

CAMOUFLAGAGE

Simplified



by Eric LOANZ

CAMOUFLAGE SIMPLIFIED

By ERIC SLOANE

author of
CLOUDS, AIR & WIND

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AUTHOR'S NOTE

Shortly after Pearl Harbor, the thought of camouflage began to appear in the minds of a number of persons concerned with the handling of vital materials.

Nearly twenty-five years had elapsed since most of us had thought much of this word, long associated in our minds with the elaborate dazzle-patterns of the first World War. Had aerial photography and the modern high flying bomber altered the problem this time, and were different techniques in order? It would seem so.

Many architectural and engineering firms were confronted with bids for concealing defense factories at the outbreak of war and Mr. H. G. Matthews of the Engineering firm of Brown & Matthews, asked me to look into modern camouflage for him and report my findings for the reference library of his staff of engineers. That is how this book came to be done. It is not an official authority nor does it reflect the opinions of anyone but myself; I compiled it mainly as a personal record of my own experiments in the hope of simplifying theories of concealment for the average interested person.

I am particularly indebted to Major Peter Rod-yenko, U. S. A., for his valuable assistance and for making his extensive material available to me especially on the subject of the aerial camera.

ERIC SLOANE

I N T R O D U C T I O N

This book contains no military secrets. It is a collection of notes of the most elementary nature compiled with the intention of simplifying in the reader's mind the meaning of camouflage.

This science frequently has been misinterpreted as a secret branch of art designed to trick an enemy with fantastic designs and optical illusions; actually it is a sound study of protective concealment. In order to understand the theory of concealment, we must differentiate at once between these outlandish, scattered, hit or miss schemes—often poorly devised and of little or no actual value—and the true science of camouflage.

The best proving ground for camouflage is of course an area under attack and it is well to remember that in total warfare no distinction is made between areas allotted to armed forces, military works, the civilian population, or civilian industrial establishments. For this reason, it seems fairly important that every citizen should have at least some appreciation of the exactitude and limitations of the science. New methods of detecting camouflage such as the infra-red camera, the stereoscope, the various highly sensitized films, plus the simultaneous development of new methods of outwitting these inventions, make the work doubly interesting and can often take on the aspects of a game.

They tell of an airport in England designed to appear from aloft like a village, where visiting pilots are instructed to make their approach along the main street, set down upon the village square and taxi immediately into the city hall. Another tale concerns a fake airport which was bombed by fake wooden bombs in an attempt to ridicule the poor camouflage efforts displayed there. Stories like these, building up the romantic and humorous side of camouflage tend to give an erroneous impression, for good concealment calls for hard work, much structural labor and plenty of good plain horse sense.

