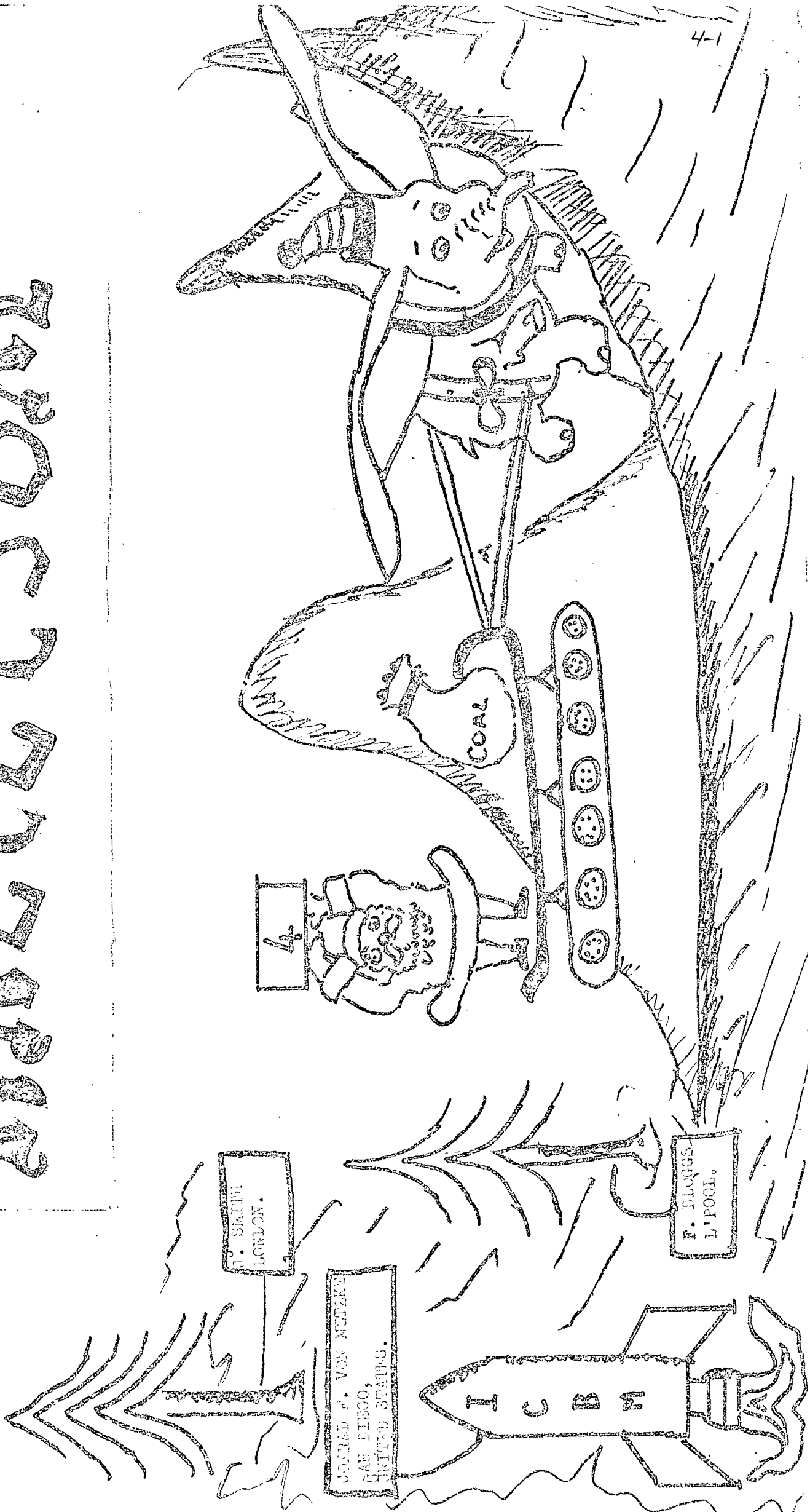


THE BATTLE



F. SMITH
LONDON.

GERRARD V. VON MEIZNER,
SAN DIEGO,
UNITED STATES.

