THE MONADNOCK
Vol XLII 1968

DOT SCREEN TEXTURE AND ITS EFFECT ON THE FIGURE-GROUND RELATIONSHIP .......... BORDEN DENT 3

A PRELIMINARY FORMULATION OF THE EFFECT OF MOTION ON THE QUALITY OF VISUAL PERCEPTION .......... J. ALAN LEACH 11

THE CONSEQUENCES OF CLOSED POLITICAL SPACE .......... JOHN B. JACOBS, JR. 15

A MORPHOLOGICAL STUDY OF HOUSING IN BARBAYQUIPA, PUERTO RICO ....... HERBERT K. MCMANI AND ROBERT P. DONNELL 19

THE APT MAP: A NEW TOOL FOR CARTOGRAPHIC PRESENTATION .......... WILLIAM CAROLAN 22

GRADUATE SCHOOL AND ALUMNI NEWS

REPORT FROM THE DIRECTOR ........................................ 24

THE WORKROOM TODAY ........................................ 25

THE GRADUATE SCHOOL, 1967-1968 .................................. 26

FACULTY NEWS ........................................ 28

ALUMNI NEWS ........................................ 32
THE MONADNOCK STAFF

EDITOR
David A. Smith

ADVISORY STAFF
Ingrid D. Hansen  Stephen P. Hobart
Gordon A. Hinzenmann  Ralph A. Lemon

TECHNICAL ASSISTANTS
Kang-Tsung Chang  Borden D. Dent

FACULTY ADVISOR
George F. McCleary, Jr.

GEOGRAPHICAL SOCIETY OFFICERS

Lewis D. Rosenthal  President
Stephen P. Hobart  Vice President
Russell W. Muncaster  Treasurer
Gordon A. Hinzenmann  Secretary
J. Alan Leach  Social Affairs

The articles presented here were originally written in response to the requirements of course or seminar work and are not necessarily representative of current research among the graduate student body. Comments or questions concerning these articles should be addressed to the individual authors.

DOT SCREEN TEXTURE AND ITS EFFECT ON THE FIGURE-GROUND RELATIONSHIP

Borden D. Dent

The successful communication of geographical ideas through maps depends upon the clear visual organization of the map's elements. There are two visual organizations that the map designer must include on the map: first, the spatial arrangement of the physical or cultural distributions must be accurately portrayed and be obvious to the reader; second, the distributions must be set on a locational framework that can be seen easily and thus provide ease of locational orientation to the map user. It is especially important for the map designer to provide the locational framework so it is this graphic presentation that the map reader first visually assimilates. Only after the map reader visually organizes the locational framework will he attempt to gain the intellectual content of the map.

A method of providing the locational framework is to develop a figure-ground relationship on the map. The figure-ground relationship is a complex perceptual phenomenon in which an object in the visual field, called a figure, "stands out" or appears to lie above a surface imagined to pass beneath it. This lower surface is called the ground. In Figure 1, the black circle is nearly always seen as figure, and appears to stand above the white background. Figures have two characteristics that may be especially useful to the map designer: first, when figures emerge from the ground they have visual prominence; second, they have shape. The cartographer can develop geographical areas on the map so that they appear to stand out from the background (the map plane). For example, land areas can appear to lie above surrounding water bodies. Figure 2 illustrates the islands of Japan as they appear to stand above a surrounding ocean. Similarly, geographical areas that are the center of interest of the map can appear to stand above surrounding land areas. Arkansas. In Figure 1, seems to be lying above the surrounding states. Geographical areas that have figure "character" offer the map reader a locational framework for his ease of visual orientation on the map.

Figure-ground relationships may be created with map elements in several ways. One is developing brightness contrasts between figure-objects and ground. The brightness contrast evident in Figure 2 causes the islands of Japan to appear to lie above the map plane. Another technique is to create differences of internal complexity of structure between geographical areas on the map. Drafting the graticule over water areas and not over the continents is an example. Figure 4 illustrates this technique. The absence of structure provided by the graticule in the land area makes Australia appear to lie "over" the water. The shapes of continents

Figure 1

Figure 2
are more clear and obey the good location framework. One other technique is the application of dot or line patterns over geographical areas presented on the map to provide differences in texture. In recent years the dot pattern (screen) has been used more often than line patterns.

The effect of textures of dot patterns alone on the perception of the figure-ground relationship has not been fully investigated. Several questions may be asked concerning their use. When two adjacent dot patterns of different texture are used, is the map reader perceiving one as figure and the other as ground? How much texture difference is needed to have one pattern appear to be "over" the other? When the cartographer applies a dot pattern to a geographical area to have it "stand out", could he strengthen the relationship by choosing a dot pattern of different texture? A test was designed and given to eighty-eight Clark University students to find answers to these and similar questions.

The remainder of this paper considers in detail the procedures and results of this test.

Hypotheses of the Test

The following hypotheses were formulated prior to designing and administering the test: a) texture difference between two dot patterns does have some effect on the perception of the figure-ground relationship; b) the pattern with the fewer lines per inch of dots will appear as figure, and the pattern with relatively more lines of dots per inch will be seen as ground; and c) two patterns with a greater difference in the number of lines per inch of dots will be seen by the test subjects as having a stronger figure-ground relationship than two patterns with lower number of lines per inch difference. A definition of texture as the number of rows of dots per inch was used in the test.

The Figure-Ground Test

A series of dot patterns manufactured by Asterix were chosen for the test. The per cent area linked (value) for each pattern was 85% and the arrangement of dots in each pattern was square. The textures of the patterns were as follows:

<table>
<thead>
<tr>
<th>Pattern Number</th>
<th>Lines per Inch</th>
</tr>
</thead>
<tbody>
<tr>
<td>6005</td>
<td>27.5</td>
</tr>
<tr>
<td>4008</td>
<td>34.0</td>
</tr>
<tr>
<td>6013</td>
<td>32.3</td>
</tr>
<tr>
<td>6018</td>
<td>42.5</td>
</tr>
<tr>
<td>6027</td>
<td>52.0</td>
</tr>
<tr>
<td>6028</td>
<td>46.0</td>
</tr>
</tbody>
</table>

The dot sizes of the patterns were not the same. When maintaining the per cent area linked as constant, and varying the texture, the dot sizes are affected. As the lines per inch increase, the dot sizes decrease. It is not known if differences in dot size of screening will affect the perception of the figure-ground relationship.

Custom has shown in a previous study (1) that as texture becomes as high as eighty-five lines per inch, observers no longer perceive individual dots in a screen, but only a gray zone. Therefore, since the perception of texture was important in this study, the number of lines per inch of dots was kept well below eighty-five.

The test included twelve test squares, each with two dot patterns separated by an irregular contour. Figure 5 shows four of the twelve test squares used in the test. Six test
squares had the area of the dot lines for both patterns oriented horizontally-vertically within the test square. Two test squares had one pattern oriented 90 degrees with respect to the edges of the square, and the other pattern oriented 45 degrees to the edge. These two squares were adopted for the test to determine if differences in orientation of adjacent patterns has any effect on figure-ground perception. The test also included two test squares with both their patterns oriented 45 degrees. Similarly, those were included to test the effect of their orientation. Finally, there were two test squares with only one pattern in each. These were used to determine if the screened area of the white area is perceived as figure.

By varying the combination of patterns chosen for this test, texture differences in the test squares ranged from 2.5 lines per inch to 55.0 lines per inch. Table 1 lists all the test squares and the texture differences between their patterns. The subjects used to record which pattern they perceived as figure by circling the letter A or B. In the event neither pattern appeared as figure to the subject he was told to circle neither A nor B.

Next in each test square was a ranking in which the subjects were to indicate their evaluation of the strength of the figure-ground relationship by checking one of the following: very strong, strong, fairly strong, weak, and very weak. These were later recorded and correlated with texture differences in the test squares to determine if there is any positive association between what the subjects perceived as strong figure-ground relationships and texture difference in lines per inch.

The test was presented in a booklet containing an instruction sheet, two sheets of printed test squares, and an information sheet at the end. In addition to data concerning the subject's personal and academic background, information was also obtained to determine if the subjects were blades. Thus the data gathered allowed the investigator to record whether the subjects were associated with the patterns as land or water, and if they felt they had consistently associated the patterns with any particular geographic area. For instance, it was suspected that since many of the students used for testing were from the New England area, they might have consistently chosen the left pattern as figure throughout the test squares because they were associating the left pattern as a land area.

The test was administered to eighty-eight undergraduate and graduate students at Clark University. Twenty students listed their college major as geography, twenty-eight were non-geography majors, and the five remaining were undeclared or undeclared majors. Typically, within the group of non-geographers, eighteen subjects were psychology majors, and the rest were divided more or less equally into sociology, history, government or art majors. Fifty-one per cent of the subjects listed claimed one of the New England states as their home residence. Twenty-nine per cent of the students were from New York, Maryland, New Jersey, Pennsylvania, and West Virginia. The remaining ten per cent came from Tennessee, Ohio, Minnesota, Washington, California, England, and the Virgin Islands.

Test Results

The first task in the analysis of the test results was to record the frequency of responses for each test square. These frequencies were then used to either square, fine, or neither cells. The fine pattern was chosen more often than the coarse pattern in each test square (2.5 lines per inch difference). In test square 40B (15.0 lines per inch difference) the course and fine patterns were chosen equally often. For the remaining test squares, the course pattern was chosen as figure considerably more than the fine pattern.

These results show that as the lines per inch difference between patterns increases so do the frequencies of choosing the course pattern as figure. Figure 6 shows these results graphically. The resulting data was analyzed to determine what effect had on the results, and tested the statistical significance of these frequencies.

