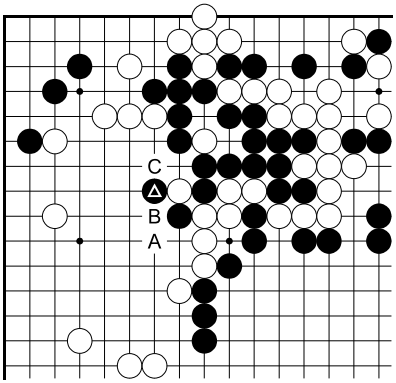
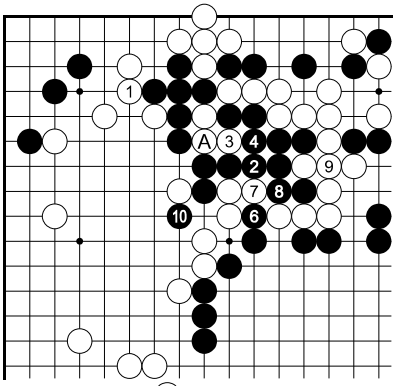
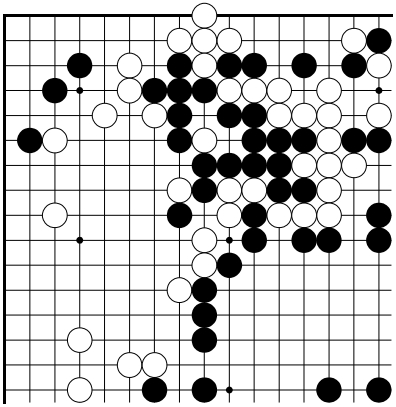


Problem 6: White to move

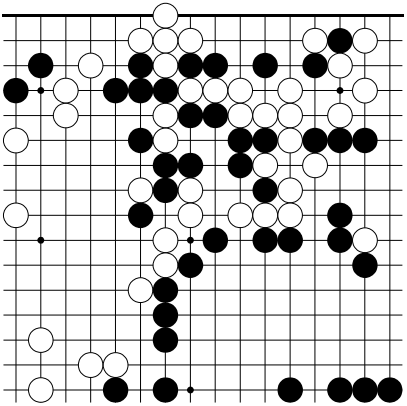


(5) at A.

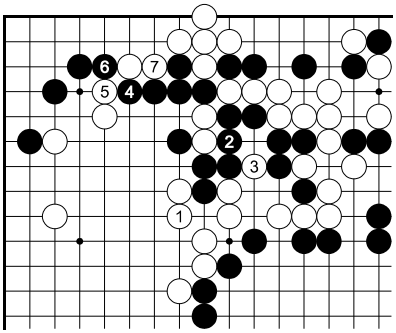
Problem 7: White tries to kill



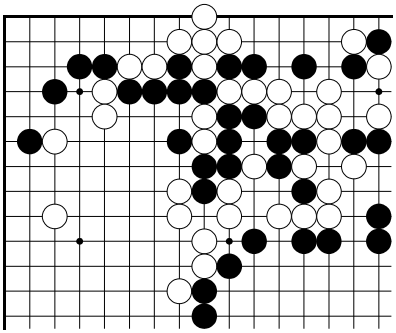
Dia. 7.1: Can White kill?



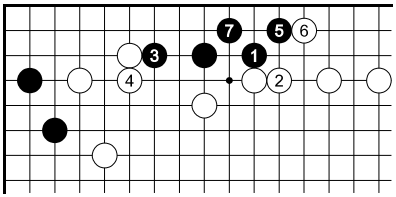
Problem 8: Can White kill?



