CHAPTER 18

"When we are collecting facts," he replied, "especially when we are absolutely in the dark, we are not bound to consider their relevancy in advance. The length of this rope is a fact and that fact might acquire later some relevance which it does not appear to have now. There is no harm in noting irrelevant facts, but a great deal of harm in leaving any fact unnoted. That is a general rule."

. . .R. AUSTIN FREEMAN
Pontifex, Son and Thorndyke

I

The foregoing techniques of analysis with the exception of the content analysis, have dealt exclusively with the underlying network of points and lines, the skeleton of the map. This came to be, because the points and lines appeared together on a single sheet of paper, while the areas appeared on tracing paper overlays. A second reason had to do with the nature of the analysis of the skeleton, which involved no measurement, but rather mere counting. The counting of the areas, while an admittedly interesting task, could never be more than part of the obvious task including measurement of the actual size of the areas.

For the analysis, I soon found it necessary to establish criteria that would separate areas per se from each other and from other non-areal phenomena. These boiled down to three rules:

1) Rivers and other "fat" line phenomena were to be neither counted nor measured as areas, no matter how areal they might appear.

2) Areas that were not completely bounded by drawn edges were to be counted, but not measured. Even when a drawn edge intersected the edge of the sheet, it was not measured, since we did not know its total extent.

3) Each bounded area was to be counted and measured as a separate entity, no matter how much it overlapped another area. Thus it would have been possible to have drawn a number of areas such that the total area included exceeded the total paper surface.

TABLE 18.0

NUMBERS OF AREAS

SESSION	# RESPONDENTS	TOTAL # AREAS	AVERAGE # AREAS
London 1	27	140	5.19
London 2	16	93	5.81
London 3	15	84	5.60
London 4	4	27	6.75

SESSION	# RESPONDENTS	TOTAL # AREAS	AVERAGE # AREAS
Rome 1	24	88	3.67
Rome 2	20	89	4.45
Rome 3	16	73	4.56
Paris 1	12	63	5.25
Paris 2	6	34	5.67
Paris 3	5	33	6.60
Paris 4	3	26	8.67

Despite decreasimg sample size in each city, there is a general increase in the average number of areas demarcated. In general there is a rise from session one through session three or four bearing out our contention that areas are the last to be elaborated upon. This data has shown up in the content analysis already, though in truncated form (only those areas mentioned by 12.5% or more of the kids were included in that analysis). The areal question was twofold. Was the amount of paper being covered growing in size or shrinking in size? And was the average size of each area drawn growing or shrinking? I had no expectations, for I was capable of postulating no reason for a systematic growth in the size of individual areas, though I did anticipate seeing a growth in the amount of paper covered by areas. The obvious conclusion of the process of geographic cognition is to be able to divide the entire area in question into discrete space-filling areas. Were our kids moving in that direction? Was it a valid hypothesis anyhow? The answers to these questions are found in Table 18.1.

TABLE 18.1

SIZE OF AREAS AND AMOUNT OF PAPER COVERED (in square inches)

SESSION	# RESPONDENTS	TOTAL AREA FOR ALL MAPS	AVERAGE TOTAL AREA PER MAP	AVERAGE SIZE OF AREAS
London 1	24	313	13.0	2.23
London 2	16	209	13.1	2.25
London 3	15	155	10.3	1.84
London 4	4	77	19.2	2.85
Rome 1	23	174	7.6	1.97
Rome 2	16	115	7.2	1.29

SESSION	# RESPONDENTS	TOTAL AREA FOR ALL MAPS	AVERAGE TOTAL AREA PER MAP	AVERAGE SIZE OF AREAS
Rome 3	14	164	11.7	2.25
Paris 1	11	71	6.5	1.13
Paris 2	6	43	7.2	1.27
Paris 3	5	47	9.3	1.41
Paris 4	3	42	13.9	1.61

Fundamentally it turns out that the average size of areas increases generally from the first session to the last session (last column on the right), though there are the anomalies of the decreases from London 2 to London 3 and from Rome 1 to Rome 2. These anomalies do not parallel the growth in the number of areas for Rome whereas they do for London. While the number of areas grew in Rome their average size was shrinking, and the number of areas was decreasing in London while their size was decreasing as well. But these observations do not seriously disturb the overall tendency shown, the average size of areas increasing in size through time. Of course, the fact that the average size of areas increases emphatically does not mean that, for instance, Hyde Park grew through each session, for we don't know that this increase in size is true for any particular area, only for areas in general.