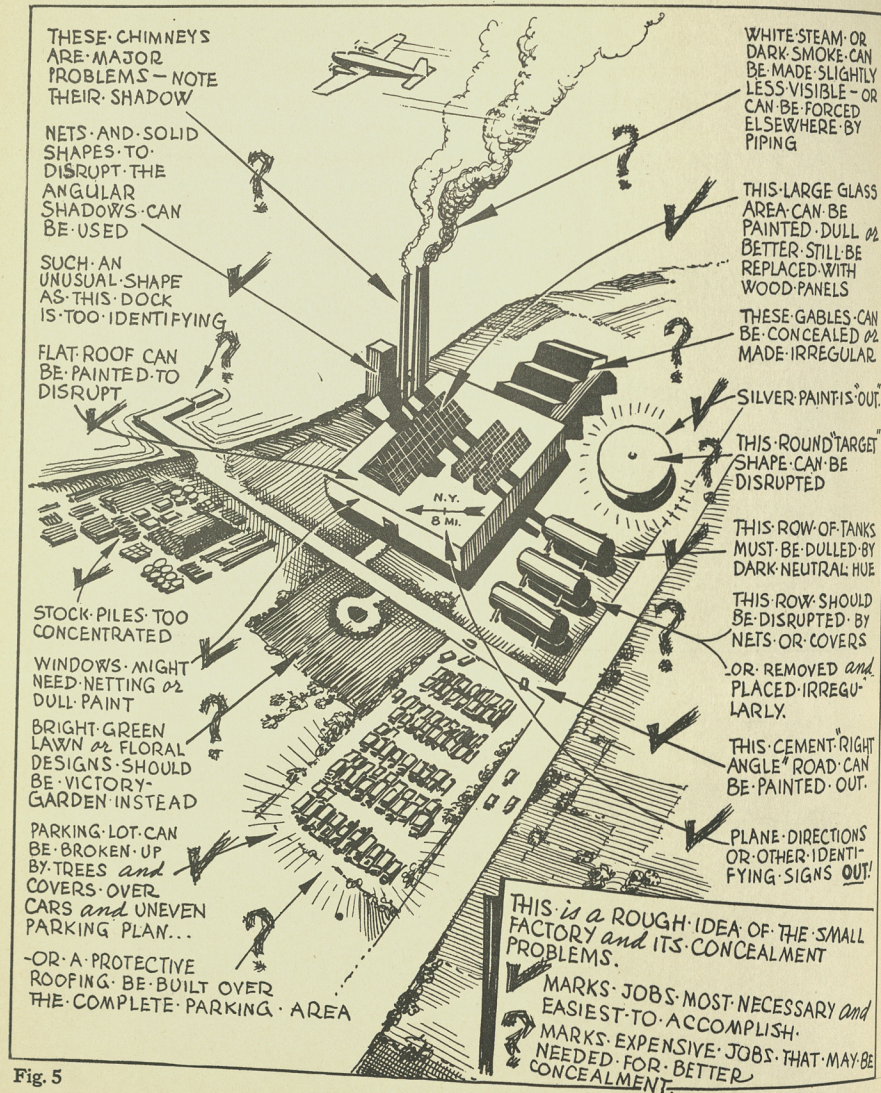


Fig. 5

(Fig. 5) is intended to show a few of the more important concealment principles of use to the average small factory. Note the features that an attacker would spot: The sharp gable shadows, the round tank, the three tanks in a row, the parking space, the dock, the smoke, the bright green lawn.

Inasmuch as this factory might be part of a greater camouflage scheme however, no one but military authorities could recommend actual concealment treatment.

With the *reduction of the differences* in color, texture, shape and shadow between it and its background, we can make the haystack approach invisibility.

(Fig. 10) shows the actual application of this theory. It is accomplished by three basic methods: By concealment; by disruption; by mimicry. This simplified chart may help the student of camouflage to classify and memorize the methods that will be described in the following pages. Military adaptations of these methods are wide and varied but the trend is always toward sound concealment and away from trick designs that can be picked up by the infra-red ray camera. Also it must be remembered in each camouflage installation, the vital importance of keeping all signs of human activity out of sight, such as wheel and foot tracks, smoke, automobiles, and lights.



Fig. 10

times a ship enjoys comparative safety because of its camouflage.

On land too, similar problems occur, for seasons cause an ever-changing background and camouflage coloration must change with them. Of course snow will cover everything and is often a boon to camouflage.

Under certain conditions, a building (A) (Fig. 12) could be made to resemble tilled land (B) and the land surrounding it be kept tilled; or actual vegetation could even be grown upon a roof and counted upon to change with the natural surrounding vegetation.

Nets or wires woven with cloth strips are used to good effect, but where bright green cloth is used, the color may be expected to fade to a gray tone before long and a new spray of paint will then have to be applied. Where nets hold actual tree branches, the leaves soon curl and turn in color, becoming conspicuous and in need of replacement. Even metal-grass (scrap-metal wool matting with the texture of grass) needs servicing and preparation, for rusty metal turns orange-red, a most conspicuous color from the air.

Where large areas of concrete, or light colored roads, runways and loading areas are to be blended with a paint application, the whole area may first be toned to a dark shade with a spray of asphalt or tar emulsion. Diluted wood stains are also of value, especially where foliage is to be added. But these flat surfaces will wear away under heavy traffic and accentuate the presence of trucks, airplanes and other mobile equipment. They will need frequent servicing. Where traffic is heavy as in airplane runways or road crossings, protective coloring may be applied to coarse sawdust, chopped rubber, or crushed stone, which are spread upon the asphalt or tar emulsion. This covering will wear better and the color will remain longer under traffic. Nevertheless, frequent sweepings and new applications are necessary.

Color resemblance accomplished by paint alone is often impossible. For instance, if grass were painted on a canvas strip and placed on a real grass plot, the effect might deceive an observer from a few feet away. Yet on an aerial photograph taken a mile and a half in the air, the painting which would do nothing but reflect light from its smooth surface would appear white while

