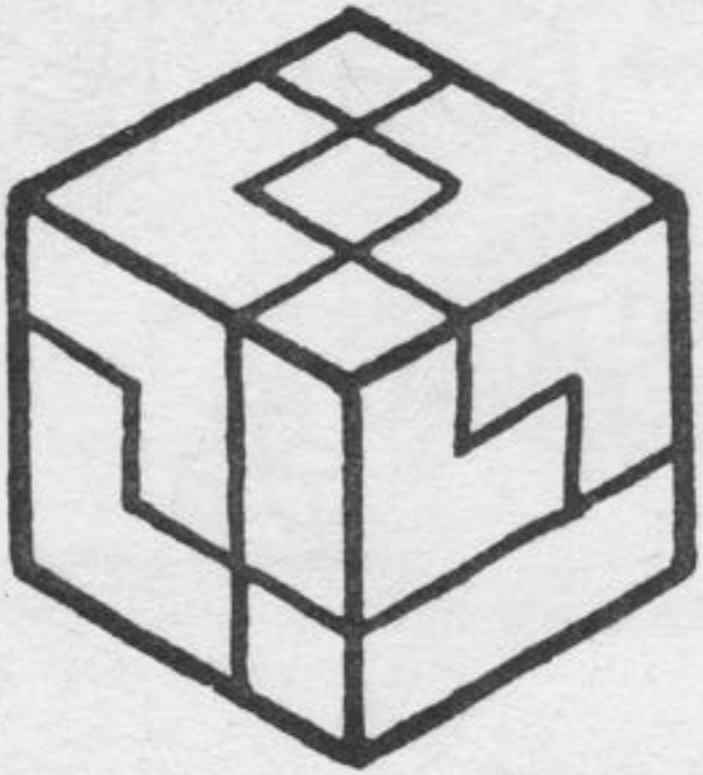
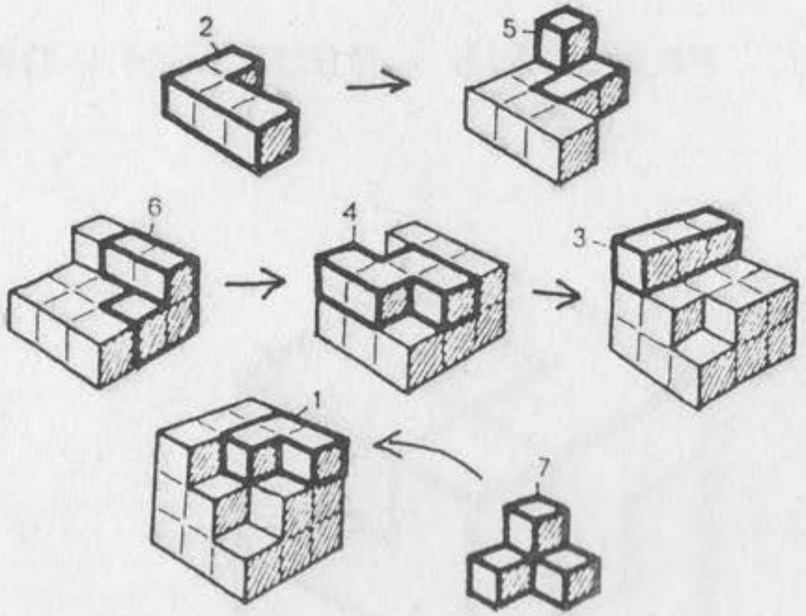
SOMA®

ENGLISH - FRANÇAIS - DEUTSCH - DANSK



A PIET HEIN PUZZLE

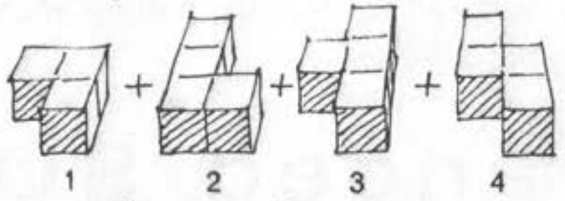


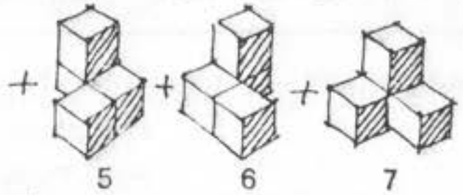
SOMA FOR BEGINNERS

Never has anything so easy been so difficult.