Furthermore this trend on the part of average size of areas is paralleled by a trend in average size of total area per map. On the first London map an area of 13 square inches was demarcated on the average, but on the fourth London map an area of 19.2 square inches was demarcated. This general tendency for growth is also true for Rome and Paris, except for the anamolies noted above in respect to London and Rome.

(It may be observed that the number of respondents varies from Table 18.0 to 18.1. This is due to the fact that we counted unbounded areas though we didn't measure them. Thus those kids who showed only unbounded areas were not included on Table 18.1.)

Now my attention turned to the kids. What could we learn about them from the areal analysis? I ranked all the kids as to number of areas per map set, and then again as to the total amount of paper covered per map set. This resulted in twenty-two sets of rankings. The rankings were not comparable because a kid often appeared on one and not on another, because the number of kids per ranking varied widely

and because of the often distressingly small size of the sample. If there was any order in the data we couldn't find it. Kids wandered up and down the rankings as though they were lost. Several attempts at averaging found all the kids in the same place. There was no systematic variation in the rankings from session to session. And so on. Nothing.

Yet I was unwilling to assume that there was no organic link between the use of areas and the kids themselves. I turned my attention to lists of largest areas and made a remarkable discovery. But before I can tell you about that, I must describe the overlay analysis.

* * *

It must not be forgotten in our concern with points-lines-and-areas that there was another type of information shown on the maps. This appeared on separate sheets of tracing paper and yet related specifically to the points, lines and areas underneath them, for the kids were all along using the extensive vocabulary of Environmental A to describe and annotate the spatial world drawn. These overlays have already proven their worth, though you have not been privy to their role. They have been used to elucidate obscurities on the skeleton and on the areal overlay. Thus, often a question arose as to the nature of a given point or line, generally unlabeled. In this case one would look to the linguistic overlays to search for further clues. There unidentified points resolved themselves into traffic circles or shops or hotels or restaurants, bars, museums and so forth, while lines were explicitly footpaths, streets, superhighways, rivers and what have you. They were particularly invaluable in describing the character of areas, and it was here that things began to fall into place.

Of the 213 maps of London, Rome and Paris, 65% of them were accompanied by descriptive overlays. No one, for example, was requested to use the Environmental A language in the first London session, to avoid an overload on the first try. Further, there was an attrition in the use of the language at subsequent sessions for some kids. A tired kid would draw the skeleton. Maybe he would complete the areal overlay, but energy was needed to complete four descriptive overlays. Thus, these overlays suffered most drastically from the caprice of the moment, from fatigue, and what have you. This explains the fact that only 65% of the maps were accompanied by overlays.

Each of the 138 sets of overlays was subjected to a quantitative analysis. Counting each isolated symbol, it was readily discovered that there was a total of 6,216 instances of symbol usage on the 138 maps, or an average of 45 symbols per map. This does not mean 45 different

symbols per map, but rather 45 instances of the usage of all symbols on the map. The next analysis performed determined the percentages of the different classes of symbols used. Reference to Chapter 3 will show you the full range of Environmental A symbols and show the manner in which they were broken down into four groups: point, line, area, and attributive symbols. These symbols were used in the same amounts from one map session to the next, but there was an increasing use of the attributive symbols and a decreasing use of other symbols, particularly the areal symbols through the mapping sessions. This change did not take place within a given city but over all the map sessions. Displayed in Table 18.2 are the percentages of each class of symbol for each map session.

