

THE ENDGAME

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PREFACE

In this book we have tried to do two things: to cover the basic moves and principles of the endgame; and to show how they are applied in actual game situations. Go is an intellectual pursuit, so we assume that you will want to try to think through as much as you can on your own, and not just take our word for it that such-and-such is a correct move. Accordingly, more than half of the following pages are given over to problems. Working them out may require some patience, but it should make you stronger in a very tangible way.

The primary responsibility for the five chapters is divided as follows.

Chapter 1 Ogawa

Chapter 2 Davies

Chapter 3 Davies

Chapter 4 Ogawa

Chapter 5 Ogawa

We consulted, however, throughout the book. One of us (Davies) drafted the entire text, and the other of us (Ogawa) passed judgement on all the diagrams.

Our thanks go to the Nihon Kiin for the use of their facilities while working on this book, and to James Kerwin, who proofread the manuscript and suggested a number of modifications.

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June, 1976 James Davies

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CHAPTER 1

Introducing the Endgame

The endgame could be called the small-scale stage of the game of go. During the opening and middle game the board is open and the fighting tends to range afield up and down and across it. By the endgame the board has been more or less divided up into separate territories, and most of the fighting tends to affect only two of them, occurring at a mutual boundary. The opening and middle game are much like a single large battle between two armies; the endgame is like a number of smaller battles going on in different places simultaneously. In a way this makes the endgame easier, because the local engagements, being smaller, are easier to read out, but in a way it makes it harder because one's attention must be focused on several areas simultaneously.

Whether you find it easy or hard, one thing can be said about the endgame: it is decisive because it comes last. True, there is sometimes no endgame—one player loses a large group of stones and resigns early—but in all other cases the endgame determines the victor. Reversals of the lead are frequent. Watch a professional game: you will see the players most tense and serious during the endgame. The endgame may be less exciting than the middle game, but there is a great amount of satisfaction to be gotten from playing it well, no small part of which comes from winning.

It is not surprising that strong professional players are generally strong in the endgame. Sakata, 9-dan, is a brilliant endgame player. Rin, 9-dan, is noted for his ability to squeeze

the last drop of profit from an endgame situation. Ishida, 9-dan, considers his greatest strength to lie in the endgame. It would be hard to find any professional or strong amateur who was really weak in the endgame.

What makes for strength in the endgame? One's reading ability and one's eye for tesuji are important, just as they are in the middle game. Another factor is one's ability to count and determine the relative sizes of different moves. These tactical matters, however, are not everything. More important than counting to find the biggest move, for example, is finding ways to make profit in sente, or to keep the enemy from doing so. A player who could not count at all, but understood the difference between sente and gote, would have the advantage over an opponent suffering from the reverse affliction. Knowing whether you are ahead or behind in the game and varying your strategy accordingly is also important. So is making sure that you are always looking at the whole board, not focusing your attention on one part of it and forgetting the rest, as so many amateurs seem to do.

Perhaps the best way to explain the kind of thinking that goes into the endgame is to take you through an actual game and show you directly, and that is what this chapter will do. The game is a professional one, so as we go through it you will see how professionals count, and get lots of glimpses of professional strategy, intuition, and reading in action. Unfortunately, we cannot avoid exposing you to the difficulties and messy details of the endgame, too, but perhaps that is just as well. It is by mastering such difficulties and details that one becomes stronger.

As you proceed through the chapter, you will find some material set aside in boxes. Most of these boxes contain analyses that support statements made in the text, and they can be skipped over without breaking the continuity of the chapter. We recommend that you do skip over them on your first read-

ing and go back to them later, perhaps after finishing chapter 2. Several of the boxes show how the values of certain moves can be counted, and this general method of counting will be explained fully in chapter 2.

The game, which begins on the next page, was my (Ogawa's) third game in the 1971 Oteai (the professional ranking tournament). My opponent, who had the white stones, was Haruo Kamimura, and at the time we were both shodan. Both of us had our eyes on promotions that year, so as you will see, we played very hard. The conditions were six hours per player and no komi. Kamimura, who is now 5-dan, is quite strong. I had a rematch against him recently and lost.

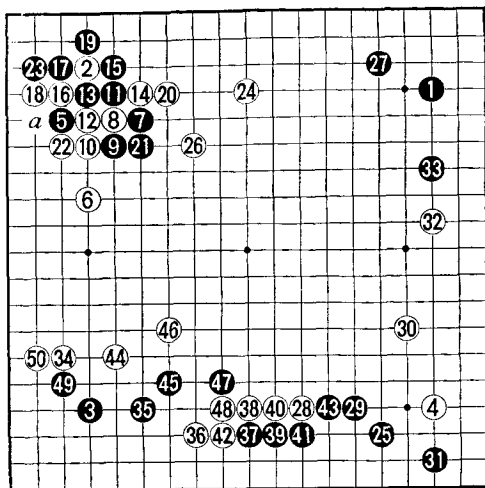
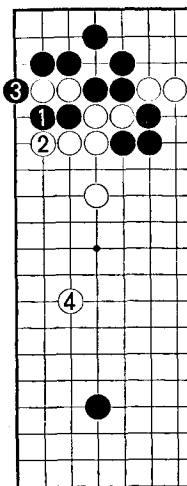


Figure 1 (1-50)



Dia. 1

Figure 1 shows the first fifty moves, and as you can see, my opponent concentrated on building up a large territorial framework on the left side and in the center, giving me all four corners. By the end of the figure, the weakness of the white group on the lower side had become the important factor in the game.

Looking back at the upper left corner, I wonder if you would have been able to resist the temptation to capture at a, instead of playing White 24 or Black 25. This is precisely the sort of move that can and should be saved for the endgame. Suppose Black plays 1 and 3 in Dia. 1, instead of 25 in the figure. Her two-stone capture is certainly big, but the corner was alive even without it and White 4, as compared with a black play in that direction, is big too. Moves like Black 1 and 3, that do not attack or defend but just take profit, are not very attractive during the opening and middle game.

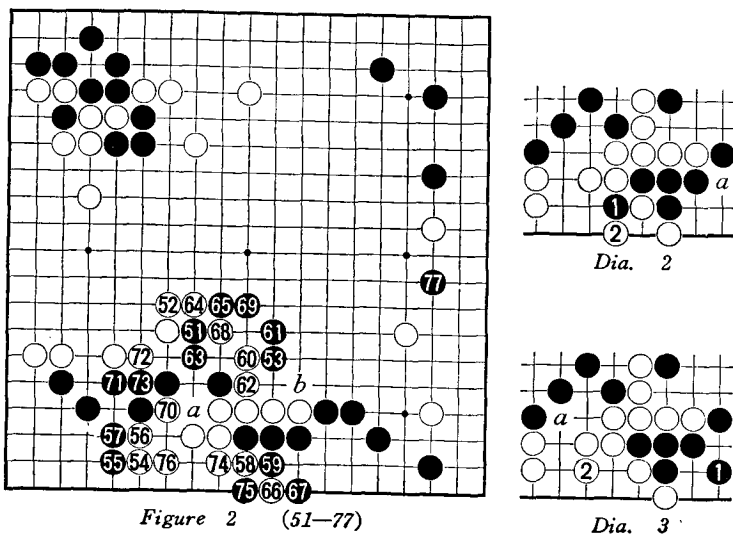


Figure 2 (51-77)

Dia. 2

Dia. 3

I attacked White's weak group with 53, and he spent the next twenty moves or so defending it. White 66, to point out just one stone in this sequence, was a well-timed forcing play. If I answered it by giving atari at 1 in Dia. 2, White would play 2, and if I lost this ko, I would stand to lose four more stones to White 'a'. If I played safe by answering at 1 in Dia. 3, however, then after forcing me with a in sente (as he did at 70 in the figure), White could connect at 2 to get a living shape. I rejected

these two diagrams and answered White 66 at 67, but that made 74 sente, so White was able to live by playing 74 and 76.

He was not absolutely alive, because I could still force a ko with `a`, but he had so many ko threats to escape, starting with b, that the ko was not practical yet. What I had to do now was invade his thin position on the right side with Black 77 and wait for a chance to start the ko later.

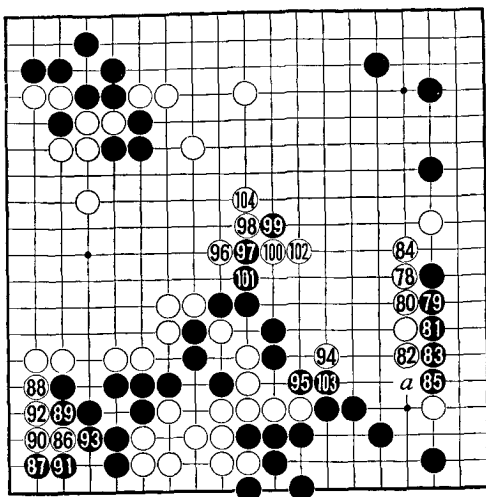
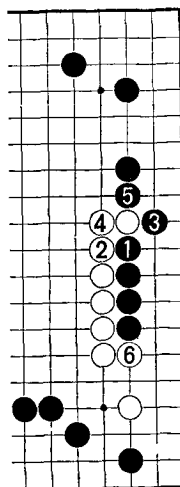


Figure 3 (78—104)



Dia. 4

Invading the right side with 77 to 85 was extremely large; a fair amount of what might have been white territory was now black territory. Moves like these, that transfer territory from one player to the other, are twice as valuable as moves that just reduce enemy territory or just enlarge friendly territory.

