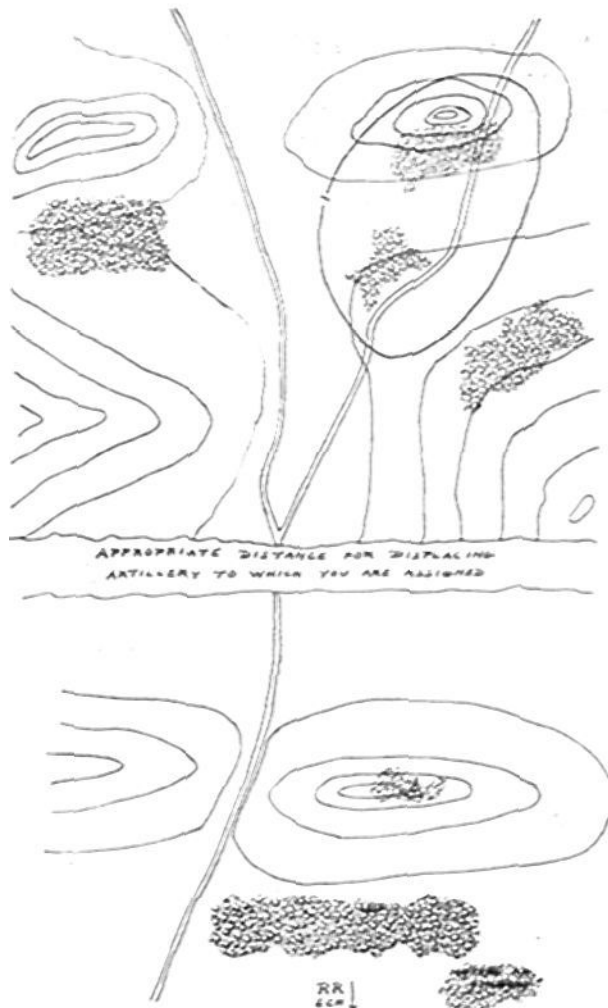
Section II—Value 45%

Answer all questions in this section.

Wt. No.

15. 18. There is attached hereto a sketch showing your battery in position. At 10:00 AM you receive the following message from your battalion commander: "Your battery will displace forward to a position within the area marked on the attached overlay (area in the circle on the sketch) at 1:00 PM. Take the necessary steps to permit a minimum interruption in the fire support by your battery. Report when displacement is accomplished."

Requirement: List in chronological order



specifically what takes place from 10:00 AM until the firing battery *arrives* at the new position area. (Answer will include *all actions, orders, etc.*, by *yourself* and/or *all other key personnel* in the battery. Make such remarks, signs, etc., on the sketch as may be helpful in simplifying answer.)

10. 19. You have recently taken command of a newly-formed battery which is quartered in *your present* battery area. You decide to conduct a conference with the officers and NCO's on the "Organization of the Field Artillery." You want to set as nearly perfect an example as possible of *proper training technique* as you can. You are already thoroughly familiar with the facts on your subject.

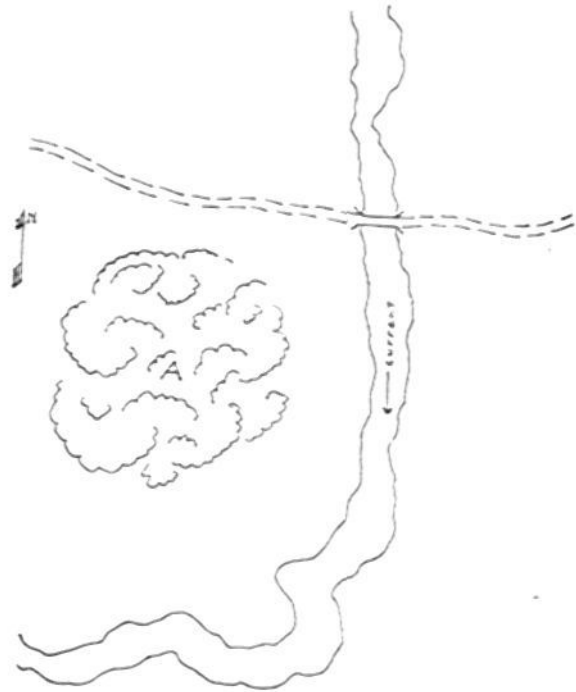
Requirement: List in detail the specific arrangements, precautions, and other things you will do, or have done, in order to accomplish your objective. (This requirement does not deal with *what* is to be said, but rather with the *when, where, how, aids, facilities, etc.*) (FM 21-5)

10. 20. Prepare a set of notes in outline form, *in sufficient detail to show the essential facts of the material to be presented*, for a short talk on *any one* of the following subjects. Organization of material, completeness and nicety of sentence structure, etc., *are not important—accurate factual matter and personal ideas are expected.* Sketches will be helpful.

- a. Disposal of Liquid Kitchen Wastes in Semi-Permanent Camps. (Pars. 29-31, FM 21-10)
- b. Lice Control in the Field (Pars. 54-58, FM 21-10)
- c. Disposal of Human Wastes in Semi-Permanent Camps. (Pars. 22-26, FM 21-10)

10. 21. Your battery has just arrived in a wooded bivouac area "A" beside a stream (see sketch) after a full day's march. The march to the east is to be resumed at daybreak. Your battery is marching with a battalion of infantry, which is going into bivouac north of the road. You receive no instructions from the infantry battalion commander.

Requirement: Draw, on the attached larger scale sketch, the battery bivouac area and installations that you would lay out, and list the things you would do yourself before going to sleep.