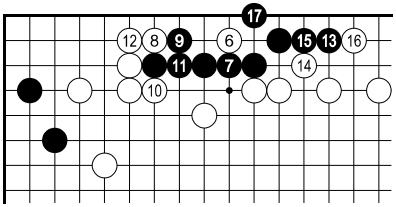
Problem 9: White tries to kill



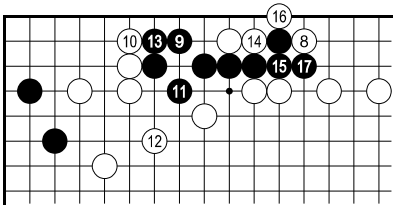
Dia. 9.1: Black to move



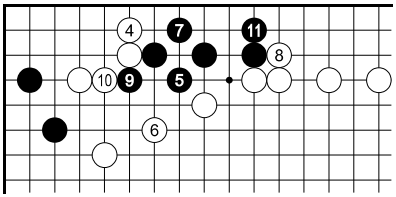
Answer 40: *alive*



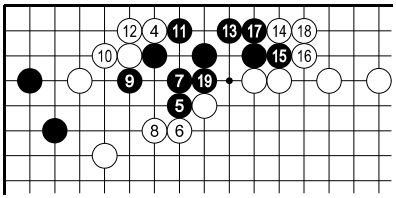
Dia. 40.1: alive



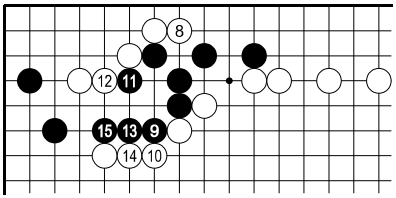
Dia. 40.2: alive



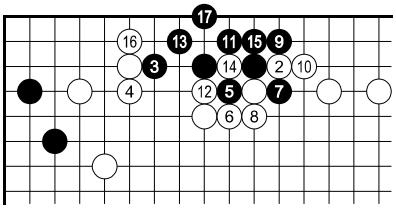
Dia. 40.3: alive



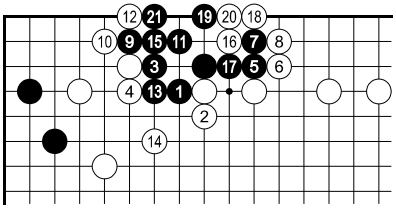
Dia. 40.4: alive



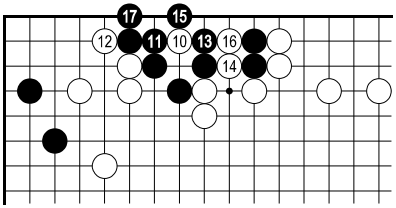
Dia. 40.5: alive



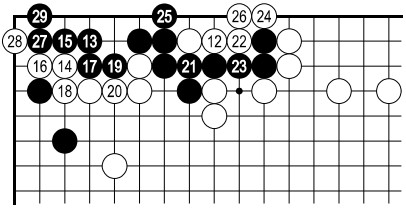
Dia. 40.6: alive



Answer 41: *alive*



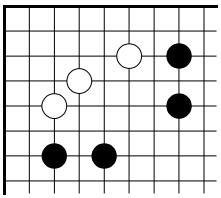
Dia. 41.1: alive



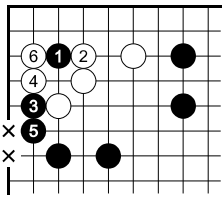
Dia. 41.2: alive

7.4 Test Invasion

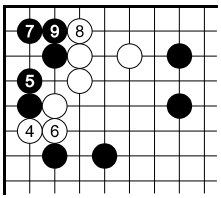
A **test invasion** is a test move and invasion exploiting aji. Depending on the defender's reply, the attacker lives with his invading group, creates a ko or gets a better reduction than a peaceful reduction only from the outside.



Example 1



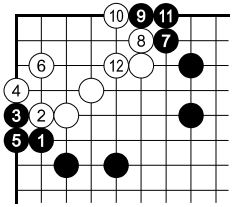
Dia. 1.1: reduction



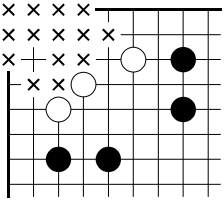
Dia. 1.2: invasion

Dia. 1.1: Instead of simply reducing from the outside with Black 1 at 5, it is better to start with the test invasion 1. Black makes the marked new territory.

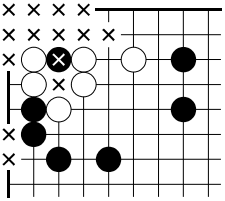
Dia. 1.2: White's killing attempt fails and the black invading group lives. This variation is a great success for Black. White prefers *Dia. 1.1.*



Dia. 1.3: naive reduction



Dia. 1.4: wrong count

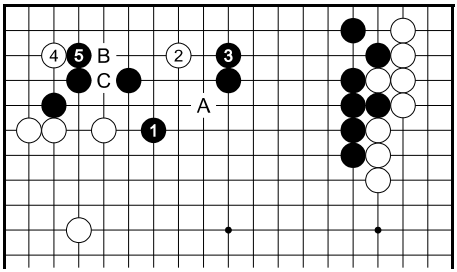


Dia. 1.5: correct count

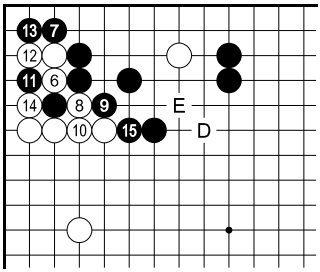
Dia. 1.3 + 1.4: It is a mistake to determine the current territory in the *Example 1* position by imagining the peaceful sente reduction sequence in *Dia. 1.3* and determining White's 14 remaining territory intersections marked in *Dia. 1.4.* This is wrong because Black has the better sente reduction of *Dia. 1.1.*

Dia. 1.5: We consider Black's best sente reduction in *Dia. 1.1,* determine the new current territory in *Dia. 1.5* and use this for the correct judgement of the territories in the *Example 1* position. Black has 2 points and White has 13 points so the territory count is 2 - 13 = -11 points in White's favour.

Example 2: Black: Yi Ch'ang-ho 9p - White: Gan Siyang 4p. Date: 2011-05-13. Komi: 7.5. Result: Black won by 1.5 points. White played the test invasion 2 as a preparation for reducing the corner and creating the forcing exchange White D for Black E in *Dia. 2.1.* If Black blocked the center, White would live inside the black moyo or get a bigger corner: instead of move 3, for example, Black A - B - C - 5 is good for White.



