New Glossary of Fairy Chess Elements, Version 1: Chris Tylor, 20 February 2022.

Background and Introduction.

In August 2020, Julia Vysotska, the organiser of the Julia's Fairies website, launched a project for the detailed listing and classification of the continually expanding range of Fairy Chess elements. There was much initial enthusiasm (although doubts were raised by some), but it soon became apparent that although a number of people were ready to make helpful comments on particular points, very few were prepared to put in work on the actual listings. By early 2021, with Julia out of action through illness, only Shankar Ram (who had been made Project Manager) and myself were still active – and I was only able to work on Word documents rather than the spreadsheets that had been envisaged as the best form for displaying all the data. Nevertheless, by April 2021 we had collated the main information on a set of 395 elements that we considered large enough for an initial database, and Julia had produced a search engine that would locate any named element within the database.

After this, Shankar and I continued identifying and adding new elements, but by August I had to drop out due to computer problems (plus some disillusion), and Shankar then took a rest, work on the project stopping for the time being.

By the end of November 2021 I felt able to concentrate on the project once again, but by then had come to the general conclusion that something more flexible that a database would be a better way to display the very varied collection of fairy elements that we had encountered. So I set myself to produce a document that might do the job better – and this **Version 1** document is a first result. It hopefully includes all the fairy elements covered in the last documents produced by Shankar and myself, plus a few additional elements. (Among these are some fairy pieces supported by Popeye that would probably have been one of our next targets; others relate to my own ideas and interests.) In producing this document, I would like to thank Shankar Ram for correcting it and tidying it up for publication in JF. I would also like to thank the many others who over the past months have provided information that it contains, or who manage sources from which information has been taken. Above all, I wish to dedicate it and any further versions to Julia – as being the person with the vision to set this project in motion in the first place.

For a Version 2, my intention is to begin by going through the tables of pieces and conditions in the PDB, plus some other sources to which Shankar gave me links (with the aid of a translation programme if necessary). I may of course not get very far.

Before describing the actual glossary, I want to consider some general points.

1. Which Elements count as Fairy Chess ones?

This issue was raised at the conception of the JF project, when it appeared that some people felt strongly about it, arguing that a fairy glossary should contain only fairy elements. As I see things, the issue of which elements count as fairy depends on the category of element. For boards and pieces the distinction is both clear and simple; the standard 8x8 square grid board and the standard king, queen, rook, bishop, knight and pawn are orthodox; anything else is fairy. For conditions the distinction is still clear though less simple. Conditions are detailed and complex entities, and it would be difficult to think of one that differed in every detail from the rules of orthodox chess. Instead, the rules of orthodox chess can be taken as the 'default condition', and anything that differs from these rules in only a single point must count as fairy. But for stipulations, which are not part of the rules of chess at all, the situation is totally different; the distinction between orthodox and fairy seems purely a matter of convention and usage. This can vary over time; the old *Fairy Chess Review* contained a regular feature called the 'Orthodox Corner', which contained direct mates and selfmates in roughly equal numbers, with helpmates appearing in the main body of the magazine with the various problems that today would be recognised as fairies. In its later issues this feature was discontinued, the then Editor C E Kemp explaining that he refused to accept selfmates as orthodox when helpmates were not so accepted. He refers (*FCR* August 1957 p143) to one of his early helpmates being published in a 'well known and well established column' and receiving 'devastating criticism' from readers!

Another point made during the discussion of this issue was that chess variants used purely for playing games should not count as fairy conditions. But this seems arbitrary to me; surely, any intellectual game can be made the basis of problems. Anyway, I regard any distinction between orthodox and fairy elements as being essentially irrelevant, and in the present glossary aim to include all elements I can lay my hands on without reference to any fairy-orthodox distinction.

2. How are particular Fairy Chess Elements used in problems?

This is a very general issue that I raise here because I have not seen it raised elsewhere (though others must surely have thought about it). It seems to me that there are two broadly different ways in which a particular element may be used – or put another way, two broadly different reasons for which a composer may choose to use a particular element in his or her problems. (i) The element is being investigated or explored for its own sake, in order to discover what new and/or interesting effects can be produced by its use; this could be called the **intrinsic** use of an element. (ii) The element is being used to achieve some predetermined problem effect that cannot easily be achieved with orthodox chess or more mainstream elements; this could be called **extrinsic** use. (I may say that my own fairy composing has nearly all been intrinsic; thus my *Get Off, Move On or Stay Put* piece explores the effects achievable from a whole range of conditions, many being my own invention. However, this piece does contain one extrinsic problem, composed to show the normally ineffective Zero or 0,0-Leaper actually giving mate!)

There are two consequences of this difference between intrinsic and extrinsic work. (a) A composer working intrinsically would tend to use either a single new or experimental fairy element or else two different elements in combination, while if working extrinsically would tend to stick to well-established elements but use them in diverse multiple combinations (such as a variety of fairy pieces of different types). (b) An element suitable for extrinsic use would need only to differ from other elements, but one suitable for intrinsic use would need to differ from other elements in an interesting way.

3. Which Fairy Chess Elements should be included in a classification?

This is a big question to which there is no simple answer, but I see three possible general answers.

(i) It should include all elements that could possible and reasonably be thought up. (The word 'reasonably' was added here to exclude such things as a piece that could move either one square directly forwards or any number of squares backwards to the left, or a condition in which a bishop after making a capture was transformed into a knight, but a knight after giving check changed colour!) Elements that had never been tested or used in problems could be called theoretical, while those that had been used would be called practical. This is the best answer in principle, but comes up against the limitless nature of human imagination. The sheer number of possible elements would be so great as to swamp those that had actually been used.

(ii) It should include all the elements that have been used in at least one published problem. This is also a good answer in principle and less impractical than the first, but would still be a massive undertaking. Some elements have been modified or renamed since they were first invented; others have been invented independently by different people at different times but in slightly different forms. Another point is that while many invented elements were given names in the hope that they would later prove popular, others were intended only for use in an individual problem and so were left unnamed. I call these one-off elements; they are perhaps most common among Stipulations.

(iii) It should include all the elements that have been found good enough to be used in a significant number of published problems. This is the best practical answer, and is something that any user of a glossary would expect from it, with the WinChloe tables the most likely source of the required information. The obvious difficulty is of course to decide on what counts as a 'significant number'. There is also the point that the popularity of different elements has varied over time, and figures for the popularity in (say) from 2000 onwards might be more useful than those for overall popularity.

In this Glossary I aim to adopt a flexible but personal approach, including all the currently popular elements if I can get hold of the figures, but also venturing into theoretical areas that seem of special interest (especially with Pieces, that seem more susceptible to theoretical investigation that Stipulations or Conditions) – and also giving undue prominence to my own past inventions!

4. The basis of the New Glossary.

The *JF* classification was based on the four 'Main Groups': Stipulations, Pieces, Conditions and Boards, each of these being divided into 'Groups' and (in most cases) 'Sub-groups' which contained the individual Elements. These Elements formed the basic units of the classification (though a few were subdivided further); each was described individually in a stand-alone format with consistent wording. This was the right approach for a database, but in a document tended to give individual elements a false precision and to obscure small but significant differences between them; it also impaired the readability of the document.

In the New Glossary I rename the Main Groups, Groups and Sub-groups as **Sections**, **Classes** and **Groups** – doing this to avoid the use of the term 'Sub-groups'. (The 'Classes' level is there to provide a large Section with some structure, but can be largely disregarded.) The overall intention is not so much to classify elements but to describe them in a way that clarifies the relationships between them. The basic units of the classification will be the Groups rather than the Elements. Each of the three Sections will be given an Introduction naming and outlining the Groups within it. Each Group will consist of a page or so of hopefully readable text describing up to maybe twenty Elements in a way that clarifies the relationships between them. My thought is that someone researching a particular element might start with the New Glossary and use it to get a general outline of the element and of others related to it, but would then consult the *JF* database (or some other database) to get more details.

A complication here is that while some elements can be described simply, others are complex to a degree that would unbalance any comparative description. My intention is to avoid these details while in some cases giving links or references to other sources and/or relegating the details to an Appendix (that might also contain details of obscure or obsolete elements). In nearly all cases each Group is intended to stand alone, with the support of common material and basic definitions given in the Section introductions and in the general notes at the beginning of the glossary.

A further change I make is to merge the JF Main Groups of Conditions and Boards, leaving me with the three Sections of **Stipulations**, **Pieces** and **Conditions**. My reasons are partly practical; the set of Boards was much smaller than the other three and tended to unbalance the classification. However, a board cannot be considered on its own without a description of how the Pieces can move on it – this description amounting to a Condition. Further, many of the descriptions of Boards in the literature tend to treat them as Conditions, e.g. to refer to 'Moebius Chess' rather than to a Moebius Board.

Other changes in the *JF* classification follow, with some groups being merged and new ones being introduced. To achieve a stable numbering system while coping with the need for further groups as more and more new elements are introduced, I give each group a 2- or 3-number label, keeping the option of adding capital letters wherever groups need to be split or of using multiple numbers wherever small groups need to be combined. The basic principle here is that in the numbering system the division into groups is based essentially on the possibilities for different elements, whereas in any individual Version the division into groups is based on the numbers of elements actually known and named. A general list of the labelled groups follows; this will hopefully serve for several future versions, in which the numbers will be retained but the wording of the group names will be flexible. In **Version 1** several of the labelled groups are either split or combined, and many of the group names have already been changed.

Notes on the New Glossary.

Sources quoted: (References underlined indicate sources used in the Glossary for information on an element)

AS	*Encyclopaedia of Chess*	Ann Sunnucks
GFC	*Guide to Fairy Chess*	Anthony Dickins
HFC	*History of Fairy Chess*	Anthony Dickins
ECV	*Encyclopaedia of Chess Variants*	David Pritchard
GOMOSP	*Get Off, Move On or Stay Put*	Chris Tylor
PFS	*Problemist Fairy Supplement*	
FCR	*Fairy Chess Review*	
TP	*The Problemist*	
TPSup	*The Problemist Supplement*	
Pop	The Popeye file *py-engl.txt*	
PDB	The *Keywords* and *Pieces* tables in the *Die Schwalbe* database.	

Solving programs:

Various references to solving programs are made in the text; however, these should not be taken as necessarily accurate or complete. This is partly due to my having limited knowledge of and access to these programs, but also because they can be expected to have been extended and developed over time.

General:

Any text in italics generally means that details are unknown or unclear.

The term 'piece' will be used to mean any chess piece other than a pawn, and 'unit' to mean any chess piece. When issues of check or mate come up, 'king' can be taken to include any other royal unit that has replaced a king.

The term 'move' will be used to include a capture, except where capturing and non-capturing moves are being contrasted.

References to particular **ranks** relate to the side being considered; thus 'its 8th rank' means rank 8 for a white unit and rank 1 for a black unit.

When pieces move on angled paths, the **angles** stated refer to deviations from a straight line rather than to angles in the path itself if drawn out. Many angles given are very approximate; thus a knight path might be referred to as "angled at 45°" when the actual angles alternate between 37° and 53° (these figures being merely closer approximations).

One unit can be said to **observe** another unit if under the conditions in force it could play to capture an opposite-colour unit on the second unit's square, even though such a capture could not be completed without leaving an illegal position such as self-check.

The **home square** of a unit is its game-array square as deduced from its current position. The home square of a Rook, Bishop or Knight is that of the same colour as the current square, that of a Pawn is on the same file as the current square, and that of a fairy piece is the promotion square of its current file.

The most important types of Pieces are **Leapers**, **Riders** and **Hoppers**. Each may be described as **Simple** if there is only one type of movement and **Compound** if there is more than one type. A **Leaper** moves directly from one square to another in a single **leap**, irrespective of any units on intermediate squares. A **Rider** moves along a straight or angled path in a series of leaps, being blocked by another unit on an intermediate square.

A **Hopper** may move in various ways, but only in the presence of another unit or set of units called a **Hurdle**; the Hurdle normally may be any type of unit of either colour, and will not be affected by the Hopper's move.

New Glossary of Fairy Elements; Version 1, February 2022.

This version mentions approximately 520 different elements or components of elements, 80 of them coming under Stipulations, 200 under Pieces and 240 under Conditions (though these figures are not directly comparable with those in *JF* Glossary documents, since the elements are not listed in the same way).

1: Stipulations.

Introduction. The stipulation of a problem is the statement printed below the diagram that tells a solver what needs to be done in order to solve the problem, together with the number of moves allowed. Many fairy problems have orthodox stipulations, and many of the stipulations described here are either regarded as orthodox or are disputed territory, no attempt being made to distinguish between orthodox and fairy stipulations. Where symbols for particular stipulations are given, these would generally be accepted by solving programs. Note that most stipulations require a goal to be reached in 'n' or fewer moves, unless the stipulation specifies '**Exact**', when solutions in fewer than n moves are not accepted. Note also that special '**one-off**' stipulations may be used in individual problems, e.g. "Mate in 3 without moving the knight" or "Where was wPc2 captured?" or "Minimum number of wK moves?"; retro problems frequently use stipulations of this type.

The elements described in this Glossary are actually components of a stipulation rather than complete stipulations, and could often be used as the name of a problem type; in this **Version 1** they are divided directly into six Groups. **1.1 Goals** cover the general aim of a problem; the other groups cover the type of **Play** by which that aim is achieved in solving the problem. **1.2 Forward Play** deals with normal forward play from a diagram position. In **1.3 Retro Play** the play is again forward, but leads up to a diagram position rather than away from it, the concept of a **legal position** being a key one here. By contrast, in **1.4 Retraction Play** moves are actually played backwards from a diagram position, but under the constraint that any resulting position must be a legal one. In **1.5 Phase Play** the play could be described as 'sideways'; this group deals with the breadth of a problem rather than its length, covering such things as variations and multiple solutions. Finally, **1.6 Hidden Play** covers a doubtful area, since the elements in it would normally be described under Conditions rather than Stipulations; their fairy aspect lies in the fact that a solver has only limited information about a diagram position and the moves that may be played from it.

1.1: Goals. These are applicable to a variety of problem types, but essentially deal with forward play.

Mate (#) is by far the most common of all problem goals. It is defined as normally understood, i.e. the side to play is checked, and cannot move to relieve its King from check. A **Fairy Mate (**as opposed to an **Orthodox Mate**) is one where the fairy Conditions remain in force up to the envisaged capture of the King. Fairy mates are the norm nowadays, but in the earlier days of Fairy Chess orthodox mates were the norm. Note that some fairy Conditions involve different types of fairy mate, but these will be described under those Conditions.

Stalemate (=) is also defined as normally understood, i.e. the side to play is not checked but has no legal moves. **Auto-stalemate** (**!=**) can be defined as occurring when the side that has just played has no more legal moves. It will only end play in a series-mover where only one side plays, but the solving program Jacobi indicates when this goal is reached in normal play.

The goals of mate and stalemate may be used in combination. **Double stalemate** (==) occurs when the side to play cannot move, nor could the other side were it to have the move.
Stalematemate (=#) (J de A Almay, *FCR* Aug 1939 p3) occurs when the side to play is mated, and the mating side would be stalemated were it to have the move and be prohibited from capturing the opposing King.

Doublemate (##), occurring when both sides are simultaneously mated, is rather different from the above since it involves a move illegal under normal conditions. Jorg Kuhlmann has defined the following three types of doublemate. **Gegenmatt** is when a side that is in mate or stalemate makes a move (which may be a king move leaving the two Kings in contact) that leaves both Kings mated.

Beidmatt is when a side that is not in mate or stalemate makes a move (which may again be a king move putting the two Kings into contact) that leaves both Kings mated. **Doppelmatt** is when a side that is not in mate or stalemate makes a move that leaves both Kings mated; however, this final move may not be a king move putting the two Kings into contact, but must completely parry any existing check to the side's own King and replace it with a new mating check.

Completely Unavoidable Mate (**###**) is something completely different, being a position where mate by one side is inevitable although the mate may not be reached for several moves. It depends on the principle of **Dead Reckoning**, invoking the Laws of Chess that state that when the outcome of a game (i.e. win, draw or loss) is inevitable the position is regarded as 'dead' and no further play is allowed.

Win and **Draw** could be taken as normally understood, though a composition with one of these goals would be regarded as a study rather than a problem. With fairy conditions or pieces, preliminary analysis would be required to determine which positions could be taken as wins or draws.

All the above goals would end play once they were achieved, but for problem purposes other goals can be defined. Some are self-explanatory, such as where the side playing last has made a **Capture** (**x**), **Check** (**+**) or **Double Check** (**++**), or has played to a particular **Target Square**. Others would require more precise definition, such as **Echo**, where a position is reached that exactly echoes the diagram position in a specified way (but does not repeat it on the same squares), and **Symmetry**, where a position is reached that shows symmetry of a specified type. A more technical example is **CapZug**, where a position is reached in which the side to play must have one or more legal captures, no legal non-capturing moves, and not be in check. The number of legal captures available may be specified.

1.2: Forward Play. The types of forward play covered here are illustrated by stipulations leading to the goal Mate, but stipulations leading to any of the other goals of 1.1 would be equally valid.