At Black 83 I could have linked up to the upper right with 1, 3, and 5 in Dia. 4. It is hard to say which is better, Dia. 4 or the figure, but Dia. 4 would leave White a big move at 6. If White had answered Black 83 at a, then I would have carried out Dia. 4.

After whittling down the lower left corner in sente White

exchanged 94 for 95, advanced to 96, bent around me at 98, and cut at 100, forcing me to connect at 103. Black 95 and 103 occupied neutral points, while White 94 (not to mention White 98, 100, etc.) was in a useful position for making territory, but I had compensation in that White had lost most of his ko threats, so the ko on the lower side was now a serious matter.

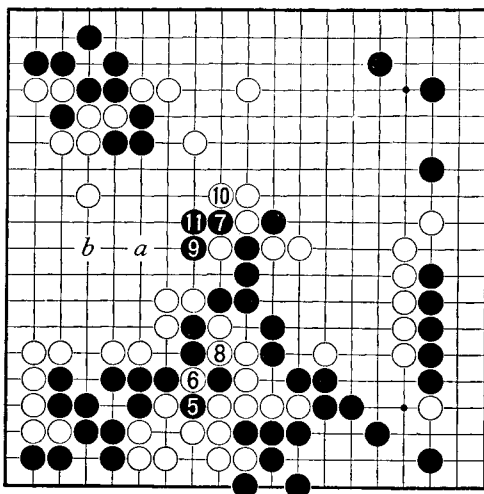
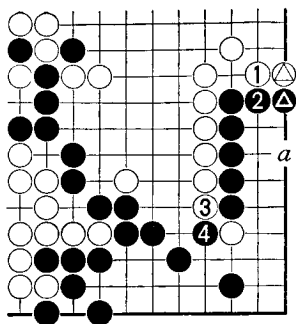


Figure 4 (105-111)

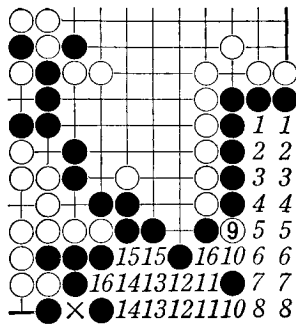
White could not afford to lose this ko, so he ignored my first ko threat and captured at 8. The exchange in this figure marked the close of the middle game, and while my opponent was thinking over the first move of the endgame, I surveyed the board and made a rough count of the territories to see who was ahead. This is something that professionals do again and again throughout the course of a game, even in the opening, and I would like to show you how we do it.

The black territory in the lower right was already pretty well settled, so I could get an exact figure for it. First I had to make some assumptions about what its final boundaries would be. I had to assume that eventually White would be able to play 1 in Dia. 5 on the next page in sente; if I did not

answer at 2, he could slide all the way in to a. Similarly, I had to assume White 3 and Black 4. To complete the boundary on the right edge I put in White &~ and Black &0. Note that I mentally added equal numbers of black and white stones.



Dia. 5



Dia. 6

Next I counted the amount of territory left. I can do this accurately in under five seconds by counting pairs of points, as in Dia. 6. There is a neat column of 8 pairs going down the right edge, two points for the white prisoner at 9, a pair at 10, four more pairs going across the bottom edge at 11 to 14, a pair above them at 15, and finally a pair left over at 16. That makes 32 points, and adding on a point for the stone I captured at `x`, I saw that I had 33 points here.

Taking the rest of my territories, I estimated the lower left corner at a glance as 5 points. I estimated the upper left corner pessimistically as 10 points, and the upper right corner optimistically as 15 points. That gave me $33+5+10+15=63$ points of secure territory.

Now why don't you try estimating White's territory? Assume Black a and White `b` on the left side, and don't count anything for him in the neutral area in the lower right center. See if you don't agree with me that even with the next move, it is hard for White to get 60 points overall, and so my prospects in the game right now were good.

Speaking of White's next move, can you guess what it was before you turn the page?

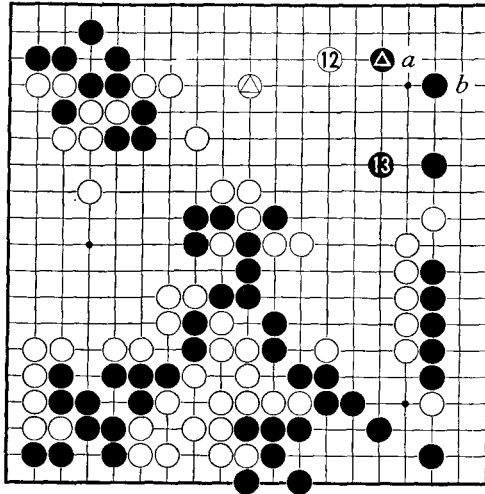
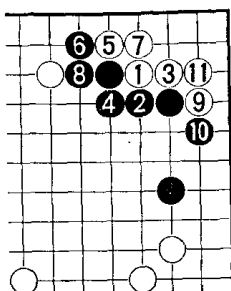


Figure 5 (112-113)

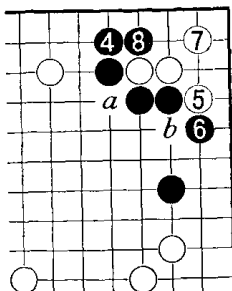
White started the endgame with 12, the largest move since besides seizing the open space between the two marked stones on the upper side, it threatened to invade the upper right corner. I knew from experience that my three-stone formation was vulnerable at either a or b, so after recounting to make sure that it would preserve my lead, I defended with Black 13. White had thus kept sente and could proceed to the next largest point. Can you guess where it was?

The six diagrams at the top of the next page show what could have happened if I had not defended with Black 13. Given the continuation shown, White 1 in Dia. 7 is the most damaging invasion. It may be possible to kill this invasion by descending at 4 in Dia. 8, but Black runs a risk in trying to do so because of the cutting points at a and b.

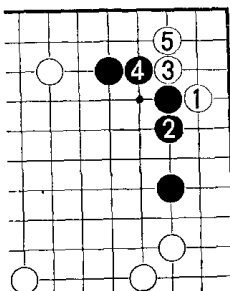
In any case, if White is afraid of Black 4 in Dia. 8, he can fall back on White 1 in Dias. 9 to 12. That invasion is unstoppable.



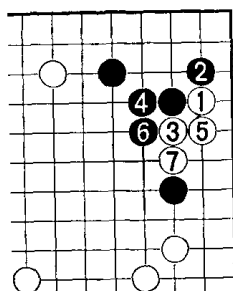
Dia. 7



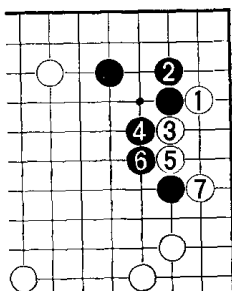
Dia. 8



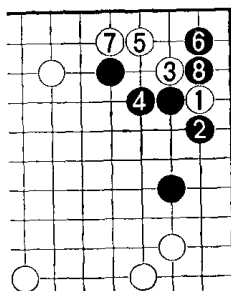
Dia. 9



Dia. 10

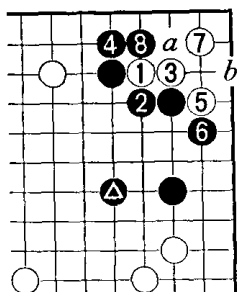


Dia. 11

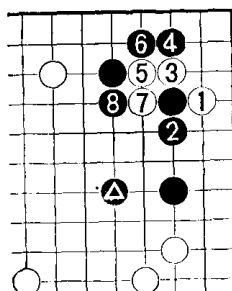


Dia. 12

With Black 13 on the board, (&Q in the two diagrams below), White's invasions no longer work. He is unconditionally dead in Dia. 13 (*a* and *b* are miai), and also in Dia. 14, where Black &0 makes Black 4 possible.



Dia. 13



Dia. 14

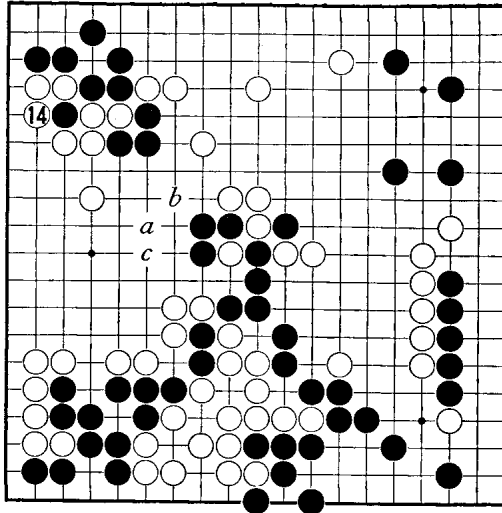
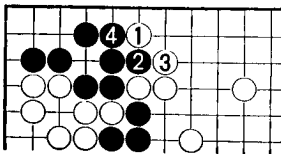
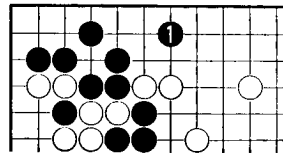


Figure 6 (114)

The time had come to capture at 14. In terms of the left edge alone, this move was worth sixteen points, as is shown on the next page, and it gave White additional profit on the upper edge by making White 1 in Dia. 15 sente. If Black fails to answer at 2 and 4, White 4 kills her. Compare Dia. 15 with Dia. 16; the difference is large. Since, after 14, White gets to play Dia. 15 free, without giving up his turn, it should be considered a part of the value of White 14, which thus rises from sixteen points to well over twenty points.