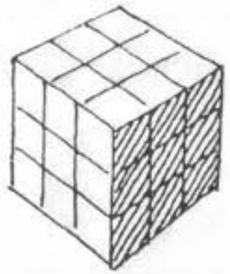
Patrick D. Powerton

The 7 SOMA pieces:





can be made into the cube in more than one million ways. =

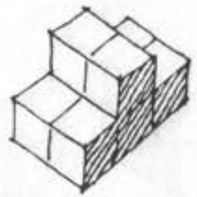


But try it yourself! There are even more ways in which the cube cannot be made.

SOMA looks so easy.

But even with a few SOMA pieces difficult shapes can be made.

This figure:



can be made from two of the seven SOMA pieces.

Which ones? And how?

(If you start with the above figure of two SOMA pieces it is particularly difficult to build the cube.)

.... And with all 7 SOMA pieces many hundred shapes can be built.

Advanced SOMA

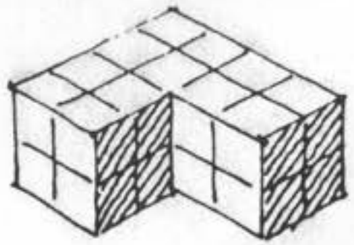
Buy SOMA for your children – but don't let them get hold of it!

Humphrey H. Welder,

Inter-Planetary Steel Corp.

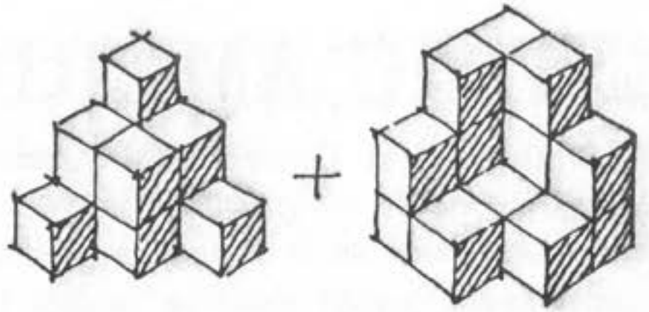
If the smallest of the SOMA pieces, No. 1, is removed

a similar shape can be made from the remaining six SOMA pieces (twice as large in all directions).



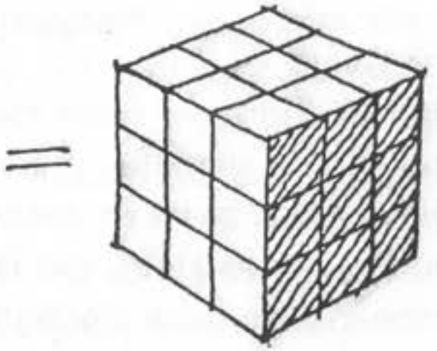
It looks easy!

There is a special way of building the cube. First build these two regular figures:



using respectively 3 and 4 of the 7 SOMA pieces.

These two figures can then be put together in three different ways to form the cube.



SOMA can also be used by two players, who compete to build a given figure in the shortest time. If the two players exchange a piece (not No. 1), they can still build the cube.

Condensed from

SCIENTIFIC AMERICAN

and from "Mathematical Games and Puzzles, II" by Martin Gardner:

THE SOMA CUBE

"...no time, no leisure...not a moment to sit down and think – or if ever by some unlucky chance such a crevice of time should yawn in the solid substance of their distractions, there is always SOMA, delicious SOMA..."

Aldous Huxley,
"Brave New World"

From time to time efforts have been made to devise a three-dimensional puzzle game.

None, in my opinion, has been as successful as the Soma cube, invented by Piet Hein, the Danish writer. He conceived of the Soma cube during a lecture on quantum physics. When the lecture touched on a space sliced into cubes, Piet Hein's supple imagination caught a fleeting glimpse of the following curious geometrical theorem:

If you take all the irregular shapes that can be formed by combining no more than four cubes, all the same size and joined at their faces, these shapes can be put together to form a larger cube.