In **Opposition Play**, White plays to achieve the goal, Black to oppose it. White will normally move first. The most important examples are the **Direct Mate** (**#n**), where White is to play and mate in the given number n moves or fewer, whatever Black plays, and the **Selfmate** (**S#n**), where White is to play and force Black to mate White in n moves or fewer. Modified selfmates are the **Reflexmate** (**R#n**), played under the rule that either side must give mate on the move if possible, and the related **Semi-Reflexmate** (**Semi-R#n**), where the rule is that Black (but not White) must give mate on the move if possible. These selfmates are combined with direct mates in the **Reciprocal** (**Grazer**) stipulations **Reci-S#n** and **Reci-Semi-R#n**, where White and Black play in opposition to reach a position where White can achieve both #1 and either S#1 or Semi-R#1.

In **Help Play**, White and Black cooperate in achieving the goal. The main example is the **Helpmate** (**H#n**), where Black starts and helps White to deliver mate on White's nth move. If n is a half-integer, White starts. The first example was by Max Lange in 1854. *GFC*

Some stipulations combine Help Play with an Opposition Play finish. In the **Helpselfmate** (**HS#n**) White starts and helps Black to reach a position where White has a S#1, (i.e. Black is forced to mate on Black's nth move). In the **Reciprocal** (**Grazer**) **HelpSelfmate** (**Reci-HS#n**) White starts and helps Black to reach a position where W has either a #1 or a S#1. And in the **Reciprocal** (**Grazer**) **Helpmate (Reci-H#n**) Black starts and helps White to a position where Black has either a #1 or a H#1. In all of these, the other side starts if n is a half-integer.

Series Play (pioneered by F Palatz and others in 1924 *GFC*) involves several consecutive moves played by the same side (though there will generally be more to the play than just the series of consecutive moves). In a simple **Series** (**Ser-**), the side moving may not expose its King to check, while the other side's King may only be checked on the last move of the series before play transfers back to that side. In a **Parry Series** (**pSer-**), the other side's king may be checked and the series punctuated by that side moving out of check; this may happen as often as desired, but the length of the series does not include these check-parrying moves.

Series Play is normally combined with Opposition and/or Help Play. There may be an introductory set of series moves of specified length n, but in **Help Free Play** moves in the series may be played by either side.

Simple examples of stipulations involving series play are the **Series Mate** (**Ser-#n**), where White plays a series of n moves concluding in mate to Black the **Series Helpmate** (**Ser-H#n**) (introduced by T R Dawson, 1926 *AS*), where Black plays a series of n moves after which White mates in 1 move, and the **Series Selfmate** (**Ser-S#n**), where White plays a series of n moves following which Black is compelled to mate White in 1 move.

More complex examples follow. In the **Series Reflexmate** (**Ser-R#n**), White plays a series of n moves following which Black is compelled to mate White in 1 move, under the rule that either side must give mate on the move if possible. (White must avoid being under that compulsion whilst playing the series, except possibly after the last move). In the **Series Helpselfmate** (**Ser-HS#n**), Black plays a series of n-1 moves, after which White has a S#1, i.e. after White's single move Black is compelled to mate on move n of Black. Finally, in the **Double Series Helpmate** (**n->Ser-#n**) (or **Double-Ser-H#n**) Black plays a series of n moves, following which White plays a series of n moves culminating in mate.

Zigzags (invented by W A Shinkman ca 1870, named by Tolosa y Carreras 1892, and much used by T R Dawson <u>*GFC*</u>) are an old type of stipulation involving series play. Black moves will only be made if some particular condition is fulfilled, and White's move options are generally limited in some way. In a **Checking Zigzag** Black will only move to check, in a **Blackcap Zigzag** he will only move to capture, and in a **Madcap Zigzag** he will again only move to capture, but will make a series of captures by a single unit until no more captures are possible. (See other sources for further details; in the *JF* classification the Madcap Zigzag was listed as a condition.)

1.3: Retro Play. This group covers the process of **retroanalysis** (pioneered by Sam Loyd 1859 with a 'castling is illegal' problem published in *Musical World. HFC*) together with concepts related to the **legality** of a position. In spite of the name, the play leading up to a diagram position is actually forwards rather than backwards.

In a **Proof Game** (**PG n**), the diagram position is to be reached from the normal game array in n double moves. (A half-integer in n implies that White moved last, e.g. 'PG 8.5' means a game to the position after White's 9th move.) An **a=>b Proof Game** (**a=>b n**) generalises the concept, with diagram position 'B' needing to be reached from diagram position 'A' in n double moves. In a **Shortest Proof Game** (**SPG**) the diagram position is to be reached in the minimum number of half-moves, this number not being stated. In a **One-sided Proof Game** the diagram position is to be reached by series play, i.e. by n single moves played by one side only.

In a **Last Move** problem, the last half-move leading to the diagram position from the normal game array must be determined. This may be generalized to require the last n half-moves, or generalised even further by an instruction such as 'Reach the position' or 'Release the position', which involves starting retro play from a position which is clearly legal. Alternatively, a 'one-off' stipulation such as "Where was wPc2 captured?" or "Minimum number of wK moves made?" may be made. (The solutions to problems with these stipulations are often given as if the moves were retractions, but this is purely a convention used for convenience to avoid having to give a separate legal position to start forward play from.)

An **Illegal Cluster** is an illegal position (i.e. one which cannot have arisen in play from the normal game array) which becomes legal if any one of the units present (except Kings) are removed. By contrast, a **Legal Cluster** is a legal position which becomes illegal if any one of the units present is removed. Either of these could form the basis of a **Construction Task**, e.g. a cluster with the maximum number of units; alternatively, the stipulation to a problem could require the cluster to be produced by modifying the diagram position is a specified way.

1.4: Retraction Play. In contrast to Retro Play, this involves moves actually played backwards from a diagram position, including events such as **uncaptures**, **unpromotion** and **uncastling**.

However, it is always required that all retractions of both sides must be to legal positions that could have been reached in a game played under whatever fairy conditions are in operation, and thus **retroanalysis** must be used to determine which retractions may actually be made. A **Retractor** problem will normally require a series of retractions to be followed by some simple forward play, e.g. 'Retract 2 moves by each side and mate in 1' (which in symbols would be written '-2 & #1'). A solution in which the forward play goal could be achieved after fewer than the required number of retractions would count as a cook to the problem. Retractors date from ca 1900, but the Hoeg and Proca types were defined in 1923-24. *GFC.*

A **Defensive Retractor** involves opposition play. White and Black alternately retract moves (White starting), with White aiming to reach a position from which the stated forward play goal may be achieved, and Black trying to thwart this aim. There are four types of defensive retractor with different possibilities for uncaptures. In a **Pacific Retractor** no retractions may be uncaptures. In a **Proca Retractor** the side retracting chooses what unit (if any) should be uncaptured on any retraction. In a **Hoeg Retractor** the opposite side to that retracting makes the choice of uncaptured unit, and in a **Klan Retractor** White always makes the choice. (This last name is an unfortunate one; the suggestion of the racist organisation 'Ku Klux Klan' in the name combined with the suggestion of white supremacy in the definition seems to have definite racial connotations. I accept that the name was actually based on the initials of its originators, but do wish that those initials could have been used in another way, perhaps by reversing them to give 'Nalk'.) Two other types are the **Help Retractor**, where White and Black act in cooperation by retracting moves (possibly including uncaptures) to reach a position where the set forward play goal may be achieved, and the **Series Retractor**, where all the retracted moves are made by one side.

1.5: Phase Play. This covers alternative moves or lines of play starting from the same position or related positions. It could be described as 'sideways play' as opposed to the forward or backward play in the previous groups. Nearly all the material here applies to chess problems as a whole rather than to particular types of stipulation, piece or condition, and applies as much to orthodox problems as to fairy ones.

Single-line Problems have no phase play; the solution (normally a long one) has no alternatives at any stage. **Duals** are alternative moves within a solution, normally regarded as a defect – while **Cooks** are of course unwanted alternative solutions, always a fatal defect! **Variations** are alternative lines of play arising from different defensive moves by Black in opposition play, while **Multi-solutions** are alternative lines of play arising from the initial position (or sometimes a later position with help-play or after a white move in opposition play – when they may be called **thematic duals**). Many **Construction Tasks** are effectively extreme cases of multi-solution positions, having a large number of solutions to very simple stipulations, e.g. #1. (However, Construction Tasks may not involve any actual play at all, and may show effects with a maximum number of pieces rather than moves of any kind, e.g. in the Legal and Illegal Clusters of 1.3).

Twins are small changes to a diagram position that result in a problem having different **parts**, the terms 'twin' and 'twinning' being used even where there are more than two parts; they are associated mainly with help-play rather than opposition play. There are many types, some of which have been named. In **Duplex** twins the colours of the stipulation are reversed (e.g. H#2 for Black as well as for White), while in the converse **Polish** twins all the units change colour while the stipulation is unchanged. In **Forsberg** twins the type of a unit is changed; **Progressive** twinning involves more than two parts, with the change in each made from the previous part rather than from the original position. In a **Zeroposition** each part involves a change in the diagram position. In **Sequential** twinning the starting position of a later part depends in some way on the solution of the previous part (e.g. the position after the key move has been made), and in the related **Shedey** twins (a fairy type named after the Ukrainian composer Sergei Shedey) the solution to an early part is only considered valid if it leads to solutions for all later parts.

Tries are failed solutions that are nevertheless accurate enough for their moves to be listed. They are associated mainly with opposition play, where they can be precisely defined as nearsolutions refuted by a single defensive move only. With help-play tries are harder to define, and tend to be subjective, existing only in the mind of a composer.

1.6: Hidden Play. This name is given here to problem types where some aspects of a diagram position and/or the moves played from it are not disclosed to the solver, and must be identified in order that the problem may be solved. These types of problem might preferably come under Conditions rather than Stipulations, but are included here on the grounds that the fairy aspect is connected with the solving process rather than to the actual play.

Many types of hidden play are closely related, differing only in the precise information given in a diagram position. In a **Rebus** problem, all pieces are indicated in a diagram by letters or symbols, so that their different types and colours can be distinguished but none of them can be directly identified. The locations and colours of **Variables** (invented by Tadashi Wakashima in 1992) are shown in the diagram position, but with no indication of the type of any piece. The locations of **Undefined Pieces** are shown in the diagram position, though their colours and types are not indicated in any way. The locations of **Unidentified Pieces** are similarly shown, but a general statement of the numbers and colours of each type of piece is given. **Invisibles** are not shown in a diagram position at all, although the number of such pieces of each colour is stated. With **Total Invisibles** only an overall total is given, and with the ultimate case of **Add Pieces** nothing about such pieces is stated (except perhaps that their minimum number is required). There are many other possibilities (some of which may well turn out to be named); e.g. the diagram may identify some but not all of the pieces, or colours but not identities may be shown. With all of them, unknown pieces must be identified through analysis of the position's legality and possibilities for play. The problem may simply require the pieces to be identified, or there may be an actual stipulation, but in all cases the reasoning behind any identification is required, and a move will only be accepted as part of a solution if it can be shown to be actually a legal move.

Kriegspiel is a special case, being based on the game of that name in which the rules for play are orthodox, but each player's moves are hidden from the opponent, though monitored by a Referee who states whether or not any move attempted may be legally played; the Referee also provides limited information about each move that is declared legal and therefore considered to have been actually played. Kriegspiel problems must necessarily involve opposition play (since help play implies that each side gives all necessary information to the other). In a typical Kriegspiel problem Black's moves are hidden, and the number and positions of some of Black's pieces in the diagram position may also be hidden. To solve the problem, White must provide responses to all Black's possible defences without knowing directly which defence has actually been played. Thus to solve a #2 problem, White would play the proposed key-move followed by all mating moves that would be required for the solution (though not necessarily all possible moves that would give mate), ensuring that each such move attempted would either give mate or be declared illegal. For further details see the Appendix.

1A: Appendix to Stipulations.

General: In the *JF* classification, Construction Tasks were listed with Knight's Tours and Chessboard Dissections as topics to be possibly developed later. Here, Construction Tasks have been mentioned in 1.3 and 1.5, but the other two topics are not considered as coming under Fairy Chess.

1.6: Hidden Play. Details of **Kriegspiel**. The information provided by the hypothetical Referee of a problem is as follows: (i) if a move played by Black is a capture (in which case the capture square would be stated), (ii) if a move played by Black gives check (in which case it would be stated whether the check was on a rank, file, short diagonal, long diagonal, or by a knight), (iii) when asked by White, if Black's last move allowed White to make a pawn capture (in which case White must attempt such a capture, i.e. move a pawn diagonally forward to a square not occupied by another White unit), (iv) if a move attempted by White was legally playable (in which case it must stand).

For more information see M McDowell: Book Review of *Are there any?* by G F Anderson, pp466-7, *The Problemist* July 2006; also the thread on the MatPlus forum: http://www.matplus.net/start.php?px=1570818322&app=forum&act=posts&fid=gen&tid=603

References for some of the other types of hidden play follow. For **Variables** see the article in http://quartz.chessproblems.ca/pdf/50/Quartz50.pdf. For **Invisibles** see JF problem 675 (2014) https://juliasfairies.com/problems/no-675/ and JF problem 1463 (2019) https://juliasfairies.com/problems/no-1463/. For these and **Total Invisibles** see the article in http://quartz.chessproblems.ca/pdf/50/Quartz50.pdf.

2: Pieces.

Introduction. Pieces are the basic units that are placed on a chessboard to produce the diagram position of a problem. They all move in clearly defined ways which are often simple to describe but may be complex; it is often convenient to describe the movement of a complex piece in terms of simpler pieces. Pieces are very numerous, with possibilities for new ones always being open; many of them can be placed in clearly defined groups containing generally similar members.

Unless otherwise indicated, Pieces move and capture in the same way. Their movement may often be described in terms of (m,n) steps or **leaps**, where (m,n) indicates m ranks and n files, or vice versa. For instance, a Knight can be described as moving by single (1,2) steps, indicating it can reach squares either 1 rank and 2 files or 1 file and 2 ranks away in any direction. The orthodox pieces are the King, Queen, Rook, Bishop, Knight and Pawn; anything else counts as a fairy piece.

Many pieces are given 1- or 2-letter symbols which agree with those used by Popeye (as listed in the file *py-engl.txt* given with the program), and imply that the pieces are supported by Popeye. (WinChloe has an extensive and modifiable definition system which allows the moves of named pieces to be restricted or extended, and also allows unnamed pieces to be programmed.)

In this Version 1 of the Glossary, Pieces are classified on three levels, with 4 Classes and 16 Groups. **2.1: Leapers and Riders** covers two of the most basic types of piece; a **Leaper** moves directly from one square to another in a single **leap**, irrespective of any units on intermediate squares, while a **Rider** moves along a straight or angled path in a series of leaps, being blocked by another unit on an intermediate square. **2.1.1/2: Simple and Compound Leapers** covers straightforward pieces that are purely leapers, while **2.1.3/4: Simple and Compound Riders** covers straightforward pieces that are either purely Riders or else Riders with a leaper component. The next three Groups cover less straightforward pieces; with **2.1.5: Limited Riders** the rider moves are limited in some way, with **2.1.6: Angled Riders** the move paths are angled rather than straight, and with **2.1.7: Extended Riders and Leapers** move possibilities are increased either through multiple moves or through interaction with the board-edge.

2.2: Hoppers covers the third basic type of piece, with moves determined by the presence of another unit (or set of units) called a **Hurdle** (which is normally any type of unit of either colour and is not affected by the Hopper’s move). **2.2.1: The Simpler Hoppers** covers straightforward pieces that actually hop over a hurdle to land beyond it. The pieces in **2.2.2A: Miscellaneous Linear Hoppers** again hop over a hurdle, but are less straightforward. **2.2.2B: Pseudo-Hoppers** covers pieces that do not actually hop over their hurdle although their moves are controlled by it. The next two groups contain pieces that hop over their hurdle at an angle; with **2.2.3: Short Angled Hoppers** they make only a single leap beyond the hurdle, but with **2.2.4: Long and Miscellaneous Angled Hoppers** they either move further beyond the hurdle or are less straightforward in some other way. Finally, **2.2.5/6: Compound and Extended Hoppers** contains Hoppers that are either combined with some other type of piece or make some sort of multiple hops.

Note. Many individual hoppers are named after the leapers or riders on which they are based, but these namings are not always consistent. This arises partly because many of the first riders to be invented were based on queen moves but given separate names to emphasise their difference from queens. Only when the value of having related pieces with modified and/or more limited moves was realised did the names of rooks and other pieces become incorporated in hopper names – and the problems that arose were not always resolved in the same way!

2.3: Assorted types of Pieces consist of three completely different groups. **2.3.1: Pawns** covers units with the general properties of orthodox pawns. **2.3.2: Families of Hybrid Pieces** covers several sets of closely related pieces which all move and capture in different ways. Finally, **2.3.3: Miscellaneous Pieces** includes all individual pieces that do not fit in any of the groups described above.

2.4: Piece Attributes is something different; it covers not individual pieces but general properties that may be applied to either individual pieces or to a range of different pieces – and if extended to cover all pieces would amount to a **Condition**. With **2.4.1: Static Piece Attributes**

these applied general properties would affect pieces permanently; with **2.4.2: Dynamic Piece Attributes** these general properties will be affected by the position and may change during the play.