Checking for Possible Subject Bias

Because of the design of each test square, with the irregular contour separating the patterns, it was felt that the subjects might have been equating this coarsely or ambiguously as a contour separating a land mass and a water body. To test for possible bias the following procedures were used:

1. Those subjects who answered that they had associated the pattern as a land-water difference were placed in one group; those who had not were placed in a second group.
2. The frequencies of response were tabulated for each of these two new groups. In this case the frequencies were cast into 2 categories: left and right (plus neither).
3. Hj: There is no difference between the two groups in the proportion of subjects who choose the left pattern or the right (plus neither) pattern.
4. Hj: A greater proportion of those subjects who saw a land-water difference (yes group) would choose the left pattern more often than the no group.

Figure 6

(4) The frequencies of responses were cast into a 2x2 contingency table. There was a contingency table for each test square. Rows: Yes; No; Columns: left and right (plus neither).
(5) Statistical Test: The X² test for two independent samples, with df = 1.
(6) N = 88 for each contingency table. Significance level: α = .05.
(7) Rejection Region: At α = .05, df = 1, X² ≥ 3.84.
(8) Results: The Hj was accepted for each test square. That is, there is no significant difference between the two groups in the proportion of subjects who chose the left pattern or the right (plus neither pattern).

It may be reasonably concluded, therefore, that although some test subjects saw a land-water difference this did not bias the test results.

The test subjects who saw a land-water difference were asked if they had associated the difference with any particular geographic area. Of the 59 who said they saw this difference, 17 recorded they had associated it with the northeastern coast of the United States, 8 with
other areas throughout the world, and 34 with no particular geographic area. Since the 17 who lived in the northeastern United States formed a large group, the decision was made to see if their responses had biased the results in any way. The test group who resided in the northeastern United States were placed into one group; those who associated the patterns with the northeastern United States might have consistently chosen the left pattern (land) on the test square. The following procedures were employed to test for possible bias here:

1. The subjects who answered that they associated the test patterns with the northeastern United States were placed into one group; those who associated the land-water difference with no particular area were placed into a second group.

2. The responses were tabulated for each of these two groups. As in the first test for bias, the frequencies were cast into 2 categories: left and right pattern (plus neither).

3. If there is no difference between the two groups in the proportion of subjects who chose the left pattern or the right (plus neither) pattern, then a greater proportion of those subjects who associated the patterns as a land-water difference with respect to the northeastern United States would choose the left-hand pattern more often than those test subjects who associated the difference with no particular area.

4. The frequencies of response were cast into a 2 x 2 contingency table for each test square. Rows: associated patterns with the northeastern United States; associated patterns with no particular geographic area. Columns: left and right (plus neither).

5. Statistical test: the $X^2$ test for two independent samples, with df = 1.

6. $X^2$ for each contingency table is a $X^2$ measure. Significance level: $\alpha = 0.05$.

7. Rejection region: At $\alpha = 0.05$, df = 1, $X^2 > 3.84$.

8. Results: The $X^2$ was accepted for each test square. There was no significant difference between the two groups.

It may be concluded that although some subjects associated the test squares as a land-water difference with particular reference to the northeastern United States, this did not bias the overall test results.

One further check was made to see if the subjects were biased in any way. Geographers have more experience with map reading than other academic groups. It was felt that perhaps the geographers might have been perceiving the test square patterns differently than the others tested.

A test similar to the bias tests above was conducted. Conclusion: At $\alpha = 0.05$, there was no significant difference between geographers (here defined as people having at least one geography credit) and non-geographers in the proportion of subjects who chose the coarse pattern or the fine (plus neither) pattern for all test squares - with the exception of test square #1. Geographers tended to choose the coarse pattern significantly less than did the non-geographers. It is unclear why this should be so.

**Testing the Significance of the Observed Frequencies**

Major bias did not enter into the test results. Therefore, the next major analysis was to test the significance of the overall responses. A test was employed here to determine if the frequency of responses in each category (two patterns: coarse and fine plus neither) were simply due to chance alone or whether they were statistically significant departures from some expected frequency.

The statistical test was the single-sample test. The $X^2$ became: the observed pattern will be chosen equally often as the fine (plus neither) pattern, or, there is no deviation from the expected frequency between the two categories. The expected frequency for each cell, then, was $48 (df = 1)$. Under this $X^2$, one would expect the coarse pattern to be chosen 44 times and the fine (plus neither) responses to equal 14 in each test square. This would indicate that there is nothing especially different between the two adjacent patterns. If the observed value of $X^2$ for each test square is accepted under this $X^2$, then the difference from the expected frequency is due to chance only. However, if the $X^2$ values are rejected, then there is some factor, other than chance, operating. The other factor in this test was texture difference.

For the test, $\alpha = 0.05$, df = 1, and rejection region $X^2 > 3.84$. The test was applied to each test square. The table of $X^2$ values obtained were:

<table>
<thead>
<tr>
<th>Test Square</th>
<th>Test Diff.</th>
<th>$X^2$</th>
<th>Accept/Reject</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2.5</td>
<td>13.36</td>
<td>reject</td>
</tr>
<tr>
<td>2</td>
<td>1.0</td>
<td>0.08</td>
<td>accept</td>
</tr>
<tr>
<td>11</td>
<td>10.0</td>
<td>1.136</td>
<td>accept</td>
</tr>
<tr>
<td>8</td>
<td>13.0</td>
<td>1.136</td>
<td>accept</td>
</tr>
<tr>
<td>10</td>
<td>12.0</td>
<td>1.136</td>
<td>accept</td>
</tr>
<tr>
<td>4</td>
<td>1.5</td>
<td>1.136</td>
<td>reject</td>
</tr>
<tr>
<td>5</td>
<td>15.0</td>
<td>6.344</td>
<td>reject</td>
</tr>
<tr>
<td>12</td>
<td>17.5</td>
<td>20.044</td>
<td>reject</td>
</tr>
<tr>
<td>2</td>
<td>27.5</td>
<td>18.18</td>
<td>reject</td>
</tr>
<tr>
<td>5</td>
<td>15.0</td>
<td>6.344</td>
<td>reject</td>
</tr>
<tr>
<td>9</td>
<td>25.0</td>
<td>20.044</td>
<td>reject</td>
</tr>
<tr>
<td>12</td>
<td>32.5</td>
<td>2.908</td>
<td>accept</td>
</tr>
<tr>
<td>55.0</td>
<td></td>
<td>20.044</td>
<td>reject</td>
</tr>
</tbody>
</table>

Test squares 6, 11, 9, 8, and 10 were accepted under the $X^2$. Test squares 1, 2, 3, 5, 7, 1, and 12 were rejected. The observed frequencies in the test squares rejected, therefore, deviated significantly (not due to chance alone) from the expected frequency under the $X^2$.

**Analysis of Results of the Observed Frequency Test**

Departures from the expected frequencies of 48-48 in the $X^2$ one-sample test become more apparent as the number of lines per inch separating the two patterns increases. A critical value or threshold may be placed at approximately 15 lines per inch (notice in the table above that the $X^2$ values increase considerably somewhere between test squares #10 and #12). After as many as 15 lines per inch separating the two patterns is reached, the frequency of choice of the coarse and fine (plus neither) patterns is no longer due to chance alone.

There were four combinations of patterns that had 15 lines per inch texture difference:

- # 8 - (accepted), coarse vertical, fine 45 degrees
- #10 - (accepted), both 45 degrees, coarse pattern on the right
- #4 - (rejected), both 90 degrees, coarse right, fine left
- #14 - (rejected), coarse 45 degrees, fine vertical

In test squares #8 and #10, both patterns were identical, but each was reversed in orientation. Reversing the patterns caused a change in the result. A better distinction between figure ground in obtained when the coarse pattern (figure) is oriented 45 degrees to the vertical, and the fine pattern (ground) at 90 degrees to the vertical.

The observed frequencies in test square #10 were not significant. There is only one other test square for direct comparison. Test square #5 (rejected) had both patterns oriented 45 degrees to the vertical, with the coarse pattern on the right side. Test square #5 had 17.5 lines per inch separating the two patterns, where test square #10 had only 15.0. That test square #10 was accepted and #5 was rejected may be due to the number of lines difference, or in the placement of the coarse pattern (right vs. left in the test square). When two patterns are both 45 degrees to the vertical, keep at least a 17.5 lines per inch difference separating the two patterns.

Test square #9 (accepted $\alpha = 0.05$, but rejected $\alpha = 0.10$) represents a combination of dot patterns that is difficult to interpret. While there was nothing unusual about this test square (the patterns were both oriented 90 degrees to the vertical, and the number of lines per inch texture difference was 31.5), something caused the coarse pattern not to have been selected as often as in other test squares. It may be that the fine textured pattern (60 lines per inch) was seen more often as a continuous grey tone, and this may have caused more test subjects to perceive it as the figure.

Test square #1 was rejected. Only in test square #1 were the dots the same size between the two patterns. Since the dots were the same size, and only the texture changed (35.0-37.5 = 2.5), the greater density of the dots may be adding some visual importance to the fine pattern. It may well be that the dots should be larger in the figure than in the ground pattern, where at the same time the number of lines per inch separating the two patterns should be 15.0 or more.

The coarse (patterned) area in both test squares #7 and #12 were chosen significantly more often as figure than the white areas. Test square #12 had one of the highest $X^2$ values, and the pattern texture was fine (55.0 lines per inch). Test square #7 had a more coarse texture (27.5 lines per inch) and a lower $X^2$ value. It seems that when only one pattern is used it should be applied to the figure object, and a fine textured screen should be used.
Position in the test square seems to have no effect on whether a coarse pattern is chosen as figure.

The Preference Test

Each test subject was asked to rank the distaction between the figure-ground relationship for each test square. The purpose of this portion of the test was to discover if the subjects perceived the relationship as stronger or weaker as the texture differences increased or decreased.

The data were tabulated in two groups: those who chose the coarse pattern as figure were assigned to one group, and those who chose the fine pattern as figure to another. The fine pattern was chosen as figure by 81 subjects, the coarse by 31.

The data were tabulated in two groups: those who chose the coarse pattern as figure were assigned to one group, and those who chose the fine pattern as figure to another. The fine pattern was chosen as figure by 81 subjects, the coarse by 31.