While the lecture continued Piet Hein swiftly convinced himself that the seven pieces, containing 27 small cubes, would form a 3×3×3 cube. After the lecture he glued 27 cubes into the shape of the seven components and quickly confirmed his insight.

Piet Hein named the set of pieces SOMA.

After working with the pieces for several days many people find that the shapes become so familiar that they can solve Soma problems in their heads. Tests made by European psychologists have shown that abi-

lity to solve Soma problems is roughly correlated with general intelligence, but with peculiar discrepancies at both ends of the I. Q. curve. Some geniuses are very poor at Soma and some morons seem specially gifted with the kind of spatial imagination that Soma exercises. Everyone who takes such a test wants to keep playing with the pieces after the test is over.

The number of pleasing structures that can be built with the seven SOMA pieces seem to be unlimited. After I wrote a column about these cubes in **Scientific American**, thousands of readers sent sketches of new figures and many complained that their leisure time had been obliterated since they were bitten by the bug. Teachers purchased SOMA sets for their classes and psychologists added this cube to their psychological tests. Puzzle addicts gave sets to friends in hospitals and as Christmas gifts.

The charm of Soma derives in part, I think, from the fact that only seven pieces are used; one is not overwhelmed by complexity.

Martin Gardner

Number of combinations

The seven Soma pieces can be made into the cube in exactly

1.105.920

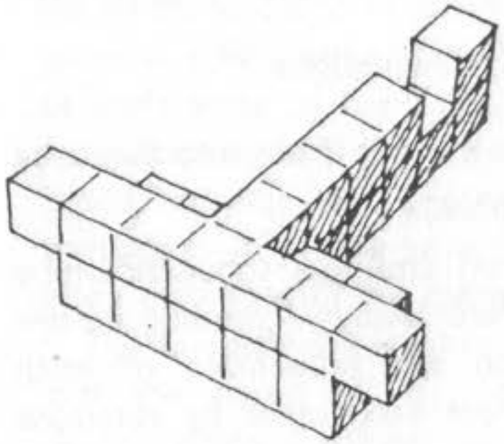
– one million, one hundred and five thousand, nine hundred and twenty – different ways (counting as different all solutions which are reflections of each other or that can arise from each other by rotations of the whole cube or of single pieces).

This figure is based on the result of an analysis by Dr. John H. Conway and Dr. M. J. T. Guy, both of Caius College, Cambridge, England, carried out by means of an electronic computer.

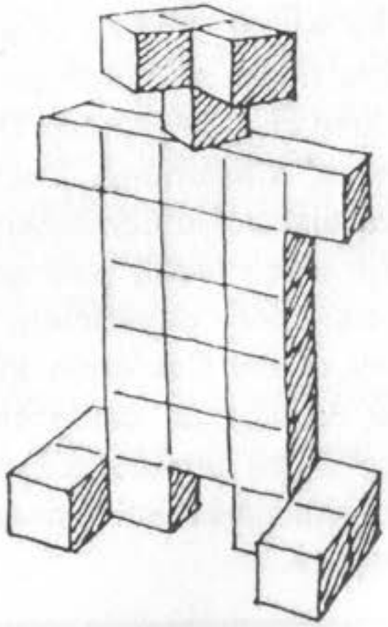
The same result was arrived at by N. S. Newhall of the trajectory department at the Jet Propulsion Laboratory of the California Institute of Technology, Pasadena, California, using an IBM 7094 electronic computer which printed out the solutions in 82 seconds. The result has later been verified by several other scientists.