Section III—Value 10%

Answer only *one* question in each group.

Group I

- | Wt. | No. |
|-----|---|
| 5. | 22. When a gunner sees that his aiming stakes are out of line, and the executive officer authorizes a correction, what action does the gunner take to make the correction? (Par. 32, FA Book 161) |
| 5. | 23. How does the executive officer determine the minimum elevation for the battery, when the mask is occupied by friendly troops? (Par. 34, FA Book 161) |

Group II

- | | |
|----|--|
| 5. | 24. Write the conventional signs or symbols for the following: (Par. 6, 7, FM 21-25) |
| | a. Hard surface motor road. |
| | b. Single track railroad. |
| | c. Intermittent stream. |
| | d. CP, 2d Bn, 14th FA. |
| | e. OP, Btry "A," 18th FA. |
| 5. | 25. Distinguish between magnetic declination and grid declination. (Par. 14, FM 21-25) |

(To be continued)

BOTTLENECKS

By Commo

Tactically two of the Field Artillery's biggest (see title) are switchboards and CP organization.

Switchboards are supposed to give flexibility to wire communication—often they hinder it. Based on observation of many battalions in over a year of maneuvers and GHQ firing tests, it is evident that switchboards delay and frequently interrupt calls and fire missions. Battery switchboards are not needed; battalion switchboards are usually, but not always, required; and there are many times when even Division Artillery does not need a switchboard in order to function effectively.

Some of the protests of the boys who regard a military phone as similar to their commercial desk phones can be heard already: "If we don't have switchboards we can't talk to all of our installations, observers can't fire all batteries, we don't save any time by leaving boards out, we can't use ground return telephone"—and so on. Well, such a complete and complex wire net as these lads envisage is not necessary. It's too vulnerable.

If necessary, the OP line can be snapped on the gun line which does run into the battalion switchboard.

It's not necessary to speak to everybody. Commanders should talk only to their immediate subordinate *commanders*, and their immediate superiors. A proper chain of command should always be used, and no commander should attempt to do everything himself.

As to time saved by forgetting switchboards, it's not the time of installation that is saved, it's the 20 to 40 seconds saved on each call that is the true time saving. It's two men saved for wire maintenance and it's time of loading, repairing, and testing that is really saved.

Ground return telephone does require a switchboard (although it can be done by just using a repeating coil alone) and hence is practically out when direct lines are used. Its advantages are direct connection, and two channels available on one wire; its disadvantages, another local line to install and non-secret nature. It is handy, but how many people observe the restrictions on type of message sent by ground return? and how often does higher headquarters send a message to a battery when the fire direction center is firing it? Not often!

- Wire communication should allow
- observers to talk direct to their own guns,
 - FDC to talk direct to all guns,
 - commanders to talk direct to their immediate subordinate commanders,
 - observers to talk to FDC *occasionally*,

observers to talk to an OP or battery other than their own, *if necessary*.

In Figure 1:

- A—Spring clips snap on to OP phone line if direct communication to battalion is required.
- B—What keeps the CP from answering all calls to the guns? SOP; 2 rings is for the CP only. Same is true for FO line, only remember his phone has a *muffled bell*. (*Remember Bataan?*)

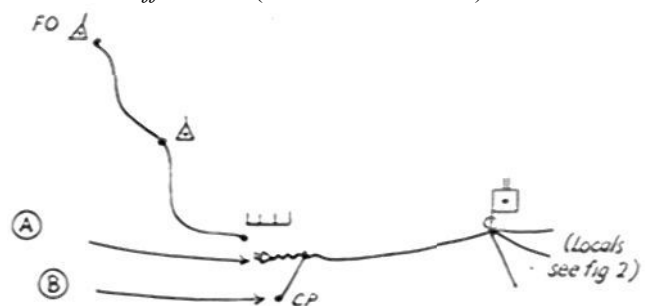


Figure 1. Battery

Battery CP has a definite purpose and should be used; it's the headquarters of the battery; it's where a duplicate of the battalion firing chart, as well as the battery firing chart is kept (FDC's are not invulnerable); it's where the BC can be found when he's in the battery area. CP is in touch with the guns by just calling or whistling through the phone—no need to ring. Battery CP consolidates, plots, simplifies and then reports to the battalion CP all information sent in by forward observers of the battery.

BATTALION CONFUSION POSTS

And well might they be so named; like switchboards they are often bottlenecks. Battalion CP's naturally divide into a firing center (concerned *only with* gunnery) and a command center (concerned with everything *except* gunnery). Firing and reports of fires come into the FDC. Exchange of information with other units—too often an entirely mythical process—may concern both firing center and command center. The firing center should be about 50 or 100 yards from everything else and should be left alone. Frequent visits with their peering over of shoulders should be eliminated; the FDC should not be bothered by anything or anybody, except firing.

Figure 2 is one solution. The FDC-CP party line enables each group to extract what they wish from all exchange of information. The CP can keep posted on fires delivered, and intercommunication is direct and simple.

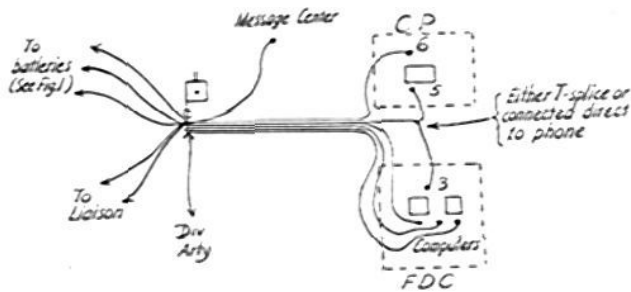


Figure 2. Battalion

The FDC keeps firing charts, metro messages, observed fire charts, record of missions fired, ammo records, location of forward observers and front lines. The CP keeps complete situation maps, Unit Journal, ammo records, S-2 and S-4 information, and administrative records. Message center may be incorporated within the CP itself, but it is generally better to have it separate although easily accessible. MC also acts as dispatcher for Bn Hq motor park. Important messages should be phoned initially, then sent by messenger for confirmation.