Some possible choices of very weak, weak, fairly strong, and very strong were ranked from one through five respectively. Each test square was given a rank depending on the subject's strength scale, and the total strength assigned by the 88 subjects. Then each test square's texture difference was ranked over eight (from smallest texture difference to largest). Thus, for each test square two ranks were obtained. The Spearman rank correlation coefficient was computed for each group:

Result:

| Coarse: S = 6.83 |
| Fine: S = 7.75 |

These were significant results under R, that there was no association between the ranks.

There is a positive association between how strongly the subjects perceived the figure-ground relationship and the texture difference between two adjacent patterns. Those subjects who chose the coarse pattern as figure felt the association stronger than did those who selected the fine pattern.

Conclusions

Several generalizations may be made from the results of this test:

a. A dot pattern will appear to 'stand out' as figure if its number of dots per inch of dots is at least 15.0 less than those of an adjacent dot pattern.

b. A dot pattern may be perceived better as a figure-object if it is oriented 45 degrees to an adjacent dot pattern (given that there is a minimum of 15.0 lines per inch texture difference separating the two patterns).

c. A coarse dot pattern will be seen as 'his above' an adjacent fine dot pattern even if both are oriented 45 degrees (but the minimum of 15.0 lines per inch texture difference must still be maintained).

da. A dot pattern may be more effective as a figure-object if its dots are larger than those of an adjacent dot pattern.

e. When only one pattern is used to create a figure-ground relationship, the geometrical area that is being emphasized as figure should be given a dot pattern. The finer the texture this dot pattern makes will be the more effective the figure-ground relationship.

f. A dot pattern may be perceived as a figure if its texture is so fine than the individual dots can no longer be distinguished.

The general hypothesis stated at the beginning of this text were confirmed by the test results. The map designer can create figure-ground relationships by the use of dot screens having differentiable texture. The results of this test present some guidelines and suggestions for their use. The results also suggest problems that need to be examined for further understanding and in the use of dot screens to create figure-ground relationships. The effect of dot screens on the perceived figure-ground relationship is influenced by the texture of the dot pattern and the size of the dot pattern. These factors need to be carefully considered. What are the effects of reversing the pattern?

A preliminary formulation of the effect of motion on the quality of visual perception

J. Alan Leach

The faster one travels, the less can be seen, and yet more is seen. As travel speed is increased, the observer is able to see less of any one object, although he may pass by many more objects. This is significant to the geographer since it may affect his perception of distance. One geographer may prefer to observe change over a longer stretch of time from one place, while another may find that a fleeting glance at a much longer stretch may provide a perspective of change over space.

Since the motion of an observer will affect his observations, this study attempts to show the relationship of speed to geographic perception in a preliminary formula of observation factors.

The automobile was selected for this study because it is a common method of travel. Furthermore, its speed can easily be adjusted during experimentation, and the limits of railroad tracks or airtime courses do not hinder its travel. The situation for another mode of transportation would easily be extrapolated from the formula developed here for the automobile. In order to standardize the human variable, it is assumed that a person will try to observe as much of the landscape around him in the amount of time available, that he possesses vision corrected to 20/20, and that he has no fatigue.

It is best to begin with the effect of motion. When velocity (v) is zero, certain observation factors can be studied. Sitting still, a person has as much time as he needs to observe any object (a) around him, and consequently time (t) is infinite for observing each object within his sphere of vision. A person who is seated in a chair has the same height above the ground as the seat of an automobile. Since the observer is allowed to see all the way around, his range of vision (d) covers the horizontal area. On a clear day the observer is able to see all objects as far as the horizon. That means, with d being the value of d, 1, stand for the observation factor, or the amount of the earth's surface observed about any given point, thereby establishing the quality of that observation. Thus, the observer can make a maximum quality observation about every object within his sphere while sitting still, or:

\[ \theta_{max} = \frac{d^2}{2} \]  \hspace{1cm} (1)

To put the earth's into motion imagine that it is placed on one of the new hovercraft being developed for future transportation. To protect the vision of the observer from annoyance by wind, imagine a clear plastic shield surrounding him. As soon as the chor begins to move, the observer views a constantly changing series of Earth objects which overlap something like this:

\[ \Theta_1 \rightarrow \Theta_2 \rightarrow \Theta_2 \rightarrow \Theta_3 \rightarrow \Theta_4 \rightarrow \ldots \rightarrow \Theta_n \]  \hspace{1cm} (2)

A line of impact spaced at even intervals parallel to the observer's path of motion will standardize the number of objects within his sphere of vision at any moment in time. If every post were the same and yet required a moment of the observer's attention, he would find it impossible to discern all the objects within his sphere of vision. If the observer's observation decreases, the figure-ground relationship of each object will decrease from maximum and eventually approach zero as velocity is increased, or:

\[ \Theta_{min} < \frac{d^2}{2} \]  \hspace{1cm} (3)

However, "a represents only one object as it passes through \( \Theta \). To express the extension of observations to include all objects currently within a sphere, one must count their number from horizon to horizon and measure the time from appearance to disappearance for one object at a given velocity (v):
This would cause an aspect error, and another will disappear, thus keeping the demonstration constant. Furthermore, by keeping the time element constant in the formula, the velocity is increased so that the distance covered is and consequently the number of evenly spaced objects is increased. Therefore, the person will have less time to observe any one object, but in traveling faster he will pass more objects to observe.

So far the problem has assumed that the amount of time available for observation in any sphere must be divided equally among the objects. However, no observer will view each object for the same time. The time at which various objects is of color, advertising gives other aspects of nature, the observer’s interests affect time allotment. If an object appears over the horizon at a position other than directly forward, the observer will not be able to see the same object as it is from the observer. Together, these two variables affect the size of the solid angle of intersection of the object in the vision of the eye:

\[
\Theta_s = \Phi (c + 1) - p
\]

When the attractive power of each object on the observer’s sphere has been computed, each can be assigned a properly weighted portion of the total attractive power of the sphere.

With a basic understanding of the methods of measuring the qualities of object observations for an observer in motion, the next step is to formalize the restrictions of a car or aircraft. The car will be a normal American-model sedan. There are two separate and very distinct pairs of factors involved in forming a car’s cross-sectional shape. Objects will not be viewed through the rear window, but only through the front window. The rear view mirror will be identical to the driver’s view with respect to measurements of the car around him. In both cases, the primary position will be looking straight ahead, and each of these positions or eyes will be turned will not be discussed here; they will be assumed to be used normally.

Windows will be assumed to possess little curvature of glass, and will be measured in flat rectangular units in inches. Objects will not be viewed through the rear window, since this is generally a rare occurrence. The exception will be the panes of glass which the driver regularly uses where rear view mirrors on the front seat behind the driver will be ignored. Allowing for head, the definition of visual freedom can be measured from the rear seat, the front seat, and the car’s head. The head will be turned will not be noted here; they will be assumed to be used normally.

Windshield measurement will be discussed without using actual glass area measurements. The front window is a solid angle of visual arc, something like the angle of intersection of the dimension of an object within the eye (\(\Phi\)). The sides of the window are extended from the front corner to the front corner, and can be measured by the number of degrees of visual freedom from the head position. Although the sides and driver have different vantage points, the number of degrees is the same. The base of the solid angle is measured from the eye to the front edge of the car head. Viewed from the side, this angle is found by simple trigonometric measurement using the horizontal and vertical distances from the eye to the head edge. The top of the solid angle is similarly extended by the top of the windshield. The side windows will be referred to as the rear seat, side view from the front, where the head is in the seat, and the driver is behind the head. The position of the left windshield in rear seat and driver will be taken by the front and rear corner points of the same side, and by the top and bottom of the window, using a triangular measurement to the position of the eye. The next window provides a great deal of observation space, while the far window is much smaller. Thus, the plastic does which alighted the observer on the heaviest part is now limited to the window area of a car. The window measurement restrictions shall be assigned the letter "w". A car next replaces the rear chair, and the moving platform is now the car itself.

With the many different types and conditions of roads, and the varying types of scenery which can surround the traveler, the position of positioning the car on the road will be used to pick up some more factors. The car will always remain in the most right-hand lane of the road, thereby standardizing the view to different effects or color, advertising give other aspects of nature, the observer’s interests affect time allotment. If an object appears over the horizon at a position other than directly forward, the observer will not be able to see the same object as it is from the observer. Together, these two variables affect the size of the solid angle of intersection of the object in the vision of the eye:

\[
\Theta_s = \Phi (c + 1) - p
\]

Where the attractive power of each object on the observer’s sphere has been computed, each can be assigned a properly weighted portion of the total attractive power of the sphere.

The time of day affects more than the actual measurement of the amount of light available. For instance, due to the fact that the angle of the sky, through which the earth makes each hour and whose color or brightness will not be noted here; they will be assumed to be used normally.

Windshield measurement will be discussed without using actual glass area measurements. The front window is a solid angle of visual arc, something like the angle of intersection of the dimension of an object within the eye (\(\Phi\)). The sides of the window are extended from the front corner to the front corner, and can be measured by the number of degrees of visual freedom from the head position. Although the sides and driver have different vantage points, the number of degrees is the same. The base of the solid angle is measured from the eye to the front edge of the car head. Viewed from the side, this angle is found by simple trigonometric measurement using the horizontal and vertical distances from the eye to the head edge. The top of the solid angle is similarly extended by the top of the windshield. The side windows will be referred to as the rear seat, side view from the front, where the head is in the seat, and the driver is behind the head. The position of the left windshield in rear seat and driver will be taken by the front and rear corner points of the same side, and by the top and bottom of the window, using a triangular measurement to the position of the eye. The next window provides a great deal of observation space, while the far window is much smaller. Thus, the plastic does which alighted the observer on the heaviest part is now limited to the window area of a car. The window measurement restrictions shall be assigned the letter "w". A car next replaces the rear chair, and the moving platform is now the car itself.