SOMA FOR BEGINNERS

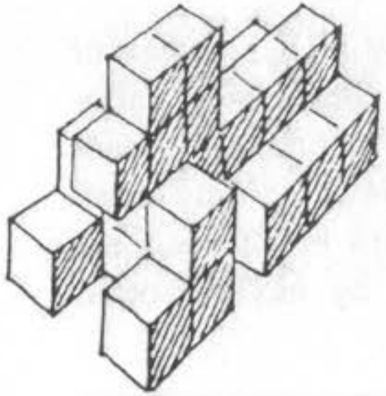
English



The Aeroplane

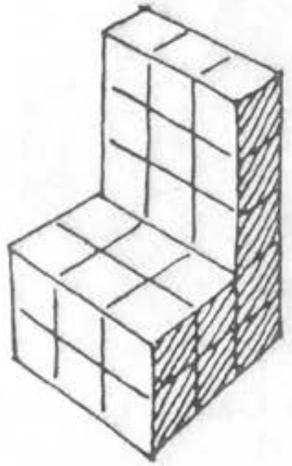


The Robot

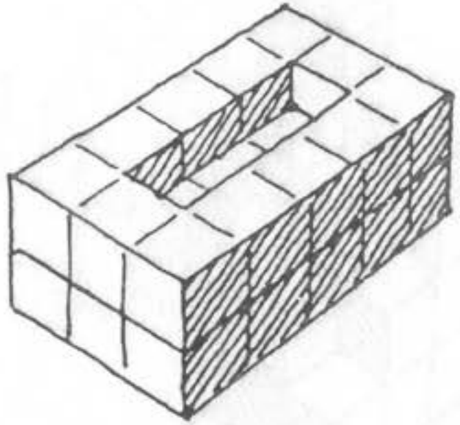


The Dog

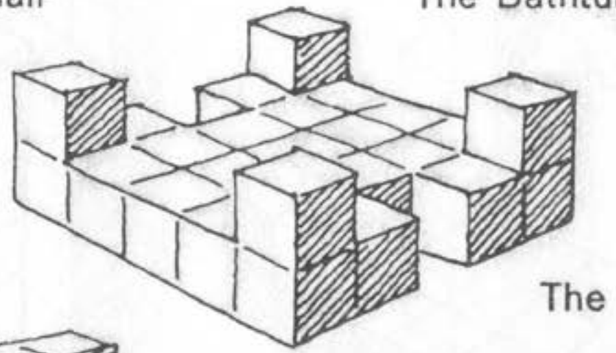
SOMA FOR EXPERTS



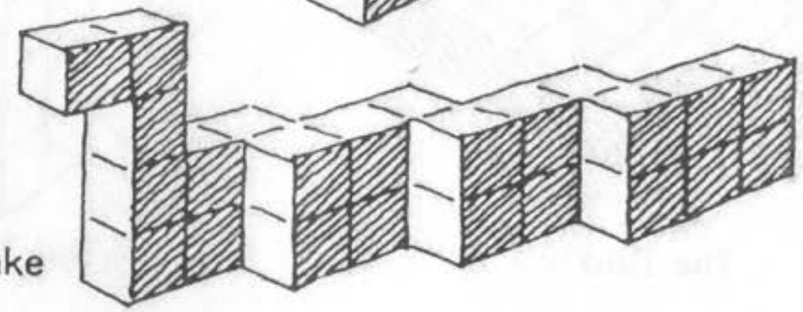
The Chair



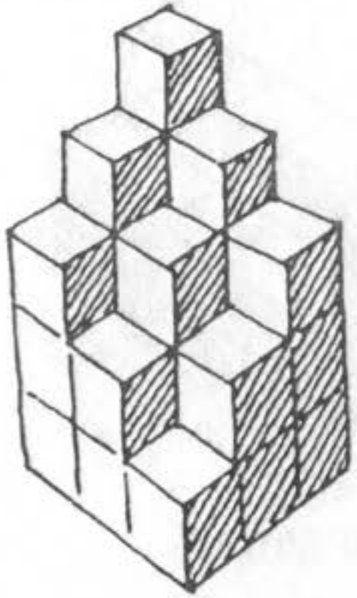