Dia. 15

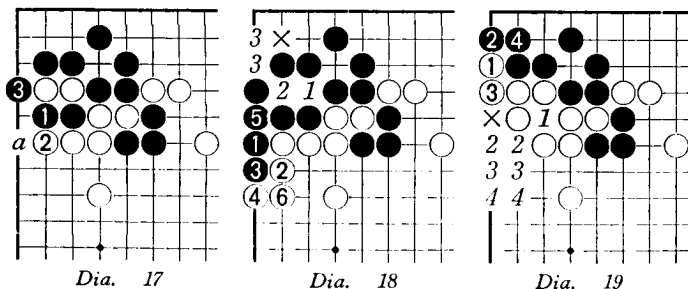


Dia. 16

It may look tempting to play White 14 in the center. The trouble with that was that if White played 14 at a in the figure, Black could still move toward her three abandoned stones with `b`. If White played 14 at b, however, Black could jump to the left at `c`. White, therefore, would really need two moves to defend this area, while he needed only one at 14.

Here is how the figure sixteen points for the value of White 14 on the left edge was arrived at. Suppose for comparison that Black plays 1 in Dia. 17. That is big in itself, and next she can push out at a to reduce White's territory further, as in Dia. 18. White cannot block Black 1 in Dia. 18 directly at 3, or Black cuts at 2, leading to a bad ko for White. Black 1 to 5 in Dia. 18 are sente, so they should be counted as part of Black's profit in Dia. 17.

Similarly, given 14 in the figure, White can play 1 and 3 in Dia. 19 later in sente, and they should be counted as part of his profit. To find the value of White 14, then, what one does is to compare Dias. 18 and 19. In Dia. 18 Black's territory is seven points larger than in Dia. 19: three pairs and the point marked `x`. In Dia. 19, White's territory is nine points larger than in Dia. 18: four pairs and the point marked x. The total difference is $7+9=16$ points.



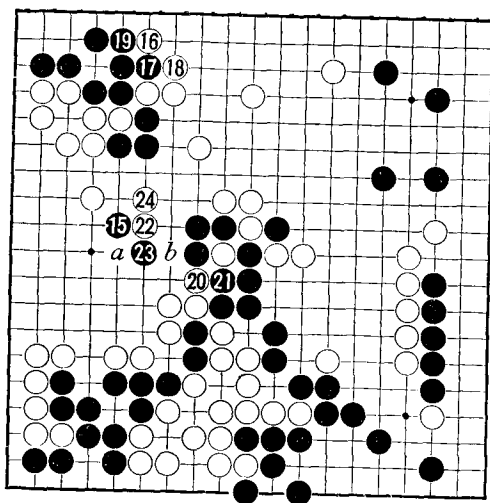
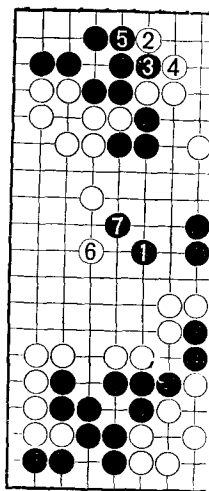


Figure 7 (115-124)



Dia. 20

Now I had sente and could take my pick of the big points left on the board. I chose the two-point jump to Black 15, and before answering it, White made his sente moves at 16 and 18. They were very big, and if he did not make them at once, I might emerge from the fighting in the center with sente and play on the upper side before him.

Next White came up with a counterattack at 20 and 22 that I think must have caught me by surprise. White 24 left *a* and *b* as miai, so Black 15 was going to get cut off. Looking back, I don't know why I didn't play 1 in Dia. 20 instead of Black 15. I must have had some reason for rejecting it, but I do not remember what it was.

Returning to the figure, how would you connect after White 24? Black *a* would not be good, letting White cut off everything with *b*, but would you play *b*, or make a diagonal connection at the point above or below it? Think about this before you read on.

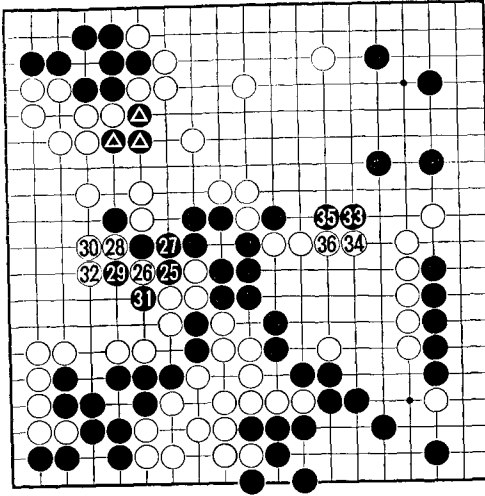
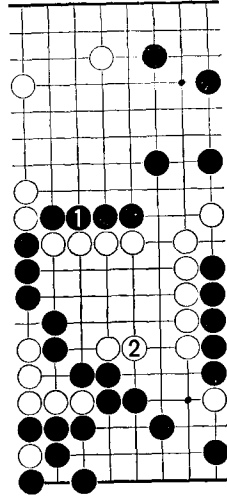


Figure 8 (125-136)



Dia. 21

Black 25 was the right way to connect. Although White immediately gave atari at 26 and forced me to fill at 27, the 25-26 exchange was important in reducing his liberties.

White's counterattack, however, had been a success; with 32 he had defended both the area on the left and the area around the three stones marked Δ . Before making my next move, I counted the territories again. For myself I got: 33 (lower right)+5 (lower left)+10 (upper left)+20 (upper right) +2 (prisoners taken in the center)=70. For White I got about 60 (left and upper sides)+10 (lower side)=70. We were exactly even; for the remainder of the endgame, both of us would be going all out.

Black 33 and 35 were forcing moves that aimed at attacking the white group in the lower right, but I stopped short of actually cutting it off with 1 in Dia. 21, which would just provoke White into living and making territory with 2, while gaining nothing in return. Next I went back to the area around 25-32. I had a very large move left there. Can you see what it was before turning the page?

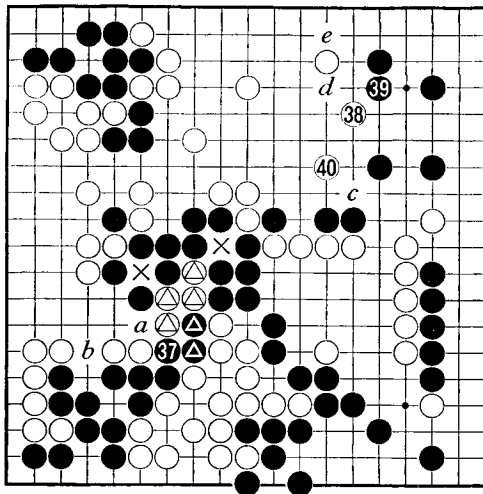
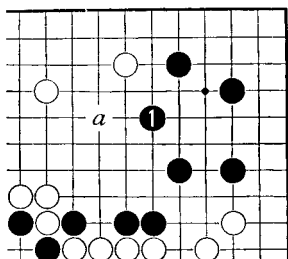


Figure 9 (137—140)

Black 37 took the two stones marked \circ out of atari and captured the four stones marked \triangle . White could not connect at *a*; Black *b* would answer that. The value of Black 37, as compared with a white play there, was fourteen points: two points for each of the six stones captured or liberated, and another pair because the points marked \times were now real territory for me instead of being false eyes. Another way of looking at it is that my territory had gone up by ten points (the \triangle 's and the \times 's), while White's had gone down by four (the \circ 's).

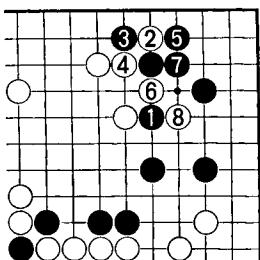
White 38 and 40, however, gave White about equal compensation, so the game was still neck-and-neck. I probably considered playing 38 myself instead of 37, as in Dia. 22 on the facing page. Next I could play *a* in that diagram in sente and make some profit in the center, but there is something more satisfying in a move like Black 37 in the figure, that gives you fourteen points of solid cash in the pocket, than in a move like Black 1 in Dia. 22, that may give you about the same amount, but is comparatively vague.

White 38 threatened an invasion of the upper right corner again, so I defended at 39. White 40 threatened White c, which would cut off my three stones in the center. Both White 38 and 40 put very effective pressure on my weak points, forcing me to defend, and thus made profit in sente.

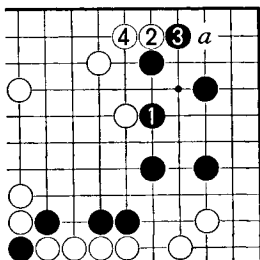


Dia. 22

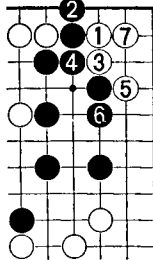
To return to Black 39, this was the correct defensive move. If Black tries to defend at 1 in Dia. 23, White has the hitting-under tesuji at 2. Black cannot very well capture White 2 with 3, because then White breaks through her defenses with 4, 6, and 8. She has to defend at 3 in Dia. 24, but then White can draw back to 4, leaving the threat of White a in the corner. White a is White 1 in Dia. 25. If Black descends to 2, White can live in ko with 3, 5, and 7. Black 39 in the figure prevented White 2 in Dias. 23 and 24, and at the same time threatened similar contact plays at 'd' or e against the white stone.