With the many different types and conditions of roads, and the varying types of scenery which can surround the traveler, the position of positioning the car on the road will be used to pick up some more factors. The car will always remain in the most right-hand lane of the road, thereby standardizing the view to different effects or color, advertising give other aspects of nature, the observer’s interests affect time allotment. If an object appears over the horizon at a position other than directly forward, the observer will not be able to see the same object as it is from the observer. Together, these two variables affect the size of the solid angle of intersection of the object in the vision of the eye:

\[
\Theta_s = \Phi (c + 1) - p
\]

Where the attractive power of each object on the observer’s sphere has been computed, each can be assigned a properly weighted portion of the total attractive power of the sphere.

The time of day affects more than the actual measurement of the amount of light available. For instance, due to the fact that the angle of the sky, through which the earth makes each hour and whose color or brightness will not be noted here; they will be assumed to be used normally.
The total amount of time which each object is within the observer's sphere of vision before the visual horizon is placed over the attractive ability of that object plus all of the observational restrictions, because as the velocity is increased the amount of time will decrease, and thus reduce the value of the quality fraction from the maximum (e). Restraint upon the attractive power of the object is expressed in a single linear relation for the sake of conceptualization. In reality, it is probable that the factors are not quite as sharply related. Although this formula cannot provide exact mathematical expressions or numerical results, it does point to the major factors involved in quantifying the effect upon the quality of observation, and it does express the general relationship between them.

In conclusion, the velocity of the observer has a tremendous affect upon the type and quality of observations. If, in this study suggests, when the quantity values of dissipation increases and the quality values decreases, there must be a point at which the two values intersect. To confirm this, further research is needed on the measurement of each factor and the relationships among the factors presented here. Factors may be changed or even eliminated to fit the context of the observation being researched, and the method used here for the automobile may be applied to other types of transportation.

For the past two years, the graduate School of Geography at Clark University has held its annual Field camp in Puerto Rico during the three-week January Independent Study Period. In 1967, 65 students (35 graduate students, 25 experienced teacher fellows, and 10 undergraduates) were quartered at the Liquele Y.H.C. Camp in Palmer.

The experienced teacher fellows, under the guidance of Dr. Henry Karman, learned field methods and made a case study of the land use dynamics of the western corner of Ute State. The undergraduates studied beach rock and coastal morphology with Dr. Joshua Bane. Graduate students under the direction of Dr. James Hahn, and Dr. James Hahn, a number of courses in the area of the study. The major focus was the expansion of the land use into new areas that had not been previously developed. The students were interested in the relation of social and economic geography of the northeastern corner of the island.

In 1968, 22 graduate students and one undergraduate student spent the three-week period in Puerto Rico with the assistance of the National Science Foundation (NSF). This NSF project provided an excellent lab. Under the supervision of Dr. Andrew, East and David Sein, a wide variety of field studies were undertaken. Studies of agricultural activities in the region, the use of Puerto Rico and adjacent towns as the object of urban studies and residential and educational land use, the distribution of retail functions, the influence of place location and morphology upon local pedestrian behavior, and the impact of industrial development on a community. Students in cultural geography were concerned with house-type variation in rural areas and in government housing projects and regional variation in musical tastes as reflected by an analysis of jukeboxes. More dissolute students included one of the south-western part of the island, one on the island's sparse fishing industry and one on the coast geography of the Anse-d'Arles-Laros area.

The field camp now follows a semester of training in methods of geographic investigation and the students are responsible for identifying a geographic problem and carrying out the investigation in the field on their own. Puerto Rico was chosen for the field camp setting because it represents the area of Latin American culture most easily accessible to Clark. The benefit of conducting field work in a different cultural setting is that the investigator must take little for granted and forced to conduct his observations were carefully and to expand his own understanding of assumptions. The field camp has also served to stimulate interest in foreign area research and several theses and dissertations now in progress reflect this experience.

Among the various projects carried out during the past year was the initial phase of an effort to recognize the map collection, in preparation for the move to a "map library" to be developed in the new space made available in the old library building. The collection has been augmented in recent years, as Clark has been made a depositary for maps and other cartography, especially items produced by government agencies. The two major Depository collections are those of the Geological Survey and the Army Map Service. In addition, the collection has been augmented by the addition of items from other federal mapping agencies. Other Clark cartography projects have included an extensive series of maps of the Worcester area.

The collection of mine maps and other materials of this type used for teaching, white acquisition of aerial photography and map resources which will aid in research and study programs has begun.

THE CONSEQUENCES OF CLOSED POLITICAL SPACE

John B. Jacobs Jr.

The Problem of Closed Space in Political Geography

The following is a discussion of twentieth century geopolitical and geostatistical thought as it relates to the concepts of open and closed space. These concepts are quite general and can be applied to a number of the fields in geography, but for the purpose of this paper discussion is generally limited to closed political space. This concept is a narrow abstraction from "closed space" in general, but it is a useful and necessary consideration in political geography. The paper is not intended as a survey of the field, and no particular chronological ordering is followed. Certain important writers are selected and their views examined. It is my contention that closed political space is a reality in today's world, and that current thought in political geography on the macro-scale is a consequence of this closed space.

In addition to political space which it is suggested, is closed, there are considerations of the resource and technological aspects of space which cannot be ignored. In general space serves as a "pattern of development within a basically closed and political framework. This paper of view is presented by Whitley in "The Horizon of Geography," (1) when he discusses the multi-dimensional concept of space.

Man has recognized the world as finite for a long time but it was not until the present century that the job of ..., the one common to all phenomena is to define the character of all its parts," was completed. (2) Whitley continues that in the "...century after the unity of the oceans was demonstrated, man's sense of space was being enlarged in a new direction by scientific discoveries and mechanical inventions which opened to utilization the third or vertical dimension of the earth's surface." This development of space can be seen as a multi-dimensional concept encompassing time (velocity, space and timing) and eventually quality of the environment.

That space in these terms is open is not questioned here, for the case can easily be made that technological-resource space is open, if not unlimited. It is the purpose of this paper, rather, to discuss the consequences of closed political space for exploration, discovery and eventual political control over all available lands, which resulted in the present condition of closed political space.

Malin, in his essay "Space and History in 1944," demonstrates that the idea of closed space is not derived from the fact that all unoccupied lands, or lands occupied by peoples, have been appropriated—so much as new lands are available. (4) The consequence of this idea is that the closed space is that man must adjust both his attitudes and way of life. Competition for space and resources increases and as a result national policies are affected.

Included in this closed space of which Malin speaks are considerations which lead him to conclude that the "totalitarian" or "closed" space is not limited to more than closed space, or a closed world. The world is no less closed in 1944, than it is now. The political relations are economic, technological and cultural, and that they have no necessary space relations which conform to closed space considerations of the usual order. "It may be said that these forces recognize no political boundaries, yet they are mobile, sometimes rapid, and penetrative. Their space is more 'open' entity, whose boundaries can advance with astonishing rapidity but can also regress." (5)

But what is the nature of political space, if space in the closing-of-the-frontier sense cannot be identified as closed space, let alone be characterized as a "physical" entity? In "The Science of Geography," Cohen points out that "A primary characteristic of political space is its 'closed' quality." (6) In fact, political space is so specific, "in most cases actual landscape features mark the edge of a political unit. The fact that "...economic ground rules, the land ..." has been replaced by the border problems of the modern world, and the point that political space, on a global scale, is a consequence of this closed space.

The importance of Cohen's contention that political space is closed can best be examined in relation to Malin's assertion that closed space is a matter of "closed mind." Malin is clearly thinking in terms of Whitley's multi-dimensional geography. The closed world of
the landpower conception of space.

Mahan was an unusual mixture of the nineteenth and twentieth centuries. His writings show influence of nineteenth-century open space as well as twentieth-century closed space. It would be entirely reasonable for me to suggest that, in terms of strict political space, Mahan was a product of the closed space school. But the argument would be academic and likely would miss the main issue, because "in Mahan's closed world, sea power was the dominant force, and science and its application through machines was being transferred in the twentieth century to new roles for a continuation of the process there." (16)

Mahan's strategic thinking developed out of a growing awareness of the closing of space in a global sense. That his interests were in the fields of naval history and strategy is of little consequence, for in a closing world with empty space was rapidly being appropriated for use... "It is probable that the wind was already blowing in the direction of maritime expansion and new naval rivalries." (16)

Gough describes Mahan's view of the world as "basically-sealed," with Russia functioning as the dominant land power in Asia. Mahan maintained that a major role of conflicts between Russian landpower and British seapower was located between the thirtieth and fortieth parallels in Asia, and that "this...dominance could be challenged by Anglo-American alliance from key land bases surrounding Russia because of the inherent advantages of sea-movement over land-movement. Indeed, Mahan predicted that an alliance of the United States, the United Kingdom, Germany, and Japan would one day hold course against Russia and China." (17)

This view of the world remains one of Mahan's fundamental concepts, although Mahan, from the nation's point of view, considered the land-locked position to be strategically weaker than the maritime. Although Mahan's point of view is not one of closed space, his predictions of future alignment of powers remind one of the closed space power framework of Mahan.

Slykstra, writing in 1944, states that the "...important change in the organisation of power was first comprehensively recognised and analysed in 1900 by Alfred Thayer Mahan in his book The Influence of Sea Power upon History, 1660-1812. It was, however, the British geographer E Falsor Mahan who, in 1900, first studied in detail the relations between land and sea power on a truly global scale." (18) Slykstra then displays, in his global views, aspects of this double heritage.

Slykstra views political space as closed, and emphasises the fact that "any attempt to consider the geopolitical relationships among the states of the Eastern Hemisphere must start with the fact that the total earth's surface has, today, become a single field for the play of international politics in which no key to the understanding of any sovereign state is necessarily affected by the policies and actions of any other states. Strategically, Slykstra's concern was with the world, which was essentially Mahan's Navy Space world. In this world the control of this world territory is such that it is not adequate to today's world is not the same. What is important is not the reality that Slykstra's global view, like other twentieth century global views, is merely a strategic reorganization of closed political space.

