PARKER BROTHERS

CLASSIC/STRATEGY SOFTWARE



Endorsed by the International Chess Federation

CARTRIDGE FOR ATARI® HOME COMPUTERS

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Introduction

Chess is a magnificent and unique game. It is the only game which has been played in every country on the globe—between the South Pole and the North, in space, and between the earth and cosmonauts circling the earth.

The rules of Chess are few and straightforward, so they can be learned in just a few minutes. Yet Chess is so complex that every game is different. A lifetime is insufficient to attain total mastery of it. Indeed, some mathematicians have established that the total number of possible Chess games is in excess of the number of particles that make up our universe!

No other game can claim such incredible scope—few others can justly claim to be enjoyed equally by beginners as well as experts. The game can be played at a variety of speeds: ten seconds, or even less, for each move; five minutes for a whole game; or to the other extreme, as much as one week for each move.

Chess can be played "over the board," by telephone, telex, via the mail ways, by computer—the game can be played by anyone, against anyone, anywhere, and under any conditions.

As you begin to play Chess on your home computer, and as you play time and time again, may you gain the same enjoyment this game has brought the countless millions of people who have played Chess since its invention over 1400 years ago.

Setting The Console Controls

1. Place the cartridge firmly into the cartridge slot at the top of the Atari 400 unit; on the left-hand side of the Atari 800 unit; or on the side of the Atari 1200XL unit.
2. Press the **ON/OFF** switch to **ON**.
3. To begin playing, press down the **START** button on the console.

The Joystick Controller

The use of a joystick controller with this program is optional. If you wish, commands may be entered by using the computer's keyboard. However, if you choose to use a joystick, be sure that the controller is plugged firmly into the Atari unit. For the Atari 400 and 800 units, plug the controller into the jack labeled "No.1."

The Cursor

When playing, you will use the cursor to move your chess pieces. In the **DEMONSTRATION MODE**, the computer uses the cursor to show you what move it is considering. At the start of the game, and whenever it is your turn to move, the light blue cursor will be situated at the bottom left-hand side of the chessboard.

Moving The Cursor

The cursor can be moved by using either the Atari keyboard or a joystick.

The Keyboard

To move the cursor, simply press down the cursor control key which features an arrow in the direction you wish to move.

Cursor Direction	Key
UP	↑
DOWN	↓
LEFT	←
RIGHT	→

Pressing one of these keys will move the cursor one square in the required direction. Holding a key down will repeat the cursor's movement in the same direction until you release the key, or the cursor reaches the end of the chessboard.

The Joystick

To move the cursor, simply push the joystick controller in the direction you wish to move; up, down, left, or right.

Entering Moves

To move a piece , position the cursor over the piece you wish to move. Press the **RETURN** key on the Atari keyboard, or press the **"FIRE"** button on the joystick. The color of the cursor will change from light blue to burgundy, indicating that the first part of your move has been entered.

NOTE: If, for any reason, the piece you've selected cannot be moved, or if you attempt to initiate a move from an empty square, you will hear a short "beep," indicating an error. The cursor will return to the bottom left-hand side of the screen. You should then enter a new move.

To complete your move, position the cursor onto the square you wish to move your piece and once again, press the **RETURN** key or the **"FIRE"** button. The chess piece will automatically assume its new position on the board.

Aborting a Move

If, while moving the cursor, you decide not to complete your move, position the light blue cursor back onto the square highlighted in burgundy. Press the **RETURN** key or the **"FIRE"** button once. The cursor will relinquish control of that piece, and you may then enter a new move.

Errors

Illegal Moves

If the move you enter is illegal, the cursors will remain where they are and you will hear a short "beep." To enter a different move, simply position the cursor onto another square and press the appropriate button. If you wish, you may cancel the entire move by repositioning the cursor back onto the chess piece you were attempting to move and then press the **RETURN** key or the **"FIRE"** button.

Special Moves

Most moves in Chess consist of moving your playing piece from one square to another, and removing from the board any enemy piece that occupies your "arrival" square.

There are, however, three special moves:

Castling

To castle, move the King to its new square; two squares to the left or right of its original square. Then, press down the **RETURN** key or the **"FIRE"** button. The King and the Rook will assume their new positions. (See **CASTLING** section, P. 16).

En Passant

To make an En Passant capture, move your Pawn to the desired square in the usual manner. The enemy Pawn which you are attacking will automatically disappear from the board when you enter your move. (See **EN PASSANT** section, P. 17).

Pawn Promotion

When you advance one of your Pawns to the far side of the board, it will automatically be promoted to a **Queen**.

If, for any reason, you wish to promote a Pawn to a Knight, Bishop, or Rook, follow the steps below to execute your decision:

A. Press down the **ESCAPE** button once.
B. Press **E** for **ENTER POSITION** mode.
C. Position the cursor onto the square where your Pawn was promoted to Queen.
D. Press down the letter **N for Knight, B for Bishop**, or **R for Rook**, depending on your decision.
E. Press the **RETURN** key or the "Fire" button twice. (Once to remove the Queen, another to place the piece chosen).

F. Press **X** to place a dark piece in the floater position.

G. Press **M** to resume to game.

(See **ENTER POSITION MODE**, P. 4).

Command Modes

NOTE: You must wait for your turn to enter commands.

Automatic Play Mode

To instruct the program to play a game against itself, press down the letter **A**. The program will play an entire game automatically. When finished, the program will reset itself to the initial game position and begin a new game.

If you wish to exit from the **Automatic Play Mode**, press down the **ESCAPE** key.

Demonstration Mode

If you wish to see what the program is anticipating for its next move during a game, activate the **Demonstration Mode** by pressing the letter **D** when it is your turn to move. After a brief delay, the program will display the burgundy cursor onto a specific piece, and the light blue cursor onto a square it is suggesting as a possible move for this piece.

To end the **Demonstration Mode**, simply press the letter **D** again when it is your turn.

Enter Position Mode

This mode is used to initiate special positions (i.e., chess problems or positions found in chess books, magazines, or newspaper columns) by allowing you to clear the chessboard and set up specific pieces anywhere on the board. In addition, you may activate this mode in order to change your current game position by removing or replacing specific pieces on the board.

To activate the **Enter Position Mode** and position specific pieces on the chessboard, follow the steps described below:

1. Press down the letter **E**.
   A white King will appear along the bottom, right-hand side of the chessboard, next to the **Level Indicator**. This, and the other Chess pieces which will appear in this location, will be referred to as the **"Floater."**
2. Select the piece you wish to place on the board by pressing one of the following letters:

P for Pawn	**R** for Rook
N for Knight	**Q** for Queen
B for Bishop	**K** for King

   When any one of these letters are pressed down, the piece which corresponds to it will appear in the Floater position.

3. Position the cursor onto the empty square where you wish to place the piece you've just selected. Press down the **RETURN** key or the **"Fire"** button once. The piece displayed in the Floater position will then appear on this square.

   NOTE: At any time, if you wish to remove a specific piece from the board, simply position the cursor onto that piece and press the **RETURN** key or **"Fire"** button once. The piece will automatically disappear from the board. Then, follow the steps described above if you wish to reposition the same piece, or introduce a new one.

4. To exit from the **Enter Position Mode**, press down the letter **E**. The Floater will disappear. **NOTE**: After exiting from the Enter Position Mode, the side to move first will be determined by the color of the **LAST** piece displayed on the Floater.

New Game

If you wish to begin a new game, press down the **RESET** key when it is your turn to move. The program will automatically set up a new game, beginning on game level #1.

Hint Mode

While playing a match, if you wish to have the computer make your next move, press down the letter **M** key. The program will automatically switch sides with you, begin searching for the best possible move, and then make it. Press **M** again and the program will make its own move next. **NOTE:** If you press the **ESCAPE** key while the program is searching, it will stop and play the best possible move "considered" up to this point. If you are not satisfied with the computer's move, simply use the **TAKE BACK mode**. (See P. 5).

Replay Mode

At any point in a game, if you wish to see an action replay of all the preceeding moves, press down the **R** key once. The program will return to the initial game position (or the position from which you began after exiting from the **Enter Position Mode**). The program will then replay the game at intervals of 4 seconds between moves. Once the program reaches the current game position, it will revert to normal command entry and you may continue your game. To exit from the **Replay Mode** while it is in progress, simply press the **ESCAPE** key. (**NOTE:** If the game you are playing is longer than 255 half-moves, the program will only replay the most recent 255 half-moves when you enter the **Replay Mode**.)

Take Back Mode

During a match, if you wish to "take back" preceeding moves, press down the letter **B** key. Each time you press this key, the program will take back one move. Holding the key down will repeat this function until you release it.

You may take back as many moves as you wish—right up to the beginning of the game. However, if you have used the **Enter Position Mode** at any time during this game, the program will only take back moves up to the point from which you exited from this mode. (**NOTE**: If the game is longer than 255 half-moves, the program can only take back the most recent 255 half-moves.)

Forward Mode
If, after using the **Take Back Mode**, you wish to return to any game position the program has "taken back," press down the letter **F** key. The program will advance at the rate of 1 half-move per entry. Holding the **F** key down will repeat this function until you release it.

Exchange Sides Mode
By pressing down on the letter **X** key once, you may "turn" the chessboard around so that White will appear on the top of the screen, and Black on the bottom. You may wish to do this, especially if you are playing Black's pieces.

Special Situations

Check
When the program makes a move that places your King in Check, your King will flash rapidly for approximately 2½ seconds. This will also happen in the **Automatic Play Mode**.

Checkmate
When the game ends in Checkmate, the losing King's color will change to red and flash for approximately 10 seconds. This indicates that the game is over and that no other moves may be entered. However, you may activate the **Take Back** and **Replay** modes at this point.

Draws
The program will test for draws by 3-fold repetition of position, draws by the 50 Move Rule, and draws by Stalemate. Whenever a game is drawn, the King of the player to move next will change in color to green and flash for approximately 10 seconds. This indicates that the game is over and that no more moves may be entered. However, you may activate the **Take Back** and **Replay** modes at this point.

Difficulty Levels

This Chess program has 8 difficulty levels. Each level is indicated by the number of solid squares appearing at the extreme right-hand side of the screen, i.e. 2 squares indicates you are playing on difficulty level #2.

If you wish to change the difficulty level , press down the letter **L** key on your turn. Each press of this key will increase the difficulty level by 1. The new level will be indicated by the number of solid squares.

The following table shows the amount of time the program will take to respond to your move with one of its own:

LEVEL	***RESPONSE TIME***
1	Instantaneous
2	8 seconds
3	12 seconds
4	22 seconds
5	40 seconds
6	1 minute
7	2 minutes
8	45 minutes

NOTE: The actual response time will depend upon the complexity and the piece's position on the board. The above timings should serve only as a guide.(See **HOW COMPUTERS PLAY CHESS**, P. 55 for more information.)

Operating Instructions—Quick Reference

To Move Cursor: Use arrow keys ←, →, ↓, ↑, or joystick.

To Enter a Move: Position cursor on departure square—press **RETURN** key. Position cursor on destination square—re-press **RETURN** key. (Joystick button has same effect as **RETURN** key.)

Command Modes

NOTE: Enter commands only on your turn.

A	Automatic Play Mode (press **ESCAPE** to cancel)
E	Enter Position Mode—to position specific playing pieces
L	Difficulty Level Mode—set level between 1 and 8
M	Hint Mode—computer plays next move
R	Replay Mode—Replays game up to this point
B	Take Back Mode—takes back moves played
F	Forward Mode—replaces moves deleted in **TAKE BACK Mode**
X	Exchange Sides Mode—switches sides with computer
RESET	Begins new game at skill level #1.

Commands Under 'Enter Position Mode':

KEY	CHESS PIECE
K	King
Q	Queen
R	Rook
B	Bishop
N	Knight
P	Pawn

These commands place the specified piece into the bottom right-hand corner square.

RETURN Key: Clears the cursor square if occupied. If unoccupied, the piece from the bottom right-hand corner is transferred to this square.

C—Clears board of all pieces
E—Exits from "ENTER POSITION" Mode
S—Swaps color of piece in bottom right-hand corner

Changing Colors of Chess Pieces

To change the color of the Chess pieces on the board, the color of the squares, or the color of the cursors, press down the **CONTROL** key, the **CAPS/LOWER** key, and then one of the following number keys:

NUMBER KEY	COLOR
7	Changes the internal color of the darker chess pieces.
8	Changes the color of the lighter colored squares.
0	Changes the color of the darker squares.
9	Changes the background color.
1	Changes the color of the stationary cursor.
2	Changes the color of the moveable cursor.
5	Returns all chess pieces and squares to original color

There are 16 colors in all, 8 shades of each color. By holding down any one of these number keys, you will will able to see all the shades of color available for the specific piece you wish to alter. When the color you desire appears, simply release that number key.

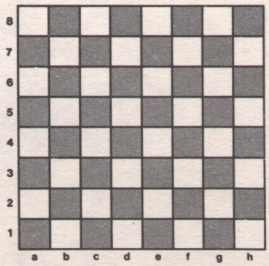
NOTE: To disable color changes, press the **CAPS/LOWER** key again.

LEARNING BASIC MOVES AND RULES

The Chess Board

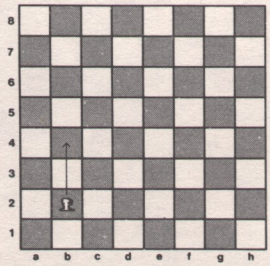
Notation

Here is the basic Chess board or battlefield. As you can see, the board is comprised of 8 squares by 8 squares.



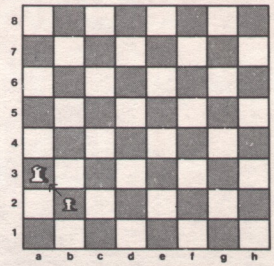
In order to describe each square of the board, and what may happen on it in the course of a game, a standard system has evolved. This straight-forward grid reference is called **ALGEBRAIC NOTATION.**

Each FILE (vertical rows) is assigned a letter—A through H. Each RANK (horizontal rows) is assigned a number—1 through 8. When a piece is moved, the notation for that move will include the designation for the original square the piece was on, and the designation for the square to which it was moved.