Dia. 23



Dia. 24



Dia. 25

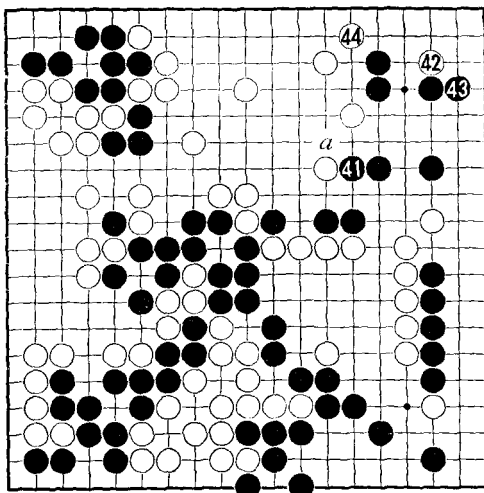
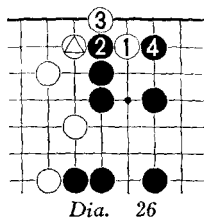
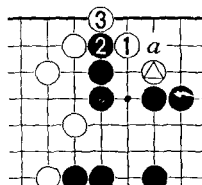


Figure 10 (141-144)



Dia. 26



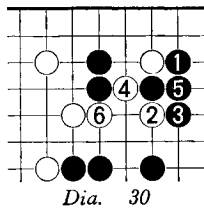
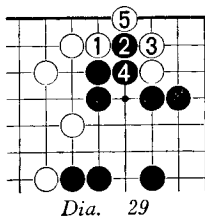
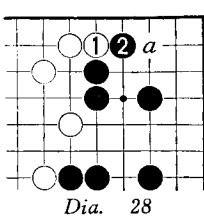
Dia. 27

I played 41, which stopped the cut and threatened a hane at `a`, but White ignored my move and probed at the corner with 42. Since I answered at 43, the effect of White 42 was to increase the value of White 44. That may be obvious without any diagrams, but let's look at a few anyway.

Suppose White plays &~ in Dia. 26 without first probing in the corner, and I ignore him. Next he can jump in to 1, but I can stop him with 2 and 4 and hold the damage to reasonable proportions. In Dia. 27, by contrast, with the stone marked &~ in place, I cannot play Black 4 at `a`.

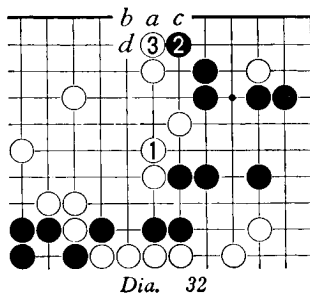
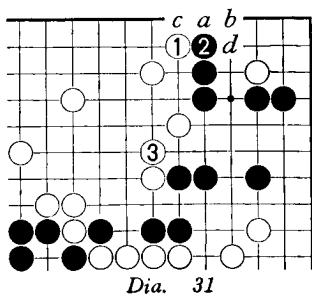
Similarly, if White plays 1 in Dia. 28 on the next page I can block him at 2, and without the probe, whether or not he can continue at a is a bit problematical. In Dia. 29, however, after the same 1 and 2 there is no arguing with White 3.

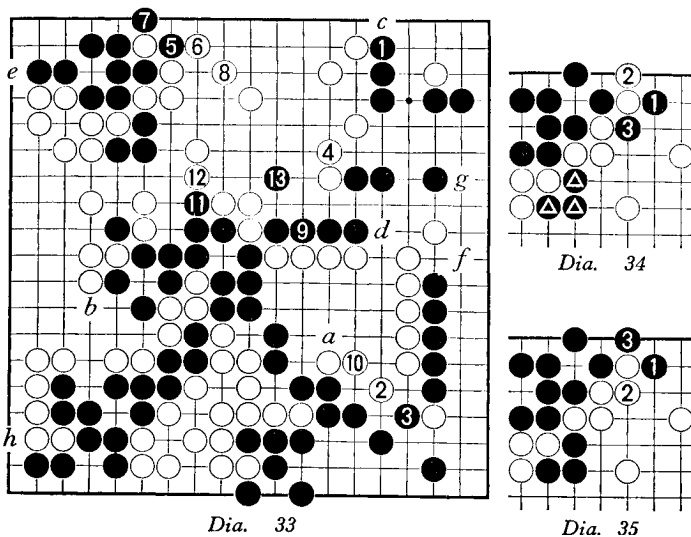
A good probing move like White 42 in the figure opens up weaknesses in the enemy's position no matter how he replies. Instead of Black 43, I could have played Black 1 in Dia. 30, but that would have left White such possibilities as 2 to 6.



In spite of White 42, my first inclination was not to answer White 44. If I played Black 2 in Dia. 31 and let White defend the center with 3, then later on White *a*, Black *b*, White *c*, Black *d* would be his sente on the upper edge, and he would have made profit in two places. Compare this with Dia. 32, where White defends the center with 1 and lets me play 2. Now Black *a*, White *b*, Black *c*, White *d* would be my sente, and I would be six points better off than in Dia. 31.

This was a close game, and if White was going to take the profit on the upper edge, I did not feel like sitting back and letting him defend the center, too. I wanted to play Black 2 in Dia. 31 at 3 instead. Before making up my mind I performed the calculation on the next two pages, but it only bore out my intuitive feeling that Dia. 31 would be a losing line of play, making my next move inevitable.





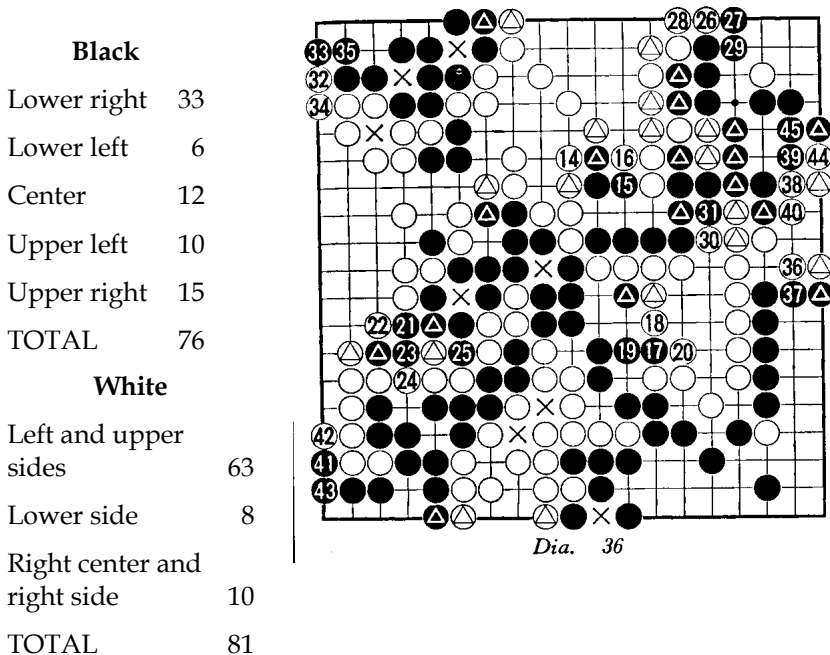
Could I play Black 1 in Dia. 33 and still win? I worked this question out in my head as follows. I imagined White making a forcing move at 2, then taking the big point in the center at 4. Next I could capture with 5 and 7 in sente, since if White omitted 8, 1 could clamp him with 1 in Dia. 34. He could not cut me off with 2 because the stones marked &0 would make the cut at 3 work. He would have to connect at 2 in Dia. 35 and let me link up at 3, but then he would lose a lot of territory. The clamping move at 1 is a useful endgame tesuji to remember.

After White 8 in Dia. 33 I could either play 9 and have White live and make some territory with 10, or play 10 myself and have White play 9. The former choice looks better, since Black 9 would enable me to reduce the center with 11 and 13. If White tries to push through and cut Black 13 off, his own stones get captured.

It is not hard to visualize the rest of the endgame from here. After White responded to Black 13, I could reduce his lower right center territory in sente with `a`, and then I would

have a choice of several gote plays, of which b looks like the biggest. White could play `c`, d, `e`, and f in sente, and then take gote at g. (If I tried to capture White `g`, I would lose my center stones.) The last large point, at `h`, would fall to me. In detail, this works out to the sequence from White 14 to Black 45 in Dia. 36. I completed the boundaries in my mind's eye by putting in the exchanges marked &~ and &0.

Taking into consideration the stones captured at the points marked `x`, I counted the territories as shown in the table, and I came out five points behind. For practice, you might like to try verifying my counting. Of course this whole sequence was only my first opinion of how the game would go, so the end result I arrived at might be off by a little, but not by as much as five points. That meant that, as I had suspected, Black 1 in Dia. 33 would be a losing move.