Conclusion

In the years which followed World War II, the rise of air power and nuclear capability demanded re-evaluation of earlier geopolitical views. Writers in the 1950's, and 1960's, such as Alexander F. de Vereaux, John S. Power, Morf, F. B. F. Kamin, and Paul F. Cohn, responded to these changes in their strategic considerations. The world that we see today is not the same. What is important is the realization that the world's political space, both in the uncontrolled and controlled worlds, has greatly complicated the global picture, but the fact remains that political space in the twentieth century remains effectively closed.

(4) Ibid., p. 13.
(5) Ibid., p. 15.
(9) Ibid., p. 32.
A MORPHOLOGICAL STUDY OF HOUSING IN BARRANQUITAS, PUERTO RICO

HERBERT K. McGINTY AND ROBERT P. DONNELL

With the exception of Salamanca's study of Mexican caserios and Augelli's study to Eastern Puerto Rico, the residential morphology of Latin American towns is ignored by the recent literature. (1) The purpose of this study, carried on in the field in January, 1968, was to delineate the residential land use in Barranquitas, Puerto Rico, determine its distinctive characteristics and analyze the patterns of residential morphology observed in this mountain town. Because of the time limitation in the field the study was restricted to the original pueblo of Barranquitas, excluding outlying areas annexed in recent years. (2)

The principal methodology used for this study was that of field mapping, observation, and interviews. An initial introduction to Barranquitas was obtained from aerial photographs and topographical maps from which working base maps were prepared. Before a residential classification system could be developed, a preliminary survey was made to obtain an overview of the pueblo and to determine locations and types of urban residential housing. Wellington D. Jones' study, "Field Mapping of Residential Areas in Cities," (3) was selected as the basic guide for our classification, although the Puerto Rican situation required extensive modification of Jones' scheme. In deriving the classification system for residences we employed such observable elements of form as (a) site of structure (number of rooms), (b) number of stories, (c) spacing of buildings, (d) upkeep of buildings and grounds, and (e) construction materials, as well as such elements of function as (f) the number of families inhabiting a structure, and (g) non-residential functions performed in the residence. In the resulting classification system five housing categories were established as representing the range of residences in central Barranquitas.

A) small to medium sized (1-3 rooms) wooden structure in poor repair with urban spacing (2 feet or less between structures) (4)
B) small to medium 1-family dwellings, fair-good upkeep, urban spacing
C) multiple family dwellings, fair-good upkeep, urban spacing
D) multiple function residences, fair-good upkeep, urban spacing
E) large (more than 3 rooms), 1-family residences, good-excellent upkeep, urban spacing

Types B, C, D, and E were subdivided by the number of stories they possessed (1, 2, and 3, etc.) and also by their construction material, whether wood, sheet metal or concrete. The classification of a residence's upkeep is based on a large extent on the condition of the roof, the most visible and well-preserved part of house exterior in Barranquitas. The house types found were recorded on base maps from which the map "Classification of Housing in General Barranquitas" was compiled.

This map shows that the predominant housing type is B, the small to medium sized 1-family dwellings in fair-good repair. Type B houses are predominantly single stories, with a larger proportion constructed of wood rather than concrete. This type has the largest number of rooms and is found throughout town. In the fairly densely occupied areas located between the Plaza and the Calle del Rio area where type B structures dominate, the mean number of residents per house was found to be five, while the mean number of residents per room was nearly two. The average length of residency by present occupants of this area was found to be seventeen years.

The better quality dwellings tend to cluster along the top and sides of the ridge which defines the center of town. Type E houses, the largest and best-kept single family residences, are predominantly concrete structures of both one and two stories. They are few in number, but they occupy some of the better hillside location. Very clean and well maintained, but more numerous and widespread and less predominantly concrete are the multiple family dwellings (Types C), in most cases multiple storyed structures accommodating two or three families. The area of Barranquitas south of the Pizarro in which are located most Type C and E residences as well as numerous Type B dwellings is considerably less dense than areas north of the Plaza. The mean number of residents per house is five, while the mean number of rooms per house also approaches five. A great many of the structures, especially those of concrete, have been built during the last twenty years; the average length of residency by present occupants is nine years.
Not surprisingly, multiple function dwellings (type D) are predominant around the Plaza and along the main roads out of town. With few exceptions these are multiple-storied structures of wood and concrete; their first floors perform commercial functions, and their upper floors serve as residences. Nelson notes that in Mexican towns "functional specialization is not great." (5) In Barriquitas most commercial establishments also serve as residences as do some manufacturing concerns.

Type A residences (small to medium sized wood houses in poor repair) dominate the Calle del Rio along the north edge of town, occupying land owned by the Parish of Barriquitas. These one-story adobe shacks are constructed of wood with metal roofs; they are provided with electricity but lack plumbing facilities. Most of these houses are not located on paved roads but have dirt lanes and paths leading from Calle del Rio. This densely populated area occupies the most topographically inferior location in Barriquitas, on the flood plain and hillside sloping down toward the river. The average number of occupants per house is five, while the mean number of residents per room is two. As in the case of other slum areas in greater Barriquitas a correlation exists between such densities and the number of years of occupancy. Type A houses are generally the older 1-story dwellings that have been occupied the longest period of time by present residents. The appearance of isolated wooden shacks in areas of better housing reflects the frequent phenomenon of a shack remaining after its residents have moved into a newly constructed concrete house adjacent to it. Housing conditions are considerably worse away from the paved streets, but the conditions do not necessarily worsen the greater distance from the street. In such lower income areas more attention is directed toward the upkeep of the house's facade rather than to its other sides, as is the case with the residents' interior as opposed to its exterior.

This study revealed a significant relationship between location and the quality of housing. The best housing is found in those parts of town which command a good view due to topography or where location on a main street permits using the street level floor for a commercial function, and poor housing typifies inferior locations. Future research could profitably explore the following questions: (a) does the same generalized conclusion hold in other Puerto Rican towns? and (b) how do the residents perceive their home site location and in what way does this influence the quality of their housing?


(2) The 300 residential units in this central area have an estimated population of 1600 out of the total 1960 population of the pueblo of 4684.


(4) Jones defined urban spacing as being 50 feet or less between structures, but central Barriquitas residences are too compactly spaced for this definition.

(5) Nelson, p. 82.

The Graduate School of Geography and the Department of Psychology cooperated during the Spring of 1968 in an interdisciplinary faculty seminar. This represented a "first" of sorts, although teachers of environmental design and behavioral science have engaged in similar efforts in the recent past. About half the paraplegy faculty and one quarter of the psychology faculty participated in the informal, often intellectually freewheeling gatherings. Discussions were led by psychologists and others from within and outside Clark. Guests included representatives of the National Institute of Health, the University of Michigan, M.I.T., and Columbia University. Among the topics touched upon were the relations of environmental stimulation to perception and cognition, the role of stimulus variation in producing meaningful experience; population density, dispersion, and stress; simulation and representation of designed environments; cities as learning media; the "urban imagery" produced by certain kinds and patterns of vehicular movement; and how children learn to "map" their environments.
THE APT MAP:
A NEW TOOL FOR CARTOGRAPHIC PRESENTATION

WILLIAM CAROLAN

The "APT" Map (Area Proportional To) demonstrates that base maps constructed on a base
other than that of surface area can maintain the familiar shape of general areas, the familiar
shapes of constituent units, and the familiar relative positions of constituent units.

Data relating to the occurrence of social, political, and economic phenomena, as well as to
that of physical phenomena, can be presented meaningfully on such maps.

On this particular map state areas were made proportional to population by use of a Salzer-
Man Enlarger-Reducer Projector. From a common base map this device projected onto a tracing
table the outline of each state enlarged or reduced by a factor equal to

\[
\frac{\text{West Virginia's area}}{\text{Other State's area}} = \frac{\text{West Virginia's population}}{\text{Other State's population}}
\]

West Virginia was the base state because it approximated most closely a theoretical base state
with area equal to

\[
\text{largest state area}
\]

and population equal to

\[
\text{most populous state}
\]

\[
\text{smallest state area}
\]

\[
\text{least populous state}
\]