Example 2: test invasion



Dia. 2.1: solidified territory

Dia. 2.1: In the boundary settling fight, Black nicely solidified his territory by surrounding it with thick shape.

7.5 Is a Region Territory Or a Moyo?

A region is **territory** if the opponent cannot invade and live. A region is a **moyo** if the opponent can invade and live. Accordingly, territory and moyo are distinguished. This requires reading. Invasions also are about the judgement whether a region is territory or only a moyo.

Determining the existence of a good invasion is relevant for territorial positional judgement.

Usually, a good invasion creates a live group but ko, seki, rare or complex statuses can also occur. The following three principles specify how to judge territories or moyos:

A territory region is counted according to its current territory.

A moyo that can be reduced by a test invasion ending in a sente reduction is counted according to the resulting current territory.

For a moyo that can be reduced by an ordinary invasion, two kinds of judgements are compared: a) the current territory of the initial position versus b) the current territory of the position resulting from the invasion.

The principles do not mention further aspects of positional judgement, such as influence or altered strengths of nearby groups. In order to compare full positional judgements in the cases (a) and (b) of the third principle, the other aspects must also be taken into account. The 'position resulting from the invasion' refers to a locally quiet position, when the invasion fight has settled, and can be the result of an invasion or an invasion transformed into a reduction. Comparing the cases (a) and (b)

8.3 Theory of Exploiting Aji

There are the following major kinds of weaknesses in the defender's groups, which the attacker of a region can exploit and which contain information on possible uses of aji. However, the attacker must be sure his actions to exploit them can achieve a fair or advantageous result.

- cutting point (a crosscut shape can occur)
- gap (an ordinary cut, connection to another group or running to wide open space on the outside can occur)
- string with few liberties (can suffer from a capture, liberty shortage, new cutting point or the attacker's new movement direction)
- possible life of an invading group, its part or better reduction group (an invasion resulting in a reduction group can be a better reduction than a direct reduction from the outside)
- possible capturing race (can result in the death of the defender's group, seki or ko)
- sacrifice (can be used for an exchange or increasing the attacker's outside influence)
- threat of one of the kinds above (a single threat can be a ko threat; a threat combined with at least one other threat or kind of weakness serves as a multiple threat)

Exploiting aji abides by the following principles:

Until a good local result is achieved, the attacker can often use a series of double or multiple purpose moves to maintain local sente by keeping the defender busy.

If the attacker exploits aji in a sente sequence, he maintains local sente to the last local move. If he exploits aji in a gote sequence, he maintains local sente to the second-last local move and then makes his last local move, which does not involve a sufficient threat and so is gote. The principle applies to all examples.

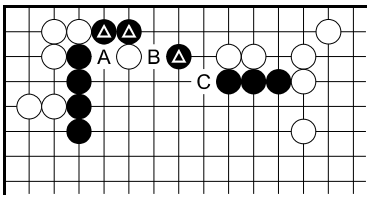
If, instead of a peaceful reduction in sente, exploiting aji in *sente* is better, make the positional judgement afterwards.

Compare the positional judgements after a) a peaceful reduction in sente versus b) exploiting aji in *gote.* Choose accordingly while also considering the sente / gote difference.

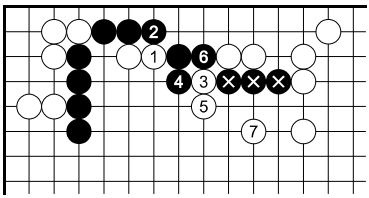
If exploiting aji results in a *ko,* compare the positional judgements after a) a peaceful reduction in sente, b) Black winning the ko versus c) White winning the ko.

Locally the ko winner ends in gote. Due to ko threats elsewhere on the board, global positional judgements are more meaningful than local positional judgements. See also *Volume 1.*

8.4 Examples



Example 1: aji

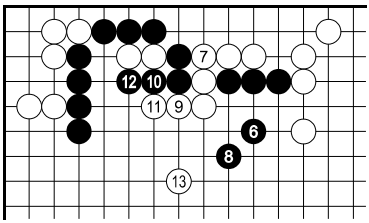


Dia. 1.1: game sequence

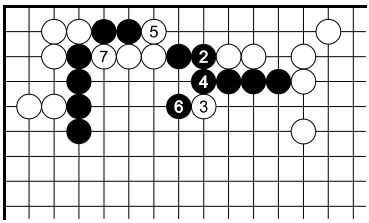
Example 1: Black: Sakai Hideyuki 7p - White: Cho Chikun 9p. Date: 2010-01-21. Komi: 6.5. Result: Black won by resignation. There is cutting aji (options to cut or threaten a cut) at A, B and C. White can exploit a liberty shortage of one of the marked strings.

Dia. 1.1: White succeeds by capturing the marked string. Now, after the aji has been used, it has become more meaningful to make a positional judgement of territory and influence stones.

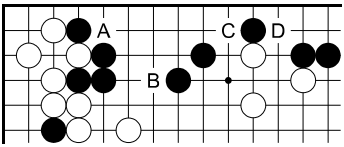
Example 1 sente versus gote: Locally, exploiting aji in gote by cutting, capturing and increasing the white center influence *(Dia. 1.1)* is more attractive than not exploiting aji well and playing a peaceful reduction in sente. This is an application of the principle of aji exploitation in gote.