EX.: If the pawn on square **b2** is moved to square **b4,** the listing for that move will read **b2-b4.** This is a move notation.

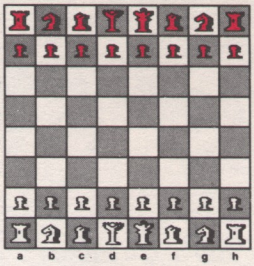
If a capture takes place, an **x** is placed between the two square notations.



EX.: If the pawn at **b2** captured an enemy Bishop at square **a3**, the listing will read **b2Xa3**.

The Chess Pieces

This illustrates the initial set up of pieces on the Chess board. As you can see, each player's "army" is composed of 16 pieces: 1 King, 1 Queen, 2 Bishops, 2 Knights, 2 Rooks, and 8 Pawns.



The following explains the importance of each piece and its possibilities for movement during a match.

The King

In the initial game position, the white King is placed on **e1,** while the black King is placed on **e8.** The King, as its name suggests , is the most important piece in the game. If your King cannot avoid being captured, you've lost the game.

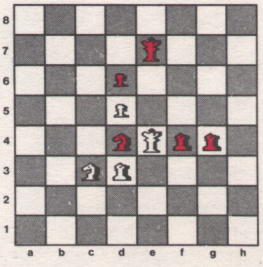
How The King Moves

The King may move 1 square at a time in any direction—forwards, backwards, horizontally, or diagonally. These possibilities are always at the disposal of any King, except under special circumstances (see **CHECK, CHECKMATE,** and **CASTLING** sections).

How the King Captures

The King may capture, and remove from the board, members of the opposing army. (The King cannot capture or remove any of its own forces.)

The King captures in exactly the same manner in which it moves. Therefore, it may move one square in any direction, and if there is an enemy piece on the square on which it lands, the King may remove that piece from the board and take over occupation of that square (providing the opposing piece is not protected. (See **PROTECTION** section, P. 50).



EX.: In this situation, the white King may only move to **d4** or **f4**, capturing the black Knight on **d4** or the black Bishop on **f4**. All other spaces are protected.

The Queen

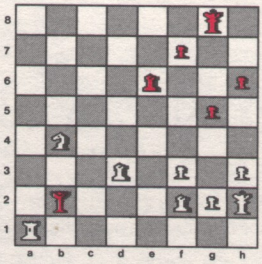
Each player also has one Queen. In the intial game position, the white Queen is placed on **d1**, and the black Queen is placed on **d8**.

After the King, the Queen is the most powerful on the board due to her great scope of movement.

How The Queen Moves
Like her husband, the King, the Queen may move in any direction—horizontally, vertically, or diagonally. But unlike the King, the Queen can move any number of spaces on a turn, providing her journey is not barred by any impediment.

How The Queen Captures
The Queen may capture, and remove from the board, members of the opposing army. (It is not permitted for the Queen to capture and remove members of her own forces.)

The Queen also captures in the same manner in which she moves. Therefore, when there is an enemy piece obstructing her route, she may advance onto its square, capture the piece and remove it from the board (provided the opposing piece is not the King. (See **CHECK** and **CHECKMATE** sections, P. 19, 20.)



EX.: In this situation, the black Queen may capture the white Rook on **a1**, the white Knight on **b4**, or the white Bishop on **f2**, but nothing else.

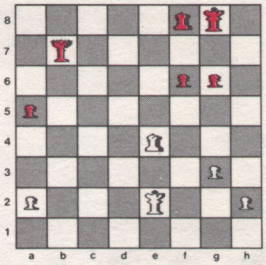
The Bishop

Each player has two Bishops. In the initial game position, the white Bishops are placed on **c1** and **f1**, the black Bishops on **c8** and **f8**.

How The Bishop Moves
A Bishop may move diagonally any number of spaces on a turn, providing there is nothing obstructing his journey.

How The Bishop Captures
The Bishop may capture, and remove from the board, members of the opposing army. (It is not permitted for the Bishop to capture and remove members of its own forces).

The Bishop captures in a virtually identical manner to the way in which it moves. Thus, the Bishop may move to any unoccupied square on its diagonal. If there is an enemy piece in its path, the Bishop may advance onto this square, capture and remove this piece, and take over occupation of the square (provided the opposing piece in not the King. (See **CHECK** and **CHECKMATE** sections, P. 19, 20.)



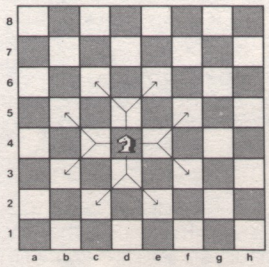
EX.: In this situation, the white Bishop may capture the black Queen on **b7** or the black Pawn on **g6**, but nothing else.

The Knight

Each player begins the game with two Knights. At the start of the game, the white Knights are placed on **b1** and **g1**, while the black Knights are placed on **b8** and **g8**.

How the Knight Moves

The Knight's move is somewhat different than any of the other pieces. Briefly, the Knight may move one space in any direction, and then one space **DIAGONALLY** from that space. The combination of these two movements makes up one move for the Knight. Because the Knight is "on horseback," he is able to "leap" over any pieces which might be in his way (even if they're his own pieces), to reach a new square.

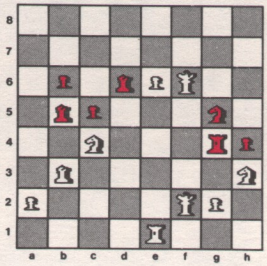


EX.: This diagram illustrates the possible moves of a Knight.

How The Knight Captures

The Knight may capture, and remove from the board, members of the opposing side's army. (It is not permitted for the Knight to capture and remove members of its own force.)

The Knight captures in the same manner in which it moves. Therefore, when examining your possible moves, keep in mind that the Knight can only capture an enemy piece which is occupying the Knight's arrival square (the square where the Knight will finally land). The Knight cannot capture any piece which stands between its starting square and its arrival square.



EX.: In this situation, the white Knight on **c4** can capture the black Bishop on **d6** or the black Pawn on **b6,** but nothing else. Similarly, the black Knight can capture the white Knight on **h3** or the white Pawn on **e6,** but nothing else.

The Rook

Each player begins the game with two Rooks. At the beginning of the game, the white Rooks are placed on **a1** and **h1,** while the black Rooks are placed on **a8** and **h8.**

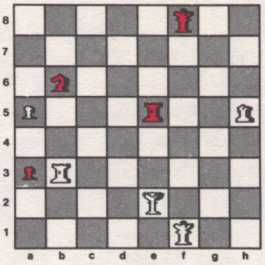
How The Rook Moves

The Rook moves in straight lines—up and down or from side to side (not diagonally), and can move as far as you wish on a turn until it meets an obstruction.

How The Rook Captures

Just like any of the other pieces, the Rook may capture, and remove from the board, pieces of the opposing army. (The Rook cannot capture and remove members of its own army.)

Again, the Rook captures in the same manner in which it moves. Therefore, the Rook may move to any unoccupied square along the rank file on which it stands, provided there is nothing obstructing its path. However, if an enemy piece is occupying a square along this path, the Rook may capture and remove this piece, and assume its position on this square. (See **CHECK, CHECKMATE** and **CASTLING** sections, P. 19, 20, 16.)



EX.: In this situation, the white Rook may capture the black Pawn on **a3** or the black Knight on **b6**. The black Rook may take the white Queen on **e2**, the white Bishop on **h5**, or the white Pawn on **a5**.

The Pawn

Each player begins the game with eight Pawns. In the initial game position, the eight white Pawns occupy all the squares on the second rank — **a2, b2,c2,d2,e2,f2,g2,**and **h2**. The black Pawns occupy the seventh rank—**a7,b7,c7,d7,e7,f7,g7** and **h7**. In effect, Pawns form the "front lines" of your army, protecting the more important pieces.

How The Pawn Moves

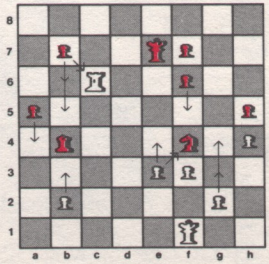
Normally, the Pawn moves by advancing one square at a time. It is permitted to advance only in a straight line forwards—it cannot move to the left or right, and can never retreat. **NOTE:** The only deviation from these rules would be **the Pawn's initial move**. From its starting position, the Pawn may be moved two squares forward. This right applies throughout the game and each player may decide to move a Pawn one or two squares, depending on strategy. **A Pawn cannot be moved two squares forward if the square directly in front of it is occupied.**

How a Pawn Captures

The Pawn may capture, and remove from the board, pieces of the opposing army. (Pawns may not capture and remove members of their own army.)

Unlike the other pieces in Chess, **the Pawn does not capture in the same manner in which it moves.** Although the Pawn only moves forwards, **it captures by moving diagonally forward one square** to the space occupied by an enemy piece. The Pawn may then remove this piece and assume the enemy's position on the board.

EX.: The following illustrates the three types of moves a Pawn might make: **OPENING MOVES, SECONDARY MOVES, and A CAPTURE.**



Special Moves

Castling

Castling is a special move of the King and Rook, and is counted as one move by the King. The purpose of the move is to get the King to safety and simultaneously bring a Rook, which might otherwise remain out of action, into play.

When castling is possible, a player moves his or her King two squares towards one of his or her Rooks, lifting the Rook over the King and placing it on the adjacent square.

Exceptions to Castling

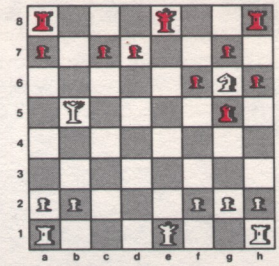
Castling is **PERMANENTLY** illegal if the King has already moved **EVEN IF IT HAS RETURNED TO ITS STARTING SQUARE.** Similarly, it is illegal to castle with a Rook that has already been moved, **EVEN IF IT HAS BEEN RETURNED TO ITS INITIAL SQUARE.**

Castling is **TEMPORARILY** illegal if any of the following conditions apply:

A. The King is in Check. (See **CHECK** section, P. 19.)

B. If any of the squares between the King and Rook are occupied either by its own pieces or by those of the opposing force.

C. If any of the squares across which the King must pass, or the square on which the King will land, is attacked (i.e., the King is not allowed to be in check, even while in transit).



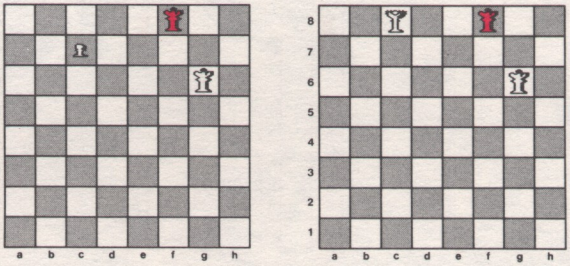
EX.: Here, white can castle King-side (to his right), by moving his King to **g1** and his Rook from **h1** to **f1.**

However, white cannot castle Queen-side (to his left), because the **c1** square is attacked by the black Bishop.

Black, on the other hand, may not castle King-side because the **f8** square is attacked by the white Knight. It doesn't matter that the **b8** square is attacked by the white Queen. The black King moves from **e8,** across **d8** to **c8.** None of these squares is attacked.

Pawn Promotion

Any Pawn which reaches the far rank (horizontal rows; 8th rank white, 1st rank black), at the other end of the board deserves some kind of reward—or promotion. Whenever this happens, that Pawn may immediately be promoted to the status of Knight, Bishop, Rook, or Queen. The usual choice is to promote the Pawn to a Queen due to her power and value. It is legal, although highly improbable, to have as many as nine Queens or as many as ten Rooks, Knights or Bishops during a match.



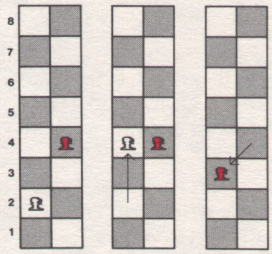
EX.: In this situation, the white Pawn is moved from **c7** to **c8,** wherein it is promoted to Queen.

En Passant

This term describes a special type of capturing move available to the Pawn. The words are French for "in passing," which helps describe the move.

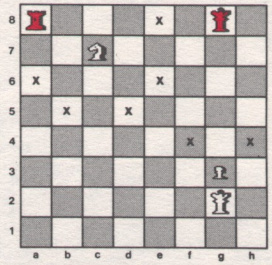
As you know, a Pawn may advance two squares from its base square (the square it occupies at the beginning of the game). If a Pawn does this, and lands on a square directly next to an enemy Pawn, then the Pawn which has just moved may immediately be captured as if it had only moved one square forward. **IF A PLAYER WISHES TO MAKE AN EN PASSANT CAPTURE, HE OR SHE MUST DO SO IMMEDIATELY ON THE VERY NEXT TURN AFTER THE DOUBLE PAWN MOVE.**

EX.: The following illustrates the three stages that create the possibility, and the result, of an en passant capture.



Attacking Enemy Pieces or Squares

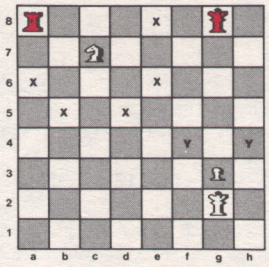
Any piece which can capture an enemy unit is said to be **ATTACKING** that unit. The piece which may be captured is said to be **ATTACKED.**



EX.: In this situation, the white Knight is attacking the black Rook, and the black Rook is attacked by the white Knight.

It is also possible for any piece to attack an empty square. This is the case when the piece would have been able to capture an enemy piece had the square been occupied.

The strategy behind attacking an empty space is to gain territory on the battlefield and possibly block your opponent's move.



EX.: In this situation, the white Knight attacks the squares marked **X;** while the white Pawn attacks the squares marked **Y.** Note that the Pawn does not attack the square immediately in front of it because the Pawn can only capture diagonally.

Check

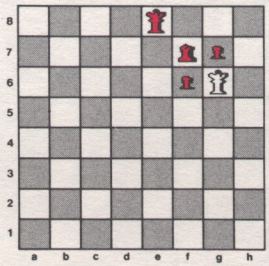
A player is said to be "in check" when his or her King is attacked by an enemy piece or Pawn. There is no alternative but to get out of check **immediately**. If it is not possible, then the position is a **CHECKMATE** and the game is over.