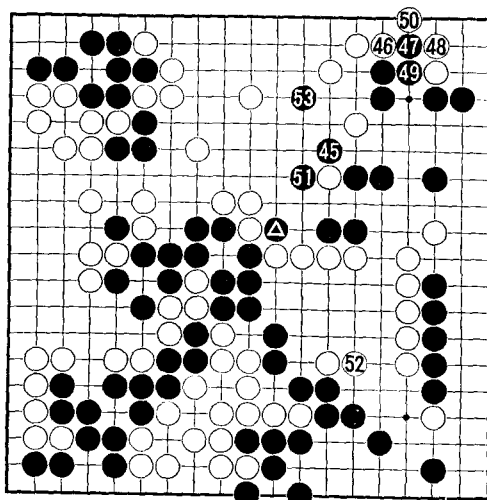
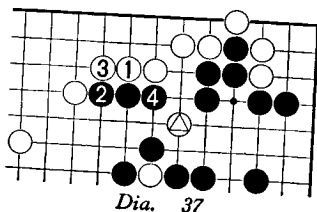


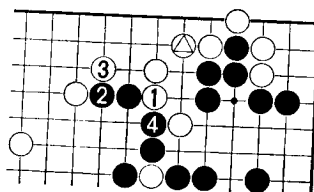
Figure 11 (145—153)

I played Black 45. White 46 to 50 hurt, but Black 51 was my sente, picking up the cutting stone &0 and forcing White to live with 52. From 45 and 51 I was able to jump out to 53. How would you have answered Black 53?

I suspect that many amateurs would automatically play White 1 in Dia. 37, letting Black make a large-scale capture of White &~ with 2 and 4. Look ahead to Figure 12 and see how White resisted with 54. I played Black 55 to keep the option of cutting off the white stone with *a*, but of course Black *a* in Figure 12 would not be as nice as Black 4 in Dia. 37.



Dia. 37



Dia. 38

White did not have to fear Black 2 in Dia. 38. In fact, because of White &~, after 3 and 4 he could take sente and play elsewhere.

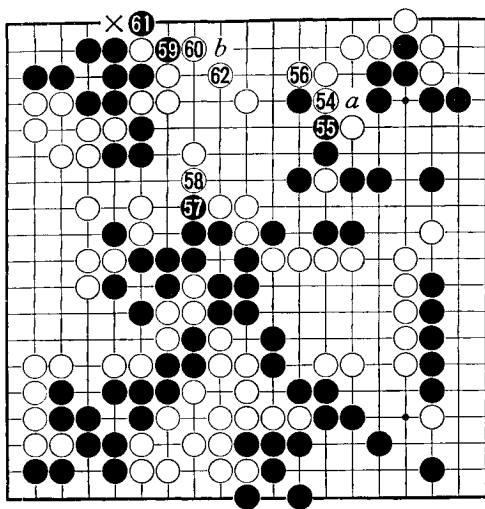
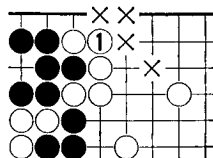


Figure 12 (154-162)



Dia. 39

When White answered Black 55 at 56, I pushed out at 57 in the center, then took my sente plays at 59 and 61. (White 62 was necessary to prevent Black `b` – see Dia. 34 on page 26.) How much did I gain by this one-stone capture? It enlarged my corner by three points, (two for the prisoner plus one at `x`), and reduced White's territory by four points, as you can see by comparing the figure with Dia. 39. That makes only seven points, but I got them in sente, and as a rule of thumb we count double value-fourteen points-for anything gained in sente.

I hope you appreciate the timing of these two moves. If I played them too early, they might not be sente; White might be willing to tolerate being clamped at b. If I waited any longer, however, White would connect at 1 in Dia. 39 and I would lose my chance.

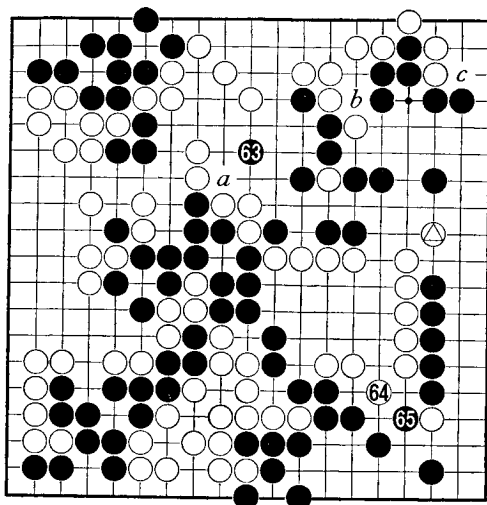


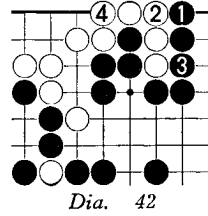
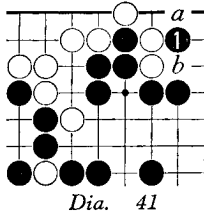
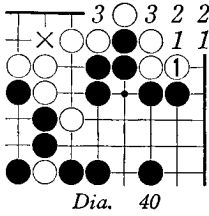
Figure 13 (163-165)

My sente profit taken, I went back on the march in the center with Black 63, which threatened to cut at `a`. Now I was putting pressure on White's weaknesses. He played a forcing move at 64, which helped the eye shape of his group in the lower right, and settled down to think.

This was a difficult point in a close game. He had three main plays to consider: he could defend against Black *a*; he could connect at *b*; or he could play *c* in the corner. I counted *b* as being worth a good eight points and *a* and *c* as worth over ten points each, but the exact values were elusive, and I dare say that Kamimura had a hard time making up his mind.

While I was waiting for him to play, I had a look at the right side around White &~, but I decided that I had no very big move there. If I tried to enlarge my territory below &~ 1 would only hurt my territory above &~, and vice versa.

Let's try to evaluate the three moves that White was considering for his next play. Again, they were (1) to play *c*, (2) to connect at *b*, and (3) to defend against Black *a*.

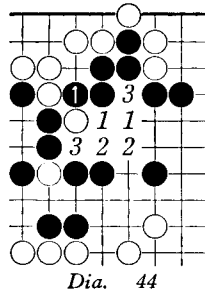
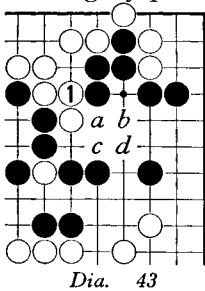


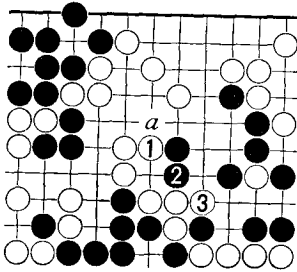
(1) White 1 in Dia. 40. First of all, this adds six or seven points to White's territory: three pairs and possibly the point marked `x`. In addition, it weakens Black's corner.

If Black plays here, his best move is 1 in Dia. 41. Whether White should ignore Black 1, answer it at *a*, or answer it at *b* is a hard problem, but let's assume that he ignores it and that Dia. 42 follows in Black's sente. This adds at least four points to Black's territory, as compared with Dia. 40, and strengthens his corner.

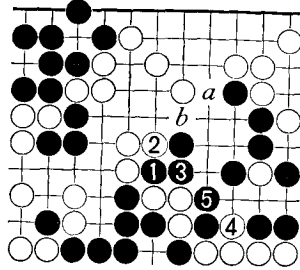
White 1 in Dia. 40 is thus worth at least $6+4=10$ points in gote, and almost certainly more.

(2) White 1 in Dia. 43. After connecting here, White can push out in sente with `a`, Black *b*, White `c`, Black *d*. Accordingly, if Black plays 1 in Dia. 44, she has gained eight points: the prisoner and the three pairs indicated. She may well have gained more than that, too, since in Dia. 43 White *b* or *d*, instead of *a*, is highly probable.





Dia. 45

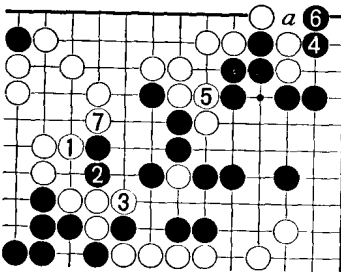


Dia. 46

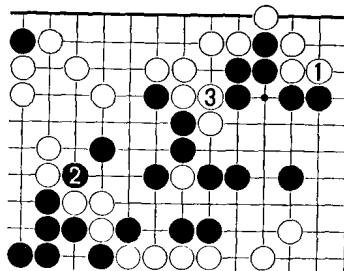
(3) White 1 in Dia. 45. This is the hardest of the three plays to figure out. Black would answer it at 2, and White would answer that at 3. How much territory White gains this way is hard to say—Black can still hane at a — but at least he has saved three stones from being captured.

If Black plays 1 in Dia. 46, White can answer with 2 and 4. Again an exact calculation is difficult, but if we think of a and `b` as Black's sente, then besides the three prisoners, she has taken five more points of territory. In addition, she has linked her groups together, which strengthens her overall board position. The total value of all this must exceed ten points.

The complexities mount when we try to evaluate different combinations of these three plays. Suppose White starts with 1 in Dia. 47, for example. After 2 and 3, Black will play 4 and White will connect at 5. If Black descends to 6, White 7 looks bigger than White `a`.