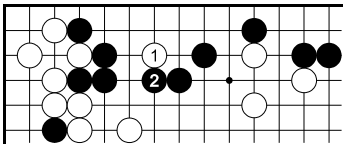
Dia. 1.2: variation I



Dia. 1.3: variation II



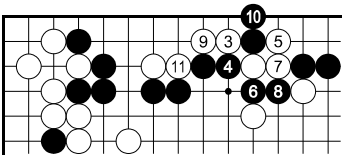
Example 6: aji



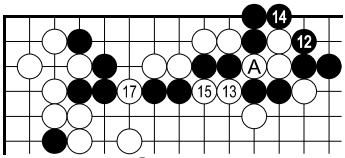
Dia. 6.1: game sequence

Example 6: Black: Cho U 9p - White: Kato Atsushi 8p. Date: 2005-09-01. Komi: 6.5. Result: White won by 0.5 points. The letters denote cutting aji.

Dia. 6.1: White 1 exploits the aji in a sophisticated manner: the move is a double threat, which threatens to cut at 2 and to assist the invading group appearing in *Dia. 6.2.* In other words, White 1 relies on the cutting points B and C.

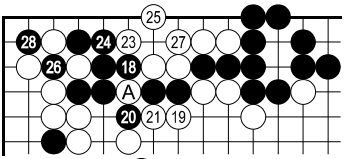


Dia. 6.2: continuation



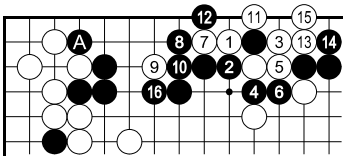
16 at A.

Dia. 6.3: continuation



22 at A.

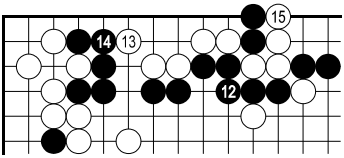
Dia. 6.4: continuation



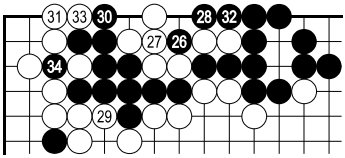
Dia. 6.5: variation I

Example 6 sente versus gote: We apply the principle of exploiting aji with ko. Exploiting aji and, if necessary, fighting a ko is better than not exploiting aji and reducing peacefully from the outside. While this local choice is clear, timing is important: White starts exploiting aji at a moment when the global positional context and its ko threat situation lead to a fair or advantageous result, regardless of who wins the ko and so locally ends in gote.

Dia. 6.5: If White delays move 9, he only gets a small life and the small option to capture the single stone A in a ko. In the game sequence, after White 1 in *Dia. 6.1,* his success was much greater: he got a small life and a huge ko, in which Black could lose much more than White.

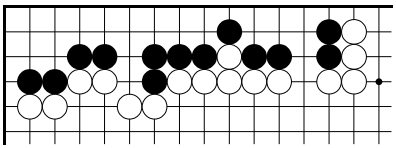


Dia. 6.6: variation II

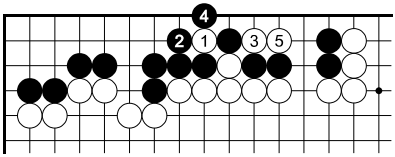


Dia. 6.7: variation III

Dia. 6.6 + 6.7: These variations are alternative successes for White.

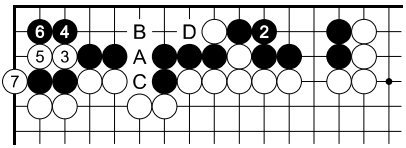


Example 7

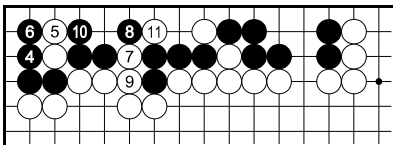


Dia. 7.1: capture I

Example 7: It would be a mistake to imagine peaceful sente reductions from the outside and count the remaining current territory because White can exploit aji to achieve a much better result. Accordingly, we apply the principle of exploiting aji in gote.

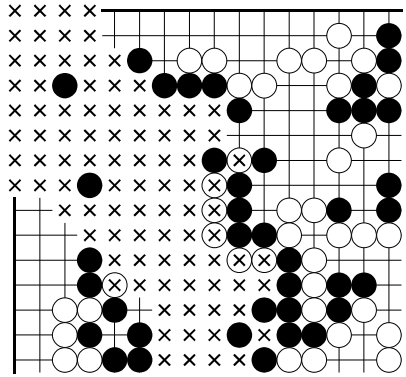


Dia. 7.2: capture II

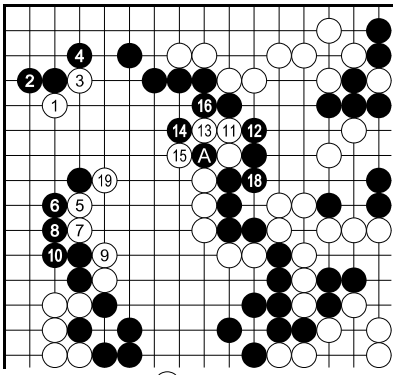


Dia. 7.3: capture III

Dia. 7.2: White has the follow-up A to D.