There are 3 ways in which a King may extricate, or be extricated from check:

1. The enemy piece or Pawn which is giving check may be captured.
2. The King may be able to move to a square which is not attacked.
3. If the King is being attacked by one of the long-range pieces (Queen, Rook, or Bishop), then it may be possible to interpose a piece between the King and the enemy unit that is giving check.

There are two important points to remember about check:

1. The King may not castle out of check.
2. The King may **never** move onto a square that is under attack by the enemy, or by moving a piece which will expose the King to an attack.



EX.: In this situation, the white King is in check. There are several ways in which the King may move out of check. However, let's examine what the King **CANNOT** do.

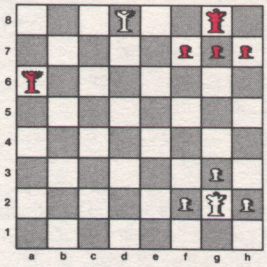
The white King cannot capture the piece that is giving check, the black Bishop on **f7**, because it is protected by the King on **e8**. If attempted, it would involve moving onto a square adjacent to the opponent's King, therefore moving into check. Similarly, the white King cannot take the Pawn on **f6** because it is protected by the Pawn on **g7** (remember, Pawns capture diagonally). For that same reason, the white King also cannot move to **h6** because that square is protected by the Pawn on **g7**. Nor may the white King escape to **g5** (attacked by the Pawn on **f6**), or to **h5** (still attacked by the Bishop on **f7**). Considering all this, it still leaves the white King with 3 choices for moving out of check:

1. Take the Pawn on **g7**. 2. Move to **h7**. 3. Move to **f5**.

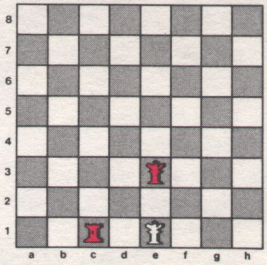
Checkmate

When a player's King is in check, and there is no way to escape it, the King has been "checkmated" and the player has lost the game.

The following illustrates 3 simple positions of checkmate:

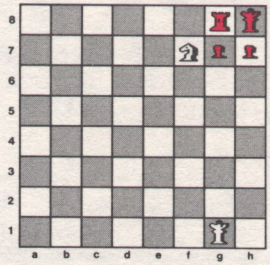


Here, the black King is in check from the white Queen. The King has only two vacant squares next to it, and if it were to move to either of those squares, the white Queen could capture it. Black cannot capture the Queen, nor can black move any piece to block the attack of the Queen. Therefore, black has no way of escaping check. White has won the game with checkmate.



Here, white has been checkmated. The black Rook is giving check. Together, the black Rook and black King attack all the empty squares next to the white

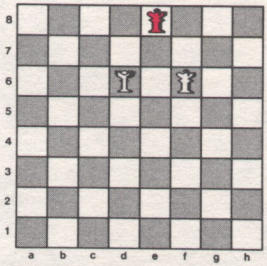
King. White has no other pieces with which to capture the Rook or place between the black Rook and the white King. There is no escape—black has won the game.



This last position illustrates a "smothered mate," in which the black King has no moves because it is hemmed in (smothered) by its own pieces. The lone white Knight attacks the black King. Since black has no way to capture the Knight and the black King cannot move, the white Knight has given checkmate. White has won the game.

Stalemate

This is a special type "drawn" ending to a game. A stalemate occurs when a player has no legal moves on his or her turn, but the player is not in check either. Stalemate does not happen often; and it is usually the result of carelessness—one player has a large advantage, but forgets to make sure that the opponent is either in check or has at least one legal move.



EX.: It is black's turn to move, but all of the squares next to the black King are attacked, either by the white Queen or white King. Therefore, black has no legal moves, but is not in check. Black has been stalemated and the game is a draw.

Draw

A "drawn" game is one where neither side is able to conclude the game with a decisive victory (checkmate).

There are 4 ways, apart from a stalemate, in which a game can be drawn. They are:

1. **Draw by Mutual Consent**
   An offer of a draw is normally made by a player **immediately** after he or she has made a move. The opponent can reply by saying, "yes" or "no," or can decline by making a move. The offer of a draw, once made, cannot be retracted, but is automatically cancelled if the opponent makes a move.
2. **Repetition of Position**
   If, on a player's move, he or she can only repeat a move which has already occurred twice during the game, the player may, instead of moving, claim a draw. If the player makes a move, he or she loses the right to this claim, and it now becomes the decision of the opponent.
3. **50-Move Rule**
   If 50 consecutive moves are played by each player and:
   A. None of them were Pawn moves
   B. None of them were captures
   C. None of them were castles
   Either player may claim a draw.
4. **Insufficient Mating Material**
   If neither side has sufficient material (pieces) on the board for a checkmate, the game is a draw. (See **Minimum Mating Material,** P. 35.)

ELEMENTARY TACTICS

The Winning of Material

When two armies wage war, the stronger army usually wins. The same is true in Chess. The side with the greatest amount of material on the board *usually* emerges as the winner, unless there are some special conditions or considerations.

It is generally safe to say that if you can capture one or more of your opponent's pieces without endangering your own army, then do so. Since material (the value of the pieces in your army), is the most important factor in deciding the outcome of the game, you should obviously be careful to avoid losing members of your own army.

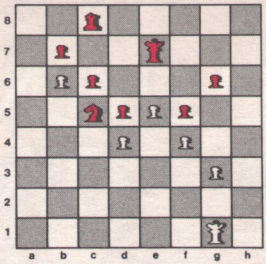
Relative Value of Playing Pieces

The following ratio will be useful in assessing whether a possible exchange of pieces or combination of exchanges is likely to be favorable for a player:

PIECE	VALUE
Pawn	1
Knight	3
Bishop	3
Rook	5
Queen	9

It must be emphasized that this formula can offer only the most over-simplified kind of help. Chess is not so formatted whereby it can be said that a Queen is always, or ever, worth precisely the same as a Rook, Knight and Pawn; or a Rook worth a Bishop and two Pawns; or a Knight worth 3 Pawns. Other factors in the position of pieces, especially the Pawn structure, determines the relative value of different pieces at any given moment in the game. As these factors change, so may the pieces relative values.

Because of the complexity of this subject, only some of the general principles concerning relative values of the Bishop and the Knight will be covered in the following pages.



This diagram illustrates one of the most important of these principles which involves the Bishop. A Bishop can be severely hampered during a game by its own Pawns if they are fixed on, or even temporarily occupy, squares of the color on which the Bishop operates. An enemy piece which has found a safe outpost on a square of the opposite color is likely to be a far superior piece. A Knight will be at least as good as a Bishop in positions where the Pawn structure is blocked and there are few or no open diagonals available.

In more open and fluid positions, the strength of the Bishop increases dramatically and any Knight that is to be its match will need a good secure post somewhere near the center of the board. This last point is important. A Bishop, as long as it has an open diagonal on which to operate, can exert considerable pressure from near the edge of the board.

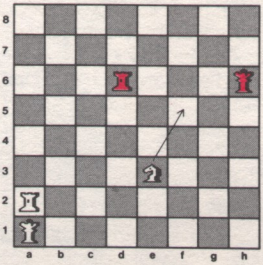
A Knight's power diminishes steadily the further it is from the center of the board. From a center position, the Knight controls eight squares; but from the edge, only three or four. From a corner, only two. Indeed, on an open board, a Bishop can completely dominate a Knight.

"Fork" Attack

There are two important tactical ideas which can often be used to win material. The simpler of the two is called a "fork," because it involves a two-pronged attack on enemy pieces (occasionally, it may be more than two-pronged). The strategy behind attacking two enemy pieces simultaneously is to capture at least one of them. Usually, it will not be possible for the opponent to move both of the attacked pieces away before one of them can be captured.

Here are some examples of how different types of pieces can "fork" two opposing pieces:

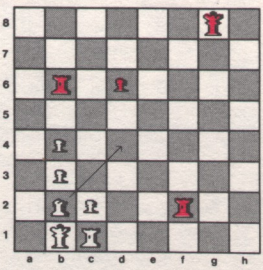
Knight Forks



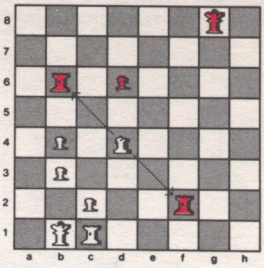
Knight forks are overlooked more often than forks of any other piece. Perhaps it is because of the manner in which the Knight moves. In this situation, the white Knight on **e3** can move to **f5**, giving check and simultaneously attacking the black Rook on **d6**.

Now, black must move the King in order to escape check. White then captures the Rook on **d6** with the Knight, completing the Knight fork attack.

Bishop Forks



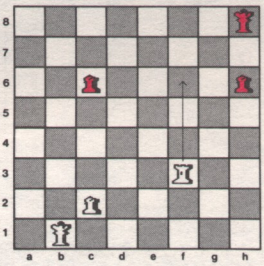
Here, the Bishop moves from **b2** to **d4**, where it then attacks both black Rooks.

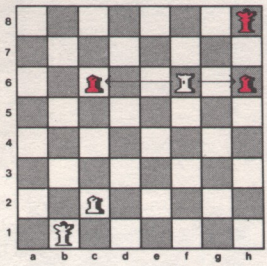


Now, if black moves one Rook, white's Bishop will capture the other. If black moves neither Rook, white simply chooses one to capture.

Rook Forks

Just as it is possible for a Bishop to fork two Rooks, so it is possible for a Rook to fork two Bishops (or any other pieces, except Rooks).





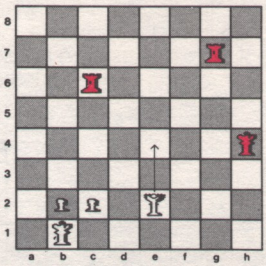
Here, white moves the Rook up from **f3** to **f6**, where it will attack both Bishops.

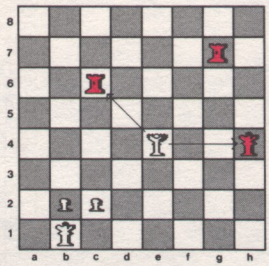
Now, regardless of what moves black attempts, white's Rook will still capture one of black's Bishops on the next move.

Queen Forks

Obviously, the Queen is the most powerful forking piece, since it combines the forking power (manner of moving), of the Rook and the Bishop.

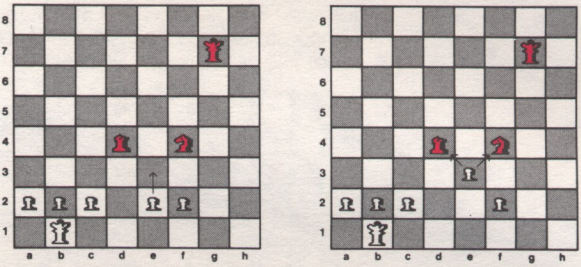
Here, the white Queen moves from **e2** to **e4**, giving check along the fourth rank, and at the same time attacking the black Rook on **c6**.





When the black King moves out of check, or the black Rook on **g7** interposes on **g4**, the white Queen will capture the Rook on **c6**. Note that the Queen is forking along a rank and a diagonal, taking full advantage of its ability to move like both a Rook and a Bishop.

Pawn Forks



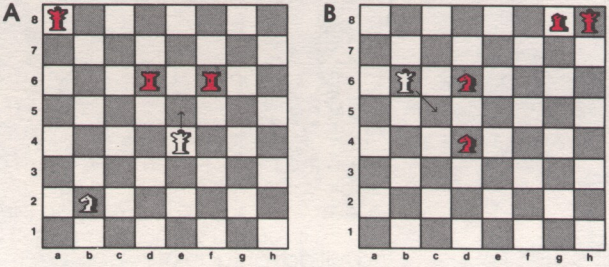
Even the lowly Pawn has the power to fork two valuable pieces. If white's Pawn advances from **e2** to **e3**, it will be attacking the black Bishop on **d4** and the Knight on **f4**. If black moves the Bishop, the Knight is lost. If black moves the Knight, the Bishop is lost.

Note that black can recoup a Pawn for the lost Bishop or Knight, although quite insufficient compensation. Also note that if white did not have a supporting Pawn on **f2**, the move from **e2** to **e3** would mean losing a Pawn to the black Bishop **(Bd4xe3)**. Therefore, when you see an opportunity for a Pawn fork, make certain that the Pawn will not be lost by attacking.

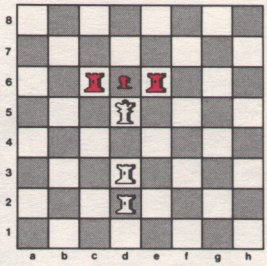
King Forks

It may seem impossible for a King to complete a successful fork because of its importance and value.

For example, in diagram **A**, if white moves the King from **e4** to **e5** in order to attack both Rooks, a capture cannot occur. Here, the Rooks are defending each other, making **e5xd6** or **e5xf6** impossible for white.



Similarly, if the King on **b6** in diagram **B** were to move to **c5**, it would fork both Knights. However, black could then move one Knight in order to defend the other, and white would not be able to capture. (One possible move for black is **Nd6-f5**.)



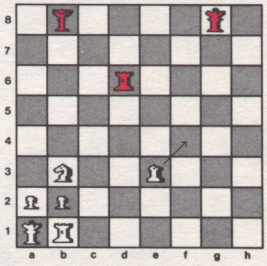
This situation *does* illustrate how a King fork is possible. White has just played **Kd4-d5**, and the black Pawn on **d6** interferes with the mutual protection of the Rooks.