The Bathtub



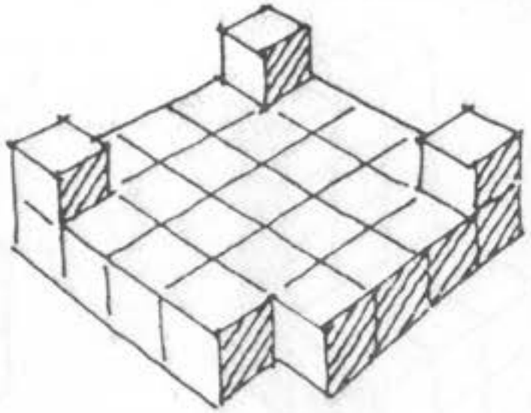
The Castle II



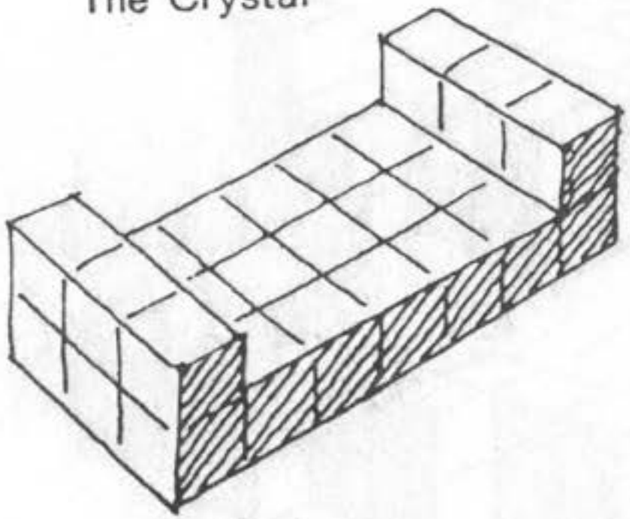
The Snake



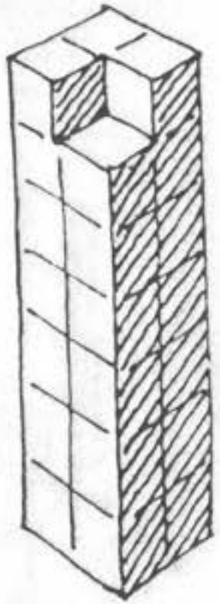
The Crystal



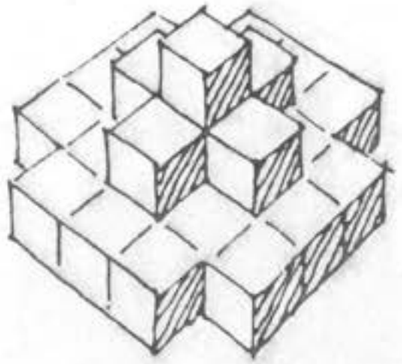
The Castle I



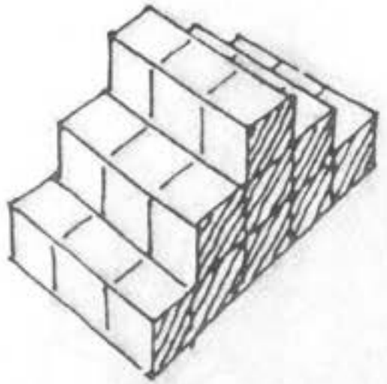
The Bed



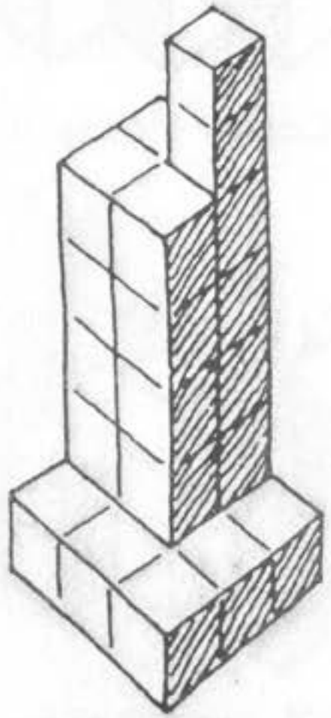
The Tower