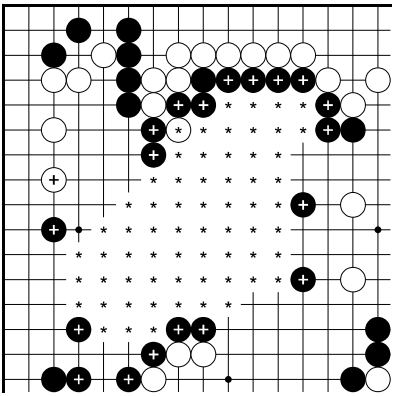
Example 8: too optimistic count



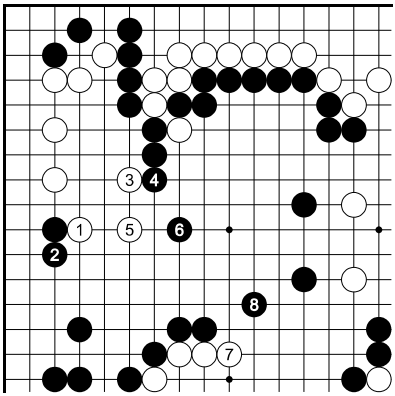
17 at A.

Dia. 8.1: game sequence

Examples of Reduction and Invasion



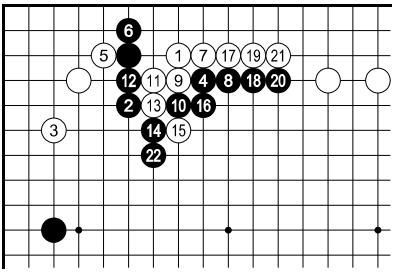
Example 1: moyo



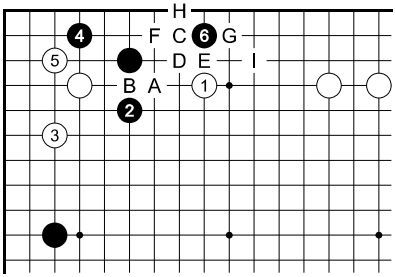
Dia. 1.1: game sequence

Example 1: Black: On So-chin 4p - White: Yi Ch'ang-ho 9p. Date: 2007-08-21. Komi: 6.5. Result: Black won by resignation. The black moyo is surrounded by 19 black and 1 white influence stones so the impressive influence stone difference is 19 - 1 = 18.

Dia. 1.1: Due to Black's great influence dominance, White could reduce only cautiously. Black transformed most of his moyo into territory.



Dia. 1.2: earlier game sequence

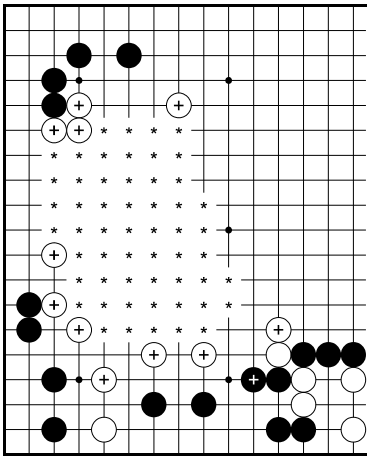


Dia. 1.3: alternative

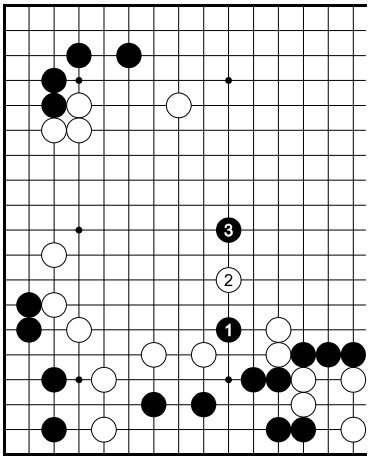
Dia. 1.2 + 1.3: Yi Ch'ang-ho's preference for territory explains his unforced choice in *Dia. 1.2.* The alternative in *Dia. 1.3* would have prevented Black's moyo in *Example 1.* Later, White has the follow-up A to I.

Example 2: Black: Yukawa Mitsuhisa 9p - White: Han Zenki. Date: 2011-04-18. Komi: 6.5. Result: Black won by 1.5 points. The marked moyo is adjacent to 1 black and 11 white influence stones so the influence stone difference is 1 - 11 = -10 in White's favour.

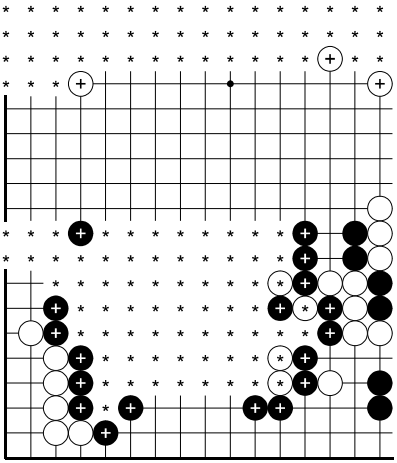
Dia. 2.1: Due to White's supremacy and insufficient space for an invading group, Black reduced the moyo at its outer boundary.