F. BLOGGS
L'POOL.

TUBE

COAL

THE GAME OF MATHS

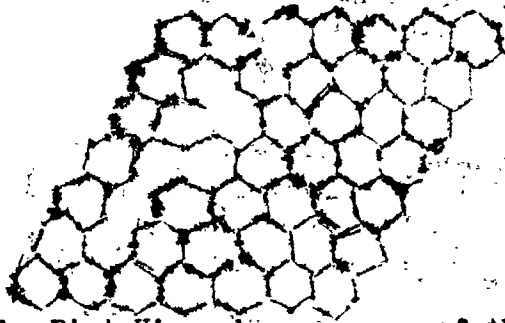
This article was inspired, if that's the right word, by a quote in ALBION 45. Don Turnbull wrote ".....On Rod's (Walker) last definition, Mathematics is a wargame.....". It is the purpose of this article to show that Mathematics is a wargame and that, indeed, most children's games are based on the basic idea of mathematics.....topology.....the mathematics and symmetry of shapes and solids. In the article I have included a two-dimensional projection of a three-dimensional projection of a four-dimensional hypercube and if you don't understand that..... you're better off than I am. Furthermore if any of you have the derivations and rules of any other simple mathematical games then send them to us for publication. No doubt I will get lots of letters telling me that I have misinterpreted Don's comment and that this article does not show maths has any basis in game design at all but the quote was an excuse for and not the cause of the article.

One point I think I should have mentioned that Icosian Calculus was the forerunner to modern Vector Analysis.... No I don't think it makes anything clearer either. For those of you who are wondering.... yes, I did write this after the article..

The Royal, but not so ancient, Game of Hex

It is unusual for someone to come up with a mathematical game which is both interesting and playable. Such a game is 'Hex'. It was introduced at Niels Bohr's Institute of Theoretical Physics in Copenhagen nigh on fifteen years ago and may be one of the most widely played and well thought out of the 'new' mathematical games of the century!

The actual game is played on a diamond-shaped board made up of hexagons. The actual number of hexes varies although it usually is 11 on each edge. Two opposite sides of the board are labelled 'black' and the other two sides 'white'. The hexes at the corners of the diamond belong to either side. One player is given a supply of black pieces the other a supply of white ones. The object of the game is to complete an unbroken chain of pieces between the sides of the board which are given the same colour as the pieces. Players take turns to place a piece on any unoccupied hex. Chains may twist and turn freely. There can never, of course, be a draw because one player can only block the other by completing his chain.



Hex was invented by Piet Hien who was one of the most remarkable men in Denmark. He began his career as a student at the Institute for Theoretical Physics; then his industrial inventions lead him to an interest in engineering, where he remained until the Germans invaded Denmark in 1940, and the materials for manufacturing his inventions disappeared. He twice had to go underground because he had been president of a pro-democratic/anti-Nazi union that was discovered when the Nazis invaded his country. During the occupation he wrote epigrammatic poems under the pseudonym of Kumbel. They appeared in 'Politiken', the leading Danish news paper. The game of Hex occured Hien while he was contemplating the famous four-colour theorem of Topology. The theorem, as yet unproved, is that four colours are sufficient to make any map so that no two countries of the same colour have a common boundary. . . . introduced the game in 1942 during a lecture to students at the Institute. On December 26 of that year 'Politiken' published an account of the game under the name of 'Polygon'. Pads on which the game could be played with a pencil were sold, and for many months 'Politiken' published a series of 'Polygon' problems. The game aquired the name 'Hex' in 1952.

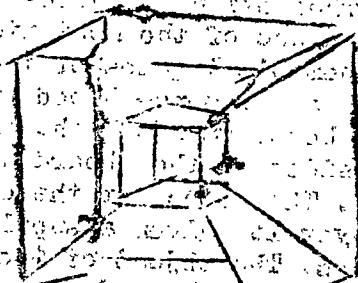
when a version of the game was marketed by Parker Bros. Inc.

The Icosian Game

The Icosian Game was invented in the 1850's by the illustrious Irish mathematician Sir William Rowan Hamilton. It was intended to illustrate a curious type of calculus that he had devised and that was similar in many ways to his famous theory of quaternions. The calculus could be applied to a number of unusual path-tracing problems on the surfaces of the five Platonic solids, particularly the icosahedron and dodecahedron. Hamilton called it Icosian calculus, although the game was played, actually, on the edges of a DODECAHEDRON. In 1859 Hamilton marketed it in several forms both on the Continent and in England. He sold it to a London dealer for £25. This is the only money Hamilton ever received directly for a discovery or publication.