The CP thus becomes truly a place of command. It gives the battalion commander a place where he can prepare sound answers to the questions he must continually ask himself: what am I going to do next? where and when am I going to do it? how am I going to get there?

Referring to Figure 2: calls for the CP only can be handled by SOP—two rings is for the Bn Exec only. Computer lines are connected to the same terminals as battery lines. Other parties calling batteries are plugged in as normal, except now the computer also listens: this keeps FDC informed, as well as enabling a quick break in for fire missions. Note that 5 circuits go to CP and FDC; as the new T/BA authorizes issue of 400 feet of 5-double conductor cable per battalion, this system is well adapted to new equipment and should simplify local battalion installation.

If no battalion switchboard is used, direct lines run from guns to FDC. The Exec-S-3 party line runs to Division Artillery. If FO radios are working directly with FDC, liaison lines run to the CP. They will normally carry more tactical messages than fire missions.

Note that in this scheme no telephone operators are used. Wire sections install and maintain wire, but phones are operated by those sending messages. The person-to-person aspect of the phone is one of its greatest advantages, and trying to get Private Plink to juggle strange polysyllables is just another bottleneck to avoid.

It is contemplated that the FO normally works direct with his own battery. If he is to report direct to the FDC, radio is the most reliable medium. Reports from abroad indicate that often the quickest way to bring fire on a target is for the observer to adjust his own battery direct, then let FDC bring in the battalion from reported adjusted data of the observer's battery. This enables the battalion FDC to derive the benefit of all FO's information and

observation yet not be cluttered up with thousands of fire commands. FO's should do more shooting and less sensing, else observed fire gunnery will become a lost art. As action continues, forward wire is more difficult to maintain, observers become more shooting and less sensing, else observed fire gun-keeping touch with the FO's. Battalions equipped with new radios will find that their radio communication problems are practically a thing of the past.

DIVISION ARTILLERY

Division Artillery CP's can be set up similar to battalion CP's. Division Artillery fire direction is simpler to transmit, as fire commands are rarely used. However, Division Artillery *must* keep a record, and plot on the master firing chart, targets and concentrations fired or prepared by battalions.

Up-to-date information, accurately notated, should always be plotted on the Division Artillery situation map. Some information will be and should be duplicated on the master firing chart. Fire possibilities charts showing overlapping fans of fire with 3600 mil sweeps but no check points or concentrations mean less than nothing, for they present a false picture.

Timely recording and dissemination to all battalions of all information received can not be stressed too greatly. Maneuvers this summer and fall have demonstrated that battalions are seldom kept informed of either our own or enemy information by Division Artillery. This must NOT be done—information is VITAL and it is not a military secret to units engaged in combat.

Switchboards can often be eliminated in Div Arty CP's by utilizing direct lines to battalions and to Div CP, but in general they do more good than harm. They permit use of the division artillery-battalion telegraph, which is seldom employed to advantage. Actually, telegraph is one of the most rapid and efficient means of communication in the artillery. We seldom use it enough.

In eliminating switchboards in batteries, some flexibility has been lost. But don't we have too much flexibility, procedure, and rigmarole today, and too damned few, direct, instant, connections? Cut out switchboards and you cut out heavy equipment, sometimes dangerous (ever see one in a heavy electrical storm?), eliminate another item needing repair, save time in training (really good switchboard operators are not easy to find), and reduce the number of operators needed in a battalion from about 9 to 2 or maybe 3. Men so released are sorely needed as additional wiremen.

These suggestions are not paper schemes. They've been used often, many will wonder why they are even mentioned, as they are standards in some units. But, many battalions are wondering today why their communications are so poor and slow. It might be well to remember that in battle only the most simple and direct plans are likely to be successful. Too much depends on communication to take a chance. LOOK OUT!