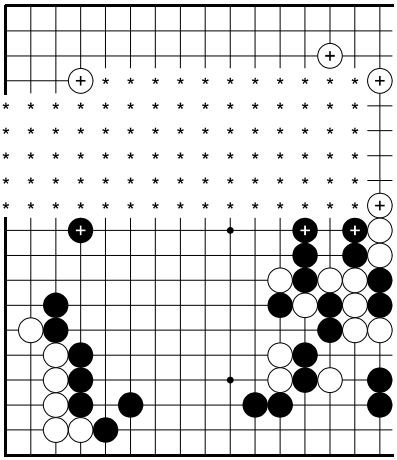
Example 2: moyo



Dia. 2.1: reduction



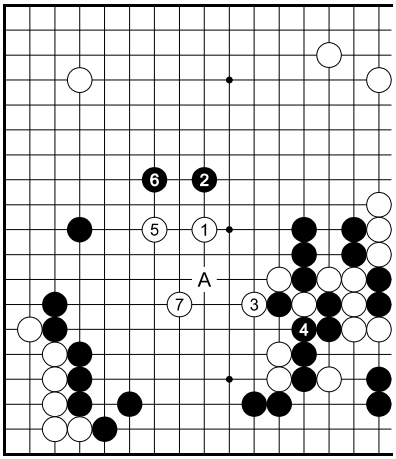
Example 3: moyos



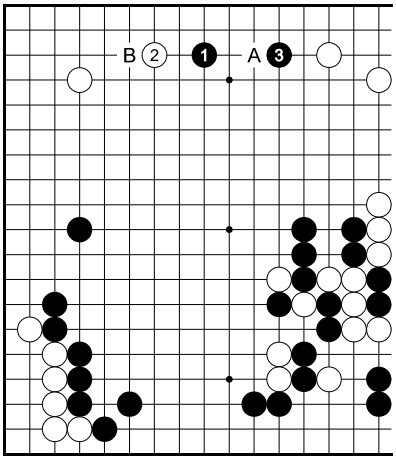
Dia. 3.1: shared valuable region

Example 3: Black: He Xin 3p - White: Tang Weixing 3p. Date: 2011-11-15. Komi: 7.5. Result: White won by resignation. The marked region in the lower center is surrounded by 18 black and 0 white influence stones. The influence stone difference 18 - 0 = 18 identifies Black's moyo. Black has territory on the lower side. The marked region on the upper side is adjacent to 0 black and 3 white influence stones. Its influence stone difference is 0 - 3 = -3 in White's favour and indicates a white sphere of influence. The black moyo is much stronger than the white sphere of influence.

Dia. 3.1: The marked huge region is adjacent to 3 black and 4 white influence stones. The small influence stone difference 3 - 4 = -1 indicates a shared valuable region, in which either player can try to build a moyo.



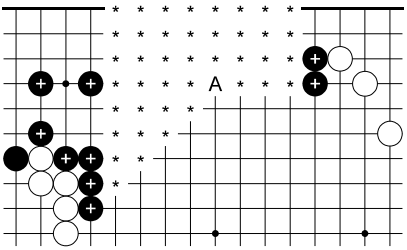
Dia. 3.2: game sequence



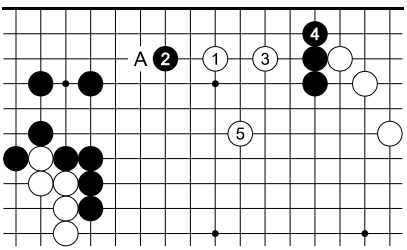
Dia. 3.3: invasion

Dia. 3.2: According to the influence stone difference 18, White should not invade, but can only reduce, the very strong black moyo. White 1 is at the boundary of the black moyo. Black decides if the move becomes a reduction (if Black replies at A) or invasion (as in the game). Black 2 is correct. Black must attack from the outside and seek compensation on the upper side. If Black defended at A, this would result in *overconcentration* (too many black stones would protect too little territory).

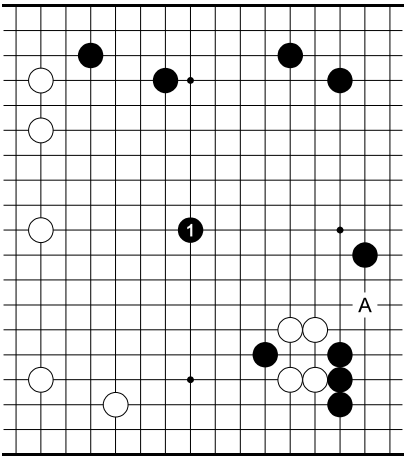
Dia. 3.3: Black can easily invade the weak white sphere of influence, whose influence stone difference is only -3. Instead of move 2, White A for Black B allows Black easy life.