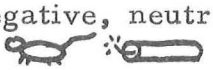
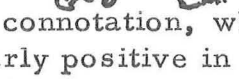
TABLE 18.2

SYMBOL USAGE BY CLASS AND MAP SESSION

SESSION	% POINTS	% LINES	% AREAS	% ATTRIBUTES
London 1	37%	19%	17%	27%
London 2	36%	17%	17%	32%
London 3	35%	18%	14%	33%
London 4	27%	22%	12%	39%
Rome 1	42%	11%	14%	33%
Rome 2	33%	17%	15%	35%
Rome 3	35%	17%	13%	35%
Paris 1	20%	20%	19%	41%
Apris 2	20%	22%	12%	44%
Paris 3	19%	23%	11%	47%
Paris 4	19%	21%	6%	54%

I find the results shown above to be rather intriguing, and especially relevant to the redesign of Environmental A. The area symbols never carry their weight. Some of this may be associated with the simple fact that there are more points and lines than areas, but a great deal of it has to do with the time it takes to produce a single area symbol. As we created the symbol system it seemed intelligent to make the line symbols to a certain extent a linear sequence of point symbols and the area symbols a conglomeration of line and point symbols. But this also meant that the area symbol was ipso facto more complex than the symbols of the other classes. The small and decreasing role they

played as seen above is clear evidence of the need for a different approach to the design of area symbols for use in the drawing of sketch maps. The line and point symbols are used inconstantly but within a certain range, and reflect, to a substantial degree the map element emphasized in a given city. Thus line symbols are most prominent in Paris—but the general emphasis was on streets in Paris, whereas Rome shows a dependence on point symbols greater than in any other city—but points were emphasized in Rome. And so on. However, the use of attributive symbols shows a steady increase throughout the map sessions. In absolute terms the increase is even more marked. There is no mystery about this. In the first place the symbols were succinct, essentially point symbols. In the second place they were more powerful linguistic symbols, symbols whose import was more apparent, less abstract than in any other class of symbol. In the third place, and most importantly, they allowed the kids to make value judgements about the items in question. This is the only chance the kids had to do this graphically, and pointedly. They could express opinions on the stereomatrices and the adjective checklists, but only in a round-about implied fashion. Here they could speak to the point in language that was "graphic" in both senses of that word.

Let's take a look at the symbols in greater detail. There are 52 items of judgement listed alphabetically in the attributive section of Environmental A. Some of these employ the same symbol, so there are actually only 44 different symbols. Each of these symbols has associated with it a connotation: positive, negative, neutral. Some of the symbols are obvious in their connotations:  were, for instance, clearly negative in their connotation, while  and  , were clearly positive in character. Some of them went both ways. The division sign, for example, was defined as "Ancient: not necessarily old in years, but old in spirit." When this symbol was found in conjunction with a drawing of a rat and followed by the picture of a man (spelling out "dirty old man"—common in Italy) the connotation of "old" was negative. But when it was used to describe the Roman Forum, while it might have meant it negatively, it was too neutral an association to allow me to consider the division sign a negative sign. Each symbol was assigned a valence, 1 for a positive connotation, -1 for a negative connotation, and 0 for a neutral or ambiguous connotation. We are actually being terribly scrupulous here, for we learned so much about the kids' attitudes toward a sufficient number of phenomena that we could assign a valence to non-attributive symbols. Thus, given the isolation of factories in the pre-departure Ideal City maps, we would be entirely justified in assigning to a factory symbol a negative weight. The opposite might be said about parks. Further, the constant association of positive attributive symbols in conjunction with park symbols and the

constant association of factory symbols with negative attributive symbols, reinforces this feeling of justification. Nonetheless, we have not done so, simply because the symbols themselves were not absolutely explicit.

Using the valences described above it was a simple matter to assign a valence to any map sheet by simply summing the valences and taking the average. Thus the existence of a 1, a -1, and an 0 would result in an overall assessment of 0. The positive has balanced the negative and the neutral concurs in an overall assessment of neutrality. All maps were assessed in this manner and a map valence derived. These valences were calculated for each of the 138 maps using attributive symbols. The data could be used in several ways. The kids could be ranked as to their attitudes session by session. This was done. No clear propensity resulted from this analysis, but certain things became clear. Often well-integrated maps showed a positive valence, while fragmented maps bore a negative valence. Many of the maps with remarks like "I didn't want to draw a map today because I was not feeling well" also showed negative valences. Thus, on a session by session basis, the valences clearly related to the nature of the day for each kid, within certain tolerances. But the data can also be aggregated to provide an assessment of each city. These results appear as Table 18.3.