Table 1

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1. New York</td>
<td>16,782,000</td>
<td>27.</td>
<td>Oklahoma</td>
</tr>
<tr>
<td>2. California</td>
<td>15,915,000</td>
<td>28.</td>
<td>Kansas</td>
</tr>
<tr>
<td>3. Pennsylvania</td>
<td>11,276,000</td>
<td>29.</td>
<td>Mississippi</td>
</tr>
<tr>
<td>4. Illinois</td>
<td>10,981,000</td>
<td>30.</td>
<td>West Virginia</td>
</tr>
<tr>
<td>5. Ohio</td>
<td>9,706,000</td>
<td>31.</td>
<td>Arkansas</td>
</tr>
<tr>
<td>6. Texas</td>
<td>9,580,000</td>
<td>32.</td>
<td>Oregon</td>
</tr>
<tr>
<td>7. Michigan</td>
<td>8,222,000</td>
<td>33.</td>
<td>Colorado</td>
</tr>
<tr>
<td>8. New Jersey</td>
<td>6,672,000</td>
<td>34.</td>
<td>Nebraska</td>
</tr>
<tr>
<td>9. Massachusetts</td>
<td>5,350,000</td>
<td>35.</td>
<td>Arizona</td>
</tr>
<tr>
<td>10. Florida</td>
<td>4,932,000</td>
<td>36.</td>
<td>Maine</td>
</tr>
<tr>
<td>11. Indiana</td>
<td>4,662,000</td>
<td>37.</td>
<td>New Mexico</td>
</tr>
<tr>
<td>12. North Carolina</td>
<td>4,396,000</td>
<td>38.</td>
<td>Idaho</td>
</tr>
<tr>
<td>13. Missouri</td>
<td>4,200,000</td>
<td>39.</td>
<td>Rhode Island</td>
</tr>
<tr>
<td>14. Virginia</td>
<td>3,881,000</td>
<td>40.</td>
<td>District of Columbia</td>
</tr>
<tr>
<td>15. Wisconsin</td>
<td>3,532,000</td>
<td>41.</td>
<td>South Dakota</td>
</tr>
<tr>
<td>16. Georgia</td>
<td>3,263,000</td>
<td>42.</td>
<td>Montana</td>
</tr>
<tr>
<td>17. Tennessee</td>
<td>3,167,000</td>
<td>43.</td>
<td>Idaho</td>
</tr>
<tr>
<td>18. Minnesota</td>
<td>3,144,000</td>
<td>44.</td>
<td>Kansas</td>
</tr>
<tr>
<td>19. Alabama</td>
<td>3,087,000</td>
<td>45.</td>
<td>North Dakota</td>
</tr>
<tr>
<td>20. Louisiana</td>
<td>2,257,000</td>
<td>46.</td>
<td>New Hampshire</td>
</tr>
<tr>
<td>21. Maryland</td>
<td>2,101,000</td>
<td>47.</td>
<td>Delaware</td>
</tr>
<tr>
<td>22. Kentucky</td>
<td>2,038,000</td>
<td>48.</td>
<td>Vermont</td>
</tr>
<tr>
<td>23. Washington</td>
<td>2,035,000</td>
<td>49.</td>
<td>Wyoming</td>
</tr>
<tr>
<td>24. Texas</td>
<td>2,056,000</td>
<td>50.</td>
<td>Nevada</td>
</tr>
<tr>
<td>25. Connecticut</td>
<td>2,035,000</td>
<td>51.</td>
<td>Alaska</td>
</tr>
<tr>
<td>26. South Carolina</td>
<td>2,035,000</td>
<td>52.</td>
<td></td>
</tr>
</tbody>
</table>
THE WORKROOM TODAY
MASTER OF ARTS STUDENTS

JAMES PAUL BARRATO, Amherst College, B.A.; Clark University, M.A. in Ed.; Physical Geography; Career Objective: College Level Teaching.

RUSSELL REGGIE CAPPELL, Jr., Dartmouth College, B.A.; Industrial Geography; Career Objective: Industrial Location Consulting; Theses Topic: Industrial Location Theory Applied to Vermont Ski Areas.

KANG-TSOU CHAN, National Tsing Hua University, B.S.; Cartography and Qualitative Methods; Career Objective: College Level Teaching; Thesis Topic: Psychographics.

WILLIAM JACK CLARK, Jr., Concord College, B.A.; Cartography.

RUSSELL WHITNEY DOWELL, Boston University, B.A.; Historical Geography and Geomorphology; Career Objective: College Level Teaching; Thesis Topic: "Early Settlement and Sequent Occupation of Martha's Vineyard, Massachusetts."

HMINDO DOROTHY KAYSER, Wellesley College, B.A.; Cultural Geography, Psychography.

GORDON ALFRED KERRISON, Jr., Wayne State University, B.A.; Economic Geography, Climatology; Career Objective: College Level Teaching or Private Consulting; Thesis Title: "The Influence of the Interstate Highway System on Urban Morphology: Prospects for the Linear City."

STEPHEN P. KOBART, Carroll College, B.A.; Urban Geography; Career Objective: College Level Teaching; Theses Topic: Transportation Land Use.

JOHN B. JACOBS, Jr., Clark University, A.B.; Political Geography; Career Objective: College Level Teaching; Thesis Title: "The Ideal State as an Ecosystem."

JONATHAN ALAN LEACH, Dartmouth College, B.A.; Economic Geography; Career Objective: Industrial Location Consulting on Transportation Planning; Thesis Title: "The Effect of Competition on the Potential Market for High-Speed Rail Service between Boston, New York, and Washington."

BERNHARD MAY, Jr., Miami University (Ohio); Economic and Urban Geography; Career Objective: Economic Development in Underdeveloped Areas.

DOCTOR OF PHILOSOPHY STUDENTS

PAUL A. BLACKFORD, Riverside, A.A.; University of Hawai'i, M.S.; Tropics, Resources, Geomorphology; Career Objective: Research Management or College Level Teaching.

WILLIAM P. CARLSON, Jr., University of Arizona, B.A.; Oregon State College, M.S.; Political-Population Geography.

HERBERT KENDRICK KEMMITT, Duke University, A.B.; Political Geography.

D. DAVID MILLER, University of Durham, England, B.A.; Geomorphology.

ALAN PHILLIP MUIR, Urban Geography; Career Objective: College Level Teaching; Thesis Title: "Spot Live Industrial Buildings in New England."

BERNICE ELLEN NEL, Clark University, A.B.; Career Objective: Secondary School Education; Thesis Title: "The Development of a Curriculum for the Teaching of Map Skills to First Graders by the Use of Aerial Photographs."

RUSSELL W. NOSICKER, Waterloo Lutheran University, Ontario, B.A.; Urban Geography; Career Objective: University Teaching; Thesis Title: "Theoretical Spatial Implications of Mixed Central Place Hierarchies."

LEE EDWIN PHILLIPS, Dartmouth College, A.B.; Marketing Geography; Career Objective: Planning or College Level Teaching and Research; Thesis Title: "Heavy Commodity Indices for Retail Sales in Worcester, Massachusetts."

DAVID A. SMITH, Clark University, A.B.; Economic Geography; Career Objective: Regional and Economic Development Consulting; Thesis Title: "An Analysis of the Characteristics of American Industrial Parks."


A. EDWARD WISEN, Middlebury College, B.A.; Career Objective: Secondary School Education.

W. DAVID WISEN, Middlebury College, B.A.; Political Geography; Career Objective: Private Secondary School Education; Thesis Title: "The Political Geographic Aspects of the New Hampshire Liquor Law."

DENIS WOOD, Western Reserve University, B.A.; Ethnic Topic: Jalisco Geography of Puerto Rico.

NORREN DEVON DENT, Towson State College, B.S.; University of California-Berkeley, M.A.; Cartography.

KENNETH SMITH, Brooklyn College, B.A.; Pratt Institute, M.A.; Regional Geography; Career Objective: City Planning and College Level Teaching.

REPORT FROM THE DIRECTOR

Past annual reports to almost have emphasized our School of Geography's plans for development. This issue of the Woodstock reveals something of the scope and past of this development. New staff appointments; program experimentation; preparation for expansion of the School into the first two floors of the old library; the changing profile of graduate student background and interest; restructuring of the undergraduate major; two large-scale research projects; and continuation of major training programs—all are chief among current operational concerns.

But what is happening within American society and within American education demands reassessment of the content within which Geography functions at Clark and Clark functions on the American graduate school scene. The challenge to redefine the goals of all the components that make up Graduate education; the need to anticipate rather than to respond to forces calling for change; the desire to build on past traditions, not as a retreat into the past but as the base for new departures—these are the broader operational milieus. We hold strongly to the urgency for pointing Geography in socially relevant and scientifically grounded directions. We believe that Geography should be tied to the methods and spirit of other disciplines. We feel that students must become partners in function and spirit in this educational enterprise. And thus it is that joint programs with Psychology, History, and (next year) Government, student-faculty dialogue, recruitment of Negro and other economically-disadvantaged students, and research in perception and foreign-areas development reflect our directions of involvement and help to justify our School's major growth program. We have far more problems to solve than have been successfully met to date, but knowing where we want to go and what we want Geography at Clark to be is more than half the battle.

This June marks Raymond E. Murphy's retirement, after 22 years of service as Professor of Economic Geography. A past director of the School of Geography, and Editor of Economic Geography, Clark and American Geography owe much to Raymond, who has charted new directions in urban geography and has trained a generation of American urban geographers. Raymond has agreed to edit Economic Geography this coming year, while the search for his successor continues. Another loss r that of Robert Scott, Associate Professor of Geography, who will take up a new post in Geomorphology with the Geography department of the University of New Mexico.

On the credit side are the appointments to permanent posts of James Plant as Professor of Geography (Cultural and Philosophy), Richard Feet as Assistant Professor (Economic Geography), and Roger Kasperson as Assistant Professor of Geography and Government. Robert Scott will receive his well-deserved full Professorial status this July. Richard Feet will expand his activities as an Affiliate Lecturer in Computer Science, Carolyn Weis has joined our staff as Research Cartographer, and Dwayne Dyson will spend next year with us as Visiting Lecturer in Urban Geography. We are continuing the search for appointments to permanent posts in Economic, Urban, and Physical Geography to bring our faculty to fourteen in number.

During the coming year, the opening of the new Goodwin Library requires that we develop a full-scale reading room in the Libbey Library. We plan to stock the room liberally with journals and are most anxious to place duplicate full size of English-language geography journals in Libbey. Should any of you be in a position to donate surplus sets to the Workroom for this purpose, you would be most appreciative. Target date for developing Libbey as a reading room in February, 1969, at which time the library's full geography collection will have been reeled to the new Goodwin Library.

J. B. COHEN

GRADUATE SCHOOL AND ALUMNI NEWS
THE GRADUATE SCHOOL, 1967 - 1968


ZELEK LAWRENCE LIPCHER, University of Florida, A.A., B.A., M.S.; Cosmology; Career Objective: College-Level Teaching and Administration.


RALPH A. LINDON, Jr., University of Massachusetts, B.A.; Clark University, M.A.; Political Geography; Career Objective: College-Level Teaching and Research; Thesis Title: "Towards the Definition of the Small State".

HENRY T. MCCLURE, McMaster University, Ontario, B.A.; Clark University, M.A.; Political Geography; Career Objective: College-Level Teaching; Dissertation Topic: "The Political Control of Organization of Massachusetts."

THOMAS CHARLES EDEN, Boston College, B.S. M.A.