Diary of War Events

SEPTEMBER, 1942

- 1st Germans deepen wedge in southwest Stalingrad defenses. Jap patrols attack United Nations positions near Kokoda, New Guinea. Chinese forces within 25 miles of Canton.
- 2nd German tanks batter southwest Stalingrad defenses; advance in Caucasus halted west of Grozny. Chinese surround Kinhwa, air base 650 miles from Japan.
- 3rd Japs land force in southeastern Solomons; U. S. Marines consolidate hold on Guadalcanal-Tulagi area. Russians fall back northwest of Stalingrad, hold in south. British repulse Rommel's tank attack on Egyptian line. U. S. sub sinks Jap light cruiser and 4 merchant ships.
- 4th Bombers and artillery force Rommel withdrawal. U. S. bombers attack Jap supply lines from Nanchang to Hankow, down 6 Jap planes.
- 5th Russians withdraw southwest of Stalingrad, counterattack in northwest; German troops from Kerch land on Caucasus, join Rumanians in westward drive. Chinese closing in slowly in heavy fighting around Kinhwa. U. S. destroyer, auxiliary transport sunk by Japs in South Pacific.
- 6th Germans breach defenses of Novorossiisk, Caucasus Black Sea port; Russian counterattacks above Stalingrad continue.
- 7th Germans make frontal assault from west on Stalingrad. Small Jap force makes landing on Guadalcanal, Solomons, suffering heavy casualties; Japs bomb island.
- 8th Germans gain in massive attack on entire Stalingrad front. U. S. Army bombers raid Crete; Rommel withdraws again. Japs attacking mountain passes in drive on Port Moresby from Kokoda area.
- 9th Germans take two villages west of Stalingrad. Russians bomb Budapest.
- 10th Three more villages west of Stalingrad fall to Germans; attempted German sea landing at Novorossiisk fails. British forces in Madagascar attack three western ports in cleanup drive.
- 11th Germans reach Volga above and below Stalingrad as Russians destroy means of own retreat across river. R.A.F. bombs Duesseldorf heavily. British advance on Madagascar.
- 12th Russians driven back southwest of Stalingrad. 20 Jap planes shot down over Guadalcanal reinforcing own troops, bombing ours.
- 13th Germans advancing slowly on Stalingrad. British closing in on Tananarive, Madagascar capital.
- 14th Russians yield slightly northwest of Stalingrad, fall back at Mozdok, on route to Grozny oilfields.
- 15th Reinforced Japs strengthen drive to dislodge Marines in Solomons; attack on Guadalcanal airfield repulsed.
- 16th Germans reach streets of northwest Stalingrad. British lose two destroyers in raid operations on Tobruk. *Yorktown*, U. S. aircraft carrier, announced as sunk in Midway battle last June. Heavy U. S. Army air force raid on Kiska damages Jap Aleutian base.
- 17th Russians reform lines in Stalingrad, driving back Germans in fierce street fighting. R.A.F. makes heavy raid on Ruhr valley. U. S. subs sink 4 Jap ships in Far East.
- 18th German armored units penetrate deeper in Stalingrad despite counterattacks of fresh Russian troops from Siberia. United Nations bombers hit Tobruk, Bengazi.
- 19th Russians, reinforced in air, retake Stalingrad districts, attack on broad front at Voronezh. Flying Fortresses drive off strong Jap naval force north of Solomons.
- 20th Russian counterattacks gain in Stalingrad streets.
- 21st Russian railroad artillery replies to German siege guns at Stalingrad, as Germans step up attacks.
- 22nd Germans capture two Stalingrad streets. British within 20 miles of Madagascar capital.
- 23rd Gunboats in Volga, and flank attack north of city, help stall Germans in Stalingrad. British patrol raid deep into Axis Libyan territory destroys 30 planes at Bengazi. British occupy Tananarive, Madagascar capital.
- 24th Russians gain in attacks northwest of Stalingrad, hold in center, yield slightly near Grozny oilfields. Navy loses destroyer, auxiliary transport off Solomons.
- 25th Russians hold in Stalingrad and Caucasus. Germans lose 40 planes and 2 subs, British a destroyer and minesweeper, in battle over Russia-bound convoy.
- 26th Russians penetrate German lines north of Stalingrad. British subs sink 5 Axis supply ships in Mediterranean.
- 27th Russians yield slightly in one part of Stalingrad, advance in others; fall back toward Grozny oilfields.
- 28th U. S. air forces in Solomons down 42 Jap planes, bomb cruisers, transports without loss in 4-day period. Germans gain slightly in Stalingrad periphery; 36,000 German troops fighting in city.
- 29th Stalingrad battle seesaws. United Nations forces recapture ridge on south side of Stanley Mountains, 36 miles from Port Moresby, New Guinea.
- 30th Germans advance in northwest Stalingrad. Japs pushed back 10 miles near Port Moresby.

Not in the BOOK



HQ SUNDRIES

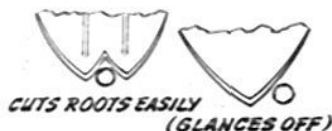
Pictured is a 2½-ton 6×6 used as a wire truck in our headquarters battery. A piece has been added to the tail-gate to form a platform on which wire personnel can stand, facilitating rapid laying and picking up especially over rough ground. The platform is held level by a chain on either side, and has railings of ¾-inch pipe. Notice that holes must be cut in the original tail-gate so that tail lights will show. A rack for eight RL-26 reels was installed in the forward part of the truck bed, so the one truck can handle 17 miles of wire.

HCO and VCO use canvas carriers to keep all their working instruments and materials within easy reach. Pockets can be tailored to fit particular equipment, and three or four sides can be attached to eyelets on the table top; even so, the plane table can easily be placed in its canvas carrier with the pockets merely folded over it. This convenience eliminates the many boxes for odds and ends—always a menace to rapid movement.

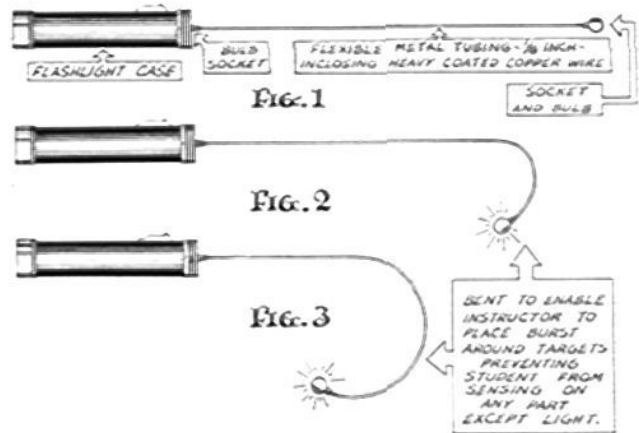
LT. JOHN A. KENAGY.



CLEANS UP WEEDS AND RUBBISH



EDITOR'S NOTE: This feature is devoted to ideas sent in by our readers describing methods or devices which, though not specified by official literature, have proved useful in service.