TABLE 18.3

VALENCES FOR LONDON, ROME & PARIS

	Number of Maps Analyzed	Valence
London	58	0.3
Rome	57	-0.4
Paris	23	0.7

There can be no question about how the kids liked the three cities in which they spent the most time. Rome was positively disliked. London was positively liked. Paris was genuinely loved. Something might be said about the attitude towards Rome. All through Italy, nay, long before we arrived in Italy, the girls exhibited definite concern about the manner in which they would be treated by the male portion of the Italian population. This apprehension manifested itself at the first opportunity in Venice where every glance accorded a girl was interpreted as an actual advance. Girls were approached by Italian men, and there

were a couple of distinctly unpleasant incidents (the first occurring on the first launch trip into Venice), but the girls developed an unwarranted attitude that amounted to paranoia about the attention they received from Italian men. Now, I won't say that the heat in Italy didn't bother them, or that the distance of the dorms from downtown Rome didn't bother them, BUT BEYOND THESE LAY A FEAR OF WALKING THE STREETS OF ROME ALONE BECAUSE OF THE PERCEIVED SEXUAL AGGRESSIVENESS OF ITALIAN MEN. This is not to comment on the truth of their belief. The fact that they believed it was sufficient. The negativism of the Rome image was, however, to more than this. Italian cities in general, and Rome in particular, were also seen as dirty. The contrast with London in this respect is impressive. London is covered with pictures of brooms: clean, clean, clean; but Rome is covered with pictures of rats and litter: dirty, dirty, dirty.

There are a couple of points about this. One of them is the ability to come to a consensus of opinion regarding a city on the basis of subjective assessments. The adjective checklist was designed to do this, but Environmental A provides another method and check, in addition to permitting these likes and dislikes to be specified for particular locations. Thus, Environmental A enables us to discuss preference with a truly spatial framework. The other is the obvious, but unexploited, possibility of re-examining all the previous analyses in the light of this subjective information. We now know which maps are positive and which are negative. Did these attitudes effect other aspects of the maps? You can be sure that they did. You can be sure that every map was shaped to a certain extent by the attitude of the mapper toward his subject. It affected his energy level, and his concern for care and accuracy, and his amount of detail, and even seemingly little things—like whether to erase a mistake or instead to cross it out.

A brief summary of the use of the Environmental A map notation language is in order before moving on:

1) The language was used on 65% of the maps collected in London, Rome, and Paris, suggesting a high level of acceptance.

2) The point and attribute symbols were more popular than the line symbols which were more popular than the area symbols, suggesting the need for redesigning the areal symbols, and perhaps for working over the attributive symbols to make them an even sharper tool.

3) The attributive symbols were either positive, neutral or negative in character.

4) By studying the relationship between the attributive symbols and other symbols it would be possible to assign values to a large number of non-attributive symbols.

5) By assigning a valence to an attributive symbol, it is possible to assess the attitude toward a particular location on the map and toward the environment as a whole. Thus the sketch map becomes an explicit tool for the evaluation of environmental preferences.

* * *

So here I was with a bunch of valences and a bunch of large areas. Could they be combined in any way to make sense out of the areas displayed on the map surface? I realize that I could assign a valence to each area and see what that would show. At first the results were unclear. Some of the largest areas had positive valences and some of them had negative valences. Very rare was a large area with either no attributive symbol, or with a resulting neutral valence. In fact, most of the areal valences were extreme. Either close to -1 or close to 1. But what was the key to unlock these results? When it first became apparent to me, it was like a rainstorm cutting through the soggy heat of a hot summer afternoon: if a large area had a negative valence, then the map had a negative valence; but if a large area had a positive valence, then the map had a positive valence. The correlation needed to test for significance for it was a perfect parallel. That is, every positive map had a positive valence in the largest area, and every negative map had a negative valence in the largest area.