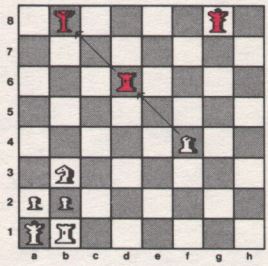
Pin and Skewer

The other tactical idea which often wins material can occur in two different forms—the Pin and the Skewer. Both are possible when an attacking piece is on the same rank, file, or diagonal as two enemy pieces. If the enemy moves the nearest piece out of the line of attack, then the furthest piece is open to capture. Likewise, if the furthest piece is moved, then the nearest one can be captured. If the nearest piece is the **less** valuable of the two enemy pieces, this is called a **Pin**—the nearest piece being "pinned against" the far piece. If the nearer piece has the same value or is **more** valuable then the far piece, then the tactic is called a **Skewer**.

Here are some examples of Pins and Skewers:

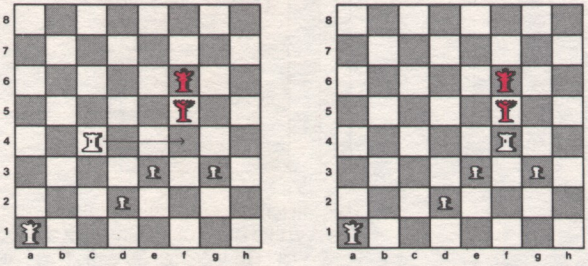
Bishop Pins





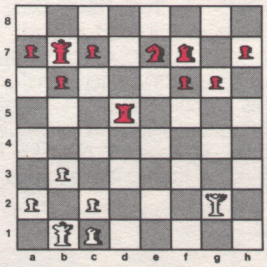
By moving the Bishop from **e3** to **f4**, white attacks the black Rook. If the Rook remains where it stands, white will capture it on the next turn, gaining Rook for Bishop—an advantage equivalent to nearly two Pawns. But if black moves the Rook out of the way, an even worse fate will befall black — the loss of the Queen.

Rook Pins



Here, white is behind on material, but can win the game by playing the Rook from **c4** to **f4**. This move attacks black's Queen. The Queen cannot move out of the line of attack without exposing the King to attack. Therefore, black loses the Queen for a Rook, while white wins extra Pawns.

Queen Pins

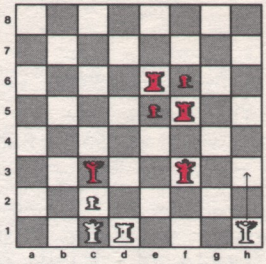


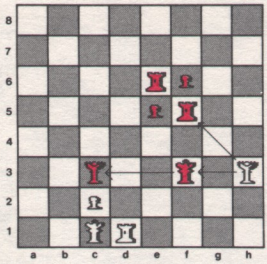
In this position, black's Rook is immobilized; it cannot move without exposing its own King to check from white's Queen.

There is no point in white's capturing the Rook with the Queen, since the Queen—a more valuable piece than the Rook—would be recaptured by the black Bishop or Knight.

But white can move the Pawn from **c2** to **c4**. Since black's Rook cannot move, it cannot escape the attack by white's Pawn. On the next move, the white Pawn will take the black Rook, and black will only be able to recapture a Pawn in exchange.

Queen Skewers

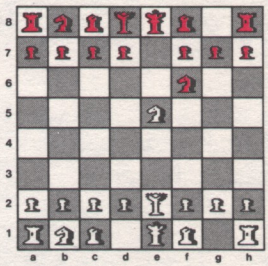




By moving the Queen from **h1** to **h3**, white penetrates a double skewer with the Queen. The black Rook on **f5** is attacked and, if it were allowed to move its colleague on **e6**, would be undefended. Unfortunately, black is now in check, and on the next move of the King, white will capture black's Queen on **c3**. As you can see, the Queen can be a powerful piece, especially on an open board.

Discovered Check

The following diagram illustrates the meaning of **Discovered Check**. Just as a check may be blocked by interposing a defending piece, so can a check appear when an attacking piece moves aside and unmasks the "line of fire" behind it. This is a particularly dangerous form of check since the piece that moves aside and "discovers" check has a charmed life for one move. It may be able to move to a square or make a capture that would ordinarily be considered foolish, knowing that the opponent's first priority is to escape check.

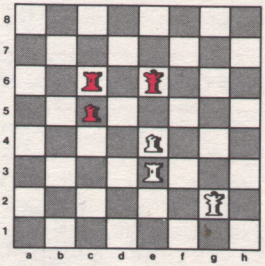


In the diagrammed position, the white Knight alone prevents the black King from being in check from the white Queen. On white's next turn, there is a choice of 8 different squares for the Knight—all of which leave the black King in check. Observing the situation, it is possible to rule out white's move to **c4**, **d3**, **f3**, and **g4**. Any of these moves would allow black to simply interpose the Queen or the Bishop

on **e7** with no serious consequences. Nor is it profitable for the white Knight to capture either of the Pawns on **d7** and **f7**, since the discovering piece is not immune to attack. The black King would escape from check by capturing on **d7** or **f7**.

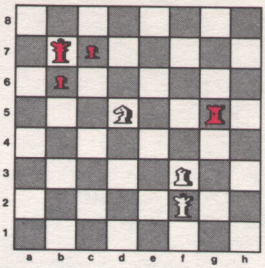
There are two possibilities left for the white Knight—to move to **g6** or **c6**. Both are good choices, but the latter of the two is better. Knight to **g6** is not wise because black will interpose the Bishop on **e7**, allowing white to only capture the Rook on **h8**. It would be much more advantageous for white to move to **c6**. Here, white could capture black's Queen and give check at the same time. The black Queen is lost to the white Knight whether it remains on **d8** or moves to **e7**.

Discovered check is by no means always a complete disaster. If, for example, the checking piece is under threat of capture, especially from a piece of lesser value, the discovered check may well be ineffectual.



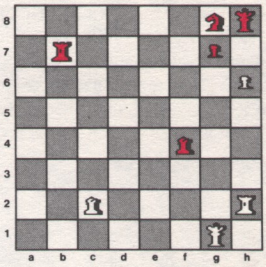
In this situation, white can capture black's Rook on **c6** with the Bishop on **e4**, discovering check. However, black simply replies by taking the Rook on **e3** and restores the balance of material.

Alternatively, a discovered check may be futile if the discovering piece cannot set up any useful threat during its "free" move, as in the diagram below, where black is safe regardless of where the white Knight moves.



Double Check

It is, of course, possible for the discovering piece to also give check—in other words, for the King to be in check from two pieces simultaneously. This is known as **Double Check**. It is possibly the most devastating check of all since the defender has no alternative but to move the King. In this situation, it is to no avail should any other defending piece capture one of the two checking pieces, or try to block the line of action, because it will do nothing to interfere with the second check.

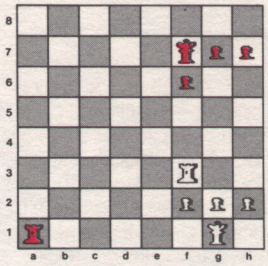


Here, it is white's move. If white captures the black Pawn on **g7** with the Pawn on **h6**, then black will be in check from both the new arrival on **g7** and the Rook on **h2**. Although black can take the **g7** Pawn with the Rook, and can take the white Rook with the Bishop, neither of these moves is permissible. The black King would still be in check from the free Pawn or Rook. Likewise, it is insufficient to obstruct the Rook's check by Knight or Bishop to **h6** since nothing is addressing the check from the Pawn. So black has only one legal move—to take the white Pawn on **g7** with the King. White can then check on **h7** with the Rook (which is protected by the Bishop on **c2** (See **PROTECTION** section, P. 50), and win the black Rook on **b7**—a skewer!

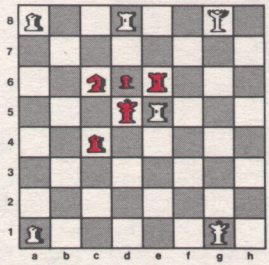
Playing for Mate

As you know, the ultimate object of the game is to checkmate your opponent's King. Sometimes you will be able to do this while there are still many pieces on the board. Other times, you will find it necessary to reduce the number of pieces in your opponent's army before closing in for checkmate. Although the winning player is usually the one with the most material on the board at the end of the game, it is possible to sacrifice some of your material in order to force checkmate. After all, if you can mate your opponent, it doesn't matter who has more material on the board—you've won the game anyway!

The following diagrams illustrate some checkmating themes.

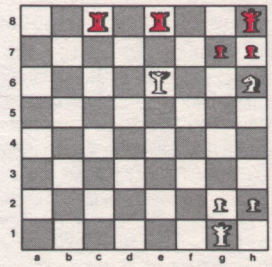


This position is an example of a "back rank" mate, a peril to which a castled King is exposed for as long as a wall of Pawns blocks its escape to the second rank. When the King is hemmed in like this, a solitary Rook or Queen will suffice to checkmate the King. If the checking piece cannot be captured, the defending side must have at least two pieces covering one of the intervening squares if mate is to be averted.



This mate shows the ranking power of two Bishops working together.

Here, the importance of the Pin is emphasized. Despite the number of black pieces (four) that, at first glance, can capture the checking white Rook on **e5**, the position is nonetheless mate. The black Knight is pinned by the white Bishop on **a8**, the **d6** Pawn by the Rook on **d8**, and the Rook on **e6** by the Queen on **g8**. The King itself cannot take the Rook because the Rook is protected by the Bishop on **a1**. Black would once again be moving into check.



In this diagram, the unique mating abilities of the Knight are illustrated—the "mate in two." The Knight is the only piece that is able to mate a King which is entirely surrounded by its own pieces. Here, white

can force black to "suffocate" itself. White moves the Queen to **g8**. The black King may not capture since the Queen is protected by the Knight. Black's only move is to capture with the Rook. White then mates with Knight to **f7**—another example of the "smothered mate."

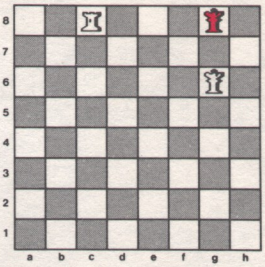
Minimum Mating Material

It is important to be aware of what pieces, or combination of pieces, constitute a sufficient force to mate a lone King on an otherwise empty board. A single Queen, a single Rook, two Bishops, or a Bishop and a Knight (always working in conjunction with their own King) are adequate. But a lone Knight, Bishop, or two Knights are not. Although it is possible to construct a position in the corner of the board in which the King is mated, it is not possible for the attacking side to bring this about by force against accurate defense.

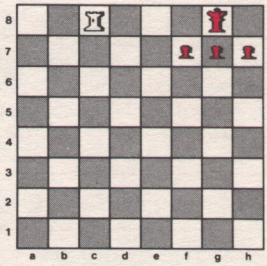
Whether a King and one Pawn can win against a solitary King depends on the relative positions of the two Kings. If the situation is unfavorable for the side with the Pawn, then it won't be possible to force the promotion of this Pawn to a Queen. The best that can be achieved for this side is a stalemate.

Standard Mating Positions

There is a distinct technical side to Chess in that once substantial material advantage is established, then a good technique will convert into a win with minimum expenditure of effort and energy. The following are all examples of standard mating positions. In all cases, the King has been caught or driven into a position where his escape is cut off—either by the King's own pieces or those of the opponent.

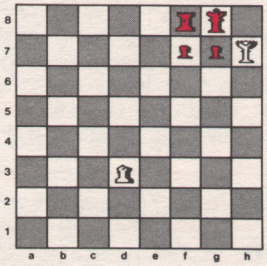


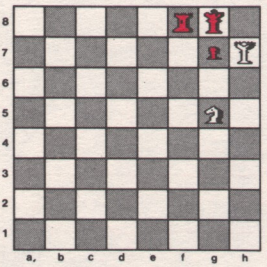
Here, white has used the King to prevent black from escaping to the squares **f7**, **g7**, or **h7**.

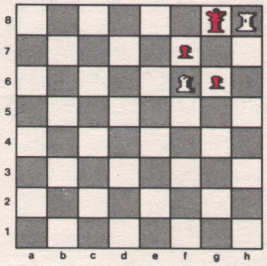


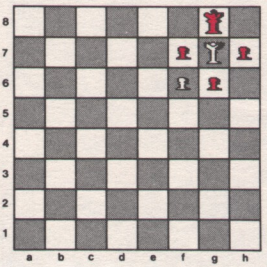
In this position, it is black's own Pawns that cut off the potential escape squares. Notice that white is helped by black's King, which is at the edge of the board.

The way pieces combine efforts to help trap the opponent's King shows the value of attacking with as many of your forces as possible. Here are some more mating positions with two or more pieces attacking in unison:









MORE ADVANCED TACTICS AND STRATEGIES

The Opening

In the opening of the game, each player decides where to place pieces for the coming battle. Depending on which Pawns are moved in the very beginning, certain pieces will be better placed on some squares than others. This process of moving specific pieces out onto the board first is called "development." It is one of the most important aspects of Chess.

A player whose forces are brought out quickly, and are strategically placed on the board, is considered to have good development. On the other hand, a player who wastes one or more opening moves will soon find that good development is difficult to achieve—perhaps resulting in a disastrous game.

It is easy to see then, that the player with many more pieces in play will often be able to utilize this lead in development to force the win of material, or even an early checkmate.

Selecting Key Positions

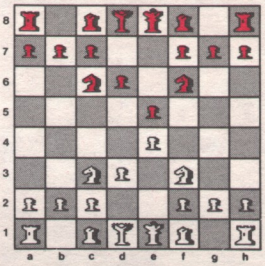
The Knights

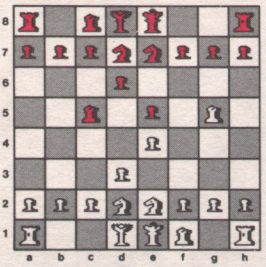
The classic squares for white's Knights are **c3** and **f3.** From these squares, a Knight attacks two squares in the center of the board (from **c3**: **d5** and **e4**; from **f3**: **e5** and **d4**), as well as another square on the opponent's side of the board.

On these squares, the Knights do not obstruct any of the other pieces, except for the Knight on **f3**. Although it obstructs movement of the Queen, it is usually safer not to bring the Queen out so early in the game.

Perhaps the only real disadvantage of posting your Knights on **c3** and **f3** is that they may allow for an awkward pinning move by the enemy Bishop.