ENLIGHTENING!

We have been using an extension for a flash light with success, as the burst for conduct of fire on a sand table.

This method of simulating the burst of a shell is simple and inexpensive. It is procurable already assembled at many plumbing stores, as it is used by the plumbers to look down pipes and in dark inaccessible corners.

Using it is just as simple. The usual sand table with a miniature landscape has the edges of the table graduated in equal divisions for both deflection and range. The student firing the problem gives a complete set of commands to open fire. His instructor selects any point for the first burst. He presses the switch for an instant, causing a flash similar to the flash of a shell, then acting on the commands of the student he shifts the subsequent bursts, indicated by the graduations on the table. By using his ingenuity the instructor can create practically any condition found in actual firing.

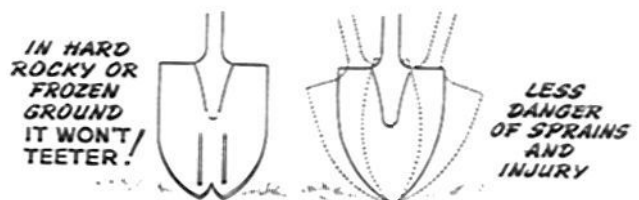
LT. COL. CHARLES F. WHITE, FA

THE VICTORY SHOVEL


Maj. Henry M. Renner, CE, has a new design for a shovel blade. The essential feature of his invention is the V-shaped cut in the point, which can easily be made in the blade of any entrenching tool. The change will increase its efficiency by at least thirty per cent, as the modification allows faster digging in hard or frozen ground, easy root cutting, and (of most importance from a military standpoint) less fatigue to the worker.

Major Renner originally developed this shovel for industrial and mining use, but has changed the design so that existing supplies of entrenching tools can be modified. Any company mechanic can do the work, the only tools needed being a hack saw, file, and grinding wheel.

ALDEN MCKIM CRANE.



BOOK REVIEWS



SUEZ TO SINGAPORE. By Cecil Brown. Random House, 1942. \$3.00.

Fascinating and sobering is this expanded diary. Openly and plainly it gives the tales of Libya, Syria, Singapore, Java, Australia, and way points, exactly as they appeared to this CBS correspondent. And his sight was keen and accurate in the main, much more so than that of many of his contemporaries who couldn't see the forest for the trees.

In many ways, as the publisher says, "It's moider!" But "moider" of this kind, which strips away the scales of blindness, is sadly needed. True, we have had the magnificent accounts of Lt. Col. W. J. Clear and others. They dealt largely with military matters, however, and the peculiar virtue of this book is that it covers a much wider field—not only geographically, but among people of different nationalities and engaged in widely differing work.

Rickshaw drivers, C-in-C's, colonial governors, generals, fighting men, cabinet members, censors both low and high, fellow correspondents, naval files—all definitely help build up a picture of things as they were and perhaps as they still are in some quarters. Aside from the fighting Dutch of the N.E.I. and some of the Australians, Mr. Brown found much the same situation everywhere—and though he doesn't say so in so many words (he doesn't really have to!), there is a terrific lesson for our people—for all of us—in his account.

Primarily there was everywhere a reluctance to face facts. All classes in the Far East were bedevilled by an "it can't happen here" attitude. At times bumbling "leaders" clung to that belief even after it *had* happened. An ostrich philosophy prevailed, and Mr. Brown gives details, names times and places of specific incidents, quotes quotes. Coordination was lacking between colonial elements and the presumably-controlling home governments. Incredible things were done or not done, as in the evacuation of Penang.

And the censorship! Ah, the censorship! It can not be forgotten for a moment by any foreign correspondent, and

least of all can it be dissociated from Cecil Brown—for the British stopped his broadcasts from Singapore, and compelled his black-listing when he moved to Java.

There is no reason to question any of Mr. Brown's quotations, whether of others or of himself. Some readers will perhaps say his "tactlessness" led to his downfall. There's a great deal to be said on the other side of that question, however. An addle-pate is an addle-pate in any language or country, and many of the censors he encountered appear to have gotten that job as the last one on the road to down-and-out as misfits. It is particularly unfortunate that Mr. Brown ran across such mentalities very shortly after he left Italy following three years of battling the highly unsympathetic Fascists. Be it said, however, that at times the excisions of underlings were approved by their chiefs, when there was a chance to put the case before them; this is borne out by the quotes of some dispatches and broadcasts, giving the "before and after" texts.

The tale carries through Turkey, the Middle East, Libya, Singapore, Java, and Australia. It covers the 11-month period from April 29, 1941. Singapore receives greatest attention, as Brown was there from August 3d to January 25th. And of course in December he was aboard the *Repulse* when she was sunk with the *Prince of Wales*—and gave a magnificent account of the engagement, which has been of great value to our people because of its detailed description.

Throughout is a vivid picture of an important part of the world yesterday. It shows many of the obstacles to be overcome, yet is devoid of "preaching." A certain preoccupation with ill health is excusable in view of the conditions (physical and mental) under which Brown's work was done, so don't let such asides affect your appreciation of his report—they actually help round out the "little picture" which is so often overlooked by others in favor of just strategy, grand or otherwise.

DISCOUNT OFFER

For cash with order, the U. S. Field Artillery Association can obtain for its members 'most any books (texts, biographies, histories, fiction) at the following discounts:

On orders amounting to at least \$2.50, 10%

On orders amounting to \$10.00 or more, 15%

No discount possible on Government publications, however.

We pay postage.