A variety of puzzles were suggested which could be played on the same basic dodecahedron but the original puzzle was to start at any corner on the solid (Hamilton labelled each corner with the name of a large city) then by travelling along the edges make a complete 'trip around the world' visiting each vertex once and only once, and return to the starting corner. In other words the path must form a closed circuit along the edges passing once through each vertex. Hamilton did once try to complete such a Hamiltonian path on a HYPERCUBE, i.e. a cube with 4 dimensions!

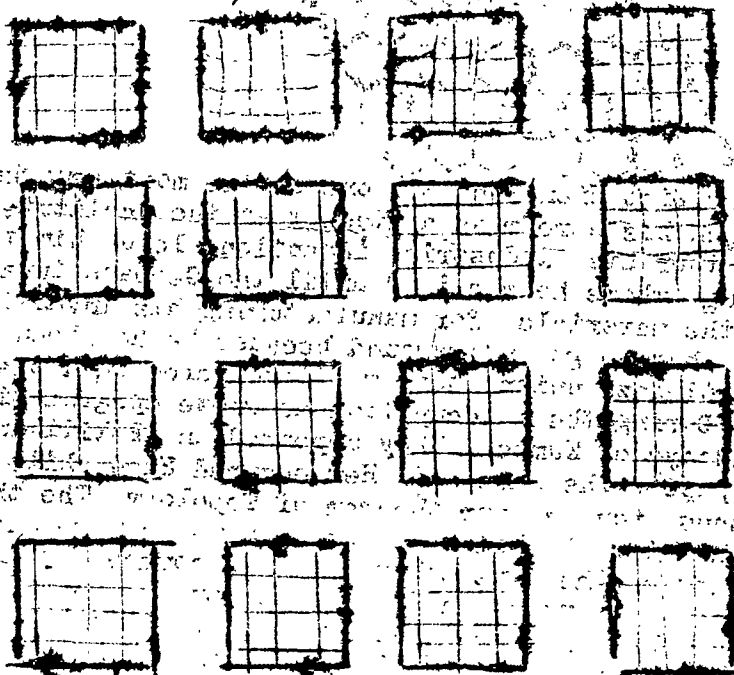
Although we cannot make a hypercube or tesseract we can project the network of its edges into a three-dimensional model. Thus the diagram below is a two-dimensional projection of the edges of a three-dimensional projection of the edges of a hypercube !!! (I think).



The cube has the co-ordinates A, B, C and D. The path it follows is given as A, B, A, C, A, B, A, D, A, B, A, C, A, B, A.

4-Dimensional Noughts and Crosses

@ 4-dimensional noughts and crosses can be played on an imaginary hypercube by sectioning it into two-dimensional squares. A 4 x 4 x 4 x 4 cube for example could be represented thus :



A win is achieved if four marks in a row are arranged in a straight line when the cube is assembled. The first player is believed to have a sure win, but a game played on a 5 x 5 x 5 x 5 cube may end in a draw. The number of possible rows on which one can win on a cube of n-dimensions is given by the formula:

$$\frac{(n \times 2)^n - k^n}{2}$$

n= number of dimensions
k= number of cells on any one side.

The ancient Japanese game of 'go-moku' (five stones), still played in the Orient, is played on the intersections of a 'go' board. (The equivalent of a 19 x 19 square) Players take turns in placing counters from an unlimited supply until one player has five in a line orthogonally or diagonally. Experts are of the opinion that the first player can force a win although to my knowledge no mathematical proof has been put forward to show this. The game became popular in England during the 1880's under the name of 'go-bang' (!).

Wordsworth wrote of noughts and crosses in 'Prelude' Book 1;

At evening, when with pencil, and smooth slate
In square divisions parcelled out and all
With crosses and with cyphers scribbled o'er,
We schemed and puzzled, head opposed to head
In strife too humble to be named in verse.

Not, I think, about 4-D noughts and crosses but then

NIM and TAC TIX

One of the oldest and most engaging of all two person mathematical games is known today as 'Nim'. Possibly Chinese in origin, it is sometimes played by children with bits of paper or by adults with MONEY! In the most popular version of the game 12 pennies are arranged in horizontal rows thus:

```

X X X
X X X X
X X X X X

```

The rules are simple, the players alternate in removing one or more coins provided that they all come from the same row (horizontally). Whoever takes the last coin wins. A good player soon realises that he can win if one of his moves leaves two rows with more than one coin in a row and the same number of coins in each; or if he leaves one coin in the first row, two in the second, and three in the third.