2.1: Leapers and Riders. Five groups, with 2.1.1/2 and 2.1.3/4 being combined.

2.1.1/2: Simple and Compound Leapers.

Simple Leapers have leaps defined by a single pair of (m,n) coordinates, but can make these in any direction; they have logical moves and make potentially useful fairy pieces, though their usefulness is likely to decrease with increasing move length. The following named ones are listed in order of increasing x- and then y- coordinates. **Zero** (0,0); **Wazir WE** (0,1); **Fers FE** (1,1); **Dabbaba DA** (0,2); **Knight S** (1,2)-leaper; **Alfil AL** (2,2); **Camel CA** (1,3): **Zebra Z** (2,3); **Giraffe GI** (1,4); **Antelope AN** (3,4); **Ibis** (1,5); **Corsair** (2,5); **Flamingo** (1,6). Of these, the Knight is of course an orthodox piece. The Wazir, Fers, Dabbaba, Alfil and Camel are pieces in Medieval Muslim forms of chess; the others were named recently (and arbitrarily). The Zero was invented in 1967 by A S M Dickins <u>GFC</u>; it can of course only make null moves (but see problem C2.5 in *GOMOSP*!).

Other simple leapers may be named by their coordinates or by the total length of leap; thus a **4-Leaper** would have (0,4) leaps.

Compound Leapers may make more than one type of leap; many are **combined pieces** which can move or capture like any one of their constituent units. The **King K** is of course an orthodox piece, and could be described as a royal (0,1)+(1,1)-leaper or combined Wazir+Fers; the **Erlking EK** is a fairy piece with the same normal powers of movement as a King, but lacking its royal powers and ability to castle.

The following combined pieces are given below, together with their leap coordinates and the names of their constituent pieces. **Alibaba**, (0,2)+(2,2) or Alfil+Dabbaba (mentioned in <u>*Chessics 11*</u> 1981 p7, where its name is credited to J J Secker); **Gnu GN**, (1,2)+(1,3) or Knight+Camel;

Okapi OK, (1,2)+(2,3) or Knight+Zebra; **Impala**, (1,2)+(3,4) or Knight+Antelope;

Bison BI, (1,3)+(2,3) or Camel+Zebra; **Zebu ZE**, (1,3)+(1,4) or Camel+Giraffe;

and **Squirrel SQ**, (0,2)+(1,2)+(2,2) or Dabbaba+Knight+Alfil.

Two compound leapers that are not combinations of named pieces but are of theoretical interest in that their two different leaps have the same length are the **5-Leaper BU** (also known as the 'Root-25-leaper' or the 'Bucephale' – hence the symbol) with (3,4) and (0,5) leaps, and the **Root-50-Leaper RF** with (5,5) and (1,7) leaps.

Of much greater mobility is the **Equileaper** (invented by N Shankar Ram), which can leap to any square that is a multiple of 2 squares distant both vertically and horizontally. (But note that the name 'Equileaper' is used widely in *Chessics* for the 2.2.2 piece now called the Non-stop Equihopper NE.) Even more mobile and complex is the **Wizard** invented by G P Jelliss (<u>*Chessics 24*</u> 1985 p100) that can leap to the first square it can reach in any direction – i.e. it can make any leap that does not pass over the centre of another square.

2.1.3/4: Simple and Compound Riders.

Simple Riders have moves consisting of one or more (m,n)-steps extending in the same direction.

First come the orthodox pieces **Rook R** or (0,1)-rider and **Bishop B** or (1,1)-rider, the Rook having the additional property of being able to take part in castling. The **Wazirrider WR** and **Fersrider FR** are fairy pieces which have the same basic moves as Rook and Bishop but different home-squares.

The **Nightrider N** or (1,2)-rider is an important fairy piece, according to the WinChloe totals being second only to the Grasshopper in overall popularity. It was invented T R Dawson, first appearing in *Die Schwalbe*, Feb 1925, though according to *GFC* and *HFC* had been anticipated in the context of Magic Squares by W S Andrews in 1907. The name is slightly unfortunate, ‘Knightrider’ seeming more logical; this does not matter for the piece itself, but causes difficulties in the naming of pieces such as Hoppers derived from it.

Other simple riders can be derived from any of the simple leapers listed in 2.1.1, but the limitations of the 8x8 board leaves only the **Camelrider CR** or (1,3)-rider and the **Zebrarider ZR** or (2,3)-rider as effective pieces.

Compound Riders have more than one type of rider move, and may be **combined pieces** which can move or capture like any one of their constituent units. The **Queen Q** (Rook+Bishop) is of course an orthodox piece. Partly orthodox are the **Waran WA** (Rook+Nightrider) and the **Elephant ET** (Queen+Nightrider); the related Bishop+Nightrider combination does not appear to have been named. Purely fairy combinations are the **Gnurider GR** or (1,2)+(1,3)-rider (equivalent to Nightrider+Camelrider) and the **Alibaba Rider** or (0,2)+(2,2)-rider, which is derived from the leaper combination Alfil+Dabbaba.

Included in this group are combinations of riders with leapers; such are the **Empress EM** (Rook+Knight), **Princess PR** (Bishop+Knight) and **Amazon AM** (Queen+Knight). According to *AS* the Amazon dates from ca 1500, and was also called ‘Terror’, ‘General’ or ‘Omnipotent Queen’.

Also included in this group are combinations of riders/leapers with Pawns; such are the **Ship SH** (Rook+Pawn), **Gryphon** or **Griffin** (Bishop+Pawn) and **Dragon DR** (Knight+Pawn). (The Queen+Pawn combination does not appear to have been named.) These Pawn combinations do not promote, and cannot move as pawns from their back rank. They may make a double step from squares on their 2nd rank, but are not subject to e.p. capture (though they may capture Pawns e.p.).

2.1.5: Limited Riders.

These are a miscellaneous group of pieces which have rider moves which are limited in some way.

The **Rankrider** and **Filerider** move as a Rook confined to a single rank or file respectively. According to *AS*, the Filerider dates from ca 1300.

The **Mao MA** is an ancient Chinese piece (see 2.3.2) equivalent to the modern Knight. It has a fixed 2-step move consisting of a (0,1) leap followed by a (1.1) leap to reach a square a knight’s move away (e.g. a1-b1-c2); however, the intermediate square must be vacant. By contrast, the **Moa MO** is a modern piece designed as a counterpart to the Mao. Its fixed 2-step move consists of a (1,1) leap followed by a (0.1) leap, (e.g. a1-b2-c2), again with the intermediate square vacant and again reaching a square a knight’s move away. These two pieces must be classed as riders in spite of the fixed length of their moves, since (like other riders) they can take part in pins and attacks by discovery.

The **Maorider AO** and **Moarider OA** extend the moves of the Mao and Moa respectively in the same way that simple riders extend the moves of simple leapers. Both move in different series of alternating (0,1) and (1,1) leaps (e.g. a1-b1-c2-d2-e3 or a1-b2-c2-d3-e3) to reach squares a number of knight’s moves away, with all intermediate squares needing to be vacant. Like their parent pieces, they can thus reach the same destinations as each other, but by different routes.

The **Edgehog EH** (invented by J E Driver, *BCM* Feb 1966 *GFC*) is a very different type of piece, its moves being limited by the board’s edge rather than by any blocks on intermediate squares. It moves as a Queen, but all moves must either start or end (but not both) on an edge square.

2.1.6: Angled Riders.

These riders move along paths containing one or more angles. A piece with (at most) one angle in its move is the **Trojan Horse** (**CAT**, **Cavalier Trojan**) *PDB*, whose move consists of a single (1,2) knight leap followed optionally by any number of linear (0,2) Dabbaba leaps angled at 22° to the original knight leap. (Other similar pieces might have move paths correspond to those of the Angled Hoppers of 2.2.3, and could be named accordingly; thus the move of a ‘Moose Rook’ would consist of a rook move followed by a single diagonal leap angled at 45°.)

The **Rose RO** (Rosencavalier) is an important piece with a move consisting of a series of knight leaps angled at approximately 45° (or more accurately alternating between 37° and 53°) in the same direction, so that it may make a complete octagonal circuit. From d1 this would be by d1-f2-g4-f6-d7-b6-a4-b2-d1 (or by the same moves in the reverse direction). The Rose could be classified as a **Falcate Rider** (the names meaning 'claw-like'); for a discussion on this name and on other possible similar pieces see the Appendix.

The remaining pieces in this group are classified as **ZigZag Riders**, their moves consisting of a series of leaps angled in alternating directions, giving zigzag movement in an overall straight line rather than circuits. Their move paths are complicated to describe, but since all such pieces follow the same pattern, it will be enough to give for each the leap coordinates, the leap angle, the overall direction of travel and an example path.

The simplest Zigzag Riders are the **Girlscout GT**, with (0,1) leaps angled at 90°, bishop move direction e.g. a3-a4-b4-b5-c5, and the **Boyscout BT**, with (1,1) leaps angled at 90°, rook move direction e.g. a3-b4-c3-d4-e3. The Boyscout was invented by J G de A Almay some time before 1940, *FCR* 1940 p83; the Girlscout was presumably invented some time later as a counterpart.

Next comes the **Serpent**, with alternating (1,1) and (0,1) leaps angled at 45°, knight move direction e.g. a1-b2-c2-d3-e3-f4. This was invented V K Raman Menon, *FCR* 4/3, 1939 p29. There should logically be a companion piece with a similar path but starting with a (0,1) leap (and possibly two other companion pieces with the leaps angled at 135°).

Basing a zigzag rider on (1,2) knight leaps allows five different angles. Four of the resulting pieces have been given systematic names that include coordinates representing pairs of leaps. These are the **(1,1)-Zigzag Nightrider S1**, with leaps angled at 37°, bishop move direction e.g. b1-a3-c2-b4-d3, the **(0,2)-Zigzag Nightrider S2**, with leaps angled at 53°, rook move direction e.g. b1-d2-b3-d4-b5, the **(3,3)-Zigzag Nightrider S3**, with leaps angled at 143°, bishop move direction e.g. b1-c3-e4-f6-h7, and the **(0,4)-Zigzag Nightrider S4**, with leaps angled at 127°, rook move direction e.g. b1-c3-b5-c7. The fifth knight-based piece is the **Quintessence QN**, with (1,2) leaps angled at 90°, (1,3) camel move direction e.g. b1-a3-c4-b6-d7.

There are two further pieces based on (1,2) knight leaps; these are the **SpiralSpringer SS**, a combination of the (0,2) and (0,4) pair with rook move directions, and the **Diagonal SpiralSpringer DS**, a combination of the (1,1) and (3,3) pair with bishop move directions. (These manes are slightly unfortunately in that the move paths are not actually spiral.)

2.1.7: Extended Riders and Leapers.

This is a group of pieces whose rider or leaper moves can be extended either by interacting with the edge of the board or by making multiple moves.

The **Archbishop AR** is a Bishop which can make a single bounce off an edge rank or file, in the process staying on the same colour squares, e.g. c6-d7-e8-f7-g6. The **Reflecting Bishop RB** extends a bishop's move even further by bouncing any number of times off an edge rank or file, e.g. c6-d7-e8-f7-g6-h5-g4-h3. In this way it may make a complete circuit, resulting in a null move. The **Cardinal C** is another modified Bishop, but differs from the Archbishop by being able to make a single bounce off the actual board-edge, e.g. c6-d7-e8-f8-g7-h6, this bounce taking it to the opposite colour squares. The **Bouncy Nightrider BN** is a 1,2 rider that can make a single bounce off the board edge *(but whether like an Archbishop or a Cardinal is at present unclear)*.

The two remaining pieces in the group both make multiple knight leaps. The **Bouncy Knight BK** makes two consecutive knight leaps, but the first one must be to the board edge and cannot be a capture. *Popeye tests appear to show other possibilities.* The **Ubiubi UU** is more powerful, making any number of consecutive knight leaps without limitation, except that only the last leap may be a capture.

2.2: Hoppers. Six Groups, with **2.2.2** being split into **A** and **B** and **2.2.5/6** being combined.

2.2.1: The Simpler Hoppers.

This group contains three general families of closely related pieces that share the basic hopper property of hopping over a hurdle and landing on a square beyond it.

Leaperhoppers make single leaps to reach a hurdle and single leaps continuing beyond it. With the **Kinghopper KH** the leaps are (0,1) or (1,1), with the **Knighthopper KP** they are (1,2). With the **Pawnhopper**, non-capturing moves are based on leaps 1 square directly forwards, and capturing moves are based on leaps 1 square diagonally forwards. From its 2nd rank this piece may make a 2-square leap forwards to a hurdle (though only a 1-square leap beyond it); its e.p. possibilities are unclear, as are its promotion possibilities on reaching the 8th rank.

Members of the **Grasshopper family** are **Short Riderhoppers**, making a rider-move series of leaps to reach a hurdle and a single leap beyond it. The **Grasshopper G** was the first hopper to be invented; the inventor was T R Dawson, and the piece first appeared in the *Cheltenham Examiner* July 1913 *HFC*. Its moves consist of (0,1) or (1,1) leaps on queen lines, and it might more logically have been named 'Queenhopper'. Other members of the family are the **Rookhopper RH** with (0,1) leaps, the **Bishophopper BH** with (1,1) leaps, the **Nightriderhopper NH** with (1,2) leaps, and the **Camelriderhopper CH** with (1,3) leaps. Also included in the family is the **Rosehopper RP**, where the (1,2) leaps are angled at approximately 45° to give an octagonal path, allowing the piece to complete a circuit and so make a null move.

Members of the **Lion family** are **Long Riderhoppers**, making rider-move series of leaps both before and after the hurdle. The **Lion LI** moves on queen lines (and might better have been named 'Queen Lion'); the **Rook Lion RL**, **Bishop Lion BL**, **Nightrider Lion NL** and **Rose Lion RN** move on the lines of the piece whose name they bear. (The Rose Lion has the special ability of being able to reach squares before its hurdle by making a complete circuit and starting a second circuit; however, it cannot capture its own hurdle by doing this.) Two other members of the family are the **Maorider Lion ML** and the **Moarider Lion MM**; these move as the Nightrider Lion except that each (1,2) leap in the move must be played as a (0,1) leap plus a (1,1) leap for the Maorider Lion, and as a (1,1) leap plus a (0,1) leap for the Moarider Lion.

2.2.2A: Miscellaneous Linear Hoppers.

This is a diverse group of pieces sharing the basic hopper property of hopping over a hurdle to land beyond it. Some have moves that can best be described in terms of the **Grasshopper** of 2.2.1, which moves on Queen lines any number of squares to reach a hurdle and 1 square beyond the hurdle.

The **Chopper** (**Andernach Grasshopper**) moves in exactly the same way as a Grasshopper, but changes the colour of its hurdle (unless that hurdle is a King) in the process. (See 2.4.1 for other Andernach Hoppers.)

The **Grasshopper-2 G2** extends the grasshopper move by making a 2-square leap after the hurdle instead of a 1-square leap. The **Grasshopper-3 G3** extends the move even further by making a 3-square leap after the hurdle. These two pieces were described in <u>*FCR*</u> Apr 1942. This idea could be taken further, either by greater extensions or by basing the move on other members of the Grasshopper family.

The **Contra-Grasshopper CG** reverses the relative lengths of the parts of a grasshopper move, making a 1-square leap to reach a hurdle and a queen move of any number of squares beyond it. This idea has been extended to produce the **Contra-Rookhopper** and **Contra-Bishophopper**, and could be extended still further, e.g. by combining it with the Grasshopper-2 etc.

The **Orix OR** (**Equigrasshopper**) is a rather different piece. It moves any distance on queen lines to reach a hurdle and then an equal distance beyond it, to finish on the square diametrically opposite its starting point. It was named 'Orix' by J E H Creed FCR 6/2 p8 <u>*GFC*</u>.

The next two pieces (both named 'Equihoppers') extend the Orix principle of moves finishing on the square diametrically opposite their starting point from the hurdle, by making leaps to and from the hurdle that may be any distance in any direction, and not necessarily on a rider line. The **Nonstop Equihopper NE** (**French Equihopper**) cannot be blocked in any way, but moves of the **Equihopper EQ** (**English Equihopper**) can be blocked by a unit on an intermediate square (if such a square exists). This second piece was invented by G Leathem, *FCR* Aug 1938 p134. The invention of the Nonstop Equihopper is unclear; it is featured several times in *Chessics*, the first occasion being in *Chessics 2* p3, July 1976, but is always referred to as the 'Equileaper'.

2.2.2B: Pseudo-Hoppers.

The pieces in this group have hopper-like moves that may leave them on the nearside of a hurdle without actually hopping over it. Two of these, both named 'Equistoppers', move towards a hurdle an even number of steps away in any direction (not necessarily on a rider line), to finish halfway between the hurdle and its starting point. The **French Equistopper QF** cannot be blocked, but the **English Equistopper QE** will be blocked by a unit on any square directly between it and the halfway square (though it may capture on the halfway square itself).