RICHARD J. IBRAHIM, Worcester State College, B.S., M.S.

THOMAS JOSEPH LEFAYE, Worcester State College, B.S.


JAMES ANDREW RIZZON, Worcester State College, B.S., Ed., M.S. Ed.

HARRY C. McPHAIL, George Washington University, A.B.; Physical Geography; Career Objective: Research Management.

RICHARD O. REED, University of Rochester, B.A.; Columbia University, M.A.; Agricultural, Urban, and Regional Geography; Career Objective: College-Level Teaching; Dissertation Topic: "Changing Patterns in Present Agricultural Areas as a Result of Metropolitan Expansion."

LINDSAY RUSSELL, City College of New York, B.A.; New School for Social Research, M.A.; Political Geography; Career Objective: College-Level Teaching; Dissertation Topic: Field Theory.

ROBERT W. THOMPSON, Worcester State College, B.S., Ed., Clark University, M.A.; Urban Geography; Career Objective: College-Level Teaching.

ROBERT Z. WEISS, University of Pittsburgh, B.S., M.A.; Urban Political Geography; Career Objective: College-Level Teaching and Research; Dissertation Topic: "The Impact of a Changing Jurisdictional Pattern upon the Urban Landscape."

EXPERIMENTAL TELIGOGY PROGRAM FELLOWS

THOMAS CHARLES EDEN, Boston College, B.S. M.A.

JAMES ANDREW RIZZON, Worcester State College, B.S., Ed., M.S. Ed.

IRVING SCHMIDT, University of Connecticut, B.A., M.A.

JAMES ARTHUR SCHMIDT, Boston University, B.A., M.A.

JACK BURKE, Colgate, B.A.; Harvard University, M.A.T.

GEORGE ARTHUR TAYLOR, Alabama State College, B.S.; North Adams State College, M.S.

DAVID C. TITUS, University of Vermont, B.A., M.A.

As a part of a continuing effort face the problem of effective communication through the use of maps, the course in map design during the fall semester found some students involved in programs of psychophysical research. The principles and methods of experimental psychophysics can be applied to maps, and thus the cartographer is able to "test" the efficiency of his product. These efforts were organized, first, to introduce the student to the basic aspects of psychophysical testing, and, second, to fill a gap or two in our understanding of various map reading problems. Many papers dealt with point symbols. Two students, Joseph Pearson and Raymond P. Yarrall, dealt with design for maps using graduated circles. All A. Poussin's research on the selection of values of different shapes. Hanley's other attempts to determine those points on the border of Massachusetts where "information" is concentrated. In order to ascertain which points are critical for area identification and thus should be included in a highly generalized representation of the state. The work of Roderic R. Snow on the problem of texture and the figure-ground relationship is reported elsewhere in this volume.
### FACULTY NEWS

**BURTON R. COHEN**

Dr. Cohen's activities for the past academic year involved a variety of enterprises connected both with the School of Geography, the Graduate School, and outside educational responsibilities. Part of the summer was taken up with a trip to Hawaii for a conference dealing with the general problem of educational innovation. Then came a brief vacation with his wife and two daughters on the Cape Breton Islands. In September his responsibilities as Dean of the Graduate School were assumed, as well as the task of pursuing the development of the School of Geography with the assistance of the National Science Program Departmental Development grant that was awarded in June, 1967. Major professional responsibilities for the year included chairmanship of the National Academy of Sciences-National Research Council Committee on Geography, and serving as vice-chairman of COMPASS (The Consortium of Professional Organizations for the Study of Special Teaching Improvement Programs). Meetings with these committees, as well as with the National Institute for the Training of Teachers of Geography, the American Association of Geographers Council and National Science Foundation programs, involved trips to Washington, New York, and Chicago. Visits were made to Florida, Texas, California, Colorado, and Arizona. In January, a visit was made to the Army in South Vietnam in connection with planning for a Clark Summer 1968 OBA Institute. Dr. Cohen's outside lectures included appearances at the U.S. Naval War College, the American War College, and the American Association of Colleges for Teacher Education. Geography Departments visited included Kent State, the University of Chicago, and North Carolina at Durham. In the spring, his appointment to a National Advisory Committee on the Teaching of Teachers initiated a series of visits to a number of universities concerned with this problem. 

**Problem and Trends in American Geography**

which was edited by Dr. Cohen, appeared in January; also published was an article on "The Contemporary Geopolitical Setting: A Proposal for Global Geopolitical Equilibrium" in Essays in Political Geography, edited by Charles Fisher, Routem, 1967. Research in Political Geography was slowed by the burdens of two administrative positions at the university. However, work continues on a new text, with emphasis upon national perception and political systems.

**RAYMOND E. MEINSER**

Dr. Meinsner's manual, Exercises in Urban Geography, designed particularly to be used with the American City: An Urban Geography, is to be published by McGraw-Hill this year. On July 8 and 9, he will take part in the urban geography session of an Institute for Advanced Geography (IGSA) being held at the University of Oklahoma, Norman, Oklahoma. His part will consist of informal discussions and two lectures.

**OFFICIALLY**

He will retire at the end of the present year, but has agreed to continue editing American Geography until a successor is found. He is attempting to make the July issue of the journal a special ISO issue, concentrating particularly on India and Pakistan. Present plans call for making extra copies of the issue available for free distribution at the November meeting of the ISO in New Delhi.

**HENRY J. WATSON**

Dr. Watson spent last summer at two institutes, the first in Bakersfield, California, at Fresno State College, and the second at Michigan State University, where he plans to return this coming summer. In addition, he taught geography at the first summer session at the University of Colorado.

During the past academic year, he acted as a consultant to Grolser Society Incorporated and to local (Starkville and Newton) school systems in curriculum development and revision.

Among his publications, he reports sets of analyses on the World, North America, and South America, and a set of three books in the series, "Living in Our Times." His articles have been "Geography in the Curriculum," in Occupational Forum, and "The Increasing Significance of Relative Location," in Journal of Geography.

He plans to attend the International Geographical Union session of the Commission on Teaching, in Madras, India, in December, along with the I.G.U. session in New Delhi.

**ROBERT P. SWEAD**

During the fall of 1967, Dr. Swead was a visiting professor at the University of New Mexico in Albuquerque. In the Spring of 1968 he returned to Clark to teach three courses: Principles of Geomorphology, a regional course on South Asia, and a Seminar on Coastal Geomorphology.

During the Spring, he worked on several research papers dealing with the West Pakistan coast plus preparation of an Atlas of Land Features to be published by John Wiley and Sons, 1969. Preparation was also made for field work along the south coast of Iran from July 1968 through January 1969. The trip to Iran, planned for the fall of 1967, had to be postponed one year.


He has accepted a permanent position as Professor of Geography at the University of New Mexico to be effective in February, 1969.

**JEROME ANDERSON**

SUMMER, 1967, was divided between conducting a summer institute in Geographic Investigation and Analysis for nine undergraduates from small southern colleges, and travel (California, Northern Mexico, Washington, Stilich). While in Seattle, Dr. Anderson attended a conference on The Agrarian Problem in Light of Communist and Non-Communist Experience, at the University of Washington.

The fall witnessed publication of "Fodder and Livestock Production in the Ukraine: A Case Study of Society Agricultural Policy," in the East Lakes Geographer, Vol. 3, October, 1967; information gathered on the reconstruction of the Linz, Austria, fortification in the Western area in conjunction with the field course; and a guest lecture at the University of Kansas.

The January study period was devoted to a very successful three-week field camp in Barranquitas, Puerto Rico, for 22 first-year graduate students and experienced teacher fellows. Located near the Cordillera Central, Barranquitas proved an ideal location for carrying out a wide variety of investigations in agriculture, urban, and physical geography. The lore of Latin American is growing with exposure. Spring vacation was devoted to conducting a study of urban morphology and urban imagery with graduate students Dena Mood and Laurel Rankin in San Cristobal los Coals, Chiapas, Mexico.

**JAMES N. BLAUT**

Dr. Blaut has been "commuting, as usual," to Puerto Rico—and this summer will go on to Venezuela. In his "Deep City Canal," he has planned institutes this summer in the Rio de Janeiro for the summer, followed by field work in the Vancanelo Guayana. He is, meanwhile, continuing research on environmental perception in children, with his wife, Ms. Blaut, and Professor George F. McCreary, Jr., a major project in this area is now underway and one paper, "Environmental Mapping in Young Children," has been completed.

**MATTHEW J. ROSSER**

Dr. Dougan completed his Ph.D. dissertation, The Dynamics of City Growth: An Historical Geography of the San Francisco Central District (1850-1914), in September and received his degree in December, 1967. His introductory course, Approaches to Geography, was a "full house," and nine members of the class were taken to Dr. Dougan's office for those three weeks of field work in January. A report, "Rainfall and Soil Moisture," will publish some of the results. A monograph arising from the previous Independent Study Project (1967)—"Hypereconomy and the Town"—is in press. He led a seminar on the Dynamics of Central District Growth at the University of Tennessee this June.

**WILLIAM A. KELLEHER**

Dr. Kelleher rejoined the staff in September as Assistant Professor of History and
Geography. In addition to teaching courses in American intellectual history and historical geography, Dr. Eshel has served periodically this year as an administrative director of the Experienced Teacher Fellowship Program in history and geography. He has completed two scholarly articles this year on the historical geography of Harlan N. Barrows and the other on Buchanan’s land policies, as well as a popular article on France’s 1809 visit to Clark.

Dr. Eshel is currently engaged in research for a book on American geography in the 19th century and in planning for new graduate and undergraduate programs at Clark. The summer will be spent in research, limited participation in the summer program for experienced teacher fellows, and travel to certain historic sites in the South Atlantic states.