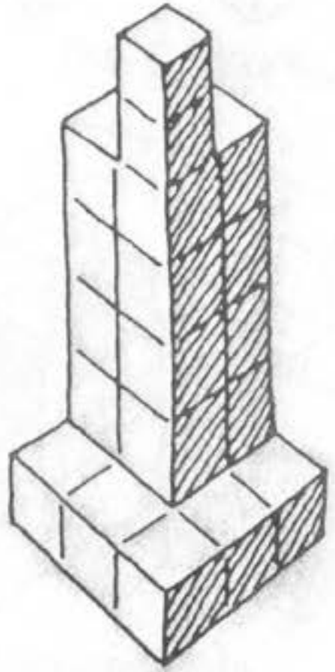
The Pyramid



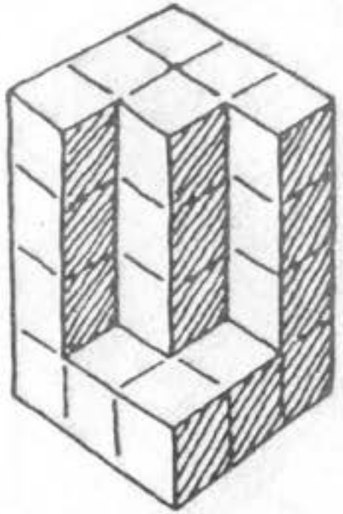
The Staircase



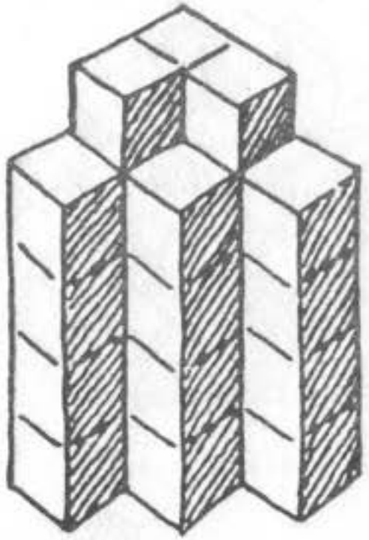
Skyscraper I



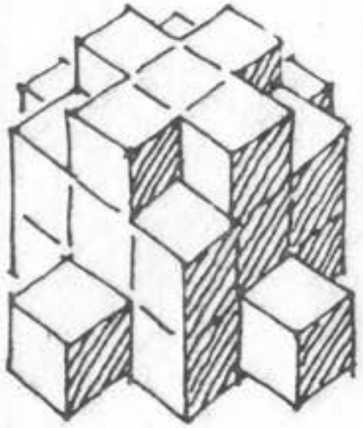
II



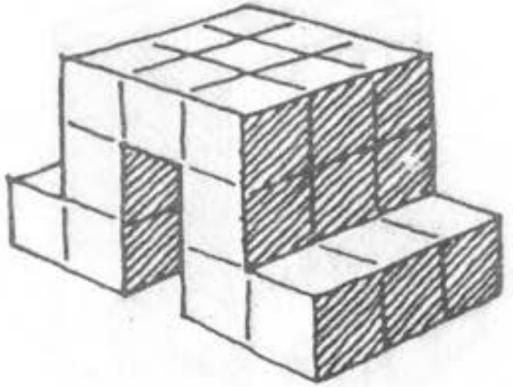
Corner House I



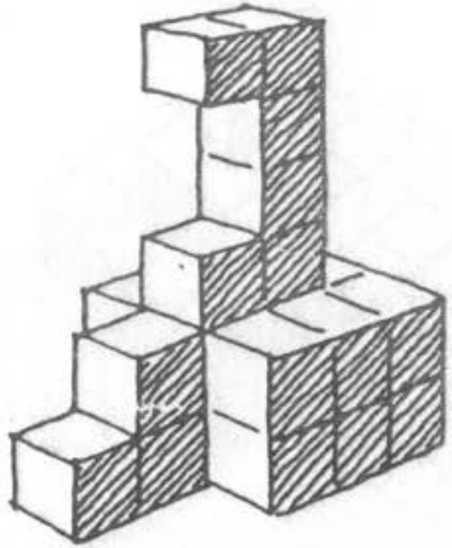
Corner House II



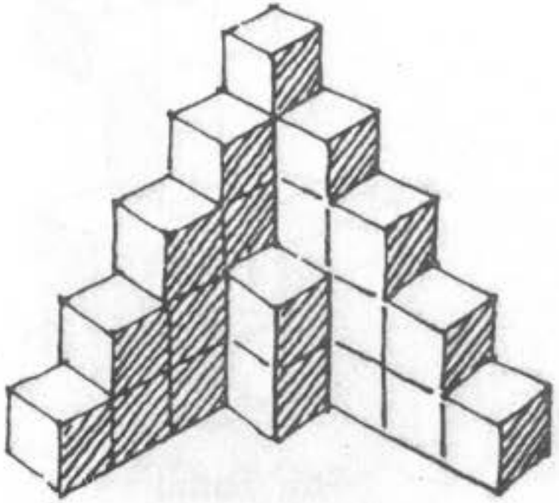