The remaining pieces in this group move on rider lines, with all intermediate squares other than any specified needing to be vacant. The **Jaguar** effectively moves as a Queen, but only towards another unit of either colour standing on the same line, thus capturing only if there is another unit of either colour behind the unit to be captured. The **Jibber** (invented by C D Locock, no 2672 *FCR* April 1937) moves on queen lines to stop 1 square short of a hurdle, so being unable to capture. The **Hamster HA** is very similar to the Jibber, but operates by moving any distance on queen lines to reach a hurdle and then making a 1-square leap in the reverse direction, so that it may return to its original square to make a null move. (G P Jelliss defined the Hamster's movement – but it was Chris Tylor who named it after the small animal that when kept as a pet seems to spend much of its time climbing up the bars of its cage and then falling down again!)

Next, the **Contra-Hamster** is a new Chris Tylor piece that reverses the Hamster's move following the Contra-Grasshopper pattern of 2.2.2A. It moves on queen lines, bouncing off another unit a 1-square leap away to move any number of squares in the opposite direction. It can thus capture, but cannot move away from a board edge or corner once it has played there.

The **Bouncer B1** *PDB* also moves or captures on queen lines by bouncing off another unit on its line, but returns along its path to the square an equal distance beyond its starting point. It can also bounce off a hypothetical piece on a square beyond the board edge (and so can escape from an edge) The **Rook Bouncer B2** and **Bishop Bouncer B3** are similar, but move only on rook or bishop lines respectively.

Finally, the **Soucie** is a doubtful member of the group. It can move in all directions on a queen line, but its move length must equal the number of all units (including the Soucie itself) on that particular line. Thus in the position wKf1, wSOa1, bKh1, bPc3, the white Soucie on a1 can move to a2, d1 or capture on c3.

2.2.3: Short Angled Hoppers

These are a closely related group of hoppers whose moves can best be described in terms of the **Grasshopper** of 2.2.1, which moves on Queen lines any number of squares to reach a hurdle and 1 square beyond the hurdle. However, they differ from pieces of the Grasshopper family by changing direction at the hurdle before making a single leap, the ability to turn left or right increasing their possible moves.

The **Moose M** was the first member of the group to be introduced. It is effectively a Grasshopper that changes direction by 45° at the hurdle, thus switching from rook line to bishop line or vice versa. It was invented by G P Jelliss (who described it as a 'Bifurcating Grasshopper', and explained that its name was derived indirectly from those of the Mao, Moa and Moo-hopper – see later for this piece), and appeared in *Chessics 1* p1 in March 1976. The **Rook Moose RM** and **Bishop Moose BM**, moving as a Moose confined to rook or bishop lines on approach to the hurdle, followed later.

The **Sparrow SW**, **Rook Sparrow RW** and **Bishop Sparrow BW** differ from the corresponding moose pieces by changing direction by 135°, thus returning towards their starting squares, but again switching from rook line to bishop line or vice versa. Finally, the **Eagle EA**, **Rook Eagle RE** and **Bishop Eagle** all change direction by 90°, thus remaining on their original rook or bishop lines. The Sparrow and Eagle were introduced (together with Hamster of 2.2.2B) in *Chessics 9*, October 1978; G P Jelliss explained that the move pattern of the Sparrow resembled both an arrow and a splay-toed bird's foot – but that how the Eagle got its name remained a mystery! The moves of all the above pieces could be extended by combining them with the Contra-Grasshopper and Grasshopper 2/3 principles – though the idea of having pieces with names such as 'Contra-Bishop Sparrow 2' tends to make the mind boggle.

Three isolated hoppers close this group. The **Moo-hopper**, mentioned earlier in connection with the Moose, is apparently a Moose that can only make a single leap to reach the hurdle (though having been invented earlier will have originally been described in a different way). The **Marguerite MG** combines the moves of the Moose, Sparrow and Eagle with those of the Grasshopper and Hamster. It moves on queen lines any distance to reach a hurdle and then a single step beyond it in any direction (including a complete reversal). Finally, the **Scarabeus** (invented by Sebastian Luce; see *JF* problem 1173, 2016) moves on queen lines any distance to reach a hurdle and then a single (1,2) knight step beyond it, changing direction by approximately 22°. Its name was suggested by the angle between the Scarab beetle's antennae. Its principle could be extended to produce a new family of pieces by varying the hurdle angle – and by including pieces approaching the hurdle by a nightrider move.

2.2.4: Long and Miscellaneous Angled Hoppers.

This is a diverse group of pieces, linked only by their being classed as hoppers and by their moves being angled in some sense.

The **Moose Lion**, as might be expected, combines the moves of both the Moose of 2.2.3 and the Lion of 2.2.1, moving on queen lines any distance to reach a hurdle and then any distance beyond it, changing direction by 45°, with all other squares on its path being vacant. It could be extended to produce a whole family of pieces similar to the main Short Angled Hopper family – though there could be mind-boggling names involved.

The next two pieces are related to the Nonstop Equihopper of 2.2.2A. The **E90** has a 90°change of direction; it moves (not necessarily on a rider line) any distance and in any direction to reach a hurdle and then an equal distance beyond it, changing direction by 90°, and its moves not being blocked by units on any intermediate squares. The **Radial Leaper RK** differs by being able to move in any direction beyond the hurdle to a square equidistant from its starting point (though it may not return to that starting point). However, for this piece the hurdle must be a unit of the opposite colour.

The last four pieces in this group are related both in name and in powers of movement. Two of these make normal hops over a hurdle (which is once again a unit of either colour) and then move an equal distance in any direction. The **Treehopper TH** makes its moves on queen lines (and thus resembles the Orix of 2.2.2A but with the ability to move at right angles as well as in a straight line); the **Greater Treehopper GE** makes a free leap to the hurdle, not necessarily on a rider line (and thus behaves as a Radial Leaper without the hurdle colour limitation). Neither piece may return to its starting square). The other two pieces make simpler moves like those of a rider or leaper (and only count as hops because they are controlled by a hurdle). The hurdle of a **Leafhopper LH** must stand on one of its queen line; it leaps in any direction on queen lines a distance equal to its distance from that hurdle; the hurdle of a **Greater Leafhopper GF** may stand anywhere on the board; it leaps in any direction a distance equal to its distance from that hurdle. Neither piece may capture its hurdle.

2.2.5/6: Compound and Extended Hoppers.

This is another diverse group of pieces. many of which have moves that can best be described in terms of the **Grasshopper** of 2.2.1, which moves on Queen lines any number of squares to reach a hurdle and 1 square beyond the hurdle. Some often arbitrary combinations of hoppers with other pieces have been named; thus, the **Sting ST** is a King+Royal Grasshopper, and the **Gral GL** is an Alfil+Rookhopper. (see 2.2.1). The **Mantis** or Locust+Knight (see 2.3.2) could also be included here.

More logical is the **Kangaroo KA**, which moves any distance on queen lines over a hurdle consisting of two units any distance apart on the same line, to finish on the first square beyond the second unit, and is thus a Grasshopper whose hurdle consists of two units. It was invented by J G de A Almay some time before 1940, *FCR* Apr 1940 p83. Next, the **Dolphin DO** is a combined Grasshopper + Kangaroo, moving any distance on queen lines over a hurdle consisting either of a single unit or of two units any distance apart on the same line, and finishing again on the first square beyond the last unit.

The **Bob BO** extends the Kangaroo's move by hopping over *four* units any distance apart on the same line. (Something is wrong, though; how can such a piece have been defined and given such a short name when the corresponding 3-piece hopper is unnamed? And how common can a 4-piece hop be?)

The **Kangaroo Lion KL** (**Rabbit RT**) combines the different properties of the Kangaroo and the Lion of 2.2.1; it moves any distance on queen lines over a hurdle consisting of two units any distance apart on the same line, to finish on a square any distance beyond the second unit. It has evidently been invented twice independently, and given two quite different names together with their symbols – either of which Popeye will accept. (This equivalence of Kangaroo Lion and Rabbit raises interesting zoological issues: what sort of rabbit hole would a Kangaroo Lion dig, and what would happen if you put your foot in one?)

The **Double Grasshopper DG** extends the grasshopper move in a different way, making two consecutive standard grasshopper moves as part of a single turn of play. The first such grasshopper move must be a non-capturing move to a vacant square; the second may involve change of direction, including switchback, or alternatively may be a capture. A first grasshopper move may only be made if a second one is possible. This piece was invented by W B Trumper, *feenschach* Jun-Jul 1968 p728 *GFC*. The **Double Rookhopper DK** and **Double Bishophopper DB** move similarly, but are confined to rook or bishop lines.

Finally, the **Grasshopper Bul** (invented by Petko Petkov) takes complexity to a new order. Its move involves two separate steps, the first of which may not be made unless a second is possible. The first step is a normal grasshopper move over a hurdle, and may apparently be a capture; the second step consists of the hurdle itself making a non-capturing grasshopper move over a second hurdle. If the first hurdle is itself a Grasshopper Bul, there is no third step; if this first hurdle is a Pawn which ends up on its 1st rank, it may subsequently make a normal single-step pawn move or capture. The properties of this piece may be extended to produce a family of **Bul Pieces** based on other hoppers; their properties can be worked out from their names.

2.3: Assorted types of Pieces. Three Groups, with no changes in numbering.

2.3.1: Pawns.

The typical characteristic of a Pawn is that it moves and captures by different single steps in one general direction (so that its moves cannot be reversed). From its game array square (normally on its 2nd rank) it may optionally move by a double step if not impeded, but is then subject to an immediate *en passant* (e.p.) capture by an opposite-colour pawn on the square passed. On reaching its final rank (which under some conditions may be by other means than a normal move) a pawn immediately promotes by becoming any orthodox piece or any fairy piece present in the diagram position. Most pawns may not reach their first rank by a normal move; their powers of movement on reaching that rank through the operation of a particular Condition depend on that Condition.

All the fairy pawns described here are closely related to the Orthodox **Pawn P**, and can be grouped with it or one another in pairs or triplets. The **Medieval Pawn** is similar to it, but lacks the double-step initial move, and may have limited promotion possibilities.

The **Reverse Pawn PP**, as its name implies, differs from the orthodox Pawn by moving and capturing in a backwards rather than a forwards direction. The **Reversible Pawn** combines the powers of both by being able to move and capture in either a forwards or a backwards direction. It promotes on its 8th rank as normal, but may not move to its 1st rank and may not make a backward double-step from its 7th rank. This pawn was T R Dawson's first invention, published simultaneously in six Journals in three countries at the close of 1911 *HFC*

The **Berolina Pawn BP** reverses the orthogonal and diagonal directions of movement of an orthodox Pawn, moving one square diagonally forwards (or two squares from its 2nd rank) and capturing one square directly forwards. It may capture e.p. immediately after a double step by another Berolina Pawn. This is the 'Berlin Pawn', invented by E Nebermann, 1926, *Funkshach 33, 38 PFS* Feb 1934. The **Complete Pawn** combines the Orthodox and Berolina Pawns, moving and capturing either directly forwards or diagonally forwards, thus, unlike other pawns having reversible moves.

The **Superpawn SP** (invented by W Speckmann in 1967 *AS*) extends the power of the Orthodox Pawn by being able to move any number of squares directly forwards and capture any number of squares diagonally forwards. Finally, the **Berolina Superpawn BS** merges the properties of the Superpawn and Berolina Pawn; it moves any number of squares diagonally forwards and captures any number of squares directly forwards. Both these last two pawns promote on its 8th rank as normal, but may not capture or be captured e.p.

Two rather different pawns described elsewhere are the Chinese Pawn and the Marine Pawn (see 2.3.2).

Some thoughts. Pawns have very illogical moves, and if none of them existed it seems unlikely that any would ever be invented. But they are incredibly useful in chess problems, not only for their own powers of movement but as providing a framework for controlling the movement of the more powerful pieces. Thus any change increasing their powers of movement might well decrease their value. I would say that the Berolina Pawn is a logical variation, and the Medieval Pawn might well be useful as providing a framework avoiding the complications of double-step moves and e.p. captures, but that the other pawns described here have doubtful value.

2.3.2: Families of Hybrid Pieces.

This group contains a number of families of closely related pieces having a particular family name. Most have moves similar to those of the various pieces described earlier, but with different powers of movement for capturing and non-capturing moves (or perhaps allowing capturing moves only). In problems they may be used either individually or as a whole set replacing the corresponding orthodox pieces – this being equivalent to a Condition (see 3.3.3). Once the general properties of a family have been stated, the moves of most of the individual family members will follow from their systematic names.

The main **Chinese Pieces** move as simple riders but capture as long riderhoppers (members of the Lion family), moving any distance to reach a hurdle and then any further distance beyond it. They are the **Leo LE** (Chinese Queen), **Pao PA** (Chinese Rook) and **Vao VA** (Chinese Bishop). Two other pieces that may be grouped with them are the **Nao NA** (Chinese Nightrider) and **Rao RA** (Chinese Rose); this whole set may alternatively be described as the **Leo family**.

Two other pieces are also classed as 'Chinese', but do not belong to the Leo family. One is the **Mao MA** (Chinese Knight) described in 2.1.5; it moves or captures by a (0,1) leap followed by a (1.1) leap to reach a square a knight's move away, with the intermediate square needing to be vacant. The other is the **Chinese Pawn CP**, which does not promote. In its own half of the board, it moves and captures one square directly forwards, but in the further half of the board moves and captures one square directly forwards or sideways. A 'Chinese King' would normally be the orthodox piece, *but there is also a Kao KA*. (These varied types of piece mean that the term ‘Chinese Pieces’ always needs clarification when being used.)

The **Argentinian Pieces** form a simpler family whose typical moves and captures are the converse of those of the Chinese pieces (the name being chosen because Argentina is directly opposite to China on the globe). They thus make capturing moves as simple riders, and non-capturing moves as long riderhoppers (members of the Lion family). The main ones are the **Faro FA** (Argentinian Rook), **Loco LO** (Argentinian Bishop) and **Senora SE** (Argentinian Queen).

An Argentinian King or Pawn would be the orthodox unit. However, the **Saltador SA** (Argentinian Knight) is effectively a combined Mao+Moa (see 2.1.5) making a (1,2)-step knight move by passing through either the (0,1) square or the (1,1) square. It can move without capturing to the same squares as a knight whenever either of the intermediate squares is occupied, and can capture on the same squares as a knight whenever either of the intermediate squares is empty.

The members of the **Locust** family could be described as ‘Hop-capturing Pieces’. They cannot make non-capturing moves, and capture not by landing on the captured unit but by moving across it to land on the vacant square one step beyond, with all other squares between the start and end squares being vacant. (This capture is equivalent to a short riderhopper move to a vacant square with the hurdle being captured.) The **Locust L** is the ‘Queen Locust’, capturing on queen lines; other members of the family are the **Rook Locust LR**, **Bishop Locust LB**, **Nightrider Locust LN** and **Rose Locust LS**. King, Knight and Pawn Locusts do not appear to exist.

Finally, the **Marine Pieces** (or members of the Marine family) move normally when not capturing but capture as Locusts. The marine King, Knight and Pawn effectively capture by a leaperhopper move. The first of these pieces was the **Siren SI** (Marine Queen); it was invented by G Brogi, *Chess Amateur* Feb 1929, but named ‘Mermaid’ *GFC*. Others are the **Triton TR** (Marine Rook), **Nereid ND** (Marine Bishop, also called Nymph), **Squid MS** (Marine Knight), **Poseidon PO** (Marine King) and **Prawn MP** (Marine Pawn), which can promote only to other Marine pieces.

A rather different marine piece is the **Scylla** or **Skylla SK** (Marine Mao). It moves to a vacant square a knight’s move away by making a (0,1) leap and then a (1,1), leap, capturing an opposite-colour unit on the (0,1) square but being blocked by a same-colour unit on that square. Closely related is the **Charybdis CY** (Marine Moa), differing only in making the (1,1) leap before the (0,1) leap.

2.3.3: Miscellaneous Pieces.

This group contains widely diverse pieces, including some that only operate on boards other than the normal one or which could be classed as something other than pieces.

Those first listed have no powers of their own, but may still make normal moves and captures. The **Friend F** takes the powers of any same-colour unit (including another Friend) which observes it, while the **Orphan O** takes the powers of any opposite-colour unit (including another Orphan) which observes it, an orphan observed by a Pawn moving like a Pawn of its own side. Neither piece may take part in castling or in pawn promotion or e.p. captures. The **Joker** takes the power(s) of the unit(s) moved in the preceding opposite-colour move; it was invented by O Dehler and revived by D Pritchard *FCR* 1942 4/18/p191. The **Querquisite QQ** (also called **Odysseus**) takes the power of the piece whose home-square is on the file that it currently occupies. See a problem by J E H Creed, *FCR* Jun 1947 p86.

Simpler than these is the **Dummy DU**, which may be captured but does not move, capture or check. A **Dummy King** is a Dummy with royal powers (i.e. it may be checked or mated). Another immobile piece is the **Pyramid**, which has no colour and cannot move or be captured or passed over by a moving unit, and so is effectively a **hole** in the board (and is listed as a Conditions under that name. It was invented by J Boyer *Les Jeux d’Echecs Non Orthodoxes*, p84 GFC.

By contrast with these immobile pieces, the **Prism**, which comes in the three varieties **45°**, **90°** and **135°**, may move freely to any vacant square, though it cannot capture. It can be captured normally, but will also allow a line-piece (rider, hopper, etc.) of either colour moving towards it to continue its move beyond it on a line deflected in either direction by its given angle.