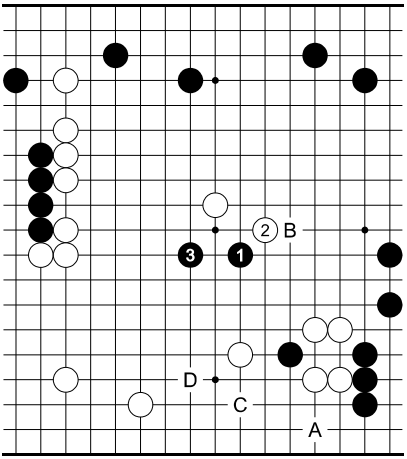
Example 4: moyo



Dia. 4.1: invasion



Dia. 6.2: early reduction



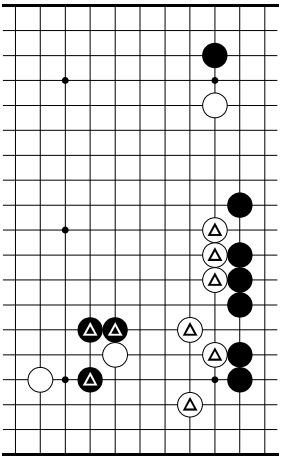
Dia. 6.3: invasion

Dia. 6.2: Instead of defending the small gap at A, Black should have reduced the white sphere of influence earlier while forming a big black sphere of influence in the upper right quarter.

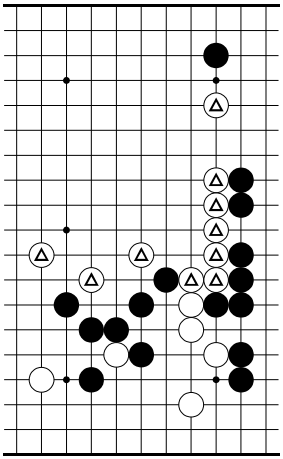
Dia. 6.3: Instead of the sequence shown, the game sequence Black A to D allowed White to defend his moyo boundaries well. *Shinogi* is the strategy of allowing the opponent to attack one's own weak group and defend it well. Cho Chikun was known as a skilful shinogi player but here he missed his second chance. Black is also satisfied if White plays 2 at 3.

Principles of Reduction and Invasion

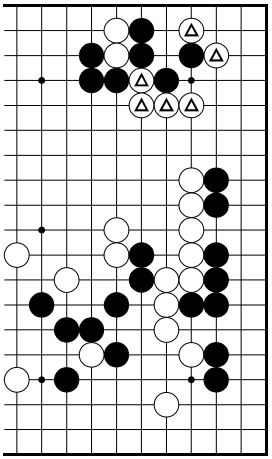
- **A player can prevent the opponent from creating a moyo so that it does not need to be reduced or invaded.** [1]
- **Reduce, but do not invade, a moyo with a large influence stone difference and without space for easy life of an invading group.** [1, 2, 3]
- **Invade a moyo with a large influence stone difference if the invading group lives easily and the opponent cannot profit well from attacking it.** [4]
- **Usually, invade a moyo with a small influence stone difference and with space for easy life of an invading group.** (Alternatively, it must have two options, such as space for life or easy running, or establish life in sente.) [3]



Example 1: thickness I



Dia. 1.1: thickness II

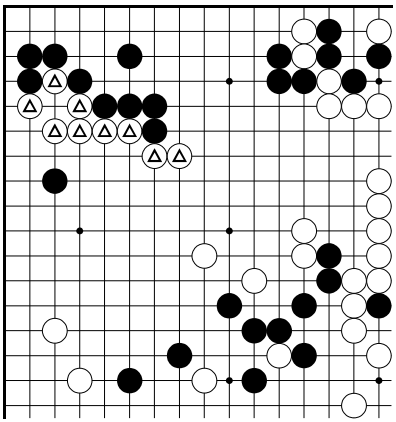


Dia. 1.2: thickness III

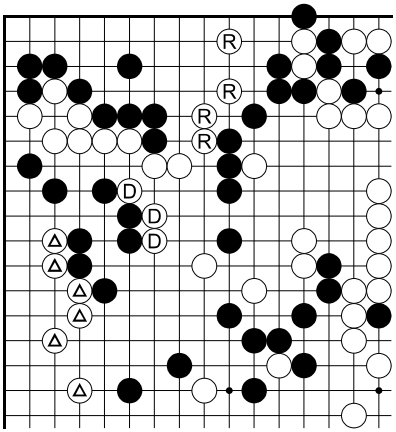
Example 1: Black: Hua Xueming 7p - White: Zhang Xuan 8p. Date: 2002-04-19. Komi: 7.5. Result: White won by resignation. The marked white thickness attacks the marked black group.

Dia. 1.1: The lower black group has been defended, the unmarked part of the white thickness is situated in a neutral region and the marked part of the white thickness constructs a sphere of influence in the upper center.

Dia. 1.2: White has used her earlier thickness in the center to a) build the marked thickness in the upper right corner to protect territory there and b) support the white sphere of influence in the center.