The Gordian Knot



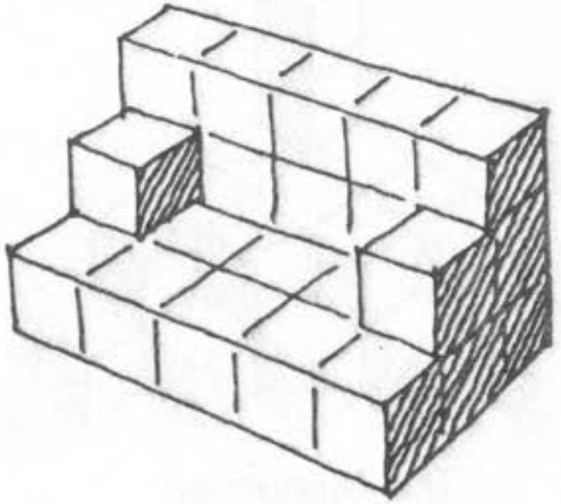
The Tunnel



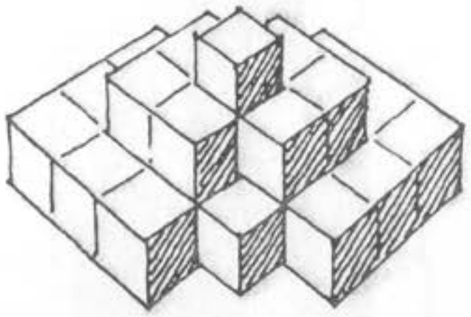
The Gallows



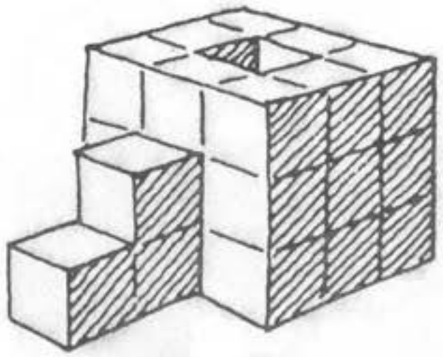
The Corner Stone



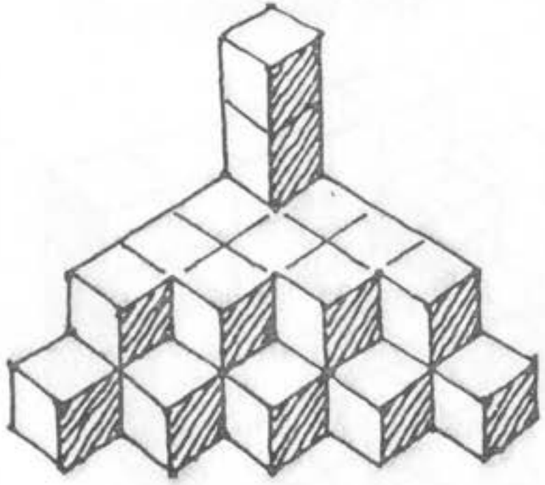
The Sofa



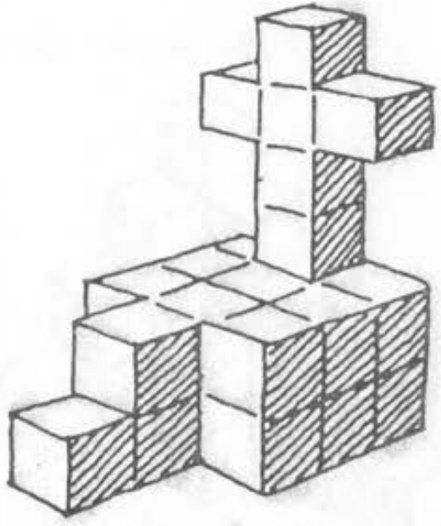
The Steamer



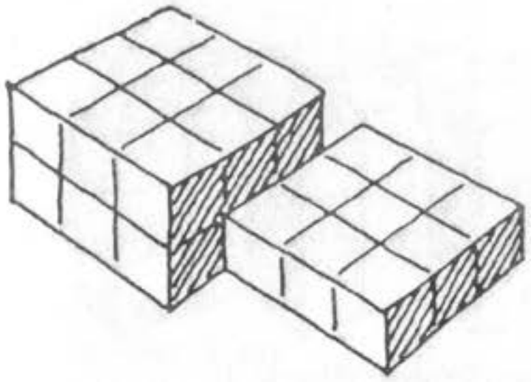