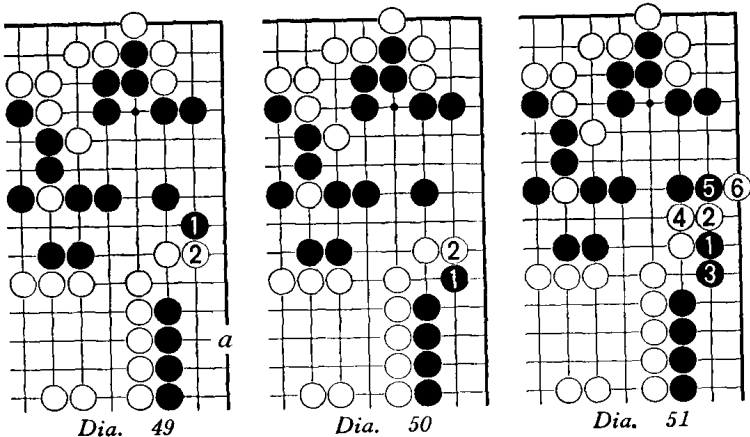
Dia. 47



Dia. 48

How does that compare with the simpler sequence shown in Dia. 48 ? In both diagrams White has gotten two of the original three large plays. In Dia. 47 he has made sizable gains in the center, but at a heavy cost in the corner. For a precise comparison it would be necessary to read out the plays that would follow each diagram, taking the whole board into account, an exercise which we shall forgo.

It is worth taking a closer look at the middle right side, not to see how big it was, but to see how small it was. Suppose Black went first. The exchange of 1 for 2 in Dia. 49 would enlarge her upper territory, but undermine her lower one, since from 2 White could slide in to a. Likewise, the exchange in Dia. 50 would undermine her upper territory. If she plays here at all, then 1, 3, and 5 in Dia. 51 would be better, but most of what they gain disappears when White hanes at 6. If the three plays considered in the box above were in the ten-point class, then a black, and therefore a white, play here would be only in the five-point class.



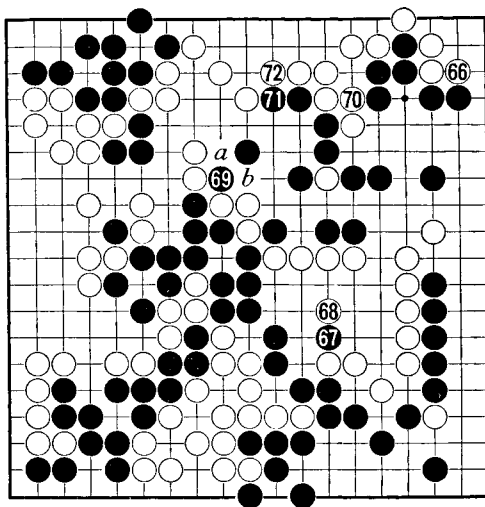
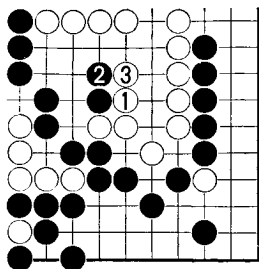


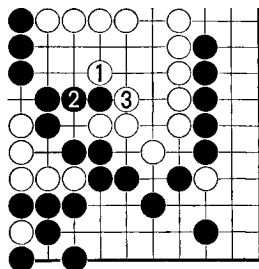
Figure 14 (166—172)

Before playing White 66, Kamimura must have tested out many different sequences, and he probably tried to work out what the rest of the endgame would come to after each one, to see whether it would leave him ahead, or at least in contention. Professionals do that constantly. There was more to this position than I could possibly explain, but one thing to note is that in the sequence Kamimura chose, White 66 and 70 reinforced each other, combining to promise further depredations against what was left of my corner.

Before cutting at 69, I made a forcing move at Black 67, and I would like you to remember White's answer at 68. Would you have played there, or would White 1 in Dia. 52 on the next page have come naturally to you? White's territory is about two points smaller in Dia. 52 than in Dia. 53, and if Black plays 2 at 3 in Dia. 53, White can simply cut her off by wedging in at 2. If you don't already know it, learn the clamp-move at White 1 in Dia. 53. It is a frequently used endgame tesuji in the center.



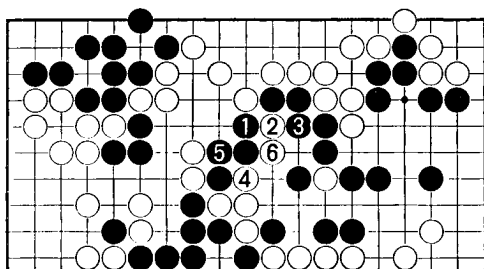
Dia. 52



Dia. 53

Returning to the figure, notice that White did not give atari at `a` and force me to connect at `b`. The reason was that he was saving himself the other atari, at `b`; it is standard practice in a position like this to leave both options open. White b would not accomplish anything in the figure, but suppose I had gone on after White 72 to play Black 1 in Dia. 54. Then White 2 and 4 would have made a beautiful combination.

I needed to add one more stone to put my newly-won center territory in order, but as long as White was keeping *a* and *b* open, my hands seemed to be tied. Finally, however, I found a move that would force White to exchange *a* for *b* and enable me not only to complete my own center territory, but to reduce his a little as well. Would you like to try to guess what it was before turning the page?



Dia. 54

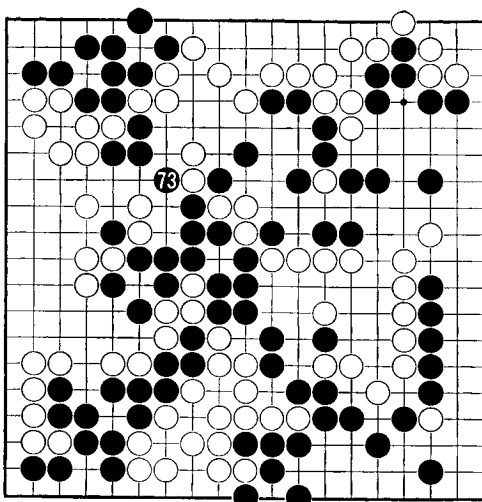
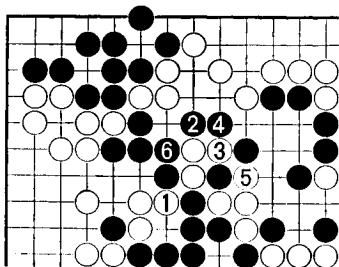


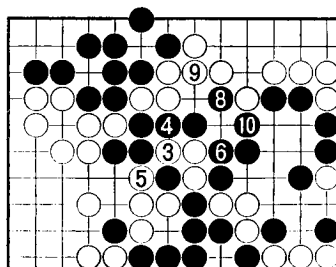
Figure 15 (173)

I played the hane at 73. After White had taken the two big points in the upper right corner, this was a saving move for me.

White could not cut me off with 1 in Dia. 55 because of the nose tesuji at 2. If he tried to go to the right with 3, he would suffer a real tragedy, and if he tried to go to the left with 3 in Dia. 56, I would link up with 4 to 10.



Dia. 55



Dia. 56

⑦ connects

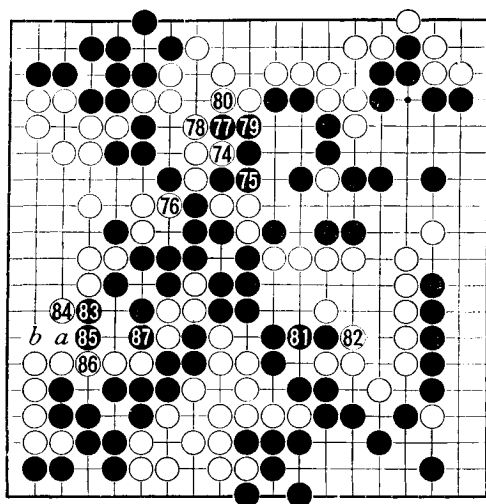
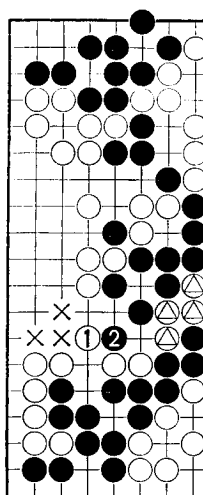


Figure 16 (174—186)



Dia. 57

First White had to give atari at 74, and then he could cut at 76. I came back with Black 77, however, and he could not cut me off at 79, but had to give way with 78. I made a nice profit out of these plays, thanks to my sacrifice at 73.

I followed them up with Black 83 to 87, which reduced White's territory by three points (assume Black *a*, White *b*) as compared with White's playing 1 in Dia. 57. Three points may seem small, but in the first place, White 1 in Dia. 57 would have been sente; I would have had to answer at 2 to keep the four stones marked &~ captured. Black 83 to 87 were what are called reverse sente plays; they were gote, but they stopped a sente play by the enemy. Just as sente plays have double value, so do reverse sente ones, so the three points here were equivalent to six points in pure gote.

In the second place, Black 83 to 87 created weaknesses in White's position that were to have repercussions all the way over on the upper edge, as we shall shortly see.