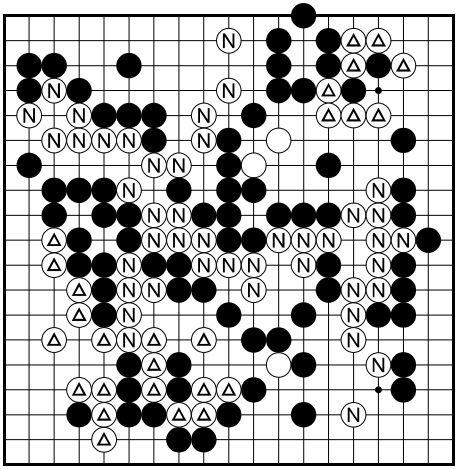
Dia. 1.3: thickness IV



Dia. 1.4: thickness V

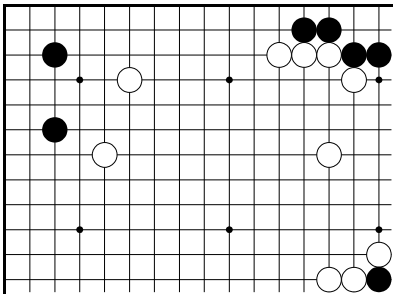
Dia. 1.3: White has used her earlier thickness in the upper right center to build the marked new thickness.

Dia. 1.4: White has used her thickness marked in *Dia. 1.3* to build new thickness, with which she protects territory on the left side (triangles), defends her own stones (D) or reduces the black region on the upper side (R). D, R and her unmarked stones in the upper left are connected but situated in a neutral region.

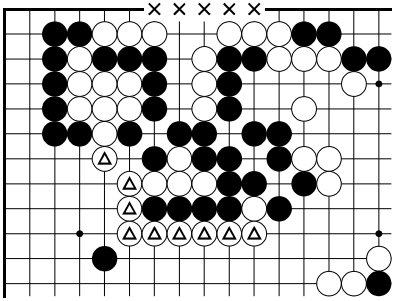


Dia. 1.5: thickness VI

Dia. 1.5: This diagram shows the two usual outcomes of the stones of thickness: protecting territory (triangles) or being situated in a neutral region (N). Exceptional outcomes can be: being sacrificed as non-essential stones or, rarely, being captured in an exchange or outright loss. The now neutral white stones have enabled White to establish the boundaries of her territory. She has used her thickness to make territory. The big white group is alive, see *Problems 1 - 4.*



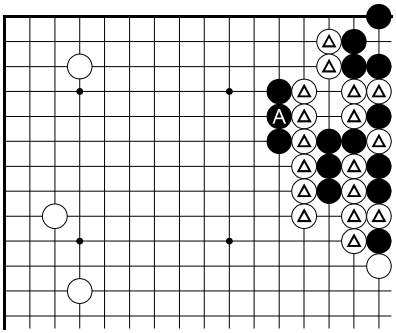
Example 2: moyo



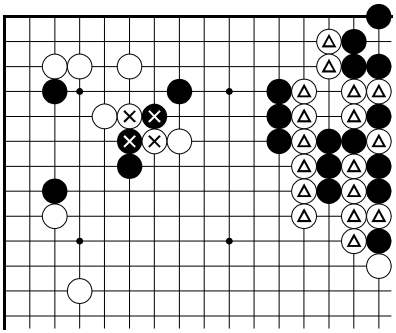
Dia. 2.1: wall and territory

Example 2: Black: Yoda Norimoto 9p - White: So Yokoku 8p. Date: 2006-12-14. Komi: 6.5. Result: White won by 2.5 points. White's influence stones and thickness built a moyo.

Dia. 2.1: White transformed the original influence stones and thickness into new thickness elsewhere (triangles) and territory (crosses).



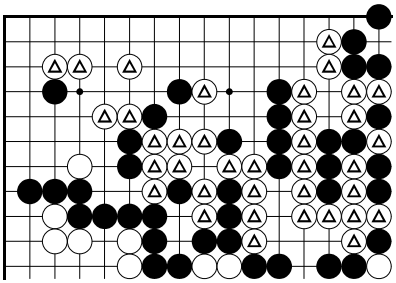
Example 3: thickness I



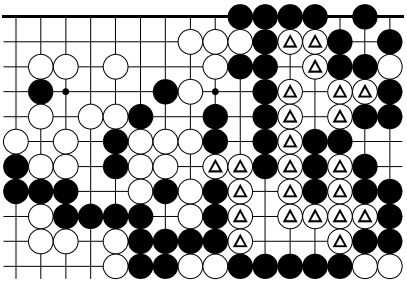
Dia. 3.1: thickness II

Example 3: Black: Heo Yeong-ho 5p - White: Mok Chin-seok 9p. Date: 2006-07-15. Komi: 6.5. Result: White won by 1.5 points. The marked white thickness protected the right boundary of the huge white sphere of influence. The black string A was a temporary sacrifice generating only little counter-influence within White's region.

Dia. 3.1: White used his marked wall of thickness for the cutting fight created by the marked crosscut. He launched a double attack on two weak black groups.



Dia. 3.2: thickness III



Dia. 3.3: thickness IV

Dia. 3.2: White's initial wall became part of the marked thickness, which protected a large territory region.

Dia. 3.3: After a ko fight and its exchange, White's initial wall and a few additional stones were transformed into neutral stones, that is, thickness doing nothing more than preventing black territory. This final destination of the marked thickness does not mean that it is useless. During the game, White has used all its extra potential for making territory elsewhere.