Not that this "little picture" is all that is given. Far from it. Mr. Brown has long appreciated the true, long-range meaning of events—in fact, his difficulties with the Italians and later with the British stemmed principally from his efforts to present this view.

It's a *must* book!

WAR GASES. By Morris B. Jacobs. Interscience Publishers, Inc. \$3.00.

This book well serves its expressed aim—to supply information useful to the gas identification officer, the war gas chemist, and the decontamination and health officer. The data compiled is very comprehensive and detailed and is a valuable addition to the technical library of gas defense agencies and those responsible for gas protection.

The first chapters detail the properties of the known gases: chemical, physical and physiological. Effective concentrations are tabulated. Effects on metals, water, foods and materials are enumerated. The next section details tests for gases, both simple and technical, with a number of methods supplied for each type of gas in various forms. The test methods include both practical and technical procedures. This important phase of gas protection is very thoroughly discussed. Decontamination and protection of materials are then given wide coverage.

The book indicates that the author has given a great deal of time to a careful study of the available literature. The text is on the technical side, as would be expected in as complete a study as has been presented. It is not a book for light reading. From the many tests and data enumerated, simplified procedures may be abstracted that can be set up for ready use by defense groups with materials available. The author summarizes his data in many tabulations that render the information more readily discernible.

If those who are responsible for defense against chemical warfare agents are thoroughly acquainted with its contents, they will unquestionably be ready to cope with the situation should such agents be used against civilians.

F. M. R.

THE GUILT OF THE GERMAN ARMY. By Hans Ernest Fried. 426 pp., indexed (excellent historical and reference notes). The Macmillan Company, 1942. \$3.50.

Fried carefully and conscientiously sets out to show that this war is not a work of Hitler alone, but that the World War I army officers have never considered their armies beaten. "It was the civilian front which failed."

After the war high German officers of the Army and the Navy were not brought under civilian control but continued to exercise many of the powers of command and leadership which were theirs during active conflict. "Not only did the Army remain free from parliamentary supervision; it even succeeded in exercising a certain supervision over federal and state parliaments, administrative

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agencies, and cabinet members, in order to safeguard its own privileges and to gain new ones. The Federal Army Ministry as well as the Army Command retained a position of exemption."

Such men as Von Bock and Von Rundstedt, though almost unknown then, never accepted our common accusation that in Germany lay the guilt for World War I. "We hate from the depth of our souls the present state structure, for it blocks the prospect of liberating our enslaved fatherland, of clearing the German Nation of the lie of the war-guilt, and of gaining the necessary living space in the East," a spokesman of the *Stahlhelm* declared.

Fried discusses ably the differences between the "Shock Troopers" and the "Foot Troops." Whereas the former rode in trucks and had no part of trench warfare, the latter marched afoot and held the muddy trenches day and night. Quite naturally a tension arose between them.

Immediately following the war, the German Army reverted to a volunteer or "Free Corps" system. ". . . some . . . officers were ordered to form detachments; others did so at their own volition, and the government established relations with them."

Speaking of various groups of the volunteers, Fried says ". . . they were united, above all by an infinite contempt for all things civilian, a lust for violence, and a spirit of rebellion that could be directed against almost anything or anybody."

Of militarism Fried says, "Neither the existence of an Army nor the gratitude and pride of the population toward its Army is, in itself, militarism."

"*Army militarism . . . begins where the armed forces are exalted for their own sake.*" In Germany the army was glorified, the uniform was glorified, every attempt was made to divorce the army from the control of civil government and to place it wholly under the command of the military.

Recurrently, Fried goes back to his all-important point of "Those who have guided the military and political path of National Socialism must, in a solemn and visible manner, be shown to be personally responsible." Thus he writes like Kiralfy in his *Victory in the Pacific*, when he decries American belief that Hirohito is to be solely blamed for the war. In Japan it is the *system* that brings war, in Germany it cannot be otherwise. The *system* will not be destroyed by killing its leaders. We must go deeper.

In his *Epilogue* Fried explains what the United Nations must do at the end of this war to insure lasting peace—that is, completely obliterate the *system* of our enemies, not just a few of the leaders.

The Guilt of the German Army was compiled after years of research by a man who ought to know. He was born in Vienna, lived in Italy, traveled widely in Europe, and lectured at Columbia. The book does not flow smoothly, but it has truth. Its style is not arresting, but it adequately covers a wide and important subject. It

delves deeply into a part of Germany that has not previously been brought successfully to us.

We can afford to read this book, regardless of its style, when it gives us an insight into an important world problem the solution of which holds individual and worldwide significance.
A. V. R.

OIL, BLOOD, AND SAND. By Robert L. Baker. D. Appleton-Century Co., 1942. 300 pp. \$2.50.

RETREAT TO VICTORY. By Allen A. Michie. Alliance Book Corp., 1942. 492 pp. \$3.00.

The authors of both of these books agree that the next important world battlefield will be the strategically vital area of the Middle East. Mr. Baker, a scholar, has turned out a work (sub-titled "Stakes and Strategy in the Middle East") which answers almost every question one could ask about the oil-rich land bridge between Europe and Asia. The jacket of Mr. Michie's book has the subtitle "A Mighty Answer to a Faltering Confidence," a legend which reveals his more emotional purpose.

Mr. Michie, a correspondent for *Time*, *Life*, and *Fortune*, is something of an expert on retreats. He has followed the British fortunes since Dunkirk in Greece, Crete, Libya, Iraq, Syria, and Iran, and he made a lightning tour of the Far East just before Pearl Harbor. His argument, which he makes very convincingly, is that the British have conserved their offensive potentialities until such time as they and their allies had the strength to employ them by a series of skillful and hard-fought delaying actions on a vast scale. He observed them at first hand, and from them he draws the conclusion that there is no excuse for defeatism.