The **Imitator** (sometimes considered as a fairy condition rather than a piece) is a non-capturing and uncapturable piece without colour, which does not move by itself but makes a parallel move along with each moving unit. The Imitator's path must be free for moves and checks to be legal. When multiple Imitators are present, they all move simultaneously in parallel with the moving unit. Pawn promotion to Imitator may or may not be allowed, and castling is carried out with the K moving before the Rook for the purposes of the Imitator move. It was invented by Dr Thomas Kok (using the alias 'G Jansen'), *FCR* Apr 1939 p130.

Finally come two pieces that cannot operate on a normal board, both being higher analogues of a Bishop. The **Unicorn** is a (1,1,1)-rider, only operating on boards of 3 or more dimensions, while the **Balloon** is a (1,1,1,1)-rider, only operating on boards of 4 or more dimensions. See under 3.5.5 for more details.

2.4: Piece Attributes. Two Groups, with no changes in numbering.

2.4.1: Static Piece Attributes.

These are not individual pieces but general properties that may be applied to pieces of various types in order to modify their powers of movement (or the powers of movement of other pieces) in a permanent way. Unless otherwise indicated, they may be applied to all types of pieces, including Kings.

Some attributes are simple. An **Uncapturable unit** is (obviously) a unit which cannot be captured, while a **Non-capturing unit** is (equally obviously) one that is unable to capture. Similarly, a **Capturing unit** is one that can only move to capture; these were invented by J de A Almay some time before 1940, <u>FCR</u> 1940 p83, who gave artificial names to the orthodox Capturing pieces (see the Appendix).

Logically, this idea of capturing and non-capturing units could be extended to give a **Moving-Capturing unit**, which would move and capture in different though orthodox ways, but such units are apparently unknown. However, the **Hunter** is a known type of unit combining the powers of two different pieces, moving and capturing forwards according to the powers of the first-named piece and backwards according to the powers of the second-named piece (with purely sideways movement not allowed). The **Bishop-Rook Hunter BR** and **Rook-Bishop Hunter RR** were the earliest Hunters, being invented by K Schulz, 1943 <u>FCR</u> 7/9/p72.

More complex than any of these is the **Siamese Unit**, which is made up of two or more identical units of the same type and colour placed on different squares but behaving as a single piece. When one moves, the other(s) move the same distance in the same direction (all moves having to be legal according to the Conditions in force). When one is captured, the other(s) disappear also; if they are Pawns and one promotes, the other(s) promote identically (even though they may not have reached their last rank).

Other attributes introduce fairy effects in pairs. A **Kamikaze unit**, when capturing, is removed from the board along with the captured unit. It was named by P Monreal, *Probleme* 1965, but the idea had been anticipated by B G Laws, *TP* Jan 1928 (before the name 'Kamikaze' had come into common use). A **Mined unit** is its converse; it captures normally, but when captured, its capturer is also removed from the board. (Together, these two attributes may produce the Kamikaze Condition of 3.2.4.) Similarly, a **Transparent unit** moves normally, but allows other units to move through it without affecting it. An **X-Ray unit** (which must necessarily have a move longer than a single leap) is the converse, able to move or capture either normally or after passing through other units without affecting them.

The final attributes listed here stand alone. A **Royal unit** is subject to check and mate in the same manner as the King in normal chess. (Typically, there will be only one royal piece on each side, so if a side has one, it will not have a King). According to *GFC*, these date back to at least 1878.

A **Neutral unit** may be regarded as belonging to either side at any turn, and may be moved or captured by either side. A neutral pawn moves only in the direction of the side playing it, but promotes to a neutral piece. A **Neutral King** would be the only King on the board; it may be checked or mated by either side, but may not be moved into check by an opposite-colour unit or by another neutral unit. Neutral units were invented by T R Dawson, *Reading Observer*, Dec 1912 *HFC*.

2.4.2: Dynamic Piece Attributes.

These are not individual pieces but general properties that may be applied to pieces of various types in order to modify their powers of movement (or the powers of movement of other pieces) in a way that changes during the play. Unless otherwise indicated, they may be applied to all types of pieces, including Kings. Many share their names with Conditions (and may be more easily understood if considered as Conditions restricted to individual pieces).

Some of these attributes involve colour change, but can only be applied if the colour change does not involve a King. A **Half-Neutral unit** is related to the Neutral unit of 2.4.1, but exists in one of three phases: white, black or neutral. In the white phase, White may play it, after which it enters the neutral phase. In the black phase, Black may play it, after which it enters the neutral phase. In the neutral phase, either side may play it, after which it enters the phase of that side. It may be captured when in the opposite phase to the side making the capture, or by either side when in the neutral phase. An **Anda unit** changes colour on giving a direct check; if initially black or white it becomes neutral; if neutral, it takes the colour of the moving side. A **Volage unit** changes colour the first time it moves from light to dark squares or vice versa. A **Magic Wandering unit MWU** changes colour on moving or capturing but if captured by anything except a king, the capturing unit changes colour and becomes a MWU in turn. There can only be one MWU on the board. (For more details see *JF* problem 1223 (2019).) A **Magic unit** is different again; it does not itself change, but may change the colour of other units. At the end of each move, any unit (except a King) newly attacked or observed by a magic unit (or by an odd number of magic units) changes colour. (If the unit is newly attacked by an even number of magic units the colour changes cancel out.) Different yet again is a **Hurdle Colour Changing unit** (or **Andernach hopper**), a hopper of any type which, when moving, changes the colour of whichever unit (except a King) that it uses as a hurdle. (A Grasshopper with this attribute is named a **Chopper**; see 2.2.2.)

Other attributes modify the properties of a piece without affecting its colour. A **Functionary unit** may only move, capture or check when observed (see the general Piece notes) by any opposite-colour unit. A **Paralysing unit** moves normally, but does not capture or check; instead, it paralyses any opposite-colour units it observes, which can then neither move, capture or check. A paralysing unit retains its powers of paralysis even if paralysed itself. When Paralysing units are present, the rules for mate are altered so that it is only mate if the side being checked, though lacking a legal move annulling the check, has at least one possible move of any unit (i.e. not all are paralysed or blocked). A **Circe unit** moves and captures normally, but if captured is ‘reborn’ on its home square (see the general Piece notes). This was the precursor of the important Circe condition, and was invented by P Monreal & J P Boyer, *Probleme* May 1968, *GFC*.

Still other attributes involve pieces actually changing their powers of movement. A **Protean unit**, on capturing, loses its own powers and assumes the powers of the unit captured. On capturing a Pawn it moves in the direction of that pawn, and promotes when reaching the last rank in that direction. A Protean unit might be a King, retaining its royal nature even though its powers of movement changed, but a **Chameleon unit** may be any unit except a King. After each of its moves, a chameleon **piece** transforms into another piece in a set sequence; this is normally Knight > Bishop > Rook > Queen > Knight…, but other sequences may be defined. A chameleon **pawn** does not transform on moving, but on promotion becomes a chameleon piece in any phase. In the presence of chameleon units, normal pawns may promote to either normal or chameleon pieces. Chameleon units were invented by W A Lester, *Chess Amateur* 1925 *GFC*. A **Chameleon Hopper** is a variation on the Chameleon unit principle, with the transformation involving four of the short rider-hoppers described in 2.2.1. The normal transformation sequence is Nightriderhopper >

Bishophopper > Rookhopper > Grasshopper > Nightriderhopper…, with Chameleon Pawns promoting to one of these hoppers.

Finally, for the highly complex **Bul Piece** attribute, see under the **Grasshopper Bul** in 2.2.6.

2A Appendix to Pieces.

This contains (among other things) obscure or outdated pieces that would unbalance the text if they were included in the group descriptions.

2.1.1: Simple Leapers.

Popeye knows the following leapers as coordinates: **15**, **16**, **24**, **25**, **35**, **36**, **37**.

2.1.6: Angled Riders.

The idea of a group named **Falcate Riders** arose from a discussion between myself and Maryan Kerhuel, though the name given to it is my own. This name (which I only found after much searching through thesaurus and dictionary) means ‘claw-like’, and is derived from the falcon, which as a bird of prey has large and powerful claws. A falcate rider has moves consisting of a series of leaps angled in the same direction, so that if unimpeded it can generally make a complete circuit amounting to a null move. (Maryan suggested ‘circuit rider’ as the name of the group, but I have not adopted this name on the grounds that complete circuits would in practice be very rare moves, and also that pieces that did not complete circuits could be devised.)

Besides the Rose, there are two other possible knight-based falcate riders that might possibly make good fairy pieces. The one with 90° angles could make square circuits, e.g. d1-f2-e4-c3-d1, that would perhaps not extend a knight move by much, but a 135° one would give 3x3 star circuits, e.g. d1-f2-d3-e1-f3-d2-f1-e3-d1. Using longer leapers that a knight would give larger and possibly more interesting star circuits; in particular, the Corsair or (2,5)-leaper gives circuits connecting exactly the same set of points visited in a Rose circuit, but in a different order!

Basing a falcate rider on orthogonal or diagonal leaps could only produce square circuits, but alternating the two types of leaps would be more interesting – and perfectly logical, since although the move lengths would vary the angles (unlike those of a Rose) would not. Alternating (0,1) and (1,1) leaps gives circuits such as d1-e1-f2-f3-e4-d4-c3-c2-d1 that are similar to those of a Rose but somewhat smaller. Might this piece be called a ‘Rosebud’?

Finally, trying to base a falcate rider on the moves of a 5-Leaper gives some peculiar results. There are now five possible move angles to use; these could be approximated to 30°, 60°, 90°, 120° and 150°. The last two of these give 6- and 12- sided circuits that are far too large to show on a 8x8 board, the 90° one gives square circuits as usual, while the 30° one gives a star-shaped circuit that seems too complex to be worth listing. However a 60° Falcate 5-Leaper Rider breaks the pattern, giving quasi-triangular where the points do not quite join up, giving a path that (without a limit on the board size) continues indefinitely in one direction in a sort of squashed helical shape, e.g. f1-a1-d5-h2-c2-f6-j3-e3-h7… (This example is a further reason for rejecting the name ‘Circuit Rider’.)

2.4.1. Piece Attributes.

The **Capturing Pieces** described in 2.4.1 are essentially orthodox pieces which move only to make normal captures. They were invented by J de A Almay some time before 1940, *FCR* 1940 p83, and given names by the inventor that now seem artificial and unnecessary: **Atlantosaurus** (King), **Dinosaurus** (Queen), **Mammoth** (Rook), **Brontosaurus** (Bishop) and **Hippopotamus** (Knight).

3: Conditions.

Introduction. A Condition is a set of rules modifying the general rules of chess in a specific way, and is thus liable to be more complex than either a Stipulation or a Piece. It will always have some basic feature that clearly sets it apart from other conditions, but there are liable to be special situations (e.g. when a condition's basic rules lead to a Pawn appearing on its 1st rank) when subsidiary rules need to be added. This would increase the complexity further, resulting in the full description of a Condition being so long and detailed that the meaningful comparison of related conditions would be impossible. Accordingly, this Glossary only gives the basic rules for any individual Condition (although some details may be included on occasion), and a user is always advised to refer to other sources for more information before attempting to compose or solve problems using the Condition.

Note that most conditions apply equally to units of both colours, but some of these can also be used in **White only** or **Black only** forms. This possibility is not always noted here, but where the single colour forms are the most common ones, both may be listed separately. Note also that conditions may be applied singly or in combinations, though some combinations may be incompatible and/or give unexpected results when tested with solving programs. Conditions may also be applied consecutively or for only part of a solution, the program WinChloe being able to handle some of the simpler conditions put in force up to or from a particular half-move in a problem's solution.

Two recurring concepts in this section are those of **observation** and **home-squares**. One unit can be said to **observe** another unit if under the conditions in force it could play to capture an opposite-colour unit on the second unit's square, even though such a capture could not be completed without leaving an illegal position such as self-check. The **home square** of a unit is its game-array square as deduced from its current position. The home square of a Rook, Bishop or Knight is that of the same colour as the current square, that of a Pawn is on the same file as the current square, and that of a fairy piece is the promotion square of its current file.

Conditions not only form the largest and most complex category of fairy elements, but are also the area in which new elements are most frequently introduced. No classification system is therefore likely to be permanent, and the present one (which now includes the *JF* 'main group' covering Boards) differs widely from previous attempts. In this **Version 1** of the Glossary, Conditions are classified on three levels, with five Classes and a total of twenty Groups – many of which have been given self-explanatory names.

3.1: Conditions related to Check and Mate covers these topics but not captures or other moves (but note that anything related to captures is liable to affect checks and mates also). Its three groups **3.1.1: Modifications of the nature of Check and/or Mate**, **3.1.2: Restrictions on Check and/or Mate** and **3.1.3: Consequences resulting from Check and/or Mate** are self-explanatory.

3.2: Conditions related to the nature of Captures is more complex. Three of its four groups cover types of capture where one of the pieces involved does not disappear but is reborn. **3.2.1: Rebirth options relating to the piece being reborn** and **3.2.2: Rebirth options defining the rebirth square** cover different aspects of this rebirth, and need to be considered together. **3.2.3: Miscellaneous rebirth-related Conditions** and **3.2.4: Forms of Capture unrelated to rebirth** are self-explanatory.

3.3: Conditions related to Powers of Movement are covered in four groups. **3.3.1A: Capture-specific Transformation and Promotion** and **3.3.1B: General Transformation and Promotion** both cover cases where pieces' powers of movement change permanently; 'capture-specific' (here and in 3.4.3A) means that any change in powers of movement depends in some way on whether or not a capture takes place. **3.3.2: Transfer of Powers of Movement** covers cases where one piece is temporarily given the powers of movement of another piece, and **3.3.3: Miscellaneous Movement-related Conditions** is self-explanatory.

3.4: Conditions where Moves are Restricted are also covered in four groups. **3.4.1: Restrictions related to Observation**, **3.4.2: Restrictions related to Move Length**, **3.4.3A:**

Miscellaneous Capture-specific Restrictions and **3.4.3B: Miscellaneous general Restrictions** should all be self-explanatory.

3.5: Board-related Conditions includes those elements which in the *JF* classification came under ‘Boards’. The five groups **3.5.1: Conditions involving Individual Squares**, **3.5.2: Conditions involving Groups of Squares or the Whole Board**, **3.5.3: Conditions involving Closed Boards**, **3.5.4: Conditions involving Boards of varied sizes** and **3.5.5: Conditions involving Exotic Boards** are mainly self-explanatory. However, ‘Closed Boards’ are those where pieces move as if opposite board-edges were joined in some way, and ‘Exotic Boards’ are those that differ so greatly from the normal board that any play on them is more ‘an analogue of chess’ than ‘fairy chess’.

3.1: Conditions related to Check and Mate. Four groups, with no changes in numbering.

3.1.1: Modifications of the nature of Check and/or Mate. These are liable to be complex, though some are relatively simple.

In **Brunner** (invented by E Brunner 1919; *FCR* Jun 1939 p193) checks are normal, except that a King is not in check if its capture would leave the opposite-colour King liable to capture (so that a check may be answered by a countercheck). In **Bosma** (invented 1993 by R Bosma from a loophole in article 21 of the FIDE rules *PDB*) checks are normal, except that a King is not in check if it is attacked by three or more opposite-colour units. In **Bicolores** a King is in check if it is observed by a unit of either colour, i.e. Kings are liable to check by units of their own side as well as by units of the opposing side (resulting in both Kings being in check in the normal game-array position). In **Half-check** (invented by Kostas Prentos for his 2013 *JF* problem 218) checks are normal, but only become effective after the next move has been played (assuming that neither checking unit nor King has moved). And in **MAFF** (**Mate with A Free Field**) checks are again normal, but to be mated a King must have exactly one square to which it is free to move.

Other conditions vary the nature of checks in more extreme ways, with Kings not being subject to normal checks at all. With **SAT** (**Salai’s Mat**, the name deriving from the inventor Ladislav Salai Sr.) a side is in check if its King has a flight, and is mated if that flight cannot be prevented. With **Vogtländer** a side is in check if one of its own units attacks the opposite-colour King (which however may not be captured), and is mated if that attack cannot be removed. And with **Anti-Kings** a side is in check if its King is not attacked (leaving both Kings in check in the normal game-array position), and is mated if it has no move that exposes the King to attack.

The **Rex Multiplex** condition is different from all of those listed above, allowing several Kings of the same colour to be present on the board at any one time. Checks are normal, but different types of mate are possible (giving this condition its own special goals). George Jelliss, in an article in *Chessics 4*, Oct 1977, p4 (which identifies the earliest Multi-Rex problem as being by A Rosenbaum in *City of London Chess Magazine* May 1875) names the types of mate as **Monomate**, where one King only is mated, **Supermate**, where all Kings are mated simultaneously, and **Groupmate**, where no King is necessarily mated, but a multiple check would leave at least one King liable to capture on the next move. With Monomate or Supermate as the goal, a move producing one of the other mates would not be allowed.

Chess4E71 is a complex system rather than a single condition; it allows starting positions with any unit of either colour on any square (approximately 4x10^71 positions, hence the name), including the possibility of multiple Kings (or no Kings) on either or both sides. There are many special rules to cover these and other situations. For details see *PDB*.