In this situation, if white plays the Bishop from **c1** to **g5**, or if black moves the Bishop from **c8** to **g4**, the Knight on **f3** cannot move without exposing the Queen to immediate loss. The Knight on **f3** is said to be pinned by the black Bishop (See **Pin** and **Skewer** section, P. 29).





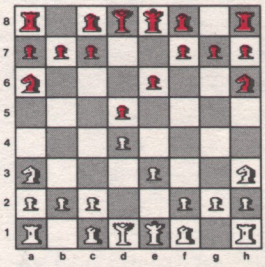
The next best squares for white's Knights are **d2** and **e2.** From each of these squares, a Knight attacks only one of the four squares in the center of the board. Therefore, the Knight on **d2** or **e2** exerts slightly less control on the center. From **d2** or **e2**, the Knight has quite a few options. From **d2**, the Knight can move to **c4**, an active square from where it attacks four squares on the opponent's side, one of which is a central square. The Knight may also go to **b3**, controlling **d4** and **c5** (both useful squares), or even move to **f3**.

When developing a Knight on **d2** or **e2**, it is important to think first about the Bishops. Will the Knight's move block your own Bishop? And if so, does it seriously effect your game? Here, the white Knight on **d2** does not block the Bishop because the Bishop had moved from **c1** to **g5**. But the Knight on **e2** does shut in the Bishop on **f1**. Either the Knight must redeploy or the Bishop must be developed at **g2**, after white advances the Pawn from **g2** to **g3**.

One final point about developing Knights on the second rank instead of the third rank is that they do not offer sufficient protection to a castled King (See **CASTLING** section, P. 16).

Placing the Knights on squares at the edge of the board offers you little advantage. From the edge, a Knight exerts absolutely no influence on the center of the board and its mobility is limited. If you look at the Knight on **a3**, you will see that it has only three moves at its disposal: **b5**, **c4**, and **b1**.

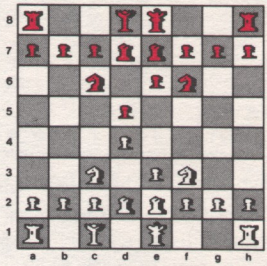
Another disadvantage in placing Knights on the rim is that if they are exchanged by an enemy Bishop, the recapturing move with the Pawn will produce a pair of "doubled Pawns."



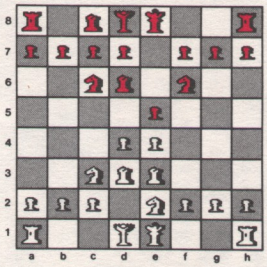
In the above situation, black can capture the white Knight on **a3**, and if white recaptures with the Pawn on **b2**, white will have Pawns on **a2** and **a3**. Normally, this is a disadvantage in the endgame (See **ENDGAME** section, P. 51), as they can be easily captured.

The Bishops

The Bishop is a more mobile piece than a Knight, and therefore, has a wider choice of squares on which to move. Whereas the Knight normally has only three possible development squares, the Bishop has five possible moves once the center Pawn has moved. In addition, the Bishop may have another two possible squares if the b-Pawn and the g-Pawn move. It is generally more advantageous to develop the Knights first, and then develop the Bishops. In doing so, you are often allowed more flexibility when positioning your Bishops.



In this situation, it is apparent that the Bishops are not actively placed. All four Bishops appear to be defending rather than attacking. However, on **d2** and **e2,** the Bishops are immune to attack for the time being. Note that white has moved the Queen from **d1** to **c1**, behind the Bishop. This type of move is often used when a player is planning to move the Bishop to a more advanced outpost where it will require some protection.

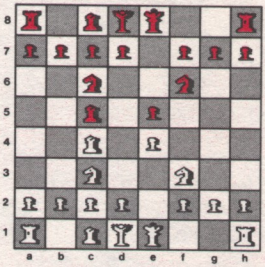


Placing Bishops on the third rank is somewhat more aggressive than placing them on the second. Here, the white Bishops on **d3** and **e3** give support to the center squares **e4** and **d4**.

In addition, both Bishops have retained the flexibility of pointing towards King-side and Queen-side. There are some disadvantages however, when developing your Bishops on the third rank. First, you should not do so if the Bishop's moves block a central Pawn.

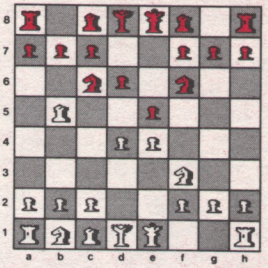
Here, black's Bishop on **d6** prevents the **d7** Pawn from moving. This, in turn, makes it more difficult for the Bishop on **c8** to become developed. Black can play the Pawn from **b7** to **b6** and then develop the Bishop from **c8** to **b7**. A more aggressive position for black's Pawn would be from **e6** to **g4**, but this cannot be done until the Bishop on **d6** is moved so that the Pawn on **d7** may advance.

Another problem is illustrated by the move of black's Knight from **f6** to **g4**—the Knight threatens to exchange off the white Bishop on **e3**, forcing white to recapture with the **f2** Pawn and creating a pair of doubled Pawns. Therefore, when planning to place your Bishop on the third rank, make certain that it does not block a Pawn, and that it cannot be attacked by an enemy Knight.



The most active squares for developing the Bishops are those on the fourth and fifth ranks: **c4**, **f4**, **b5**, and **g5**. From here, they may bear down on the enemy position. Here, white and black have developed their Bishops on **c4** and **c5** respectively. These two squares are the most aggressive of all. The white Bishop on **c4** attacks **f7**, which is the most vulnerable point in black's territory. The reason for this degree of vulnerability lies partly in the fact that **f7** is defended by only one piece, the black King.

Although **c4** and **c5** (white and black respectively) are good squares for the Bishops, their counterparts on the King-side are not as active. Placing your Bishop on **f4** or **f5** does attack the enemy Pawn on **c7** or **c2**, but does little to threaten the enemy King. For this reason, the moves **Bf1-c4** and **Bf8-c5** are more prevalent than the development to **f4** or **f5**.



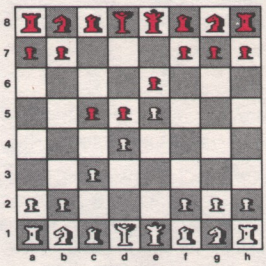
On **b5**, white's Bishop is also actively placed. The square **b5**, however, is not so obviously strong as **c4**. But in this diagram, it is easy to see why white's Bishop on **b5** is a threat. If white advances the d-Pawn from **d4** to **d5**, the black Knight on **c6** will be attacked by the Pawn—but the white Bishop on **b5** prevents it from moving. Were the Knight to move, white's Bishop could capture the black King. So the Knight on **c6** is pinned by the Bishop, and it could be captured by the Pawn on **d4**. One of the prime reasons Bishops are developed on **b5** or **g5** is because of this type of pinning move.

One important aspect of pinning the **f3** Knight is that if the defending side is careless, the opponent may be able to exchange the Bishop for Knight in such a way as to force the recapture with the g-Pawn. In doing this, the opponent then opens up the g-file for an attack against the King.

The Pawns

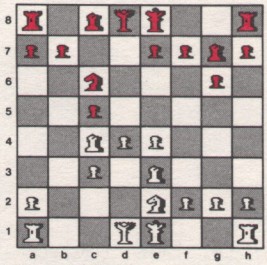
The Pawn structure in the opening of a game tends to set out a "demarcation line." Too many Pawn moves will weaken your position and waste time that could be spent on development. On the other hand, too few and cautious moves will mean a cramped position which will affect the maneuverability of your pieces in the middlegame.

It will usually be any of the **c**,**d**,**e**, and **f** Pawns that will operate in the opening phase by trying to combine these two tasks—gaining space and facilitating development.



In this position (reached by 1 **e2-e4 e7-e6** 2 **d2-d4 d7-d5** 3 **e4-e5 c7-c5** 4 **c2-c3**), black has challenged white's central positioning with its Pawns. White now occupies the squares **d4** and **e5**, while black controls the other central squares **d5** and **e4**. In addition, black is trying to undermine white's center from **c5**. But white has supported its center by the Pawn move to **c3**.

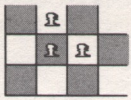
Although white has a restricting Pawn outpost at **e5**, black has a target to attack on **d4** with its pieces. The game might continue 4 . . . **Nb8-c6** 5 **Ng1-f3 Qd8-b6**.



Here, black has allowed white to occupy the center with its Pawns, offering black a target to attack with its pieces. As you can see, black exerts great pressure on **d4**, which compensates for its space disadvantage. This position was reached by 1 **d2-d4 Ng8-f6** 2 **c2-c4 g7-g6** 3 **Nb1-c3 d7-d5** 4 **c4xd5 Nf6xd5** 5 **e2-e4 Nd5xc3** 6 **b2xc3 Bf8-g7** 7 **bf1-c4c7-c5** 8 **Ng1-e2 Nb8-c6** 9 **Bc1-e3**. As the game continues, black will continue to apply pressure to the center, while white tries to consolidate its forces.

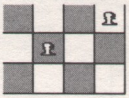
There are some Pawn formations which should be avoided, especially when they are in front of your castled King (See **KING SAFETY** and **CASTLING** section for additional information).

Double Pawns



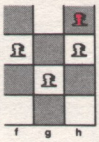
The movement of the second or back of the two doubled Pawns is limited.

Isolated Pawns



These positions leave weaknesses, especially on the squares in front of them. They cannot defend each other, and consequently, pieces are restricted by their own defense.

Backward Pawns



Here, the Pawn at **g2** is not supported and cannot advance. It can be subjected to great pressure from pieces advancing down the g-file.

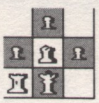
King Safety and Castling

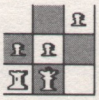
A King is never 100% safe from attack, but you can substantially increase the odds against it being trapped. One way is to castle fairly early in the game; this also brings the Rook into the center of the board. Postponing castling could result in your King getting trapped in the middle of the board.

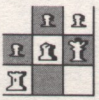
The only time castling can safely be delayed is when the center of the board is completely closed. Even then, there may be a possibility of sacrificing other pieces in order to keep your King there.

When you castle, you should make certain that you are not unwillingly putting your King in danger. The following castled positions are, in general, fairly safe.









Of course, the safety of a position depends on the line of development your opponent has adopted.

The Rooks

In the opening, the Rooks are generally placed on squares where they will be potentially threatening. Moving them to either **e1** or **d1**, or **f1** or **c1**, if the **f** or **c** Pawns have been advanced. Then, once a capture is made, the obstructions on those files will be removed. In some cases, the Rook may be left on its starting position in order to support the flank advance, **a2-a4-a5** or **h2-h4-h5**. This is an effective strategy against the black Pawns on **a7**, **b6**, **c7**, the Bishop on **B7** or **g7**, or the Pawns on **f7**, **g6**, **h7**.

The Queens

In most cases, it is unwise to move the Queen out early in the game. Remember, it is your most powerful piece and too valuable to risk on speculative sorties.

The Queen is quietly developed at **e2** or **c2** in anticipation of the middlegame. Obviously, if there is a real chance of substantial material gain, then bringing the Queen out early may be justified. Even then, be careful not to allow your opponent a large lead in development , i.e., bringing out pieces which will threaten your Queen.

The Middlegame

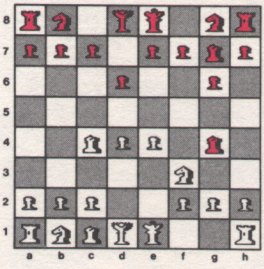
The middlegame is often decided by how the match opens. If the players castle on opposite sides, for example, then it is likely to be a tactical game (i.e., each player attempting to attack the opponent's King first.) Or each player may concentrate on developing more slowly before committing to a particular plan or strategy.

The player who has seized the initiative in the opening can, in many cases, dictate the course of the middlegame. It is vital, therefore, to decide which types of positions you think are best in order to "fight the battle" as much as possible on your own terms.

How to Decide on a Plan

Assuming your development is complete, you are now ready to set about the game in earnest. In many cases, you should already have a strategy in mind. Being flexible, though, is the essence of Chess!

Let's look at the following example:



(This position has been reached by: 1 **e2-e4 g7-g6** 2 **d2-d4 Bf8-g7** 3 **Ng1-f3 d7-d6** 4 **Bf1-c4 Bc8-g4**.)

Here, black has ignored the placing of the opponent's pieces. Normally, black's moves would be considered good for development, but in this context, they are disastrous . White wins a Pawn and fatally weakens the opponent's King position by 5 **Bc4xf7** + **Ke8xf7** 6 **Nf3-g5** + **Kf7-e8** 7 **Qd1xg4**.

General rules for devising a plan are not easy to provide. Obviously, it is best to study different types of positions in order to have a wide range of ideas to draw on for the middlegame. However, there is one useful rule you can often apply: look for the piece that is most out of play and see if you can improve its position.

Let's consider the various strategies and positions.

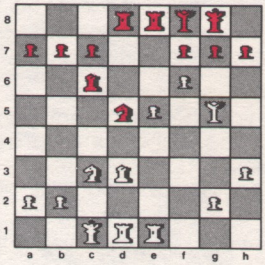
Attacking the King

Preparing an Attack

In preparing an attack, keep in mind that what you are trying to do is remove the King's defenders (either by exchange or sacrifice), and you must therefore have reserves ready to throw into the action.

In the following section, you will notice how the winning side's pieces almost miraculously appear in the right place at the right time. This careful planning before embarking upon an attack is the secret of tactical Chess.

Alexander Alekhine, World Champion from 1927—1935, was a master of attack, but he realized fully the importance of "position first, combination second." Look at how all of his pieces and Pawns combine to batter his opponent into submission.