Both writers agree that the British campaign in Greece and Crete, retreat though it almost immediately became, served the inestimably useful purpose of throwing Hitler's time-table off by two or three weeks and destroying the cream of his airborne force. These two facts turned an impending invasion of the Middle East into a military hazard even Hitler did not dare undertake, even though they were achieved at the cost of the breakdown of Wavell's potentially decisive Libyan campaign.


Mr. Baker does not believe that the German war machine is as short of oil as some of the optimistic experts have tried to make out. These gentlemen time and time again have statistically proved that the Panzer armies must be powered by charcoal and lubricated with butter. He does, however, make the flat statement that unless Hitler gains the Eastern oil this year "he will unquestionably lose the war, power, everything, in 1943 or 1944."


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described in *Oil, Blood and Sand*. In the case of the Russians, the stakes are high and the strategy positive because loss of the Caucasian oil fields would mean the loss of 84% of Russia's oil production, a critical blow to its mechanized armies and agriculture.

Mr. Michie's recent travels in the turbulent countries and mandates of the Middle East give him a slight advantage over Mr. Baker in his portrayal of that troubled region.

If Hitler were able to force a passage through Turkey, either diplomatically or by his arms, the United Nations' defenses would be split through Mesopotamia and the road to India laid open. Mr. Baker rates the preservation of this Turkish barrier and the holding of Trans-Caucasia as the two keystones in the defense of the Middle East.

Either of these books is an excellent guide to the Middle East. Mr. Michie's is a record of events he has witnessed, Mr. Baker's a penetrating analysis of the shadow of coming events. The former is full of personal glimpses and the observed detail, the latter of hard facts interestingly presented. Both are highly recommended, but for the reader who wants to know the facts about the Middle East, "Oil, Blood, and Sand" is probably the better. Maps are sadly lacking in both books.

L. B. C.

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*THE FOURTH HORSEMAN. By Lt. Col. J. H. Doherty,
Fin. Dept. Military Service Publishing Co.,
Harrisburg. 88 pp. \$1.00.*

This 2nd edition brings Col. Doherty's book right up to date in its helpful information for those we leave behind us. As he says, "Death is not the worst thing that can happen to you; it's just the last thing that occurs to you." And when it occurs there is nothing we can do to help our wives and families care for the many necessary details.

But we can smooth their path considerably by taking a few simple steps now. We can collect the information they will need, and put it down in an orderly fashion. This book is well designed to help with that job, especially since its large pages (full letter size) provide plenty of room for filling in the actual forms which are provided. These also include a number which you will find of current use, as well. And the text outlines and explains many things, from allotments to life insurance provisions.

It is interesting to note that this book is the outgrowth of *Death! Then What?* by the then Capt. Doherty, published in the JOURNAL for Sept.-Oct., 1935.

THE REAL ITALIANS. By Carlo Sforza. Columbia University Press, New York, 1942. \$2.00.

At a time when the internal reconstitution of our enemies lies obscured beyond the hatreds of war and the huge military effort we face before it can be accomplished, it is good to be reminded that there is a strong and healthy Italian tradition behind the Fascist facade. Count Sforza's thesis is that Fascism is a temporary deviation from the normal Italian inclination toward loosely federated regional autonomies. The city and its environs is the natural political unit, and Italy has prospered when it prevailed and suffered when (as in imperial Rome) it was replaced by centralized government.

For Mussolini and his crew Sforza, naturally, has nothing but contempt. In their frantic attempt to manufacture a spurious tradition of grandeur overnight they have had to befoul their own nest by arguing that their use of castor oil and the blackjack was necessary to "correct" and "elevate" the Italian character to its imperial strength. The author makes a very appealing case for the value of the Italian character as it really is, minus the fake valor with which Fascist oratory has tried to endow it. The "real Italian" is a man of the soil, intelligent, hard-working, brave, and loyal. His heritage is great if not grand, and he is the natural citizen of the world. Sforza makes it plain that what the Italian has learned in two thousand years he cannot forget in twenty.

L. B. C.

HOW TO LIVE IN THE TROPICS. By Virginia Hunt. Harcourt, Brace and Co., New York, 1942. 178 pages. \$2.00

Adjusting yourself to a tropical climate is not easy. Knowing what to take there isn't easy, either, but Virginia Hunt is able and willing to help in her book subtitled *A Practical Handbook*. It is filled with commonsense precautions and proven suggestions. She repeatedly refers to famous explorers and renowned scientists, and gives names and addresses where additional material can be obtained.

If you plan an extended journey or sojourn in the tropics, *How to Live in the Tropics* will be a valued standby.

If you're not going south but would like to know what people face and do when they are there, you will find Virginia Hunt's book a welcome assistant.

A. V. R.

GAS WARFARE. By Brig. Gen. Alden H. Waite. 274 pp.; illustrated; appendices; index. Duell Sloan & Pearce, Inc., 1942. \$2.75.

A book by the Executive Officer for the Chief of the Chemical Warfare Service should be worth reading. It is informative for the civilian whether or not engaged

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in organized civilian defense work, it is also useful for those in the armed services. The practical side of chemical warfare is well covered in clear, non-technical language.

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Gen. Waitt steers clear of the canned phrases that abound in so much military literature. His story is so well told that reading his book is a good refresher for the soldier, an eye-opener for the civilian.

MIRACLE ON THE CONGO. Report from the Free French Front. By Ben Lucien Burman. John Day Co. 153 pp. \$1.75.