The first player is supposed to have a win if he removes two coins from the top row and thereafter plays 'rationally',

A full analysis and proof was published in 1901 by Charles Leonard Bouton, associate professor of mathematics at Harvard University. In Bouton's terminology every combination was either 'safe' or 'unsafe'. If the position after a player's turn is such that it guarantees a player victory it is said to be 'safe'. To determine whether a position was 'safe' or not, the position was denoted in binary form. If the position was 'safe' he found that the columns added up to 0 or an even number. An 'unsafe' position can only be made safe by a correct move whilst a 'safe' position is made 'unsafe' by ANY move. Thus the starting position reads:

```

      4 2 1
3     1 1
4     1 0 0
5     1 0 1
Totals 2 1 2

```

The middle column adds up to 1 Position 'unsafe'.

Tac Tix

Piet Hien introduced a variation on Nim called Tac Tix. This was played on a square thus:

```

X X X X
X X X X
v v v v

```


Cont.

Players alternately take counters from either vertical or horizontal rows. They must always be adjoining counters with no gaps between them. For example, if the first player took the two middle counters on the top row, his opponent could not take the remaining counters on that row in one move. Tac Tix is played in reverse form the player who takes the last counter wins. When played in this way it is difficult to work out a direct strategy which wins every time although for certain configurations e.g. 3x3 these do exist. Hein showed that this game can be played in 3, 4 and, if you like 5 dimensions!

D. Dwyer

C H E S S .
SCHESCHES.
CHES SCHE.
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CHESCHES.
SCHESCHESCHE.

Victor Paul Dwyer

ORIGIN.

Many experts think that Chess was first played by the Indians. From India it travelled westward and players in various countries made changes in the game. Some historians think that the game of Chess did not start as a war-game but instead it was used by fortune tellers who believed that the position of the pieces on the board could show what would happen in the future. Today's rules were adopted in Europe sometime around A.D. 1550.

The pieces.

Pawn. The word pawn is supposedly derived from an old French word meaning Foot-soldier.

Rook. Rook comes from the word 'Roc' which in Ancient Persian meant "a mythical bird so big that it could carry off an elephant" (how it became mixed up in Chess is anybody's business not clear).

Check Mate. Check Mate is a mispronunciation of an Arabian phrase "Al-shah-mat" meaning "The King is Dead".

Openings.

The Opening is a very important stage in the game. It is, moreover, the stage to be studied most. Some openings are named after their discoveror. For example Alekhine's defense this was first tried out by Alexander Alekhine, who throughout his years of tournament and match play often changed his repertoire of openings. It is almost impossible to name an opening not used in one of his games. The Russian analysts which include people such as Alekhine, Petrov, Philidor, Lasker and Chigorin, who incidentally was the founder of the Russian school of Chess have made an enormous contribution to the game and yet we very rarely see their names connected with openings and the variations, with the exception of Alekhine and Petrov. Nevertheless the superiority of the Soviet play in their practice and, also, the theory of the game is something that grandmasters of other countries have had to admit after their defeats by the Russians.

Because of the great contribution made by the Russians it seems a pity that Spassky lost in the recent world Chess Championship, when he fought to defend the honour of a nation of 4,000,000 Chess fanatics, to Bobby Fischer the American champion.

It has been said that Spassky's defeat was due to psychological reasons but I have wondered if it had anything to do with his opening.

To test this hypothesis I examined 100 games played by several Grandmasters including both Fischer and Spassky.

Opening. Popularity. success. Won drawn Lost.

1 Sicilian Defense.	31%	10	7	14.
Played by Black after:				
1 P-K4 black plays				
1.....p-QB4.				
2) ruy Lopez	17%	14	3	0.
Played by White				
1 P-K4. P-K4.				
2 N-KB3. N-QB3.				
3 B-N5.				
3) Caro Kann.	7%	7	1	3.
Black plays P-QB3				
after 1 P-K4.				
4) King's Indian.	8%	5	3	0.
Black Fianchetto's				
his Bishop on N2.				
5) Queen's Gambit	6%	3	2	1.
1 P-Q4 P-Q4				
2 P-QB4				