Republican is the opposite to Rex Multiplex in the sense that there are no Kings on the board during play. However, if the side which has just played can then put the other King on an empty square where it would stand mated, this is done. With the **Type 1** form this ends the game, but with the **Type 2** form such a mate can be immediately reversed by the apparently mated side putting the first side’s King on a square on which *it* is mated.

The remaining conditions in this group vary the whole concept of royalty. In **Capture the King** Kings are not subject to check or mate but are still royal, with capture of the King the equivalent to giving mate. **Royal Squares** (which could also have been grouped in 3.5.1) are an alternative to royal pieces, being designated squares (no more than one for each side) in a diagram position that have royal properties for that side. A Royal Square may be crossed or occupied by units of its own side, but a threat to occupy it by a capturing move of an opposite-colour unit counts as a check, this being mate if the threat cannot be parried. **Royal Dynasty** allows the possibility of multiple Kings through Pawns of either side promoting to Kings. Such multiple Kings lose their royal power, but this is regained when a king-capture leaves the side with one King only. **Extinction** extends the Royal Dynasty concept to include units of all types, a side's last surviving unit of any type counting as royal, with mate is achieved if a threat to it cannot be prevented. Pawns may promote to Kings, and a check may be answered by promoting a Pawn to another unit of the type threatened. Finally, in the **Losing** condition (invented by Walter Campbell, 1876 *AS*) Kings have no royal power and are not subject to check or mate but may be captured, with Pawns again able to promote to Kings. Each side must capture if possible, but plays to lose all its pieces or be stalemated. The equivalent to giving mate is thus to reach a position where the 'mating' side would be left with no mobile pieces after the opposing side's move.

3.1.2: Restrictions on Check and/or Mate. These are generally straightforward. In **Checkless**, neither side may give check unless the check is also mate. Several converse conditions, requiring checks where possible, have for some reason been defined as applying to Black only (though they could presumably also be applied to White only or to both sides). If no Black checks are available, **Black Must Check** allows another move to be freely made, **Black Checks** requires a 'pass', allowing White to make two moves in succession, while in **Ultraschachzwang** Black would be stalemated.

Conditions with restrictions on mates include **Exclusive**, where a mating move may only be played if it is the only mating move available, and **AMU** (**Attacked Mating Unit**), where a mating move must be given by a unit which, prior to the mating move, is attacked by exactly one opposite-colour unit. In **OWU** (**One White Mating Unit**), a position where Black is mated must have exactly one white unit in the black king's field. Opposite to these is **Reflex**, where if a mate on the move exists at any stage it must be given. This was invented by B G Laws in 1885, and is the origin of the 'Reflexmate' stipulation (see 1.2). A different type of restriction occurs in **Dead Reckoning** (an offshoot of the Laws of Chess relating to tournament play); in it, positions where no mate by either side is possible (or when mate by one side is unavoidable) are considered 'dead', and no more moves may be played from them (so that goals such as stalemate cannot be achieved).

3.1.3: Consequences resulting from Check and/or Mate. Some conditions in this group involve an immediate change in the position after a checking move; a checking move may not be played if the resultant change results in self-check. With **Swapping Kings** the two Kings are simply interchanged. **Masand** invokes the concept of observation; with it, all units except Kings observed by a checking unit change colour. In the simple form of Masand this applies only to a direct check, but **Masand Generalised** extends it to include units giving an indirect or battery check. With **Anda** the checking unit itself changes colour, but the concept of neutrality (see 2.4.1) is invoked; a non-neutral piece (except a King) that gives a direct check becomes neutral, while a neutral piece (except a King) that gives a direct check takes the colour of the side that moved it. **Anda Inverse** reverses this process in the sense that the colour changes only take place after a non-checking move.

Other conditions affect only the immediate move of the checked King. With **Reflecting Kings**, a checked King may move either normally or like the unit or units giving check. A King checked by a Pawn moves in the direction of the Pawn of its own colour, and if on its 2nd rank may make a double-step pawn move forward. **Transmuting Kings** restricts this behaviour; a checked King may move *only* like the unit or units giving check, with a King checked by a Pawn moving in the direction of the Pawn of its own colour. **Supertransmuting** (**Pressburger**) **Kings** involve a more drastic change. When checked, a King must play as the unit or units giving check if possible, thereafter the King becomes an ordinary (non-royal) unit of this type permanently, and play continues without that side having a royal piece. If it is not possible for a King to move as the checking unit, another unit may parry the check and the King does not change – and if *that* is not possible, the King is mated.

Conditions in this group relating to mate rather than check involve the concept of **Play After Mate** (**PAM**) introduced by Andrey Frolkin and Chris Tylor in *Feenschach* 2015. After a mate, the mating position is changed in a specified way and (unless self-check results or relieving the mate proves impossible) play continues with a normal move of the mated side. Games may thus contain an indefinite number of mates in successions, and mating stipulations may require specified combinations of mates by White or both colours. The first three condition listed below are supported by Jacobi, which uses '$' instead of '#' for all mates except final ones. PAM conditions are **#Removal** (**#R**), where the mating piece (defined as the piece or pieces giving check in the mating position) is removed, **#Colour** (**#C**), where the colour of the mating piece (defined as above) is changed, **King Exchange** (**Kk**), where the two Kings are interchanged, **Mate Retraction**, where the mating move is simply retracted, and **Mate Rotation**, where the mating position is rotated through 90° (anticlockwise) or 180°.

3.2: Conditions related to the nature of Captures. Four groups, with no changes in numbering.

3.2.1: Rebirth options relating to the piece being reborn. In a **Circe** condition the **captured unit** is reborn. A default is that Kings are not subject to rebirth (i.e. checks are normal); in the **Rex Inclusive** option the rebirth condition also applies to kings; this rebirth never actually happens, but its possibility means that a check is only effective if the rebirth square is occupied, so preventing rebirth. A further default is that a capture may be made (and would be a normal capture) if the rebirth square is occupied or if the capture takes place on that square; in the **Strict** option, a capture may only be made if the rebirth square is empty so that rebirth can take place.

In an **AntiCirce** condition the **capturing unit** is reborn. A default here is that Kings are included in the rebirth condition, meaning that a King may make a capture if the capture square is attacked by an opposite-colour unit but not if the rebirth square is so attacked; in the **Rex Exclusive** option kings are not included in the rebirth, so that checks are normal. A second default is that a capture may not be made if the rebirth square is occupied; in the **Relaxed** option such a capture may be made (and would be a normal one). A third default (in the basic AntiCirce condition being given the name '**Calvet**') is that a capture on the rebirth square (which would be a normal capture) may be made; in the **Cheylan** option such a capture may not be made.

Further options show special ways of dealing with the situation where a rebirth square is occupied. In **Assassin** rebirth takes place, the reborn unit replacing the occupying unit. In **Parachute** the same thing happens but only temporarily, the replaced unit reappearing if and when the replaced unit moves away. **Volcanic** is the reverse of this, rebirth being delayed and only happening if and when the rebirth square is vacated. In both of these, more than one replaced unit may be waiting for reappearance after the vacation of the rebirth square.

Yet other options involve the reborn unit changing colour. With **Turncoats** this is the only new effect, but with **Double Agents** the rebirth square is that appropriate to the unit's new colour.

In the final set of options the reborn unit changes type rather than colour. **Chameleon** has the cyclic sequence of transformations Knight > Bishop > Rook > Queen > Knight >…; a Pawn does not transform. However, other transformation sequences could be defined. **Einstein** uses the one-way sequence Pawn > Knight > Bishop > Rook > Queen > Queen, and **Reversal Einstein** the reverse sequence Queen > Rook > Bishop > Knight > Pawn > Pawn. (Note that these names are also used for conditions where rebirth is not involved.)

A final general option involving the concept of legality is **Alsatian** where a rebirth will only take place if the resulting position is one which would be legal in orthodox chess. Note that some of these rebirth options lead to special situations for which general rules do not apply. However, a King or Rook reborn on its home square would normally be able to castle. A Pawn reborn on its 1st rank would normally be able to make single-step moves or captures, and on its 8th rank would normally promote at the choice of the side making the move.

3.2.2: Rebirth options defining the rebirth square. Unless otherwise indicated, one of these options is taken with one or more of the 3.2.1 options to give the name of a condition. In the basic Circe and AntiCirce conditions, the rebirth square is the **home square** of the reborn unit (see general notes), and some options define rebirth squares in terms of home squares. **Diametral** uses the square symmetrically related to the reborn unit's home square with respect to the centre of the board, e.g. c1>f8. **Mirror** uses the home square of an opposite-colour unit of the reborn unit's own type. **Couscous** uses the home square of the other unit involved in the capture. (The closely related **Cuckoo** differs from Couscous only in that the promotion of a Pawn reborn on its promotion rank is determined by the captured Pawn's side. There is some odd naming here.) **Clone** uses the home square of a unit of its own colour but of the type of the other unit involved in the capture.

Other options define rebirth square in terms of the square on which the capture takes place. **Antipodean** uses the square 4 ranks and 4 files away from the capture square. (If the board were a torus, this would be the furthest away or 'antipodean' square.) **Symmetry** (**Diametral**) uses the square symmetrically related to the capture square with respect to the centre of the board, e.g. a3>h6, while **Vertical Symmetry** and **Horizontal Symmetry** differ by using the type of symmetry implied in the name, e.g. a3>h3 and a3>a6. **File** uses a square on the file of capture, a Pawn on its 2nd rank, any other orthodox unit on its 1st rank, and any fairy piece on its 8th rank. **Frischauf** also uses the 8th rank of the file of capture, but is a special case, only applying to a unit that can be proved by retro-analysis to have been a promoted piece. **Rank** combines the two principles by using the square on the unit's home-square file but on the rank of capture (and of the same colour as the capture square in the case of R, B or S).

Other capture-square based options are more complex. **Equipollents** uses the square that continues the capture move an equal distance in the same direction. **Parrain** (**LastMove Equipollents**) has a delayed rebirth on completion of the following move made by the other side. Here the rebirth square lies at the same distance from the capture square as the length of the above-mentioned following move and in the same direction as that move; if it is occupied or does not lie on the board, no rebirth takes place. **ContraParrain** is similar, but the rebirth square lies in the diametrically opposite direction to the capture move. in the diametrically opposite direction to that move. in the diametrically opposite direction to that move.

Further options use rebirth squares unrelated to either a home square or a capture square. **Platzwechsel Circe** (**PWC**) uses the departure square of the unit making the capture, so that the two units simply change place. It has the special rule that a Pawn reborn on its 1st rank will subsequently be unable to move. (In its AntiCirce form a capture would simply amount to a null move.) **Diagram** uses the square occupied by the reborn unit in the diagram position of a problem. **Cage** uses any vacant square on the board (at the choice of the side making the move) from which the reborn unit would have no non-capturing legal moves (including responses to a check) and thus would be reborn in a 'cage'. **Super** is the ultimate option, using any vacant square on the board at the choice of the side making the move.

3.2.3: Miscellaneous rebirth-related Conditions.

Some conditions have a delayed rebirth on the capture square itself. In **Ghost** (invented by T R Dawson *FCR* 8/7 p500) a captured unit disappears at first, but re-appears on its capture square as an uncapturable 'ghost' of itself as soon as the capturing unit moves away. In **Memory Circe** (invented by Diyan Kostantinov in 2012 for *JF* problem 184) a normal reappearance takes place when the next capture by either side takes place. If by then the capture square is still occupied, the original capture is permanent.

Other conditions feature a rebirth that takes place at the beginning of a move (not necessarily a capture move). In **Mars Circe** non-capturing moves are normal, but for captures a unit (Kings included unless the Rex Exclusive option of 3.2.1 is applied) must first be replaced on its home square (see general notes) and then make the capture from there, all as one move. If this home square is occupied, the capture may not be made unless the Relaxed option of 3.2.1 is applied. **Mars Mirror Circe** is similar, but the rebirth square is the home square of an opposite-colour unit of the same type as the capturing unit (as in the Mirror option of 3.2.2). With **AntiMars Circe** the Mars home-square rebirth (Kings excepted unless the Rex Inclusive option of 3.2.1 is applied) applies only to non-capturing moves. The **Phantom** condition is in effect a generalised relaxed Mars form. Units may move and capture normally; alternatively, a unit (Kings excepted unless the Rex Inclusive option is applied) may be reborn on its home square (if empty) and move or capture from there.

Yet other conditions involve a move by the reborn unit rather than a reappearance. In **Conversion Captures** (invented by A.J.Karwatkar in 1975) the colour of a captured unit is reversed, and this unit is reborn on the departure square of the capture move if and only if it could move to this square according its own power. In **Circe Take&Make** (**Anti Take&Make**) a captured unit does not disappear but makes a normal non-capturing step determined by the capturing side as part of the capture move. The original **Take & Make** condition is an AntiCirce form, where a capturing unit (King included) must make a further non-capturing step in the manner of the captured unit as part of the capture move. In it, a Pawn can only promote if it captures and is conveyed to the promotion rank by such a step, and a capturing Pawn may not be conveyed to its 1st rank by such a step. In the related **Make&Take**, a capturing unit must first make a non-capturing step in the manner of the unit to be captured unit before capturing normally as part of the same move. In all these last three conditions checks are normal, but a capture may only be made if the other step in the move is possible.

Related to the Take/Make conditions are the Chris Tylor **'Transitive'** conditions described in *GOMGSP* pp 8-14 in terms of moves to an occupied square rather than captures (though the 'capturing' unit might be of the same colour as the 'captured' unit, and there might be a series of moves after the 'rebirth'). A **Skip** condition would be equivalent to a capturing unit moving under its own power, and a **Pass** condition to that unit moving under the power of the captured unit. Similarly, a **Tag** condition would be equivalent to a captured unit moving under its own power, and a **Kick** condition to that unit moving under the power of the capturing unit. Each of these four conditions would be combined with one of the options **Auto-**, **Oppo-** or **Free-**, according to whether the 'capturing' and 'captured' units were of the same colour, different colours or either colour. Further options might also be added to limit the excesses of these conditions to more manageable proportions.

3.2.4: Forms of capture unrelated to rebirth. These are varied, some being simple but others highly complex. Note that conditions where a capturing unit simply changes its colour and/or type are described not here but in 3.3.1.

The simplest captures involve nothing more than the disappearance of the captured unit. In the **'Free-Capture'** Chris Tylor forms of *GOMOSP* p4, units may capture other units of the same colour as well as those of opposite colour. In **Reform** (invented by L Tabi, sometime before 1971) checks are normal, but in **Bicapture** (invented by Romeo Bedoni, 1958) Kings are sensitive to check by units of their own colour (as in the Bicolores condition of 3.1.2). In **Auto-Capture** (Chris Tylor, *GOMOSP* p6) units may only capture other unit of the same colour, with Kings only sensitive to check by such units.

In **Kamikaze** (which is also a piece attribute, see 2.4.1) captures result in both the capturing unit and the captured unit disappearing together. In the normal form Kings capture normally, but in **Kamikaze Dardilly** Kings cannot capture or give check, and therefore can be adjacent to each other. In **Oppo-Surrender** (Chris Tylor, *GOMOSP* p7) only the capturing unit disappears, a King being in check if standing adjacent to an opposite-colour unit.

Slightly more complex are **Breton**, where one other unit of the same type as the capturing unit (if any are present) is removed at the same time as the captured unit, and **Breton Adverse**, where the additional unit removed is of the same type as the captured unit. In both cases, if more than one such unit is present, the choice of which is to be removed is made by the capturer.

The '**Combinative**' Chris Tylor conditions of *GOMOSP* pp 15-21 are listed there as alternatives to capture, but could also be described as versions of capture where the 'capturing' and 'captured' units both remain on the same square, the **Auto-**, **Oppo-** and **Free-** options indicating whether the 'capturing' and 'captured' units are of the same colour, different colours or either colour. In **Coexistence** conditions the two units retain their separate identities, in **Additive** conditions they are combined into a single unit, and in **Alliance** conditions they may play as either a single unit or separate units. Auto-Alliance is equivalent to the **Augsburg** condition invented by Erich Bartel in 1965.

The final conditions in this group involve the removal of units from the board by processes other than capture. In **Dynamo** no normal captures are made. Instead, a unit may push or pull an opposite-colour unit any number of squares along its lines of action; either or both units may move or be moved off the board. [See *JF* problem 954 (2015)]

Mated Units (Roddy McKay) extends the idea of 'mate' to other units besides Kings. Normal captures and checks may be made, but in addition, if an opposite-colour unit (other than the King) is threatened with capture after a move and no opposite-colour move is available which would prevent this capture, the unit is 'mated' and is removed at that point (unless an illegal self-check position would result). More than one unit may be removed in one move. Once mated units are removed no further evaluation is done to see if other units are mated. See the Appendix for more details. **All-Mate** (Chris Tylor) is based on the same principles as Mated Units, but has no normal captures or checks. It is also recursive in that once any mated unit is removed the position is re-evaluated to see if any further units are mated.

3.3: Conditions related to Powers of Movement. Four groups, with 3.3.1 split into A and B.

3.3.1A: Capture-specific Transformation and Promotion. This includes all cases where a condition applies differently to capturing and non-capturing moves.