1 Bd3-c4: Preparing the winning advance:

1 ...	**Nd5xc3**
2 **Rd1xd8**	**Re8xd8**
3 **f6xg7**	**Nc3xa2+**
4 **Kc1-b1:**	

Preventing the saving:

4	... **Qf8-c5+**	after 4 **Bc4xa2**
4	...	**Qf8-e8**
5	**e5-e6:**	**Bc6-e4+**
6	**Kb1-a1**	**f7-f5**
7	**e6-e7+**	**Rd8-d5**
8	**Qg5-f6**	**Qe8-f7**
9	**e7-e8(Q)+**	**Qf7xe8**
10	**Bc4xd5+**	Resigns

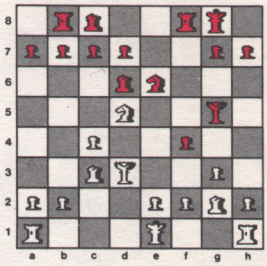
If 10... **Be4xd5**, then 11 **Re1xe8** mate; if 10... **Qe8-f7**, then 11 **Bd5xf7** mate. Notice how black was given absolutely no respite; no time to regroup his pieces and consolidate his position.

Pressing Home The Attack

First, let's look at a position where the players castle on opposite sides. In this type of game, with the Kings virtually at opposite corners of the board, the excitement is at its highest. Either player will storm his opponent's castled position, often sacrificing Pawns in order to clear the lines for his major and minor pieces.

Timing is all important when launching the attack. Your thoughts should be directed towards seizing the initiative: the more pieces your opponent is forced to defend with, the less he or she will have for an assault. Once your opponent is forced to abandon an attack for the sake of defense, you will have more time to build up your own position. For your attack to succeed, it must be launched at the ideal moment!

Here, it is a well timed and finely executed attack based on a Pawn assault. It was played in 1934, by Riumin against Euwe.



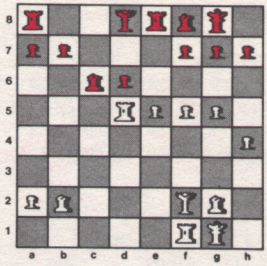
1	**h2-h4**	**Qg5-h6**
2	**g3-g4**	**Ne6-c5**
3	**Qd3-d2**	**b7-b6**
4	**0-0-0**	**Bc8-b7**
5	**g4-g5**	**Qh6-e6**
6	**Qd2-d4**	**Qe6-f7**
7	**h4-h5**	**Nc5-e6**
8	**Qd4-d3**	**Ne6-c5**
9	**Qd3-d2**	**f4-f3**
10	**g5-g6!**	

If 10... **h7xg6** 1 **h5xg6 Qf7xg6** 2 **Bg2xf3** with threat of 13 **Rd1-g1.**

10 ...	**Qf7-f4**
11 **Nd5xf4**	**Bd6xf4**
12 **e2-e3**	**f3xg2**
13 **Rh1-h4**	**Bf4-g5**
14 **g6xh7+**	**Kg8xh7**
15 **Qd2-c2+**	**Kh7-g8**
16 **Rh4-g4Nc5-e6**	
17 **f2-f4**	**Bb6-f3**
18 **Rg4xg2**	Resigns

Notice in this game how white saved time by using the opponent's Queen as a target to help his Pawn advance. Also, the timing of the attack was impeccable, as black's pieces were temporarily tied up on the Queen side.

In the next example (Cohn vs. Chigorin), white's attack is in full swing. He has carefully advanced his Pawns to weaken his opponent's defenses, and massed his pieces behind this Pawn advance. He faces a solid defense position, and has to watch out that he does not over-extend himself. The way he breaks through is very instructive.



1 e5-e6!...

If now 1... **Bc6xd5** 2 **Bg2xd5 f7xe6** 3 **f5xe6 Qd8-e7** 4 **Qf2-d4** and there is no good answer to the threatened **Rf1-f7**.

1 ...	**f7xe6**
2 **f5xe6**	**Qd8-e7**
3 **Qf2-f7+**	**Kg8-h8**
4 **Rd5-f5**	**Qe7xf7**
5 **e6xf7**	**Re8-e2**
6 **Rf1-f2**	**Re2xf2**
7 **Rf5xf2**	**d6-d5**
8 **Bb2-d4**	**h7-h5**

To stop the advance **h4-h5-h6**.

9 **g5-g6**	...

Threatening **Rf2-f5** and **Rf5xh5** mate.

9 ...	**Bc6-d7**
10 **Rf2-e2**	...

Threatening **Re2-e5** and **Re5xh5** mate.

10 ...	**Bf8-d6**
11 **Bg2-h3**	**Bd7-b5**
Or 11... **Bd7xh3**	12. **Re2-e8**
12 **Re2-e6**	Resigns

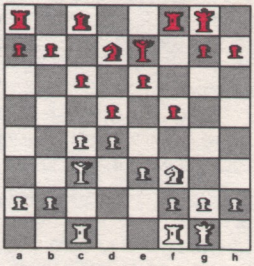
If 12... **Bd6-c7** 13. **Bd4-c5 Bc7-b6** 14. **Bc5xb6 a7Xb6** 15. **Re6-e5** and black is mated.

Notice that in spite of having castled on the same side as his opponent, white was able to launch a successful Pawn offensive. This shows his skill, since by removing the Pawn guard from in front of his King, he gave his opponent the chance to move into the gaps created. But black could not take this chance because white had prepared his advance with great care.

Defense and Counterattack

If your opponent has been attacking throughout the game, then he or she may become increasingly reckless if the defense is solid. This is the time to strike back. Suddenly on the defensive, your opponent may become dispirited and fold quickly. This may not happen in all situations, but it is an important principle to remember, particularly if it is you who are attacking for most of the game.

One recurring theme in Chess is that the best method of answering a Pawn assault on the flank is to strike back in the center. In this example, Alekhine (white), quickly demolishes Maroczy (black), simply because of the latter's unprepared attack on the King side: his Pawn moves are shown to have created weaknesses in his own position.



Positional Play

A division is often made between tactical Chess and positional Chess (pursuing a quiet strategic aim). This is largely for the purposes of discussion, since in any position there are always tactical possibilities lurking beneath the surface of an apparently quiet game.

There are, though, important strategic themes which can be applied to the middlegame . They are often described as "positional."

Attacking the Base of the Pawn Chain

Obviously, when Pawns form a chain (i.e. supporting each other along a diagonal), it makes sense to attack the base of the chain—either undermining it with a Pawn attack, or piling up on it with pieces only.

The Blockade

As was pointed out in an earlier section, an isolated Pawn is a weakness. The classic way to exploit this weakness is to first take control of the square immediately in front of it. This is known as the **Blockade**.

Once the blockade is established, the process of destruction can commence. The pieces can be trained one after the other with their sights on the unsupported Pawn.

Good Bishop and Bad Bishop

A Bishop is said to be "good" if it is not on the same color square as most of its own Pawns. A "bad" Bishop is one which is hampered by having too many of its own Pawns on the same color squares.

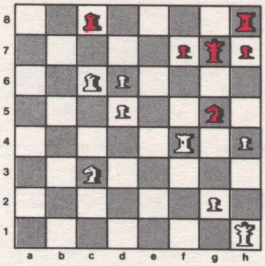
Protection

The idea of protection is central to Chess. If a player doesn't wish to see pieces captured without compensation, then he or she must take steps to ensure that mutual covering fire is maintained.

Some examples of protection have already been seen in explaining check. The principle is simply that if piece **A** could move to the square on which piece **B** of its own side stands (where **B** is not there), then piece **B** is protected and cannot be captured by the opposing King for as long as the protection lasts—since this would be moving into check. It has been mentioned, too, that if an interposing move is to be adequate defense against a back rank check (See **CHECK** section, P.19), then the interposed piece must be protected by another. Otherwise, it is simply captured with impunity.

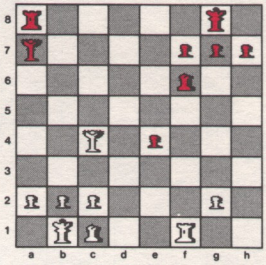
We can now draw a general rule concerning protection that makes use of what we know about the value of the pieces: a piece should move when it is attacked by one of lesser value, and should either move or be protected when it is attacked by one of equal or greater value.

The following illustrate some examples of, and exceptions to, the concept of protection.

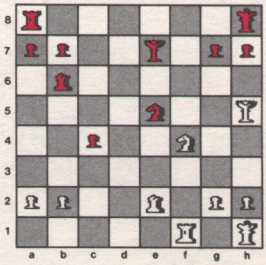


In this position, the white Pawn on **h4** attacks the black Knight on **g5**. Black however, "protects" the

Knight, not by moving it, but by playing the Pawn on **h7** to **h6**. Then if white takes the Knight with **h4xg5**, he loses the Rook to **h6xg5**—discovered check—and emerges with a material deficit.



The Pawn in this situation is "protected" because it is not really attacked. White cannot take it with the Queen because it would allow black to play Queen takes Pawn on **a2** mate, the black Queen being protected by the black Rook on **a8**.



This last example illustrates the idea of "overworking." A piece or Pawn is overworked if it is required to perform two defensive functions at the same time. As you can see, the black Knight is overworked because it is preventing both Knight to **g6** check, winning the Queen; and Bishop takes Pawn on **c4**. This means that if it's white's move, it is safe to play the latter move.

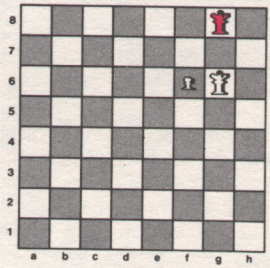
Endgame

The endgame is perhaps the most difficult aspect of Chess in that it demands a combination of tactical ability, far-sightedness, and extreme accuracy. In many positions, literally one slight mistake may throw the whole game away.

The Opposition:



When the Kings face each other in this manner, it is called "the opposition." Whatever player has made the last move is said to have "gained the opposition."

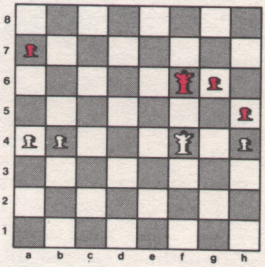


White has the opposition, and its Pawn is on the 6th rank. Black has to move: the play continues 1... **Kg8-f8,** 2 **f6-f7 Kf8-e7** 3 **Kg6-g7**! and white shepherds its Pawn home to Queen.

Supposing in this position it was white to play, and black had the opposition. Then white could not win. Play would continue 1 **f6-f7 + kg8-f8** 2 **Kg6-f6** and it is a stalemate.

Queen-side Pawn Majority

The Queen side Pawn majority is another important aspect of the endgame because more often than not, both players have castled on the King side and their Kings are still in that part of the board, far away from the Queen side.



Here, each player has three Pawns. White, though, has the Queen side Pawn majority. White can create a passed Pawn and divert black's King to the Queen side. Meanwhile, white quickly captures black's King-side Pawns and promotes its own h-Pawn.

Some Basic Rules For Endgame

A. When you are a Pawn (s) up, exchange pieces rather than Pawns.

B. When you are a Pawn (s) down, exchange Pawns rather than pieces

C. A Bishop is preferable to a Knight in open positions and endgames where there are Pawns on both sides of the board.

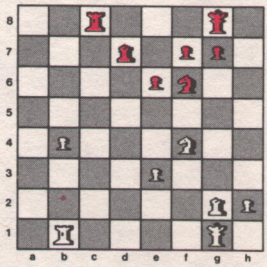
D. In Rook endings, make sure that your Rook is as active as possible. If you can, try and penetrate to the seventh rank for white; second rank for black.

E. Major piece endings (Rook and/or Queen) give the most scope for saving a lost cause.

F. Once you have created a passed Pawn, push it. If your opponent creates one, blockade it.

Passed Pawns

Since a Pawn can be transformed into a Queen upon reaching the eighth rank, it naturally constitutes a danger to the opponent when far advanced into its territory. In particular, a **Passed Pawn**, as illustrated in the following diagram, can be a formidable weapon.



In this position, if the white e-Pawn advances, it will find itself blocked by the black Pawn on **e6**. If the h-Pawn advances, it will eventually expose itself to capture by the black g-Pawn. The white b-Pawn, by contrast, has no enemy Pawns standing in front of it on its own file, or either of the adjacent files. It is therefore called a Passed Pawn.

Even if a Passed Pawn is effectively stopped by an opposing piece, it can still be a source of advantage—since the piece dispatched to deal with it may be diverted from other duties (attack or defense) on other parts of the board. The most drastic examples of this arise in endgames where only the Kings and Pawns remain on the board and where one player has an *Outside Passed Pawn* (a passed Pawn remote from the main scene of battle).

HOW COMPUTERS PLAY CHESS

How Computers Play Chess

A computer is a high-speed calculating device which is capable of storing a vast amount of numerical information, performing arithmetic and logical operations on this information and regulating the results of the calculations. By using one storage location for each of the sixty-four squares on the chessboard, and by denoting a White Pawn by (say) 1, a Black Pawn by -1, and White Knight by 2, a Black Knight by -2, etc., it is a simple matter to make a computer appear able to remember a complete chess position, when what it is actually doing is storing sixty-four numbers (empty squares are usually denoted by zeroes). If the squares are numbered (for example), from 11 through 18, 21 through 28, etc., it is possible to calculate what moves are possible in a given position.

81	82	83	84	85	86	87	88
71	72	73	74	75	76	77	78
61	62	63	64	65	66	67	68
51	52	53	54	55	56	57	58
41	42	43	44	45	46	47	48
31	32	33	34	35	36	37	38
21	22	23	24	25	26	27	28
11	12	13	14	15	16	17	18

Thus, a Knight situated on square **N** attacks the squares **N minus 21, N minus 19, N minus 12, N minus 8, N plus 8, N plus 12, N plus 19, and N plus 21.**

Being endowed with the ability to remember positions and to generate all legal moves from any position, a computer can "think ahead," creating for itself all possible positions at any desired level of look-ahead.

If the number of feasible chess games was not so enormous, a computer would be able to play perfect chess. It could analyze the initial position out to mate or to a mandatory drawn position at the termination of every line of look-ahead analysis. But the number of possible games (more than 10), far exceeds the number of atoms in the universe and the time taken to calculate just one move in the perfect game would be measured in millions of years. Clearly, some corners must be cut. The depth of look-ahead must be kept to less super-human dimensions and the evaluation of the so-called "terminal positions" (those at the deepest level of look-ahead), must be more sophisticated than merely the recognition of mate or of an obligatory draw.