		Won	Drawn	Lost	
6) <u>Grunfield Defense</u>	5%	2	1	2	4-11
1) P-QB4 P-KN3					
2) P-Q4 N-KB3					
7) <u>Nimzo Indian Defense</u>	2%	1	1	0	
This opening is used by black in order to counter attack in the Queen's Gambit.					
1) P-Q4 N-KB3					
2) P-QB4 P-K3					
8) <u>Center Counter</u>	1%	0	0	1	!!
To my mind the worst opening that Black can play it is really a waste of time, and of two moves.					
1) P-K4 P-Q4					
2) PXP QXP					
3) N-KB3 Q-Q1					
9) <u>Evans Gambit</u>	2%	2	0	0	
1) P-K4 P-K4					
2) N-KB3 N-QB3					
3) B-B4 B-B4					
4) P-QN4 !?					
10) <u>French Defense</u>	3%	0	1	2	
1) P-K4 P-K3					
2) P-Q4 P-Q4					
In this defense Black tries to switch the attack from King's side to the Queen's.					
11) <u>Modern Benoni</u>	1%	1	0	0	
This opening produces an open fight. It is not as strong as the Nimzo Indian but is still a good defense for Black.					
1) P-Q4 N-KB3					
2) P-QB4 P-K3					
3) N-KB3 P-B4					
12) <u>Ninzovitch</u>	1%	0	0	1	
P-Q4 N-KB3					
P-QB4 P-K3					
13) <u>King's Gambit</u>	2%	2	0	0	
White sacrifices a pawn in order to get a strong King's side attack.					
1) P-K4 P-K4					
2) P-KB4.....					
14) <u>English</u>	6%	3	1	2	
A strange opening and an interesting one.					
1) P-QB4 P-QB4					
2) N-KB3					
15) <u>Giuoco Piano</u>	9%	5	3	1	
An interesting opening in which White aims his attack on KB2 the weakest square on the board.					
1) P-K4 P-K4					
2) N-KB3 N-QB3					
3) B-B4					

If we examine the above list we notice that the Ruy Lopez is the second most popular opening and is also the most successful. The percentage success is a staggering 91%.

Is it a coincidence that this is Fischers favourite ??

Spassky's favourite on the other hand is the Queen's Gambit. In the Six games played (all played by Spassky) the percentage success is only 66 $\frac{2}{3}$ % perhaps this is the reason he lost the Championship..

Championships.

Doubtless to say the majority of Chess players follow the championships the most important was probably the most recent when 29 year old American champion Bobby Fischer dared to challenge the previous 25 years of Russian supremacy.

Quote Robert Byrne who was at the time playing in a very strong Alekhine testimonial tournament in Moscow in 1971.

"Fischer will win by 12½-8½ and will be world champion for the next twelve years," as prophecy yet to be seen. To become the Challenger in 1971 he had to win the Candidates tournament. The Candidates is held once every three years, therefore the next Candidates will be in the Summer of this year, it will find next years Challenger to take on the World champion, Bobby Fischer, if he defends it.

In this part of my article I will endeavor to find who the next Challenger I've chosen the two Grandmasters who I think will stand the greatest chance of becoming the new Challenger. These players are:-

- 1) Boris Spassky
- 2) Victor Korchnoi.

It should be noticed that both these players are Russian Boris Spassky.

Although Boris lost to Fischer in the recent Championship I think that now the pressures are, off him and now placed on Fischer he stands more of a chance now than he did 2 yrs ago and I think some of his many talents will begin to show.

Boris Spassky was born in 1937 and educated while Hitlers armies moved on Leningrad. After spending 4 years in a Children's home he returned to Leningrad and joined a Chess club called "the palace of young Pioneers". At first he was afraid to meet players with ratings, so when games were being analysed he usually listened rarely contributing his own ideas. In 1947 Boris entered his first major competition. Although his opponents were mature and experienced his fine play attracted such notice and one of his games was judged the best in the tournament.

In 1948 he finished 5th in the Leningrad Junior championship (Junior being up to 17). The prominent Leningrad player Mark Taimanov also took part in that tournament. The Spassky v's Taimanov game was a dogged battle and at the decisive moment 11 year old Boris let himself be carried away by his plans and by underestimating his opponents threat he sadly lost the game.

In 1951 the young Leningrad player became a Candidate Master by defeating several masters in the U.S.S.R. championship. A really great record he stands a really good chance this year in the Candidates.

The other player that I chose was Victor Korchnoi. Victor Korchnoi was born in Leningrad in 1931 he learnt chess at the age of seven and soon after was organising family and district 'tournaments'.