With some conditions, the transformation is a simple colour change and does not apply to Kings. With **Andernach** (anticipated by H M Cuttle, *FCR* Dec 1939, p53), non-capturing moves are normal, but a unit changes its colour after capturing. **Anti-Andernach** is the reverse, the colour change taking place only after a non-capturing move. With **Double Tibet**, the colour change takes place only when a unit captures another unit of a different type; with the simple **Tibet** form, only a black unit changes colour *PDB*.

Other conditions involve a transformation in unit type rather than colour. With **Protean** (**Frankfurt**), a capturing unit simply takes the nature of the captured unit, a King retaining its royal power as a royal piece. **KoBul** (**KoBul Kings**) is more complicated. After a piece (not a pawn) is captured, the King of the same side retains its royal nature but adopts the powers of movement of the captured piece and no longer moves as a King. After a pawn of that side is captured, the King reverts to its normal movement.

In **Einstein** a capturing unit is transformed according to the sequence Pawn > Knight > Bishop > Rook > Queen > Queen, but after a non-capturing move the moving unit is transformed according to the reverse sequence Queen > Rook > Bishop > Knight > Pawn > Pawn. In **Reversal Einstein** these two transformation sequences are reversed, and in **Anti-Einstein** they only occur after a non-capturing move, with captures being normal. In all these forms Castling results in a Rook transformation, and is also possible with a newly-transformed Rook. A Pawn appearing on its 1st rank may move 1, 2 or 3 steps and is subject to e.p. capture if moving more than 1 step. A Pawn appearing on its 8th rank will immediately promote, but there is no normal promotion.

In the various forms of **SneK** (invented by Diyan Kostadinov and named after his wife Snejina, see the 2013 *JF* problem 432), the capture of a Queen/Rook/Bishop/Knight results in any available

Rook/Bishop/Knight/King of the same colour being transformed into a piece of the same type as the one captured, without its royal or non-royal status being affected, and any choice of transformed piece being made by the capturing side. In **Snek Circle** the captures of Pawns are normal; in the simple **Snek** form the capture of a Pawn results in any royal Knight of that colour being transformed into a normal King, while in **Snek Adverse** it is a royal Knight of the *opposite* colour that is transformed into a normal King.

3.3.1B: General Transformation and Promotion.

Some of these are simple colour changes. In **Super Andernach** any moving or capturing unit (King excepted) changes colour. With **Oscillating Kings** the two Kings change colours (or places) after any move. (In the 'Black/White only' form of the condition this only happens after a Black/White move.) With **Volage**, any unit (King excepted) changes colour the first time it moves from a light to a dark square or vice versa; with **Hypervolage** the colour change takes place whenever the moves from a light to a dark square or vice versa. With **Traitor**, any unit (King excepted) changes colour the first time it crosses the line separating the 4th and 5th ranks. In the normal form a King may not cross this line, but in the **Rex Exclusive** form it may cross the line without being affected. (See also Magic Squares in 3.5.1.)

Chameleon is a condition where pieces (but not Kings or Pawns) change type cyclically after each move by that piece. The default sequence is Knight > Bishop > Rook > Queen > Knight >…, but other sequences may be defined. (See also Chameleon combined with rebirth in 3.2.3 and Chameleon pieces in 2.4.2.)

A conditions varying the rules for pawn promotion is **Single Box**, where Pawns promote normally only when the promoted piece would be one of a normal set of chess pieces containing one Queen and two each of Rooks, Bishops and Knights. There are three possible responses to a situation where such a promotion would not be possible; **Type 1** prohibits the promotion move, **Type 2** has the Pawn remaining immobile Pawn on its 8th rank, but immediately promoting when a piece capture makes promotion possible. T*he **Type 3** rule is unknown*. Simpler conditions involving more drastic changes in promotion are **Glasgow**, where Pawns promote on their 7th ranks instead of their 8th ranks, and **Relegation**, where a piece moving to its 2nd rank changes to a Pawn.

The **Changeants** and **Variable** (**Wandelschach**) conditions generalise the Relegation concept. On moving to any game-array square, a unit (King excepted) is transformed into a unit of the type (King included) and colour associated with that square; if more than one king results, Rex Multiplex rules (see under 3.2.1) apply. (This Variable is not to be confused with the Variables described under 'Hidden Play' in 1.2.5.) *But something is wrong; Changeants and Variable appear identical, though they were originally differently worded.*

The final conditions in this group combine transformation with quite separate restrictions on moves. In **Norsk**, a Rook on moving changes to a Bishop and vice versa, and a Queen on moving changes to a Knight and vice versa. Also, a unit may only capture an opposite colour unit of the same type, though checks are normal. In **Pandemic (i**nvented by Alexandre Leroux in 2020 to commemorate the Covid pandemic of that year), when a black unit moves, all white units adjacent to its arrival square change colour. Also, a white unit (King excepted) can only move to a square not adjacent to any black unit.

3.3.2: Transfer of Powers of Movement. This single group covers conditions where one unit is temporarily able to move according to the powers of another unit. In **Bolero** captures are normal, but a piece (not the King or a Pawn) makes non-capturing moves according to the power of whatever piece has its home square on the starting file. With **Inverse Bolero** this transfer of powers occurs after a capturing rather than a non-capturing move. In both conditions, pieces moving as Kings do not become royal.

In **Annan**, a unit (Kings included) standing one square directly in front of another unit of its own side moves as that other unit. Pawns may move to the first rank but cannot subsequently move; however, a piece standing directly in front of a pawn on the first rank moves one or two squares forward or captures diagonally as a pawn. In the related **Nanna** ('Annan' reversed) a unit (Kings included), when standing one square directly behind another unit of its own side, moves as that other unit. A pawn on its back rank is immobile unless moving as its front piece. A piece moving with the power of a pawn may capture e.p.; a King and Rook may only castle if moving with their own power.

Three other related conditions involve two opposite-colour units (Kings included) exchanging their powers of movement if they stand on adjacent squares. With **Back-to-back** the white unit must stand one square directly above the black unit, with **Face-to-face** it must stand one square directly below the black unit, and with **Cheek-to-cheek** the units must stand directly beside one another on the same rank (with a unit standing between two opposite-colour units getting the powers of both the adjacent units). **Point Reflection** extends this principle to units of either colour, any two units standing on squares symmetric with respect to the centre of the board (e.g. c2 and f7) exchange their powers of movement. Only a non-reflected King and Rook can castle, and only non-reflected pawns can capture e.p.

Two miscellaneous conditions close this group. In **Circe Power Transfer** a unit (Kings excepted) moves as the unit occupying its home square at the time (if such a unit is present). In **Transmission Menace**, a unit may in addition to its normal moves, move as any opposite-colour unit that observes it.

3.3.3: Miscellaneous Movement-related Conditions. Some conditions grouped here are wide-ranging, others limited to particular types of moves or pieces.

In **All-in** (Chris Tylor, *Chessics* 1, 1976) the side making a move may move a unit of either colour, Kings included, with Pawns always moving in the correct direction for their colour, but no move may cancel out the last move played. **All-in type 2** is a restricted form where a side may not move an opposite-colour King into check, and may not cancel a check to its own King by moving the checking unit away (both being possible in the main form). In **Messigny**, normal moves may be played, but instead of a normal move a side may exchange the position of any one of its units with that of a similar unit of the opposite colour. No unit may be part of an exchange in two consecutive moves.

Sentinels is a set of conditions in which a piece (not a pawn) moving away from a square not on the 1st or 8th ranks leaves a new Pawn behind, provided that a set limit on the number of Pawns present is not exceeded. On colour, the default is that new Pawns have the colour of the side that has moved (including moves by neutral pieces, if present). With **Enemy Sentinels** Pawns have the opposite colour to the side that has moved, and with **Neutral Sentinels** neutral pieces leave neutral pawns. As to numbers, the default is a maximum of 8 Pawns of each colour, but other numbers for individual colours (or a total number for both colours) may be specified.

Black Passes if Stuck is a limited condition where (as the name implies) White may make several moves in succession when Black is unable to make a legal move. Other limited conditions involve the castling move only, extending its possibilities but retaining the normal rules about not castling over occupied squares, out of check or through check. **Staugaard** (**Pam-Krabbé**) **Castling** <u>*PDB*</u> is an additional type where an unmoved King may castle (moving two squares in the process) with a newly-promoted Rook on its file. In **Rokagogo, a** king and rook may castle from any positions three squares apart on any rank or file. In the simply-named **Castling** a King, even if it has already moved, may castle with any piece (not a pawn) of either colour standing anywhere three or more squares away on the same orthogonal or diagonal, moving two squares in the process.

Chess960 is a set of conditions where the starting arrangements of the pieces on the first rank may be varied in any of the 960 ways that leave the Bishops on different coloured squares and the Kings in between the pairs of Rooks. For forward play only the nature of castling is affected, with the King moving two squares to finish on the c- or g-file and the Rook on the d- or f-file; however, retro play would be affected in more profound ways.

A further set of conditions involves orthodox pieces being replaced by fairy ones in the starting position. These allow fairy diagram positions to be printed without the need to indicate individual fairy pieces, and in some cases affect pawn promotion rules; promotions to the corresponding orthodox pieces would not be allowed, but promotions to member of a fairy family not present in a diagram position would be allowed. **Cavalier Majeur** uses Nightriders (1,2 riders, see 2.1.3) in place of orthodox Knights. Other conditions use the families described as 'hybrid pieces' in 2.3.2 (and need to be looked up there). **Marine** uses the Marine King, Queen, Rook, Bishop, Knight and Pawn in place of orthodox pieces. **Chinese** similarly uses the Chinese Queen, Rook, Bishop, Knight and Pawn, but Kings are orthodox (but according to *PDB* Pawns are also orthodox). Finally, **Argentinian** uses the Argentinian Queen, Rook, Bishop and Knight, but Kings are again orthodox; Pawns are also orthodox, but promote to Argentinian pieces.

3.4: Conditions where Moves are Restricted. Four groups, with 3.4.3 split into A and B.

3.4.1: Restrictions related to Observation. The concept of Observation is defined and invoked in various places in this Glossary. One unit can be said to **observe** another unit if under the conditions in force it could play to capture an opposite-colour unit on the second unit's square, even when such a capture could not be completed without leaving an illegal position such as self-check. Related here to observation is the concept of **paralysis**. A paralysed unit may not move, capture or check, but its powers of observation are not affected, so that it may paralyse other units where a condition involves paralysis. Some of the conditions in this group have opposites named not by the use of words such as 'anti' but by reversing the letters of another condition's name. Some are specifically capture- or check-related, with any references to captures taken to apply also to checks; others apply equally to all moves and include checks.

Some conditions relate to observation by opposite-colour units. In **Paralysis** (apparently not a condition name but required to make sense of the following condition), a unit standing observed by an opposite-colour unit may not move or capture. In **Partial Paralysis**, such a unit may not move or capture in the manner of the observing unit, e.g. a Queen observed by an opposite-colour Rook may not make orthogonal moves but only diagonal moves. In **Eiffel**, a unit may not move or capture if observed by an opposite-colour unit according to the sequence Pawn > Knight > Bishop > Rook > Queen > Pawn, e.g. a Knight will be paralysed if observed by an opposite-colour Pawn.

Leffie ('eiffel' reversed) is naturally enough a reversed form of Eiffel. In it a move may not be made if it leaves any unit observed by an opposite-colour unit according to the sequence Pawn > Knight > Bishop > Rook > Queen > Pawn, e.g. if it leaves a Knight observed by an opposite-colour Pawn. Other quite different reversed forms of the above conditions are **Functionary** (**Beamtenschach**), where a unit (Kings included) may only move or capture when observed by any opposite-colour unit, **Manager**, where a unit (Kings included) may only move or capture when observing any opposite-colour unit, and **Provocation**, where units move normally, but a unit (Kings included) may only capture when observed by any opposite-colour unit.

Other conditions involve units of the same colour. In **Patrol** units move normally, but a unit (Kings included) may only capture or check when observed by another unit of the same colour. In **Ultrapatrol** this restriction extends to all moves. In the reverse condition **Lortap** ('patrol' reversed) a unit (Kings included) may only move, capture or check when not observed by another unit of the same colour. In **Superguards**, any unit observed by another unit of the same colour cannot be captured, so that a King observed by another unit of the same colour cannot be put in check. In the less drastic **Shielded Kings**, a King observed by one of its own units cannot be captured by the opposing King, and so can stand adjacent to it without being in check. Other checks are normal. In the more drastic **Central** Kings move and capture normally, but any other unit may only move or capture if observed by its own King or by another unit of its own side that is observed directly or indirectly by its King.

A lone condition involving units of either colour is **Devresbo** ('observed' reversed), where a move may only be made if the moving piece stands observed by another unit of either colour at the end of the move.

Further conditions involves pairs of units observing one another. In **Madrasi**, pairs of opposite-colour units paralyse one another; Kings are excluded unless the **Rex Inclusive** option is applied. In **Isardam** ('madrasi' reversed), a move or capture may not be made if it leaves two opposite-colour units (Kings included) observing one another. This applies to checks also, so that a check is not effective if the threatened king capture would leave two opposite-colour units observing one another.

A final set of conditions have names taken from imaginary creatures in A A Milne's 'Winnie the Pooh' books, where Heffalumps are pictured as honey-loving elephants but references to Woozles suggest only that they would leave tracks in the snow indistinguishable from those of bears. With **Woozles**, two units of either colour which observe one another may not capture or check. With **Heffalumps**, the above limitation applies only to captures or checks along the units' common line of action. In both cases, the prefix **Mono-** limits the effect to pairs of units of the same colour, and **Bi-** limits it to pairs of units of opposite colour.

3.4.2: Restrictions related to Move Length. Move length is defined as the geometrical length of a move, i.e. the distance measured between the centres of the departure and arrival squares of the moving unit(s), and is not affected by whether or not the move is a capture. Thus if a1-a2 is 1 unit, then a1-b2 is approximately 1.41 units, a knight step is approximately 2.24 units, 0-0 is 4 units and 0-0-0 is 5 units.

The most common basic types are the **Maximummer** and **Minimummer**, where one or both sides must play their longest/shortest legal moves available, choosing freely from among such legal moves of equal length. In the basic conditions Kings are included but checks are normal; however, in the **Ultra Maximummer/Minimummer** attacks on a King are only checks if the king capture would be one of the longest/shortest legal moves available. The Maximummer and Minimummer conditions are frequently applied to one side only, but for historical reasons the default is taken to be Black only (though in a duplex problem it would be the defending side), and **Double** is used where the condition applies to both sides. Black maximummers were invented by T R Dawson, *Chess Amateur*, Dec 1913.

Different from the above conditions is the (Black) **Equimover**, where Black must if possible play a move equal in length to the previous White move; if this is not possible, any move may be made. The condition was invented by E Saladini *PFS* Jun 1935 p115.

Different again are the **Growing Men** and **Shrinking Men** conditions, where no unit may make a shorter/longer move than it has made before. The restrictions here apply to individual units rather than to a whole position; the default is the usual one that the condition applies to both sides. In a problem it is assumed that all units start off with their greatest possible mobility consistent with the initial position; thus in a Shrinking Men position with white Pawns on a3 and b2, the a3 Pawn must have made a single-step move and thus cannot now make a diagonal capture move. Black Shrinking Men were invented (but called 'Dwindlers') by G Leathem, *PFS* Feb 1935 p102.

3.4.3A: Miscellaneous Capture-specific Restrictions. Two simple conditions are **Must Capture**, where White/Black captures if able but otherwise makes another move, and **No Captures**, where neither side may capture, though checks are normal.

Others are more or less equally simple. In **Multicaptures** a unit may be captured only if it is directly attacked in at least two ways. In **CAST** (**Capture after Sole Threat**) a unit may capture only if it could make no other capture, and in the reverse condition **CAST Inverse** may capture only if it could make more than one capture. In **Blockade** checks are normal, but a unit may only capture an opposite-colour unit of the same type.

A final pair are slightly more complex. In **Immune** a capture may only be made if the home square of the captured unit is vacant; a unit (Kings excepted unless the **Rex Inclusive** option is applied) is thus immune to capture if its rebirth square is occupied. In the similar **Geneva** a capture may only be made if the home square of the *capturing* unit is vacant.

3.4.3B: Miscellaneous general Restrictions. These relate to moves of all types. They are generally more complex than the capture-specific restrictions, though a few are reasonably simple. Two such only apply when combined with other fairy forms. In **Active** no null moves (such as by a Rose completing a circuit) may be made. In **Alsatian** (listed as a rebirth option in 3.2.1.) every position arising during the solution to a fairy problem must be legal in orthodox chess.

Some conditions limit the units able to move. In **Fuddled Men** no unit can make two moves consecutively, so that a unit cannot give a direct check when moving. In **Alphabetic**, each side must play with one of its units that stands on the square which is earliest in alphabetical sequence (a1,a2,...,a8, b1,...,h8 etc.) and which has a legal move, checks and mates being normal. In **Single Combat** (**Duellist**), the last moved unit of each side must continue to play all subsequent moves for that side until it has no legal moves left, after which a new unit can be chosen freely to make the next move. After a move in **Disparate**, the other side may not reply with a move by an identical piece; this restriction includes a reply to check and the notional capture of a checked King. (There are two forms, one implemented by Popeye, the other by WinChloe.)