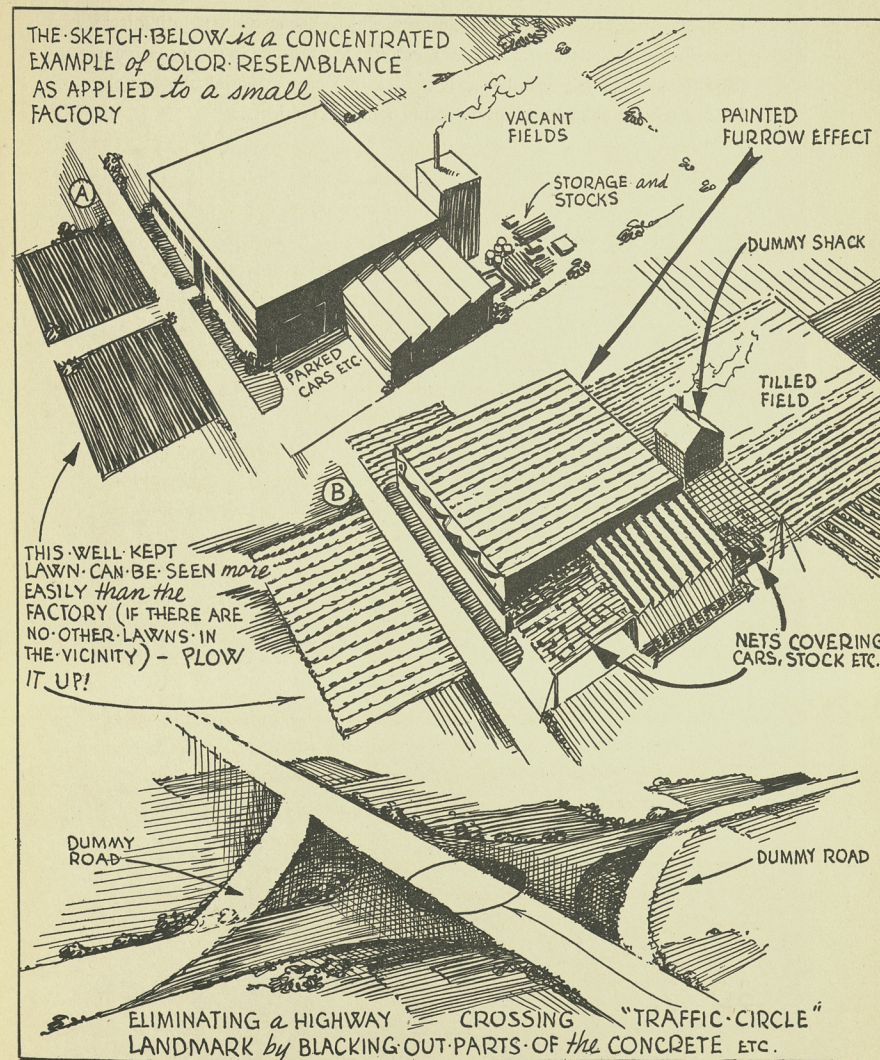


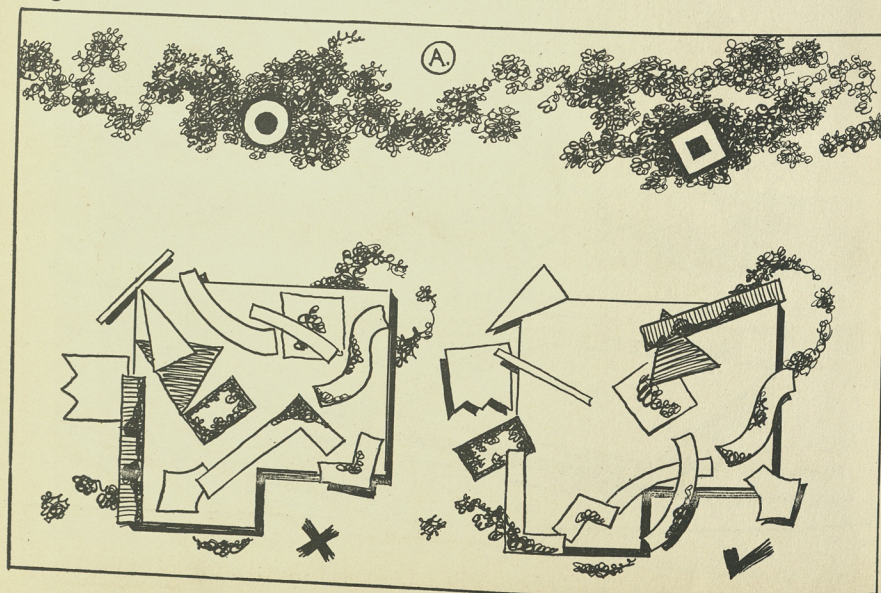
Fig. 12

DISRUPTION AS AN ART

II

To an attacking bomber searching the pattern of ground landscape for a camouflaged objective, elaborate coloration and radical disruptive design are give-aways. Any square or round shape stands out in sharp contrast to rolling terrain and soft foliage. (See A. Fig. 20). Any unusual shape in a painted pattern such as (B) (Fig. 21) acts as an attention getter; from one badly done part of a pattern, the attacker can spot and pick out the rest of a camouflage plan. Nature weaves fantastic designs but she avoids round or angular patterns, or monotonously regular curves. Irregularity is what the camoufleur should seek at all times when designing disruptive concealment. Regularity invariably indicates human activity.