David Eshel

Mr. Fowl has joined the staff as visiting associate professor for 1967-68. He is permanently on the staff of the Geography Department, Hebrew University of Jerusalem, Israel, where he earned his degrees (M.Sc. 1960, Ph.D. 1964). In 1966 he was awarded a research associateship for 1966-67 by N.S.F.-N.I.H. He worked in research on statistical models in climatology in the U.S. Army lab in Natick and on meteorological instrumentation in the Department of Meteorology at M.I.T. This year, he has taught courses in climatology and quantitative methods and carried on research in Natick with the cooperation of graduate students Barry McPherson and Karl Chang of Clark, as well as Professor Joseph Sage of W.P.I.

Last September he attended a seminar on Nforko chains in Meteorology held in the Air Force Cambridge Research Lab in Bedford, Mass. During the second semester he taught a methodology course in the Department of Geography at Boston University and in May he will present a paper on the production of temperature-humidity at the American Meteorological Society conference on agricultural meteorology in Ottawa, Canada.

He expects to return to Israel this summer.

Richard Field

Mr. Fowl joined the faculty in September, having served on the graduate school at Berkeley, and has spent all his free time this year completing his Ph.D. dissertation on the spatial expansion of agriculture in 19th century America. He contributed a brief note on "Climate Theory" to the Amara Commentary, A.A.A.A.C., Vol. 57, No. 4 (December, 1967), pp. 810-811.

Dietrich

Dr. Stoe assumed a joint appointment to the Psychology and Geography departments last fall and is a fellow with the Helen W. Kivett here, as well as being a research affiliate at M.I.T. In the fall he is living in Boston’s Back Bay.

During the last year, Dr. Stoe delivered five guest lectures at six other universities and attended various areas to Landscape, Journal of the American Institute of Architect, and The Vue des de la Societe d’Institut de Francia. His research on Mexican urban imagery recommended on April’s supplementary of other socials of psychological characteristics of physical form.

Charles F. McCleary, Jr.

After participation in two seminars and a two-month stay in Vancou (working on the unfinished dissertation), Mr. McCleary introduced course work both in various technical aspects of map production and in map design (covered on elsewhere in this volume). Attention was devoted also to the map collection, where a corps of students began a large-scale program to reorganize and catalog the holdings, as well as to the production of maps and graphs for books, reviews, and articles. The most ambitious effort undertaken was the preparation of maps and address coding for the 1970 census.

"Street time" veterans were attendance at various cartographic meetings, planning for the new space which will be developed in the old library, the initiation of an information storage and retrieval system (see the note elsewhere in this volume), and an occasional minute devoted to the problems of documentary mapping.

On the home front, John A., his second son, joined the family.

Richard A. Warren

Mr. Warren is instructor of computer programming at Clark University and Worcester Junior College while pursuing a Ph.D. program in resource planning at the University of Massachusetts in Amherst.
undergrad major..." and a staff which now numbers 20 and is due for expansion by 1 to 2 members annually. From January 1969, the Library is currently directing a project in the remote sensing of grazing lands with a long-term test site designed to produce assessment of world crop conditions in the event of fire phenomena in Latin American savannas as related to the potential for livestock potential. He is serving on the I.A.G., National Council and the Geographical Advisory Board of the London Map Record for Educational Teaching Service.

EUGENIUS K. HUSS (M.A. Clark 1946) is an Associate Professor of Geography at the University of Colorado, Boulder. He received his M.A. and Ph.D. degrees from the University of California, Berkeley, in 1944 and 1949, respectively, and has been teaching at the University of Colorado since 1950. His research interests include the geography of the American West and the development of geographic education. He has published numerous articles in professional journals and has served on various editorial boards. He is a member of the American Association of Geographers and the Association of American Geographers.

GERALD L. NELSON (Ph.D. Clark 1956) is a Professor of Geography and Head of the Department of Geography at the University of Minnesota. He received his B.A. and M.A. degrees from the University of Wisconsin-Madison and his Ph.D. from the University of Chicago. His research interests include the geography of the American West and the development of geographic education. He has published numerous articles in professional journals and has served on various editorial boards. He is a member of the American Association of Geographers and the Association of American Geographers.
participated in experimental design and testing work for partially-sighted children. He has also explored potential applications of wave sensing (primarily infrared) to biological sensing. He has published numerous articles and has consulted with many organizations on wave sensing techniques.

VICTOR W. SIM (M.A. Clark 1932) is Associate Professor and Chairman of the Biology Department, University of Western Ontario, in London, Ontario. He has recently been appointed to another position, which will involve the construction of a computer-oriented regional data bank of the local four-county area.

ROBERT B. SIMPSON (M.A. Clark 1913; Ph.D. Clark 1942) is Associate Professor of Geography at Dartmouth College. In addition to his teaching duties, he is continuing his research into tundra ecology, with emphasis on salamanders. He teaches a short course at the University of Michigan last summer to bring himself up to date on infrared sensing.

HELEN L. SMITH (Ph.D. Clark 1938) is Lecturer in Geography at Chulalongkorn University in Thailand. She is an excellent and well-documented consultant for the Stanford Research Institute on Village Information Systems - Thailand (VIST). The project, which concerns Thai geographical place names, has been completed. Her new project, "Changes and Trends in Thai Vegetable Production," will be published in the Journal of the State Society.

AURORA R. SORRELL (M.A. Clark 1946) is Head of the Geography Department at Government Post-Graduate College.

CHARLES B. SORRELL (Ph.D. Clark 1952; M.A. Clark 1953) is Professor in the Department of Geography-Geology at Western Michigan University in Kalamazoo. He is also the Director of the University Honors Program there.

R. PAUL TERWELL (Ph.D. Clark 1949) is Professor of Geography at Western Kentucky University in Bowling Green. His recent article, "The Role of Prehistoric Peoples in the Southeast," was accepted by Journal of Geography for publication. In 1967, "Papier and Papierube: A Historic Indian Village in the Southeast, 1677-1967" was published in the April issue of the Journal.

CRAIG C. TUCKER (Ph.D. Clark 1972) is Vice-President and Executive Director of the New York and New England Institutes. He is a real estate consultant with a particular interest in the construction of new buildings.

LESTER WINTERBERG (M.A. Clark 1962) is Regional Director of Camden Fleisch & Associates.


KLAAS M. VAN DER WAAL (Ph.D. Clark 1959) is Professor and Head of the Geography Department at Government Post-Graduate College.

CHARLES B. VANDERBILT (M.A. Clark 1959; Ph.D. Clark 1963) is Professor in the Department of Geography-Geology at Western Michigan University in Kalamazoo. He is also the Director of the University Honors Program there.

MAURICE W. VITALAS (Ph.D. Clark 1953; M.A. Clark 1951) is Professor of Geography at California State College in Los Angeles. He is also the Director of the University Honors Program there.

MILES W. WEAVER (Ph.D. Clark 1950; M.A. Clark 1941) has recently sold his interests in a business venture. He is looking for an administrative and teaching position in junior or community college. His wife, Carol, is now at Yale and plans to interview Dr. Van Cleef this spring for possible entrance in 1968.

ROBERT L. WEAVER (Ph.D. residence 1964-66) is on leave from the Geography Department at Harvard University. He spent the summer of 1967 doing field work for an urban sociological study of Nashville, Tenn. The fall semester was devoted to teaching at Harvard. He spent part of January 1968 in Puerto Rico with Peter Szabolowsky (M.A. Clark 1964) experimenting with 30 students with a view to establishing a field course for credit in the future.

DORIS W. WEST (M.A. Clark 1949) is completing her Ph.D. residence requirements at Rutgers University and will be teaching at Rutgers-West in the coming academic year.

SEYMOUR J. WERTH (M.A. Clark 1943) is in Contact Specialist for the U.S. Government in Philadelphia, Pa.

HARRISON W. WEBER (Ph.D. Clark 1939) is Director for the Center for Urban and Regional Studies at VPI in Blacksburg, Va. He spent a total of two years and eight months (three visits) in Turkey from 1960 to 1962, where he worked with the Turkish government on a project aimed at improving the economy and development of some of Turkey's rural areas.

MART CAMPBELL YOUNG (M.A. Clark 1943) is a Research Geologist in the Branch of Geologic Survey, U.S. Geological Survey, part-time. She is President of the Amateur League of Women Ecologists. She uses her geography background in her league studies, which include metropolitan Chicago problems (urban and physical geography), water resources, and foreign economic policies (economic and political geography).

DAVID C. WENSLEY (Ph.D. Clark 1940) is Professor of Geography and Director of the Survey of the Government's Department of Geography at Indiana University of Pennsylvania. He is working on a multi-volume study of economic development in Puerto Rico and Jamaica. He continues to edit The Pennsylvania Geographer and is also editing a Handbook for Town Planning.

L. J. ZIERTE is with the Planning Branch, Region V, Department of Housing and Urban Development.

Under the direction of Dr. Van Valkenburg, a series of special lectures were arranged for the Department of Geography. Each of the 20 or so special candidates, and geographers from other institutions, were invited to speak. The following is a list of the participants and their topics:

Judy M. Blass
Hans Meowel
Harold Carter
George Dewey
Howard L. Cazmir, Jr.
B. L. Hechtze
Fred E. Lukerson
J. Richard Peet
Gerald Buxton
David Stoe
Samuel Van Valkenburg
Michael Volkenfels
Robert Weiner

Under the direction of Dr. Van Valkenburg, a series of special lectures were arranged for the Department of Geography. Each of the 20 or so special candidates, and geographers from other institutions, were invited to speak. The following is a list of the participants and their topics:

"De-Natured Geography"
"Mission to Indonesia"
"Growth of the City System in Wales"
"Problems in Environmental Quality: A Case Study"
"On the Development of Transportation Networks in Brazil"
"On the Images of Australia During the Nineteenth Century"
"On Place"
"Location Theory as the Central Integrating Theme in Economic Geography"
"Scaling of Location Preferences"
"Cognitive Maps and Human Orientation: Some Preliminary Ideas"
"A History of Geography at Clark University"
"On the Hierarchy of Central Places"
"The Impact of a Changing Jurisdictional Pattern Upon the Urban Landscape"