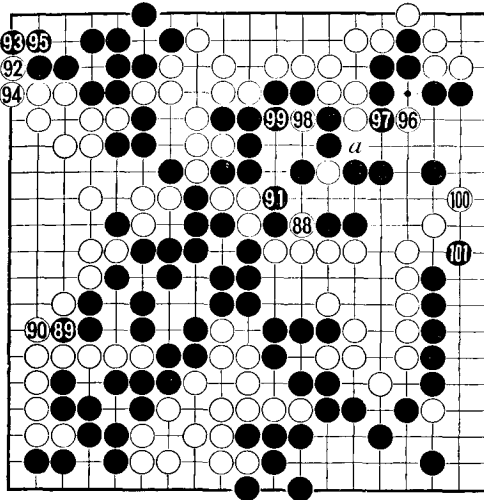
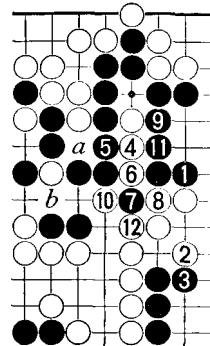


Figure 17 (188—201)

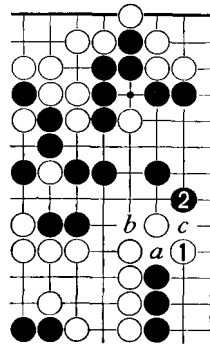
White made a series of sente moves at 88 to 94, in the midst of which I slipped in an important sente move of my own at 89. Next he found a good combination at 96, 98, and 100 in the upper right, (White 98 made sure that White a would be sente), and now I abandoned what little I had left there and played 101.

Even if I had defended at 1 in Dia. 58, I could only have saved about four points of territory. After forcing me with 2, White would crawl forward to 4, and with a his sente, I would have to play 5 and let him escape with 6. Considering the prisoner taken at 7, the loss suffered at 2, and the fact that White could next pull out his stone at `b`, I would not have made any profit.

On the other hand, if White had started with 1 in Dia. 59, I would have answered at 2, threatening Black a, which in turn would threaten Black `b` and `c`.



Dia. 58



Dia. 59

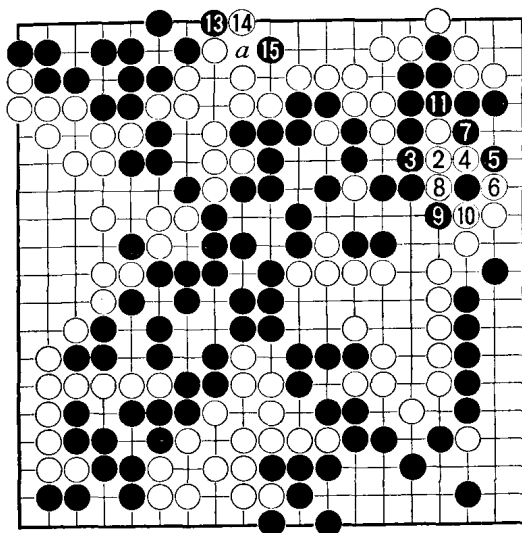
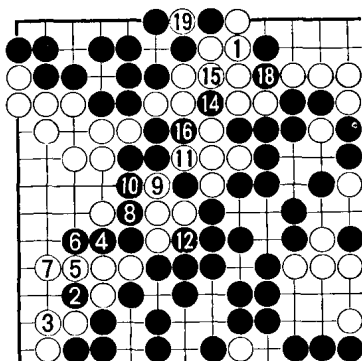


Figure 18 (202—215) ⑫ connects

White 2, 4, etc. in Figure 18 destroyed all my territory in the upper right, even taking a prisoner. This was a considerable setback, but then came Black 13 and 15 and my revenge. These two moves were what I had been aiming at when I played Black 83 in Figure 16.

White could not connect at a without running the risk of the huge ko shown in Dia. 60. Once he got into this ko he would have to ignore any ko threat I made, and I had one or two good ones. I suspect that Kamimura overlooked this sequence, with its squeezing combination at 10 and 12 and throw-in at 14, or he might have played differently earlier.



Dia. 60
⑬ and ⑰ connect

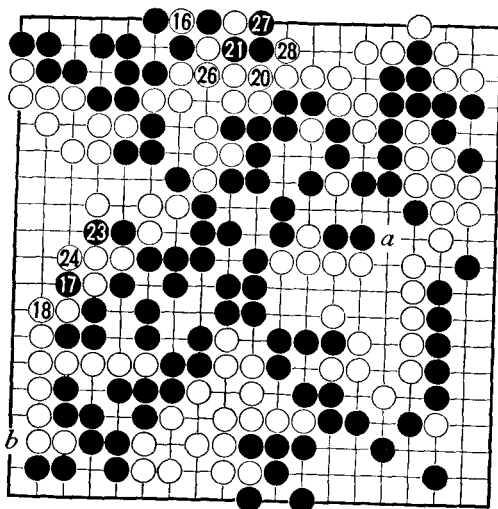
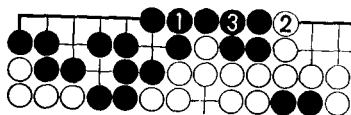


Figure 19 (216—228)
 19, 22, and 25 take ko

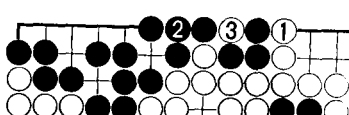
White played 16 and 22 to make me use up two ko threats, but he had to give way and connect at 20 and 26, letting me capture at 27. At the end of this figure it was my turn to play, and there were three large points on the board, at 16, *a*, and *b*. The analysis is complicated, but *a* was the largest, 16 the second largest, and *b* the smallest.

The first step in analyzing the three plays is to examine each individually, as follows.

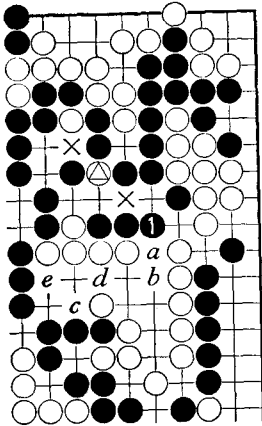
(1) Black 1 in Dia. 61 is worth six points in gote. Compare Dia. 62, where White 1 captures three black stones.



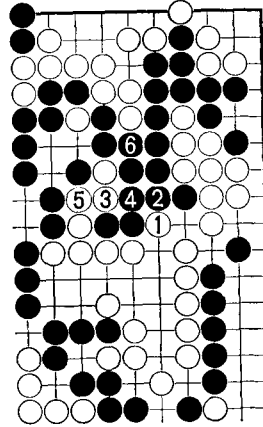
Dia. 61



Dia. 62



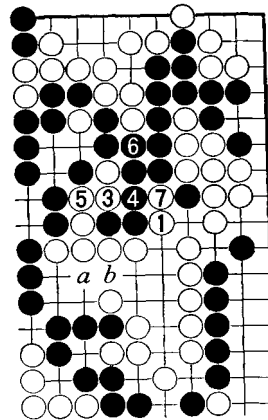
Dia. 63



Dia. 64

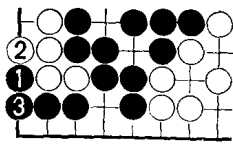
(2) Black 1 in Dia. 63 is worth four points in reverse sente, or up to $9\frac{1}{2}$ points in gote. For comparison, first I assume that White plays 1 in Dia. 64 and I answer at 2. White 3 and 5 destroy four points of my territory in sente: the two points marked x and the prisoner marked \textcircled{X} in Dia. 63.

Next I try ignoring White 1, as in Dia. 65. White carries on with 3, 5, and 7. Again my territory is four points smaller, and now White's is five points larger than in Dia. 63. In Dia. 65 I will later exchange a for b. In Dia. 63 I can play a, White b, Black c, White d. That leaves me a possible point at e, which I count as half a point since I may or may not get it. The total difference between Dias. 63 and 65 is therefore $4+5+1\frac{1}{2}=9\frac{1}{2}$ points.

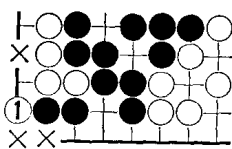


Dia. 65

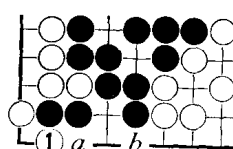
elsewhere



Dia. 66



Dia. 67



Dia. 68

(3) Black 1 in Dia. 66 is worth three points in reverse sente. If White played I in Dia. 67, he would immediately enlarge his territory by the point marked x on the left edge and reduce my territory by the two points marked 'x' on the lower edge. Furthermore, if I did not answer White 1 in Dia. 67, he could continue with 1 in Dia. 68. In Dia. 68, if I gave atari at *a*, then White *b* would threaten a snap-back, while if I played *b*, then White *a* would be an atari, and either way I would end up with almost nothing on the lower edge.

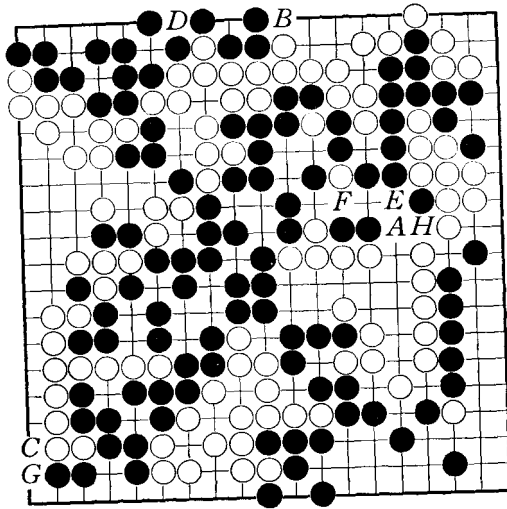
Now that we have seen what these three plays have to offer individually, we can put together such possible combinations as the following, (the lettering comes from Dia. 69 on the next page):

I. I take *A*; White takes *B*; I take *C*, ending in gote. This is the simplest sequence, and we shall use it as a point of reference.