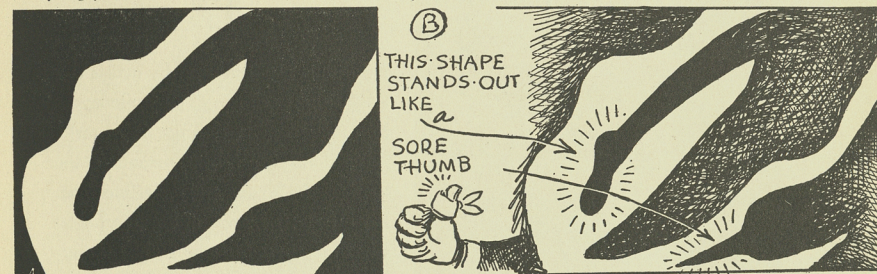
Fig. 20



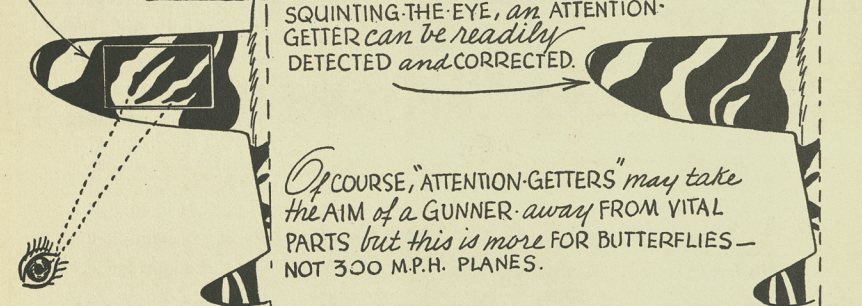
Notice in (Fig. 20) how a set of identical shapes can be placed first badly and then successfully to disrupt a certain outline. In this case a model is valuable for it is simpler to experiment with disruptive pattern on cardboard than on actual roof or field.

REGARDING IRREGULAR PATTERNS

Fig. 21

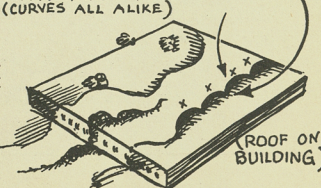
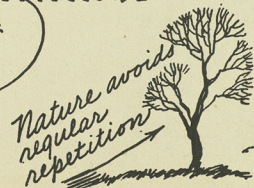
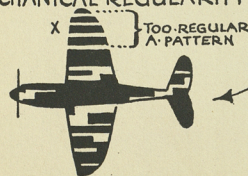


HERE IS A TYPICAL DISRUPTIVE PATTERN BUT IT HAS A TOO-DEFINED SHAPE THAT ACTS AS AN ATTENTION-GETTER. THIS SHAPE NEEDS A BLENDING OUT... BY SQUINTING THE EYE, AN ATTENTION-GETTER CAN BE READILY DETECTED AND CORRECTED.



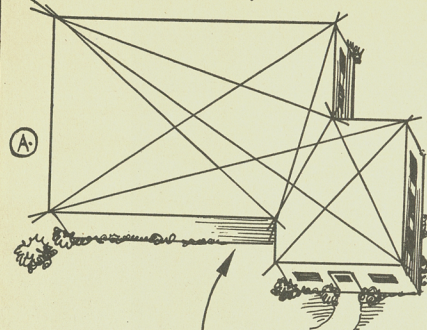
OF COURSE, "ATTENTION-GETTERS" MAY TAKE THE AIM OF A GUNNER AWAY FROM VITAL PARTS BUT THIS IS MORE FOR BUTTERFLIES - NOT 300 M.P.H. PLANES.