The number of these parallels becomes important. Only 137 of the total 312 maps of London, Rome and Paris included totally bounded areas, and only 138 maps employed areal overlays. These two sets of maps did not overlap completely. The size of the population that both drew bounded areas and used the overlays was a scant 89, so we were forced to compare areas and valences on only 89 maps. However, these maps included the efforts of twenty-three kids and were drawn from all eleven map sessions. Thus the maps used in this particular study were highly representative of Group L, were drawn from the entire length of the tour, and amounted to a sample size of 89.

The significance of the fact that every positive map had

positive showing in the largest area and vice versa is rather enormous. Examine Table 18.4. Look at that list of places. What are the characteristics of these places? Bluntly, they are not characterized by anything

TABLE 18.4

LARGEST AREA (ON A GIVEN MAP) ON THE FIRST LONDON MAPS

AREA	% OF TOTAL AREA DEMARCATED	% OF PAPER SURFACE COVERED
South Bank	45%	14.8%
Piccadilly	67%	4.2%
Area Around Dorms	16%	9.6%
Shopping	28%	6.7%
Westminster	60%	4.0%
University	37%	3.2%
Petticoat Lane	51%	.9%
Shops	46%	1.1%
Hyde Park	57%	9.0%
Factories	65%	7.3%
Middle	65%	8.6%
Shops	45%	3.6%
Shops	100%	3.2%
Piccadilly	48%	1.8%
Soho	55%	3.1%
Shopping	63%	1.7%
Carnaby-Oxford	53%	20.6%
Shopping	49%	7.0%
Museum	32%	2.4%
Historic	41%	2.5%
Bloomsbury	44%	5.5%
Shopping	33%	14.1%
Hyde Park	24%	3.3%
Piccadilly	86%	3.1%

in particular. They are drawn from the entire possible range of areas. Some of them refer to specific object-like areas: Hyde Park. Others refer to political units: Westminster. Others to neighborhoods: Bloomsbury. Others to vaguer areas with locational anchors: Carnaby-Oxford. Still others are generic: shopping. Or refer to landuse in the traditional sense: factories. Or are unintelligible: middle. They are not all parks or all industrial or all anything. THE LARGEST AREAS RUN

THE FULL GAMUT TYPES OF AREAS.

Okay. Now let's check out the implications of this discovery. Take a map from the third London session that had as its largest area something called "Factories." This area accounted for 65% of the total area demarcated on this map, and for 7.3% of the paper surface (which was the seventh largest area on the list). Now it so happens that this area has associated with it an attributive overlay containing a picture of a rat (dirty), a set of inpointing arrows (crowded or congested), and three minus signs (the most explicit negative symbol). Period. The valence of this area is -1. But there were five other areas drawn on this map: hotels, dorm areas, university area, park and medical area. The five other areas all had either neutral or positive valences. But from one area, despite the evidence of the other miniscule areas, we can leap to the valence of the map as a whole. The entire map earned a valence of -.2, not terribly negative, but certainly far from positive. (In case you're confused by the fact that only one area had a negative valence and five had neutral to positive valences and yet the map as a whole had a negative valence, I might point out that in assessing map valence I considered the attributes applied to all points and lines in addition to areas; in addition to which, the negativism of the largest area was very negative, five negative symbols being found there alone.)

What does this mean? It means that there is a connection between the assessment of the largest area and the map as a whole, as though the attributes of the largest area were capable of casting a pallor or a light on the city as a whole, or as if the city were impregnated by the attributes of this area. After all, the largest area discussed above was not simply the largest area, but far and away the largest area. So the suggestion of power of the largest area is not untenable. But in a way it is begging the question to suggest this. A more likely relationship is that the general attitude toward the city as a whole finds its expression in the largest area, that in effect, the general attitude toward the city creates the largest area. The argument might run something like this.