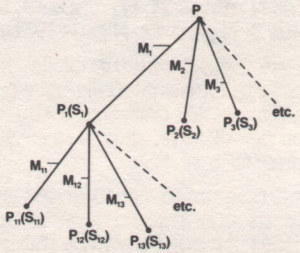
To assess the merit of a chess position, a program employs a device called a scoring function (or eval-

uation function), which can assign a numerical score to any position. This score is intended to reflect which side has the advantage and the magnitude of its advantage. The score is calculated by first determining the quantity of various features, such as material, mobility, center control, etc., possessed by each side, and then combining these quantities into a weighted sum. The sums reflect the relative importance of the features. For example, the material measure might be arrived at by counting one point for a Pawn, three for a Knight or Bishop, five for a Rook, nine for a Queen, and one million for a King. Mobility might simply be the number of moves that a player can make, provided it is his or her turn to move. A primitive scoring function would then be:

material + (0.2 x mobility) = score

This assumes, other things being equal, that it is worth giving up a Pawn if one's mobility is increased by five moves relative to that of one's opponent. The coefficients in the scoring function (e.g. the 0.2 in the above example), are normally arrived at by hopefully intelligent guesswork followed by modifications which are made in the light of the manner in which the program plays. Thus, a program which tended to sacrifice flagrantly when attacking its opponent's King would have its "King attack" coefficient reduced.

The structure created by a program when it is looking ahead is called a **Tree**. A simple tree is shown in the following diagram:



P represents the position from which the program has to make a move. P_1, P_2, P_3, etc., are the positions that can be reached by making one move (M_1, M_2, M_3, etc., respectively) from **P**. P_{11}, P_{12}, P_{13}, etc., are the positions that can be reached after the program makes the move M_1 (to position P_1) and its opponent replies with the moves M_{11}, M_{12}, M_{13}, etc. (respectively).

For the sake of this explanation, lets assume that the program analyzes only to the depth of two "ply" (or half moves). The positions P_{11}, P_{12}, etc., are thus the terminal positions and it is for these positions that the scoring function must make its evaluations. The scores associated with P_{11}, P_{12}, etc., are denoted by S_{12}, S_{13}, etc. We shall adopt the convention that a high (positive) score is good for the program and

that a low (negative) score is good for its opponent. Then if the program were to make the move M_1, leading to position P_1, the best that its opponent could do would be to move whichever of P_{11}, P_{12}, P_{13}, etc. had the **LOWEST** score associated with it. Thus the score S_1 associated with position P_1 **should be the minimum of** S_{11}, S_{12}, S_{13}, etc. (similarly for S_2, S_3, etc.). Since the program wishes to maximize it own score, it should move to whichever of P_1, P_2, P_3, has the **HIGHEST** score associated with it. This process of choosing the maximum of the maximums of the maximums of the maximums . . . is called the **MINI-MAX** method. Minimax was originally advocated by Shannon and today's chess programs use a sophisticated modification of Minimax. (One obvious modification is that not all branches of the tree are analyzed to the same depth—if one line appears to loose the Queen for nothing, then analysis of that line is immediately curtailed, whereas a long sequence of exchanges may be analyzed to a depth of ten ply or more.)

HOW TO IMPROVE YOUR PLAY USING YOUR CHESS PROGRAM

How To Improve Your Play Using Your Chess Program

It has been found by experiment that even those who do not know the moves and rules of Chess can become reasonably good players within a few weeks using a Chess playing program. In the Netherlands, for example, an experiment was conducted with a group of approximately 40 participants—none of whom even knew how to move the pieces. The participants were shown the rules of Chess and loaned a Chess computer program for two months. At the end of that time, it was found that most of them exhibited a rather good understanding of the fundamentals of the game, and played much better Chess than the average beginner did after learning the same amount of information using more conventional forms of teaching.

It is well known that the best way to improve at Chess is to play frequent games against an opponent of roughly the same strength as yourself, or perhaps a bit stronger. From this point of view, a computer program offers you two big advantages. First, it is always available to play whenever you want, and never tires of playing game after game. Secondly, you can instruct it to play on whatever level of skill you find most suitable.

If you are a complete beginner, then once you have learned the moves, you should start to play a series of games against the program at its lowest level. If a move that you try to make is against the rules, the computer will always inform you of your error. It is a good idea to switch sides after each game. This will give you some experience of playing with the initiative the white pieces bring, and it will also give you the opportunity of starting the game from the slightly weaker side. Once you find that you can win convincingly and regularly against the program set at a particular level, you should increase the level of difficulty and play a number of games at the new level. This whole process is continued, level by level, until you find a level of play at which you feel comfortable. This will normally be a level at which you can win some of the time and lose some of the time. If you persist long enough, you will eventually become stronger than your program. When that happens, you can try to give yourself a handicap, either by playing much more quickly than the program or by giving it a material advantage at the start of the game.

You can give the program a head start by using the setup position mode to remove one or more of your own pieces at the start of the game. This will give you experience of waging an uphill battle, but it is somewhat artificial and will not help your understanding of the game. A more useful approach is to

constrain yourself to move at a faster rate than the program. For example, if you are becoming quite experienced, you might set the program to play at 1 or 2 minutes per move, while you respond within 5 seconds. You will find that sometimes you will make tactical oversights, but this method provides excellent training for competition games in which you are playing with chess clocks and a time limit.

You can also learn a lot from the program by watching it play against itself. After each move is made, try to guess what the next one will be. If you think the next move is obvious and are then surprised to see the program do something different, you can retract the move played, enter the move that you thought was best, and find out how the program answers it. Keep asking yourself the reasons for the program's moves. The stronger you become, the more easily you will be able to understand them. If a particularly complex and interesting situation arises, you can always halt the program's play and study the position at your leisure.

In addition to these general methods of self-improvement, there are two areas where your chess program can offer specific help.

The Openings

There are two different ways in which you can use your program to help you practice the chess openings. The simplest is to play the program over and over again, so that you get the experience of playing against all of the openings and variations in the program's own openings library. The other method is to choose an opening or a variation which you wish to study, and play through the first few moves of the opening by using the mode which allows you to enter moves for both sides. Then, setting the program at a fast rate of play (say 5-10 seconds per move), play a few moves against the program until you have seen how things develop and which side has the advantage. (Of course, you can complete the whole game if you wish.) Next you should go back to the same starting position (you will have written down the move sequence leading to that position), and try to improve on your play in the previous game. Or perhaps, rather than try to find better moves, you might merely try different moves. In either case, you will see how the program reacts, and again, you should continue until you have seen how the game develops.

Once you have played an opening variation many times at this fast level, and are confident that you understand how to treat the variation, you should swap sides and try the same experiment with the opposite color. You already know how the program likes to play the position as, say, white. So now you should play the white pieces and see how the program handles black. This process of swapping sides after a few games will help you to get an overview

of the most important aspects of the opening variation in question. You can even use what you have learned in the second series of games to improve your play with the original color simply by swapping again.

Eventually, you will have played many games with both white and black at a fast rate of play. You can then increase the level by 1 and repeat the process again. This time, because the program is searching the game tree more deeply, it will give you a greater measure of understanding what the opening variation is all about. As before, play a number of games with black and white, swapping colors every few games in order to ensure your understanding of how the variation looks from the other side.

The Middlegame

A well tried method of improving one's middlegame is to conduct an extremely thorough analysis of middlegame positions, and then write down the analysis in a systematic manner. This approach will help you to think more methodically, and to ensure that you examine all avenues—even those which appear very unlikely.

By using your chess program as a collaborator in this task, you will find the analysis itself more interesting and more rewarding. In addition, the program will often suggest moves which you had not really considered.

Select a middlegame position from a chess book, magazine, or newspaper column. Study the position by yourself for a few minutes, and make a note of which moves you think are worthy of serious consideration for the side whose turn it is to move. Try to work out what plans seem most sensible for both white and black. When you feel confident that you have grasped the salient features of the position, and you have written down a list of what you consider to be the best moves to play in the position, it is time to call on your chess program.

Set up the position on the computer, and set the program on its fastest level of play. Make a note of the move that the program chooses and a note of the level of response time. Then, take back the move and increase the playing level, and again ask the program to move from the same starting position. When you have done this for a number of different playing levels, you will have another list of moves—those suggested by the program. It is possible that this list is smaller than your own, and it may even be restricted to just one move which was chosen at every single level. This will depend on the type of position—in a sharp, tactical position in which a lot is happening, the program might well prefer one move at the lower levels of play and then switch to another move when it has more time to find the correct continuation. If the position is quiet,

with no clear and obvious plan, the program may select a different move at each level.

You will already have put your own list of moves in order of preference, and now you should merge your list with the program's. If you are unable to decide which move you prefer, put a move suggested at a higher level of play on the list instead of one chosen at a faster response time. If the computer has suggested a strong move which you have overlooked, you may decide to place it at the top of the merged list. If you think that one or more of the computer's suggestions are feeble moves, put them at the bottom of the list.

You are now ready to begin a deeper analysis of the situation. Take the move at the top of your complete list and make this move from the starting position. Study the resulting position for several minutes, and repeat the steps described earlier. Again, sort and merge your list of responses—some chosen by you, others by the program. Now, you have the beginnings of a chess tree (similar to the one shown on P.56)!

COMPUTER CHESS COMPETITIONS

Computer Chess Competitions

Computer scientists began to take an interest in the possibility of writing chess playing programs as long ago as the late 1940s. For the first two decades of its history, computer chess was a subject which was the province of a select few—those who had free access to computer time on large computers. But in 1967, a student at M.I.T., Richard Greenblatt, wrote a program which was to launch computer chess into the news media in a big way. His program took part in conventional chess tournaments in Massachusetts with results that were rather impressive for that time. It even won a game against a player rated 1510 in the 1967 Massachusetts State Championship.

By 1970, thanks largely to the publicity created by Greenblat's program, there was sufficient interest in computer chess for a tournament between computer programs. This event was staged in New York, as part of the annual conference of the Association of Computing Machinery. Six programs took part, and the winner was a program called CHESS 3.0, written by David Slate, Larry Atkin and Keith Gorlen at Northwestern University. The Northwestern program was subjected to intensive development during the 1970s, and to this day remains one of the world's strongest programs.

The ACM tournament in 1970 was such a success that it has been held annually ever since. The first five years of this event were notable for the poor standard of play exhibited by the contestants and the amusing programming bugs which seemed to occur only too often. On one occasion, at the San Diego ACM tournament in 1974, a program reached a position in which it could force checkmate in two moves. It had 45 minutes at its disposal for the next 18 moves. But because the program "saw" so many ways in which to win, it continued to review its possibilities until time finally ran out. The game, which could have been won so easily, was a forfeit. On another occasion, a different program had the opportunity to deliver mate on its move, but delayed taking advantage of the situation move after move, until the opponent eventually turned the tables. Occurrences such as these have helped to turn computer chess tournaments into extremely light-hearted affairs, in which programmers chat with each other in a friendly atmosphere during the games—something unheard of in serious, conventional competitions.

By 1974, the annual tournaments in the U.S.A. were proving so popular that it was decided to hold a World Computer Championship. This event took place in Stockholm, as part of the triennial conference of the International Federation for Information Processing (IFIP). Thirteen programs from eight countries participated, and although most of the work on computer chess had hitherto been carried out in the United States, the winner of the tournament was the Soviet entrant, KAISSA.

The most interesting game from the Stockholm event was a struggle between two American programs, CHAOS and CHESS 4.0. It was played in the second round, and up to then the Northwestern University program had never lost a competition against another computer program. The game itself is remarkable, in that it is the first example ever of a computer program sacrificing material in return for a strategic advantage ! Here is the game:

White: CHAOS
Black: CHESS 4.0

Queen's Gambit Accepted

1	**d2-d4**	**d7-d5**
2	**c2-c4**	**d5xc4**
3	**Ng1-f3**	**Ng8-f6**
4	**e2-e3**	**e7-e6**
5	**Bf1xc4**	**c7-c5**
6	**Qd1-e2**	**a7-a6**
7	**0-0**	**b7-b5**
8	**Bc4-b3**	**Bc8-b7**
9	**Rf1-d1**	**Nb8-d7**
10	**Nb1-c3**	**Bf8-d6**
11	**e3-e4**	**c5xd4**
12	**Nf3xd4**	**Qd8-b8**
13	**g2-g3**	

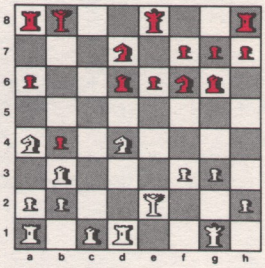
Up to here, both programs have been following their own stored openings books, and have therefore been playing moves which have been tried and tested in countless master games over the years. Now, however, CHESS 4.0 is "out of book," and begins to "think" for itself. Its very next move is not necessarily bad, but what follows is horrible.

13	...	**b5-b4**
14	**Nc3-a4**	**Bb7xe4**

The safest move here is for black to castle, but all computer programs are materialistic and cannot resist the temptation to take a Pawn.

15 **f2-f3** **Be4-g6?**

This is fatal. The correct move is 15... **e6-e5**, 16 **Nd4-e6 f7xe6**, 17 **f3xe4 Bd6-c5+**, 18 **Na4xc5 Nd7xc5**, 19 **Qe2-c4 Qb8-b5**, when black has staved off the attack.



16 **Nd4xe6!**

The sacrifice of the Knight was obviously based on purely positional considerations, since CHAOS could not possibly have analyzed as far as move 24.

16	...	**f7xe6**
17	**Qe2xe6+**	**Bd6-e7**
18	**Rd1-e1**	**Qb8-d8**
19	**Bc1-f4**	

Threatening 20 **Bf4-c7 Qd8xc7**, 21 **Qe6xe7** mate.

19	...	**Ke8-f8**
20	**Ra1-d1**	**Ra8-a7**
21	**Rd1-c1**	

White could win at once by 21 **Bf4-d6 Nf6-g8**, 22 **Na4-c5**, for example 22... **Nd7xc5**, 23 **Bd6xe7+ Qe6-c8+** etc. But the move played by CHAOS, which threatens 22 **Rc1-c8**, can hardly be bad.

21	...	**Nf6-g8**
22	**Rc1-d1**	**a6-a5**

Black simply has no good move.