ANOTHER ATTENTION-GETTER IS TOO REGULAR A PATTERN DONE EITHER WITH MECHANICAL REGULARITY OR RHYTHMIC REGULARITY (CURVES ALL ALIKE)



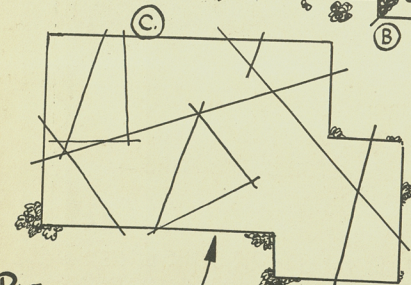
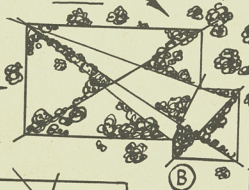
MORAL: WHILE DISRUPTING THE CONTOUR, DON'T PAINT IN A BULL'S-EYE X

DRAWING LINES *from POINT-TO-POINT*
IN *this HOUSE OUTLINE,*

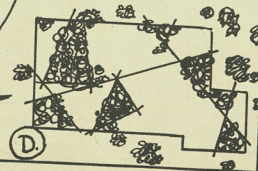


GIVES US A GROUP OF LINES IN HARMONY
WITH *this PARTICULAR SHAPE*. NOW, IF WE
USE THESE LINES AS CAMOUFLAGE BASE,
WE WILL ONLY DEFINE and ACCENTUATE
JUST WHAT WE WANT TO HIDE!

HALF-CLOSE YOUR
EYES and YOU
STILL SEE THE
HOUSE SHAPE



BUT USING LINES
NOT IN HARMONY
WITH THE SHAPE
WE DISRUPT OUR
SHAPE BETTER



THE DISRUPTIVE PATTERN

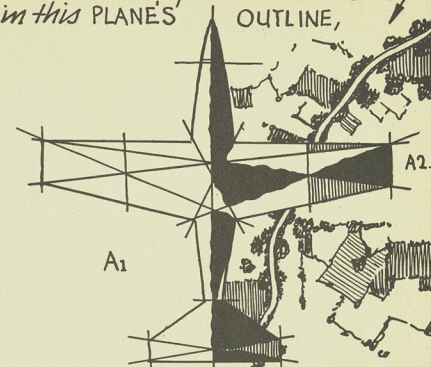
12

A formula is often used by artists and advertising men to get dynamic layout composition. The practice is to make straight lines from the corners of the shape of the layout, and more lines from any intersection or point thereon. Logically then, these lines will all be in harmony with the shape they are in. A composition drawn over it will also harmonize. In (Fig. 22) a factory shape (A) has been treated with similar lines, from point to point. As these lines are in harmony with the shape they will tend to accentuate it; therefore such lines must be avoided in disruptive camouflage (B).

By using lines that do not harmonize with the shape, we get a disrupted mass (C). Using these lines for a base over which to place our disruptive pattern we get a good disruptive camouflage design (D).

Fig. 22

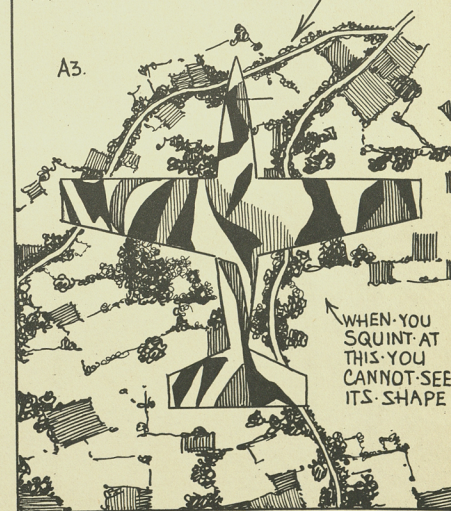
DRAWING LINES *from POINT-TO-POINT*
IN *this PLANE'S* OUTLINE,



A1

GIVES US A GROUP OF LINES IN HARMONY
WITH *this SHAPE*. USING SUCH LINES
AS CAMOUFLAGE BASE WILL NOT HIDE
THE PLANE'S SHAPE *as shown on the*
RIGHT SIDE BUT USING THE SAME
SHAPE AND DRAWING IN LINES NOT IN
HARMONY WITH IT, YOU MAY DISRUPT
THAT SHAPE EFFECTUALLY

A3.



WHEN YOU
SQUINT AT
THIS YOU
CANNOT SEE
ITS SHAPE

This technique can be used in disrupting any shape. In (Fig. 23) we see an airplane, a difficult shape to disrupt because it is so dynamic. In (A1) the plane has been mapped out with harmonious lines, and in (A2) these lines have been followed through with a camouflage effort that is slightly confusing but still accentuates the shape of the airplane. In (A3) we see a dazzle design in which all patterns are out of shape. The result is complete disharmony and good disruption of outline. This theory can be used for the placement or parking of automobiles, and anywhere that disruption is of use in concealing a shape.

Fig. 23

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