Here is a mapper, mad at London for whatever reason (bad food at the dorm, poor sleep the night before, a hangover, disappointment with some "sight," anything at all), and this mapper is drawing a map. Having created the underlying skeleton (which leaves less room for emotionalism), the mapper attacks the areal overlay. A couple of small local areas are sketched in, when the mapper begins to draw the areas of factories. As the line is being traced the kid realizes that he's mad and starts to take it out on the city. How? Not by exaggerating the nice things about the city. No, by exaggerating the bad. So the "Factories Area" grows and grows until it accounts for a large portion of all the

areas drawn, for a larger portion than any other area. Along comes the attributive overlay: that factory area gets it. Minus, minus, minus. A rat and a litter basket for added measure. Pow! For London is a mess. Anger has been satisfied. The kid "has got back at" the city by drawing an ugly map of it. It's the same impulse that produces nasty graffiti. Recall at this point our discussion of the drawing of the Tiber, the release of the hand and pencil that resulted in those baroque curves, those elaborate cirriforms. Much the same is taking place here. THE AREA GETS OUT OF HAND. Out of hand, an interesting way of putting it. The hand traces out, not the geographical area, but the emotion. The same is true to a heightened degree when it comes to positive feelings. Feeling good about a city is apt to result in enormous parks, in shopping districts loaded with multiplication signs (for "now" or "with it") or exclamation points (for a feeling of "Wow").

What I am saying can be boiled down to this: affection, emotion, feeling, desire, attitude all play a part in the cognition of space. One perceives an industrial area. The size of that area cognitively will vary with the attitude toward industry and the attitude toward the city as a whole.

"I hate London," says one kid.

"I love it," says another.

"How can you? It's (UGH) all factories!"

"Not where I've been. It's mostly parks."

Such a conversation is possible even if the experiences of the kids have been identical. London, of course, is neither park nor factory, but park and factory. It all depends on how you see it. The fact that five kids saw factories in London and located factory areas in what is actually Holborn, Clerkenwell and The City (Marina Giaconda, George Aiken, Bill Brown, Erica Cruz and Karl Prinz) is fairly conclusive evidence of what I am saying. What is a factory for these kids? And what are they doing all over downtown London. Factories? I located a factory area on my first map of London, misled by the stacks of the Battersea Power Station into believing that it was a mill of some sort. But I had no factories on subsequent maps because I encountered none. Yet these kids saw factories all over the place. What's going on?

I maintain that the association of largest area with the map in terms of subjective assessment shows that attitude and emotion are not likely to be separated from the perception and cognition of space, and that

emotion can create factories out of warehouses and small shops, and that emotion can escalate them into areas, and then into large areas. And that the emotion or attitude that did this then colors the map accordingly. And if I am all overboard on this, still emotion and attitude shape, perhaps not to the extent that I maintain, the character of the map. This is the sense I make out of the area and overlay analysis.

Let me see if I can summarize the content of this chapter. In the first place, we have looked at the areas. Areas were seen to grow in number and size through map sessions within an individual city. Further, the areas demarcated covered increasingly larger portions of the space of the city. That is, the kids were able to discriminate the city into increasingly greater numbers of areas with increasing experience, and these areas grew in size and total paper coverage. It has been additionally demonstrated that the attitude taken toward the largest area (positive, neutral, or negative) is the same as the attitude taken toward the map as a whole. This was true for all 89 relevant maps. This was used as evidence to support the contention that affection plays an important role in the cognition of space.

This final conclusion leads to the following remark: that space per se (whatever that may be taken as meaning) is not an abstract, impersonal facet of existence, but is rather cognized as part of a general system including values. The dimensions of space vary with this larger system and may not be studied outside of it, particularly in a developmental context. It further suggests that such aspects of the environment as legibility and imageability are fruitlessly studied outside a preferential framework. We have seen that Paris, along a variety of measures, proved to be the most legible of the three cities visited. Now we have seen that it is the city most positively evaluated using subjective assessment. The two sets of conclusions seem to be related. Is Paris liked because it is legible or is Paris legible because it is liked? Or do the two grow together little by little, liking finding reinforcement in legibility, and legibility in liking? Or is a legible city nothing more than a liked city? Are all legible cities liked and are all liked cities legible? Does legible mean nothing more than liked? These are questions that need answers and the answers may be sought using the techniques pioneered here, in conjunction with many others. The answers, my friend, are blowin' in the wind.

That doesn't mean they're easy to get hold of.