Mr. Burman is an American novelist whose special locale is the Mississippi River. In this little book he has journeyed far afield into the steaming land of the Congo, abandoning fiction for fact. Although he presents an occasional interesting vignette of life on the Free (or Fighting) French front in Africa, and his eye is somewhat sharper than that of the run-of-the-mill foreign correspondent, not everyone will agree that Mr. Burman's new adventure was a happy one.

To begin with, there is the author's ever-present belief that the Fighting French are perfect and that De Gaulle can do no wrong. While the story of these brave Frenchmen holding the southern front in Africa undoubtedly needs telling, Mr. Burman is a little too starry-eyed in his wholehearted admiration for them to give a very clear picture of why they are there and what they are doing. And he either does not know or does not choose to admit that the participation of Fighting French troops in the United Nations' conquest of Syria (at the insistence of General De Gaulle) considerably prolonged that campaign by stiffening the backs of its Vichy-French defenders.

The miracle that Mr. Burman thought he saw on the Congo was the rebirth of the spirit of France. What he tells about here is the difficult job of gallant men in an "impossible" country.

L. B. C.

BROTHERS OF DOOM. By Hoffman Birney. G. P. Putnam's Sons. 332 pp., indexed. \$3.00.

You recall, in your study of history, that when South America was first seen by white men, a Spaniard named Pizarro was a leader. In fact, there were four Pizarros—brothers, Brothers of Doom: Hernando, the eldest; Francisco,

best known; Juan and Gonzalo, much younger than the others. Only Hernando could claim legitimate birth, only he died a natural death.

This story of the Pizarros of Peru starts with births of the brothers in Spain and gives in absorbing detail their adventurous travels across Chile, Ecuador, Peru, and other parts of South America.

Francisco, the leader, could neither read nor write; but he could lead his men and his ability to fight his way out of difficult situations won for him the gold of Peru, audiences with the King of Spain, and an unchallenged place in history.

Of considerable interest to soldiers are the accounts of battles between armor-clad Spaniards and sun-worshipping Incas, and numerous fights between factions of Spaniards. The Spanish use of artillery, infantry, and cavalry and the exploits of Carvajal, 300-pound, 80-year-old fight leader for the Pizarros, lend the book a diverting color. Francisco Carvajal ". . . is a character out of legend, that huge, roistering old Demon of the Andes, who feared neither God, man, nor devil and had no particular reverence for any of the three."

This story of the treasures of Peru and the men who found them is smoothly written in good English style by one who has done very considerable research on the subject. Throughout the tale, the four Pizarros take and hold a dashing lead. They were an incomparable lot.

A. V. R.

DESERT WAR. By Russell Hill. Alfred A. Knopf, 1942. 310 pp.; photographs; maps. \$2.75.

Mr. Hill's book covers the period from the start of last fall's British offensive in Libya down to the stabilization of the lines in roughly their old positions which preceded Rommel's devastating advance of the early summer. He was there at the front living with the troops and sharing their discomforts as intimately as an observer ever can. He did everything but kill, and returned to the oblivious luxury of Cairo only to try to push his newspaper stories through the purblind censors.

As a detailed impression of the British side of the front during those three or four critical months, Mr. Hill's book is notable for the feeling it gives of troop life in a desert war. As military analysis it is naturally much more inadequate, since Mr. Hill must substitute common sense and a sharp eye for technical experience of warfare, and because a good deal of what he might say is still shrouded in the secrecy of a battle still in progress. There is the further drawback that the correspondent and his paper cannot enjoy real critical freedom if they are to maintain the personal and official contacts which enable them to ply their trade.

Mr. Hill does remark, however, that the British command seemed to be "brigade-minded" rather than "division-minded," enabling Rommel to dispose of their reinforcements in detail. Rommel also appears to have

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had the edge in his supply machinery, and—more than any other single factor—the supply problem caused the British offensive to peter out.

Desert War has some rather good maps of the various phases of the campaign. From Mr. Hill's narrative one can piece out a fairly clear picture of that critical, yet indecisive, battle for Egypt.

L. B. C.

THE HISTORY OF THE UNITED STATES ARMY. By Col. William A. Ganoe. 529 pp.; appendices; bibliography; index. D. Appleton-Century Co., 1942. \$5.00.

Colonel Ganoe's earlier edition, published some years ago, was a pioneer in the telling of the army's epic. This new edition brings the account through the Battle of Bataan, places some earlier events in better perspective, and most important of all contains new matter about General MacArthur never before revealed. As the General's adjutant at West Point for over two years, Col. Ganoe was in an unexcelled position to study him in action, while overhauling the curriculum and even some of the traditions of the academy.

This is the story of our Army as an agency of the nation, doing all manner of odd jobs through the doldrum years of peace and penury. Soldiers, personages, and personalities are followed in turbulent and in quiet times. Their homely and heroic services emphasize again the intertwining of our Army with the growth of our nation.

Many civilians—and some soldiers newly come from civilian life—still ask "Why was the Army so small? Why weren't we ready with an expeditionary force when the Japs attacked? What were you doing in the years since the last war?" Col. Ganoe ably recounts the sad, sometimes sordid story of that period, how the Army did so much with so little, the heroic efforts of MacArthur as Chief of Staff to disturb the lethargy of the people. This section should make uncomfortable reading for some of our citizenry, but the facts can not be told too often: they should be repeated and re-emphasized again and again, so that basic truths will not again be ignored in the years following this present war.

Every officer should know this book, every day-room should have a copy for its men. It is a fit companion for the *School of the Citizen Soldier*. Together they give a perspective which should never be lost.

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