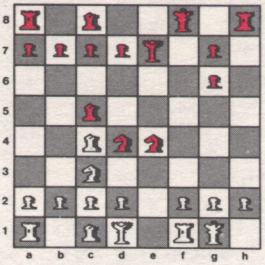
23	**Bf4-d6**	**Be7xd6**
24	**Qe6xd6+**	**Ng8-e7**
25	**Na4-c5**	**Bg6-f5**
26	**g3-g4**	**Qd8-e8**
27	**Bd3-a4**	**b4-b3**
28	**g4xf5**	**b3xa2**
29	**Ba4xd7**	**a2-a1=Q**
30	**Rd1xa1**	**Ra8-a6**
31	**Nc5xa6**	**Qe8-d8**
32	**Kg1-f2**	**Kf8-f7**
33	**Qd6-e6+**	**Kf7-f8**
34	**Qe6xe7+**	**Qd8xe7**
35	**Re1xe7**	**Kf8xe7**
36	**Na6-c5**	

and white won.

The popularity of computer chess tournaments has grown from year to year since the mid 1970s. The number of entries in the annual A.C.M. tournaments has shown an increase, and the publicity created by these events, as well as the tri-ennial World Computer Championships have all contributed to the public awareness of computer chess.

Even in the regular chess magazines and newspaper columns, where chess masters of the human variety once mocked the attempts of programs to play acceptable chess, the performances of certain programs have given rise to a new level of acceptability. One noted authority on computer chess, Professor Monroe Newborn of McGill University, made the comment that, "a few years ago, chess masters came to watch computer chess tournaments so that they could laugh; now they come as serious spectators. In a few years, they'll come to learn!"

As an example of the creativity of the very best chess programs, consider the following position, which was taken from a game won by BELLE at the 1978 A.C.M. tournament in Washington, D.C.



BELLE, which was written by Ken Thompson and Joe Condon at the Bell Telephone Labs in New Jersey, uses a PDP 11 computer in conjunction with some special chess hardware capable of evaluating more than 200,000 chess positions per second. In this position, BELLE already had a decisive material advantage. But the manner in which it finished off its opponent is a delight to see!

1 ...	**Rh8x2!!**
2 **Kg1xh2**	**Qe7-h4+**
3 **Kh2-g1**	**Ne4-g3!**

Threatening mate on **h1** with the Queen.

4 **Qd1-h5**

Prolonging the game for one move.

4 ...	**g6xh5**
5 **f2xg3**	**Nd4-f3** mate

BELLE had "looked ahead" to this point when making the Rook sacrifice!

The advent of the microcomputer allowed almost anyone with sufficient interest to write their own chess program. Whereas computer chess had been the province of only a few, it became, during the second half of the 1970s, available to all. The ever reducing cost of semiconductor components made it possible for companies to manufacture chess computers at a price well within the reach of many consumers' pockets. By 1978, there was sufficient interest in microcomputer chess for tournaments to be devoted solely to programs running on micros. The first of such events took place in California. But it was not long before competitions for micro-based chess programs were taking place in England, Germany, France, and the Netherlands—as well as in the U.S.A.

By the summer of 1981, West Germany had become the center of interest in chess playing microcomputers. A number of books had appeared in German on the subject, and the German chess public was continually asking about the latest developments in

the field. A group of enthusiasts decided to organize the first official World Championship for micros, and they decided that the event should be split into two groups—one for the commercially available programs, and one for "experimental" entries. The tournament took place in Travemunde, late in September of 1981.

Winner of the commercial section was the CHESS CHAMPION MARK V, programmed in London under the direction of David Levy and Kevin O'Connell. The MARK V finished two points ahead of its nearest rival, FIDELITY ELECTRONICS' CHAMPION SENSORY CHALLENGER, programmed by Dan and Kathe Spracklen. Probably the most exciting game played in the Travemunde competition was one from the first round of the experimental group, in which the latest FIDELITY program was pitted against an experimental version of the same program that was in the MARK V.

White: FIDELITY Experimental
Black: PHILIDOR Experimental

Sicilian Defense

1	**e2-e4**	**c7-c5**
2	**c2-c3**	**d7-d5**
3	**e4xd5**	**Qd8xd5**
4	**d2-d4**	**e7-e6**
5	**Ng1-f3**	**Nb8-c6**
6	**Nb1-a3**	**c5xd4**
7	**Na3-b5**	**Qd5-d7**

This position has rarely been seen in master chess. 7 ... **Qd5-d8** can be refuted by 8 **Bc1-f4**, when white has a tremendous position. Probably black's best is 7 ... **Bf8-d6**.

8	**Bc1-f4!**	**e6-e5**

Forced, to prevent **Nb5-c7+**

9	**Bf4xe5?**	

9 **Nf3xe5 Qd7-e7**, 10 **Qd1-e2** would have kept white's opening advantage. The move played allows black a lot of counterplay.

9	...	**Nc6xe5**
10	**Nf3xe5**	**Qd7-e7**
11	**Qd1-e2**	**d4xc3**
12	**Nb5-c7+?**	

It looks more natural to play 13 ... **Bf8-e7**, since the Knight move blocks the Bishop, but black soon shows that the Knight can come into the game with great effect, and that the Bishop on f8 also becomes active in the near future.

14	**Ng6xh8**	**c3xb2**

Now black is probably winning because white's King is so exposed.

15	**Qe2b2**	**Qd7-a5+**
16	**Ke1-e2**	**Qa5-a6+**
17	**Ke2-d2**	**Qa6-a5+**

Even though Philidor is repeating the position, this does not mean that the program wants a draw. What happens is that the program first satisfies itself with the fact that it has a draw at hand. Then, the next time around it looks deeper, and finally, before submitting to a draw by threefold repetition, it usually consumes a lot of time in order to see if there is a better solution. We shall never know how Philidor would have continued, because here Fidelity did not move back to **e2** (being material ahead, the Fidelity program wanted to win).

18	**Kd2-d1**	**Bc8-g4+**
19	**f2-f3**	**Ra8-d8+**
20	**Kd1-e2**	**Bg4-e6**
21	**g2-g3**	

Hoping to create a flight square for the King on **g2**.

21	...	**Ne7-d5!!**

Now the Knight comes into play with devastating effect.

22	...	**Qb2-c1**

Everything is hopeless.

22	...	**Bf8-c5!**
23	**Ke2-d1**	**Nd5-c3!**
24	**Kd1-c2**	**Be6-f5+**

Announcing mate in 4.

25	**Bf1-d3**	**Bf5xd3+**
26	**Kc2-d2**	**Nc3-e4+**
27	**Kd2-d1**	**Ne4-f2 mate**

This struggle between Fidelity and Philidor is only a microcosm of a discussion which has been going on among computer chess masters for many years. There are two diametrically opposing schools of thought on the question of exactly how a chess program should think. One approach, called the "brute force" method, relies on a deep search along all branches of the game tree, so that they examine everything up to a certain depth (say 5, 7, or even more half-moves). After this, the exhaustive part of the search , the program then examines some variations more deeply, but only those which look tactically interesting. A typical brute force program might examine everything to a depth of 5 half moves, then all checks and captures for another 2 half moves, and then all captures for another 2.

The opposite approach is called "selective search." As its name implies, this method relies on the program's ability to select which variations should be examined deeply, and to reject those which look uninteresting. This is very much in the spirit of a human player's approach to the game—a chess master will normally examine only 50-100 positions in the game tree when thinking about his or her move, but knows from experience which 50 or 100 are the most important.

Both methods of tree searching have something to recommend them. The brute force method can guarantee that a program will never overlook a shallow sequence of moves that might result in some tangible advantage such as the winning of material or the forcing of checkmate. On the other hand, a brute force program is less likely to be able to go very deep in that one crucial variation which can determine the outcome of the game. A selective search program is sometimes likely to overlook a shallow win, and the program rejects the winning variation at an early stage. But while the selective program occasionally makes errors of this type, it will find certain deep continuations which are beyond the horizon of a brute force program.

Arguments concerning the relative merits of the two approaches will doubtless continue to be debated for many years to come. Since chess programming is a branch of science known as Artificial Intelligence , it is not unreasonable to argue that to make a chess program play as well as Bobby Fischer, one must program it to think in an "intelligent" manner, in other words, like a human being. There are also those who argue that as computing speeds get faster and faster, the best way for a chess program to benefit from the extra speed is simply to look deeper along all branches that involve captures and checks. One program which follows this course is CYRUS, written in England by Richard Lang. This program first sprang into prominence at the European Microcomputer Championship in London, in September 1981, where it scored an impressive 100% to take the title. The following game was the most exciting of the event.

White: ADVANCE 2.0
Black: CYRUS

Sicilian Defence

1	**e2-e4**	**c7-c5**
2	**Ng1-f3**	**Nb8-c6**
3	**d2-d4**	**c5-d4**
4	**Nf3xd4**	**Ng8-f6**
5	**Nb1-c3**	**d7-d6**
6	**Bc1-g5**	**e7-e5?!**
7	**Nd4-b5**	

White could gain some advantage from 7 **Bg5xf6 g7xf6** 8 **Nd4-f5**.

7	...	**a7-a6**
8	**Bg5-f6**	**g7xf6**
9	**Nb5-a3**	**Bc8-e6**
10	**Bf1-c4**	

Both 10 **Na3-c4** and 10 **Nc3-d5** are frequently played alternatives.

10 ... **Qd8-b6?!**

Typical CYRUS aggression.

11 **Bc4xe6** **f7xe6**

Now white can unsettle the black King, though the central Pawn mass gives it fair protection. After 12 **Qd1-h5+ Ke8-e7**, white can choose either 13 **0-0-0**, or else 13 **Ra1-b1** and 14 **0-0 Instead...**

12 **Na3-c4?!** **Qb6-b4**
13 **Qd1-e2?**

White must play 13 **Qd1-d3**, when 13... **Nc6-d4** 14 **0-0-0 Ra8-c8** 15 **Nc4-e3** is satisfactory for white.

13 ... **d6-d5?!**

Black is probably winning, but makes things unnecessarily complicated. Instead 13... **Nc6-d4!** wins quite comfortably (14 **Qe2-d3 Ra8-c8**, and if 15 **b2-b3 b7-b5** with an overwhelming position).

14 **Qe2-h5+** **Ke8-e7**
15 **e4-d5** **Nc6-d4!**
16 **Nc4-e3**

16 **d5-d6+ Ke7-d8** 17 **Qh5-f7** fails to 17... **Qba4xc4**, and after 18 **Qf7xf6+ Kd8-d7** 19 **Qf6-f7+ Kd7xd6**, black can consolidate the material advantage.

16 ... **Qb4xb2**
17 **d5-d6+** **Ke7-d8!**
18 **Ke1-d2** **Ra8-c8**
19 **Nc3xc2** **Nd4xc2**
20 **Ne3xc2** **Qb2xc2+**
21 **Kd2-e3** **Rc8-c4**
22 **Qh5-h4** **Bf8-h6+**
23 **Ke3-f3** **Qc2-d3+**
24 **Kf3-g4** **Qd3xe4+**
25 **Kg4-g3**

and white's programmers resigned.

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180-Day Limited Warranty

PARKER BROTHERS warrants, subject to the conditions below, that if the components of this product prove defective because of improper workmanship or material during the period of 180 days from the date of original purchase, PARKER BROTHERS will repair the product or replace it with a new or repaired unit, without charge, or will refund the purchase price.

CONDITIONS:

1. Proof of Purchase: The retail sales receipt or other proof of purchase must be provided.

2. Proper Delivery: The product must be shipped prepaid, or delivered to PARKER BROTHERS (address: 190 Bridge Street, Salem, MA 01970, Attention: Quality Control Dept.) for servicing, either in the original package or in a similar package providing an equal degree of protection.

3. Unauthorized Repair, Abuse, etc.: The product must not have been previously altered, repaired or serviced by anyone other than PARKER BROTHERS; the product must not have been subjected to an accident, misuse or abuse.

REPAIRS AFTER EXPIRATION OF WARRANTY:

If the product malfunctions after the 180-day warranty period, you may ship the product prepaid and enclosed with a check or money order for $8.00 to Parker Brothers. Parker Brothers will, at its option, subject to the conditions above, repair the product or replace it with a new or repaired unit, subject to availability of parts. If replacement units or required parts are not available, the $8.00 payment will be refunded.

EXCEPT TO THE EXTENT PROHIBITED BY APPLICABLE LAW, ALL IMPLIED WARRANTIES MADE BY PARKER BROTHERS IN CONNECTION WITH THE PRODUCT, INCLUDING THE WARRANTY OF MERCHANTABILITY, ARE LIMITED IN DURATION TO A PERIOD OF 180 DAYS FROM THE DATE OF ORIGINAL PURCHASE: AND NO WARRANTIES, WHETHER EXPRESSED OR IMPLIED, INCLUDING THE WARRANTY OF MERCHANTABILITY, SHALL APPLY TO THIS PRODUCT AFTER SAID PERIOD. SHOULD THIS PRODUCT PROVE DEFECTIVE IN WORKMANSHIP AND MATERIAL, THE CONSUMER'S SOLE REMEDY SHALL BE SUCH REPAIR, REPLACEMENT OR REFUND AS IS HEREIN ABOVE EXPRESSLY PROVIDED, AND UNDER NO CIRCUMSTANCES SHALL PARKER BROTHERS BE LIABLE FOR ANY LOSS OR DAMAGE, DIRECT OR CONSEQUENTIAL, ARISING OUT OF THE USE OF, OR INABILITY TO USE, THIS PRODUCT.

SOME STATES DO NOT ALLOW LIMITATIONS ON HOW LONG AN IMPLIED WARRANTY LASTS, OR THE EXCLUSIONS OR LIMITATIONS OF INCIDENTAL OR CONSEQUENTIAL DAMAGES, SO THE ABOVE LIMITATIONS OR EXCLUSION MAY NOT APPLY TO YOU. THIS WARRANTY GIVES YOU SPECIFIC LEGAL RIGHTS AND YOU MAY ALSO HAVE OTHER RIGHTS WHICH VARY FROM STATE TO STATE.