II. I take *D* (plus 6); White takes *A*, I answer at *E*, and White plays *Fin* sente (minus 4) then *G* (minus 3). I end in gote because I still have to defend the lower edge against White 1 in Dia. 68, (although first I will play *H* and capture White *A* in sente). Compared with sequence I, I have come out plus 6 on the upper edge, but minus 7 elsewhere, or one point worse off overall.

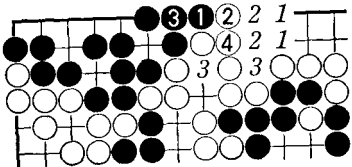
III. I take *D* (plus 6); White takes *A*; I take *C*; White takes *F* then *E* (minus 9 1/2). This time I come out 3 1/2 points worse off than in sequence I. I end in sente, but there is nothing left for me to take to get those 3 1/2 points back.

Perhaps any of these sequences would have been good enough to win, but the first sequence was the best. This was the last hard problem of the endgame.



Dia. 69

You may be wondering what the significance of the ko in the last figure was if I was going to let White play B in Dia. 69 and capture my three stones. That makes an interesting study. If I had simply played 1 and 3 in Dia. 70, then White would have gotten six points, (three pairs), in an area where he gets only five after playing B in Dia. 69, (three black prisoners minus one point for the white stone lost between B and D). More important, he would have had those six points and not needed another move to get them back. If I had played as in Dia. 70 and then taken A in Dia. 69, White would have replied at G without needing to play B, and I might have lost the game.



Dia. 70

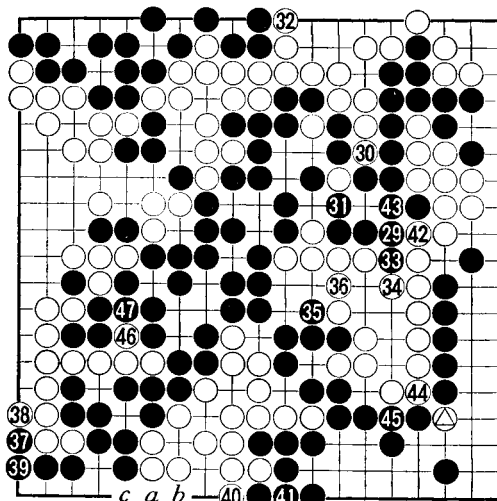


Figure 20 (229-247)

Black 29 to 37 in Figure 20 went according to plan, and the game was now essentially over. White took sente plays at 40, 42, and 46, each of which reduced my territory, or enlarged his territory, by one point. White 44 gave him some potential ko threats in connection with the stone marked ^alb, and if I had not answered at 45, a white atari at 45 would have reduced my territory by one point in sente. There was a two-point gote play at a for me on the lower edge, but one point in sente is worth two points in gote, and that is why I answered at 45.

Thus White got to play 50 in Figure 21, enlarging his territory by one point and reducing mine by one point as compared with Black a, White b, and Black c in Figure 20. After this two-point play all the rest of the moves in Figure 21 were worth only one point. I captured White 48 with 57, but White won it back in the ko there, the moves of which, if we actually played them out, are not recorded.

Now let's calculate the final score. At the beginning of the endgame I counted my lower right corner as 33 points. If you remember the boundaries I assumed then, you will see that it had grown by the one point at the right of Black 61, so it was now 34 points. I had 5 points in the lower left

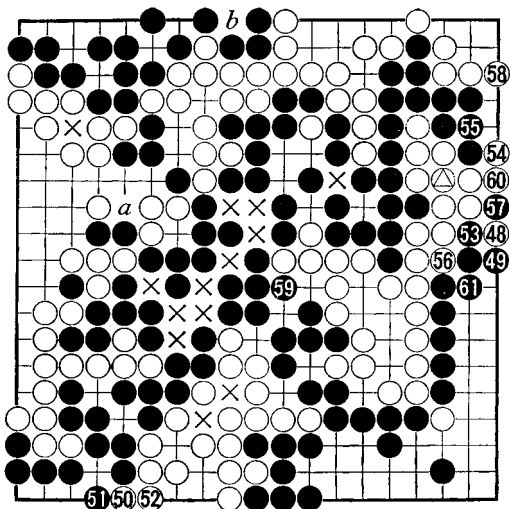


Figure 21 (248-262)

62 ko at 48. White connects at 57

corner and 10 points in the upper left—precisely my previous estimates. I had acquired a lot of new territory in the center, however; for practice, why don't you see if you can count it yourself? Figure two points, or one pair, for every point where a prisoner has been captured—these points have been marked with 'x's—and one for every other point, including the point under Black 59. Next see if you can count White's territories, noting that he will have to connect at a, and remembering to deduct one point for the prisoner he lost at b and add one point for the prisoner he captured at ^alb. The three black and three white stones taken in the kos cancel out.

| Black | | White | |
|-------------|----|--------------|--|
| Lower right | 34 | Left and | |
| Lower left | 5 | upper sides | |
| Upper let I | 10 | Lower side | |
| Center | | Right center | |
| <hr/> | | <hr/> | |
| TOTAL | | TOTAL | |

The correct figures are:

| Black | | White | |
|--------------|----|----------------|----|
| Lower right | 34 | Left and upper | |
| Lower left | 5 | sides | 58 |
| Upper left | 10 | Lower side | 8 |
| Center | 27 | Right center | 6 |
| TOTAL | 76 | TOTAL | 72 |

I had won by four points. Reviewing what had happened, I think I came out of the middle game with a lead, but then I made that questionable two-point jump in the left center, (Black 15 in Figure 7) that White was able to cut through, and the game became very close. Both sides played aggressively in the upper right quarter of the board, which led to White's taking territory in what had been my corner and my taking territory in what had been his center. After this exchange, I found the hane at 73 in Figure 15, which gave me a tidy profit, and although later on White came up with a sequence that destroyed all my remaining territory in the upper right corner, I came up with an equally good ko sequence on the upper edge. Perhaps White's failure to notice this last is what let me win.

I have tried to show you the approach that professionals take to the endgame and to give you a taste of the difficulties it involves. Perhaps I have overdone it; I am afraid that you may be feeling a little dismayed right now by all the sequences and calculations. On the other hand, perhaps you have noticed a few things that I had to gloss over. At any rate, before leaving this game behind, I would like to summarize what I think are the main points to be drawn from it.

First of all, you have to appraise the size of individual moves in the endgame. That means reading and counting, as was done several times in the boxes on the previous pages, and it is not always easy. One important principle involved is to take into consideration not only the move itself, but also the subsequent moves that it enables you to play. Another important principle is that a sente, or reverse sente, play has twice the value of a gote play.

Secondly, besides thinking about different moves in isolation, you have to think about them in combination. Ideally you should test out different sequences and calculate to see which gives you the most profit, but even without going to those lengths, you can get in the habit of thinking not in terms like, 'Gee, this is big-I'd better play here,' but in terms like, 'If I play this way I can get two of the three big points, but if I play that way I'll get only one of them,' or like, 'A moment ago there were two big places to play; my opponent has just taken one of them, so instead of answering his move, I'd better take the other,' or like, 'Move A may be much smaller than move B, but it gives me a possible next move which is just as big as B.'

Thirdly, you have to search out your opponent's weaknesses and put pressure on them; that is how you can get profit in sente. Recall White 12, 16, 20-24, 38, 40 etc. and Black 41, 45, 51, 63, etc. in Figures 5 to 13, and you will see that this is what both sides were doing almost constantly. If you cannot find any weaknesses in your opponent's position, try to create some, as White did by probing at 42 (Figure 10) in my upper right corner and as I did by playing 83 (Figure 16) on the left side.

Fourthly, you have to learn to recognize areas that look big, but are largely worthless. One such area in this game was on the right edge, where if I played from one direction, I would only be hurting myself in the other direction, (Dias. 49 and 50).

Fifthly, it helps a great deal to know whether you are ahead or behind. If you know where you stand in the game, you will know whether you can afford to relax, or whether you must put forth some extra effort, or even take risks. If I had gone through this endgame on the assumption that my middle-game lead was holding up, I might never have bothered to hunt for the plays that eventually enabled me to win.

To find out how you stand, you have to count or estimate the territories on the board. I have shown you how I count by pairs, and I recommend this method, although some professionals count directly by two's instead of counting by pairs and doubling the result, and some others count by units of

four. Territories that are only vaguely defined can be estimated in multiples of five, which makes adding them up easy. The important thing is to count the territories individually and remember them, instead of trying to count all your territory together and then having to recount everything whenever one territory changes in size. Sixthly, especially when the game is close or you are behind, you must not accept the ordinary move too readily, but look for the move that gives you a little bit more. Black 173 (Figure 15) and Black 215 (Figure 18) were two places where I did that. Finding such tesujis is, above all, what makes the endgame interesting.

In the next chapter we shall take up counting and calculation again, which cover the first two of these six points. In the third chapter, we shall cover the last point by surveying endgame tesuji. In the final two chapters we shall look at some more games, and give you a chance to try yourself out on them by presenting them as whole-board problems.