A set of conditions with related names have restrictions on moves to or from occupied squares. In the basic **Koeko** (**Köko**) all moves must finish with the moving unit adjacent to an occupied square; an attacked King will only be in check if it stands adjacent to an occupied square. **Anti-Koeko** (**Anti-Köko**) reverses this by prohibiting moves finishing with the moving unit adjacent to an occupied square, so that an attacked King will not be in check in the above situation. **Okök** (‘Köko’ reversed) has a different type of reversal; in it, a unit can move only if it starts adjacent to an occupied square. Two other Koeko forms are more complex. In **New Koeko** (**New Köko**), any unit standing adjacent to an occupied/unoccupied square may only move to finish adjacent to a square with the same property. **Anti-New Koeko** (**Anti-New Köko**) reverses this, prohibiting the moves described above. In both cases, an attacked King will only be in check if its capture would be allowed under the conditions stated.

Some miscellaneous restrictions close this group. In **No Promotion** pawn-promotion by one or both sides is not allowed. In **Follow my Leader**, Black/White must when possible play to the square vacated on White’s/Black’s last move, checks and mates being normal. **Back-home** (Nicholas Dupont, *JF* 2013) is more complex. On any move, if a unit (including a promoted pawn) can move to the square it occupied in the diagram position, it must do so (with a free choice between alternatives). Checks are included in the condition, so that an attacked King will only be in check if the king-capture would take the capturing unit back to its diagram position, or if no other move by a unit back to its diagram position is available.

3.5: Board-related Conditions. Five groups, with no changes in numbering.

3.5.1: Conditions involving Individual Squares. These are a miscellaneous collection of conditions with play on the normal 8x8 board, in many of which the individual squares concerned are specified in a diagram position. See also **Royal Squares** in 3.1.1.

Forced (**Obligatory**) **Squares** in a diagram position must be marked ‘Black’ or ‘White’, and the designated side must play to such a square where possible, though checks and mates are normal. **Ultra** (**Consequent**) **Forced** (**Obligatory**) **Squares** are similar, but the compulsion to play to the square extends to cover checks and mates.

Magic Squares in a diagram position are not marked with a colour, and there is no compulsion to play to them; instead, any unit (except a King) landing on one of them changes colour. **Holes** are squares which no unit may occupy or pass through, a single hole being equivalent to the piece **Pyramid** listed in 2.3.3. **Wormholes** are in a sense opposite to holes, and have invisible pathways between them. They may be crossed by normal moves, but any unit which plays to a wormhole immediately passes to any other wormhole as part of the same move. A capture can be made on the entrance wormhole but the exit wormhole must be empty.

Two further conditions are related to Holes, but in them holes are produced during the play. In **Haaner**, the departure square of each moving unit becomes a hole, and in **Hanover**, the departure square of each moving piece, together with all squares passed over by the move, become holes.

3.5.2: Conditions involving Groups of Squares or the Whole Board. These also are a miscellaneous collection of conditions with play on the normal 8x8 board.

In **Plus**, units may move and capture normally, but a unit standing on one of the four central squares (de45) may move, capture or check as if it were standing on any unoccupied central square. **Actuated Revolving Centre** (W H Rawlings and A E Farebrother, *FCR* 1937) involves the same set of four central squares, but the set of squares rotates 90° clockwise after any move into, within, or away from it. **Actuated Revolving Board** has the same concept, but here the whole board rotates 90° clockwise after every move. Pawns moved to their first or last rank by this rotation are immobile and do not promote.

Some conditions amount to general restrictions in units' powers of movement. In **Edgemover**, all Black/White moves must end on a square on the edge of the board, and Black/White is mated if no such move is possible. In **Monochrome**, all moves must be made to a square of the same colour as the starting square; it follows that Pawns cannot make non-capturing single-step moves, and that queen-side castling and all Knight moves are impossible. In **Bichrome**, all moves must be made to a square of the opposite colour to the starting square of the move; it follows that Pawns cannot capture, and that all castling and bishop moves are impossible. In **Grid** (W Stead, *FCR* 1953), the board is envisaged as being covered by a set of grid-lines, and all moves must cross one or more of these lines. In the standard form the grid-lines cut the board into 16 2x2 squares, resulting in Knight moves being unaffected but Pawns in particular being much restricted; however other patterns of grid-lines are possible. **Contact Grid** is a combination of Grid with the Koeko condition of 3.4.4; in addition to crossing grid lines, all moves must finish with the moving unit adjacent to an occupied square; an attacked King will only be in check if it stands adjacent to an occupied square.

Alice (invented by V R Parton in 1954, see *FCR* 8/16 p122) involves a more extreme modification in play than any of those above. Positions consist of units on two separate boards, normally referred to as 'A' (the game array board) and 'B', with no square being simultaneously occupied on both boards. (A position may be represented on a single board by the 'B' pieces being shown in a different font.) After each move, which must be legal on the board on which it is played, the moving unit is transferred to the same square on the other board, which must have been empty.

3.5.3: Conditions involving Closed Boards. These are a related set of conditions where units move as if the edges of the normal 8x8 board were joined in some way. They are named according to the shape produced if this joining was done physically with a flexible board, but it is unnecessary (and in some cases impossible) to visualise this shape in order to determine the movement of pieces. These boards have no discontinuities, and may be validly presented with the 'join' in any position, e.g. down the centre, so that moves of pieces across 'edges' may be clarified by re-drawing diagrams in this way.

Considering a single pair of edges to be joined will produce either a **Vertical** or a **Horizontal** condition (but note that joining vertical edges will primarily affect horizontal moves and vice versa). In either case, a simple join will produce a **Cylinder** condition and a join with one edge reversed a **Moebius** condition. All combinations of these produce conditions in which a Rook may make a complete circuit or null move. Any Horizontal condition will involve both Kings being in multiple check in the normal game array (so that simple retro problems will be impossible); it will also allow Pawns the possibility of moving forward indefinitely (so that promotion would either not occur or need to be redefined). A Vertical Cylinder join produces no special effects, but a Vertical Moebius join leads to an inconsistency about the direction in which Pawns move (as may be seen by considering two white Pawns on a7 and h2, which are obviously on different ranks but through the join stand next to each other on the same rank); this could be resolved by using inverted pawn symbols where necessary in a diagram.

Combining vertical and horizontal cylinder joins produces the **Torus** (or ‘Anchor Ring’) Condition; other combinations are best left named as combinations. However, considering both pairs of edges joined allows the further possibility of twisting the board before the ‘join’ is made. *GFC* p62 describes a **Moebius Ring** (invented by B R Mason, 1966) which is a torus twisted so that a8 joins e1 and a1 joins e8.

A related Condition of theoretical interest is **Spherical**, using a board best visualised as a Horizontal Cylinder with each of the top and bottom edges condensed to a single **Polar** point. A version of this, invented by D L Miller, is described in *GFC* pp19-20; but its interpretations of bishop and knight moves over the poles appear inconsistent, and a better version is that of L Nadvorney (*ECV* 1st Ed, p287), which appears to give logical polar moves for all orthodox and fairy pieces. In it, a piece crossing the top ‘polar edge’ reappears exactly 4 squares along the edge, moving downwards at the same angle it initially moved upwards. Thus a Ba8 heading for ‘b9’ would emerge on f8 heading for g7, and a Sa8 heading for ‘b10’ would emerge on f6.

3.5.4: Conditions involving Boards of varied sizes. These conditions involve modifications of the size and/or shape of the normal 8x8 board, which change the scale or possible complexity of play rather than its nature. Boards may be **square**, **rectangular** or of **irregular** shape. Play on them would be as normal, except that there might need to be special rules for castling and for the initial moves and promotion of Pawns. For problems, there is no general reason to prefer any one size or shape to any other; larger than normal boards would allow the showing of complex interactions between line-moving pieces impossible on the normal board, while smaller boards would allow an economical presentation of a simple idea without the need for blocking units. According to the WinChloe database (2020) the most popular sizes (with numbers of examples) are 7x8 (212), 4x4 (141), 10x10 (78), 4x8 (51), 3x3 (50), 9x9 (49) and 7x7 (47). An example using an irregular board is the ‘Revolver Practice’ problem by T R Dawson, 1911 (*GFC* p29).

A special case of these boards is the **1D Board**, consisting of a single rank or file only. Possibilities seem small, with Bishops and Knights immobile, Pawns able (at best) to move but not capture, and Queens equivalent to Rooks. Nevertheless, problems are possible, the WinChloe database currently containing some 38. Another special case is the **Infinite Board**, where the square grid is considered to extend to infinity either in all directions or in one dimension, one quadrant or one half of the board. In a problem by T R Dawson (*Caissa’s Fairy Tales* 1947, p31), this board provides the ultimate extension of what begins as a normal-board problem.

3.5.5: Conditions involving Exotic Boards.

The term ‘exotic’ is used here to mean any board based on something other than the square grid on which the moves of orthodox and fairy chess pieces are defined. Any pieces on such a board would be better considered as **analogues of chess pieces** rather than anything else, and any play with them as a **chess-related game** rather than fairy chess. They thus fall outside the scope of this Glossary and are only outlined briefly (though some details from the *JF* classification are given in the Appendix).

One set of exotic boards extends the normal square grid to **3 or more dimensions** – resulting in the need to reduce board sizes in order to avoid an excessive number of ‘squares’. Pawn moves need redefinition, but other pieces can simply be taken as moving in any two dimensions. Positions need to be shown in a set of diagrams rather than a single diagram.

At least three multi-dimensional Conditions have been described. The **Stereo-Schach** of Gerhard W Jensch (invented in 1975) uses the orthodox set of pieces on a composite 2D+3D square-lattice board with a 4x4x4 cube sitting over a normal 8x8 board and aligned with the squares c3-c6-f6-f3 on that board. The ‘normal form’ of **3D Space Chess** (invented in 1907 by Dr Ernst Maack) uses a 5x5x5 purely 3D board, the orthodox pieces being supplemented by two **Unicorns** or (1,1,1)-riders (see 2.3.3). A **Four Dimensional** form, developed by T R Dawson to extend the ‘space’ concept, uses a 4x4x4x4 board of 256 ‘squares’ with orthodox pieces plus the Unicorn and the **Balloon** or (1,1,1,1)-rider (again see 2.3.3).

Another type of exotic board has a **2-dimensional hexagonal grid** (which has ‘squares’ of three colours and therefore needs three bishops for complete coverage). The widely played **Glinski** version (invented by J Glinski in 1936) and its later **McCooey** modification both use a hexagonal board composed of 91 individual hexagons orientated so that one orthogonal is vertical (giving it files but not ranks, the file-length varying between 6 and 11); the two versions differ only in their game-array positions and in the way Pawns capture.

3A: Appendix to Conditions.

3.2.4. Mated units; more details. Example: in a position with bPs h6, h7, wRh1, wBh3; if White plays 1.B~ the bPh6 is mated and removed but not now the Ph7. If 1.Bf5, however, both Ps are mated and removed. As a further example, there is a fool’s mate from the normal game array, 1.e3(4) g5 2.Qh5(-f7, -g5)#.

3.8.4. Details of the listed Exotic Board Conditions follow.

The **Stereo (Stereo-Schach) Board Condition** of Gerhard W. Jensch uses a composite 2D+3D square-lattice board with a 4x4x4 cube sitting over a normal 8x8 board and aligned with the squares c3-c6-f6-f3 on that board. Positions are shown on an 8x8 diagram plus four 4x4 diagrams, and squares on the central block are indicated by prefixing the normal coordinate with A, B, C or D (going upward); the A and C diagrams have the normal square-colouring reversed.

The pieces are the orthodox set with the normal game-array; they move according to normal rules, but on the central block can move in the forward-upward or sideways-upward dimensions as well as in the normal forward-sideways dimension. A Pawn makes non-capturing moves 1 square directly forward or upwards, capturing moves 1 square diagonally forward and sideways, forward and upward or sideways and upward, and (for a white Pawn) promotes on a8-h8 or on Dc6-Df6. Initial pawn double-step moves, e.p. captures and castling are as normal.

For more information see https://www.chessvariants.com/3d.dir/stereo.html

The **3D Space (Raumschach) Board Condition** of Dr Ernst Maack uses a 5x5x5 purely 3D board based on a square lattice and made up of 125 ‘squares’. Positions can be visualised in three dimensions, but are shown on five 5x5 diagrams labelled A-E, these letters being used as upward coordinates when identifying squares; thus the central square would be ‘Cc3’. The A, C and E diagrams have dark squares in the corners, the others having light squares.

The pieces used on this board are those of the orthodox set, but with 10 Pawns plus two new pieces, these being **Unicorns** or (1,1,1)- riders. Moves are as normal but adapted to the three dimensions (which can be described as ‘forward’, ‘sideways’ and ‘upward’). Thus a Rook can move in any one of the three dimensions, a Bishop or Knight move across any two of them, while a King (which has no castling move) or Queen can move in either of these ways. The Unicorn is the only piece that moves simultaneously across all three dimensions (alternating its square colour on every step. White Pawns start off on the A2 and B2 ranks with no initial double-step, making non-capturing moves 1 square forwards or upwards, capturing moves 1 square diagonally forward and sideways, forward and upward or sideways and upward; they promote on the E5 rank. Black Pawns similarly start off on the E4 and D4 ranks, promoting on the A1 rank.

For more details see *GFC* pp 16-18, and https://www.chessvariants.com/3d.dir/3d5.html

The **4-Dimensional Board Condition** of T R Dawson uses a 4x4x4x4 board of 256 ‘squares’. Positions are shown on a 4x4 set of 4x4 diagrams with alternating square colouring (the bottom left diagram having the normal colouring); these diagrams are labelled A-D in rows and I-IV in columns. A square may thus be identified by four coordinates, the extreme top right square being IVDd4.

The pieces used are the orthodox ones adapted for 4-dimensional movement (but without castling or double-step Pawn moves), plus the two new pieces **Unicorn** or (1,1,1)-rider and **Balloon** or (1,1,1,1)-rider. It is not really possible to visualise moves in 4 dimensions, and the best way to think about them is as the ranks and files of any one of the 16 diagrams plus the rows and columns made up by the diagrams themselves. Thus a Rook move will be along any one of these four dimensions, a Bishop or Knight move across any two of them, and a King or Queen may move in either of these ways. A Unicorn moves in straight lines across any three of these dimensions, and a Balloon in straight lines across all four dimensions. A Pawn moves without capturing a single step in a direction that takes it towards its promotion rank (IVD4 for White and IA1 for Black), and captures by moving a single diagonal step across 2 dimensions that also takes it towards this rank.

For more details see *GFC* pp 18-19, and https://www.chessvariants.com/invention/4chess-four-dimensional-chess

The **Hexagonal Plane Board Conditions** of **Glinski** and **McCooey** use a hexagonal board composed of 91 'squares' (that are actually hexagons) with 6 along each side. These 'squares' are in three colours (the actual colours apparently not being standardised), and form orthogonal and diagonal lines in three directions (though along the diagonals the squares are not in contact). The board is orientated so that one orthogonal is vertical (giving it files but not ranks, the file-length varying between 6 and 11); individual 'squares' are labelled in the normal way with the letters a-k for the files and a number for the position of a 'square' up from the bottom of the file.

The main pieces used consist essentially of the normal orthodox set adapted for the changed geometry (though the existence of 3 different sets of diagonals means that 3 bishops instead of 2 are needed to cover the whole board). The main changes to the moves bring an increase in possibilities; Rooks and Bishops have 6 possible lines of action instead of 4, and Queens 12 instead of 8, while Kings and Knights have 12 possible destination squares instead of 8 (though there is no castling).

Pawns always make non-capturing moves 1 square directly forwards (or 2 squares initially, with the possibility of e.p. capture); they promote on reaching the final angled row a6-f11-k6. The **McCooey** version uses 7 pawns of each colour, the white ones initially on c1, d2, e3, f4, g3, h2, i1; these capture 1 square diagonally forwards. The **Glinski** version uses 9 pawns of each colour, the white ones initially on b1, c2, d3, e4, f5, g4, h3, i2, j1; these capture 1 square orthogonally forwards. (In this version, a capture from a starting square may bring a Pawn to another starting square, from which it may make an initial double-step move.)

Note: An actual hexagonal board is needed to appreciate the play properly, but an approximation on a normal board can show the differences between moves. Mark the squares b1, b7, d4, f1, f7, h4 with one colour, b5, d2, d8, f5, h2, h8 with a second colour, and b3, d6, f3, h6 with a third colour, ignoring the other squares. Starting from b1, a wR can move to b3-b5-b7 or d2-f3-h4, a wB to d4-f7 or f1, the wK to b3 or d2 or d4 or f1, a wS to d6 or f5 or h2. Under McCooey rules, a wP could move to b3 (or to b5 if b1 was the starting square) and capture on d4; under Glinski rules, it could move to b3 (or to b5 if b1 was the starting square) and capture on d2.

For more details on the Glinski version see
https://www.chessvariants.com/hexagonal.dir/hexagonal.html

For more details on the McCooey version see
https://www.chessvariants.com/hexagonal.dir/hexchess2.html