In 1944 he joined the chess club of the 'Palace of Young Pioneers', but unlike Spassky was an adventurous player challenging the first fanatic in sight.

In the Leningrad championships he competed against masters for the first time. Taking second place and 4½ points out of 5. His next major tournament was in 1955 when Korchnoi was one of the 14 finalists in the all-Russian Chigorin memorial tournament. Hundreds of thousands of amateurs competed and only in the first round of the finals did Korchnoi suffer defeat. Not losing heart he struggled on eventually gaining the title of master.

Original plans, a constant quest for the new, good combinational vision and a high level of technique are all features of the AMAZING play of Victor Korchnoi.

Vince Dwyer

And our thanks to Paul Dwyer for helping with the research and typing.

Your Albert, a sub-zine to Our 'Entry, carries Mike's parttime game. It is available from Mike Sherras, 136, Newton Rd., Burton-on-Trent, Staffs. for just the postage!

THIS IS A TAKE OFF () LANDALL THAT ALL COMPLAINTS SHOULD BE SENT TO WILL HAVENOR RICHARD SHARP

DONCASTER 2 LIVERPOOL 2 HAAARRRGGGHHH.

Brian Yare, in his 'zine Grafeti, said that 'no variant compares with the regular game for ease of running', then, in War Bulletin, Hartley P. said that he would probably keep at least 1 regular game running in W.B., the remainder of the 'zine being, presumably filled with variant games. We have only been GM's for a few weeks, and have only had the priveledge of adjudicating one season's orders for a variant game (the Third Age game). Hence, one can see that we are hardly the world's leading experts on GMing variants. However, from out experience with one seasons' orders for one game, we can draw some conclusions. Firstly, more time was spent messing around with the Third Age moves, and hiding the ring, than was spent announcing the start of Asiatic Salamander and adjudicating Aardvark. The problem is not the rules of the games, or, for that matter, the maps. It is simply that GM's are familiar with the regular board. They can adjudicate the moves in their heads, without messing around with Smarties or modelling pins. In fact, despite all that it is said about it, Para-Time is probably as easy to run as Clans, and easier to run than Foundation, merely because the regular board is used, and the GM knows what the regulac board looks like without having to consult a small, and often poorly printed board.

Many of the variants produced in this country have real quality, they are excellent in fact. However, in terms of ease of running and play they can never rival the regular game, simply because the regular game is so familiar to the players. Games such as Youngstown and Abstraction are perhaps better games than Diplomacy, if one is to go merely by play balance, and the possibilities for interaction between players (although personally speaking I would not agree. However, they are not as popular as the regular game, because the presentation of the game (amateurly produced) is way below the standard of presentation of the regular game; this in turn means that it is much harder to play the game postally, as keeping track of the pieces takes much more time, and to follow the game one must have the board constantly in view, as well as concentrating hard on the game report.

For this reason, we intend to closely watch the number of variant started in Hannibal and ensure that this never reaches the titanic proportions of some of the other 'zines which we receive.

.....
WANTED

Geoff Challenger, 23, Priestnall Road, Heaton Mersey, Stockport, Cheshire, ~~add of 11111~~ would like an opponent for postal NATO. Willing to be either NATO or Warsaw Pact in M+ 1 or M+ 31 scenarios.

We are willing to carry ads of this type from anybody, free of charge.

.....
WANTED

As usual, we are appealing for articles, letters, rules for postal play of assorted games....anything if fact. Payment is by good Hannibal credit. PLEASEPLEASEPLEASEPLEASEPLEASEPLEASEPLEASEPLEASEPLEASEPLEASEPLEASEPLEASEPLEASEPLEASEPLEASEPLEASE

NEX
NEXT ISSUE

- The Lepanto Opening - Key variant by Andrew Herd.
- The return of 'Variants' by Dave Pink, together with the latest positions in the variant poll.
- An Editorial, probably on the I.D.A.
- The usual gam 'zine reviews.
- More letters.
- Geoff Challenger has also promised to give us an SF story, written by him.
- And lots lots more.....

We may even have the American article which was supposed to have been in this issue, but wasn't.

.....
With this issue, Hannibal is 10 weeks old; happy birthday to us...

+++++
Welcome to new readers; Steve Doubleday, Edi Birsan and Silvano Worynzi (sic).

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Conrad von Metzke is no longer issuing Miller numbers; Burt Labelle is. All editors are requested to trade with him.

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