The Well



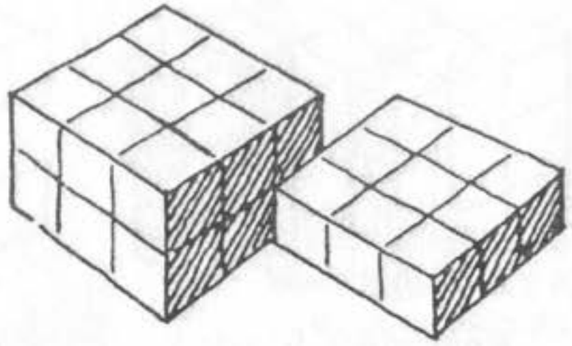
The Monument



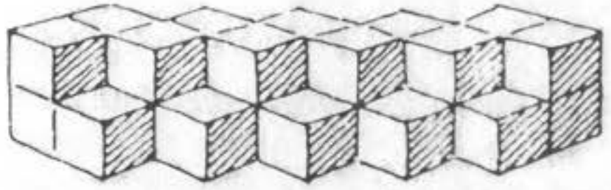
The Tomb



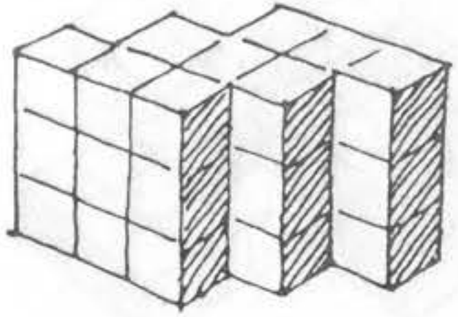
High and Low I



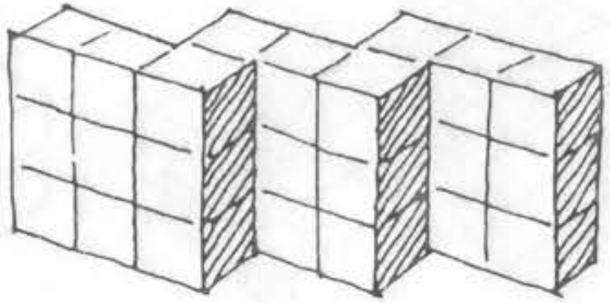
High and Low II



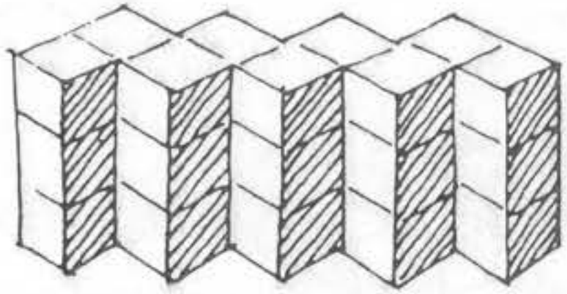
The Five Seats Bench



Apartment Block I



Apartment Block II

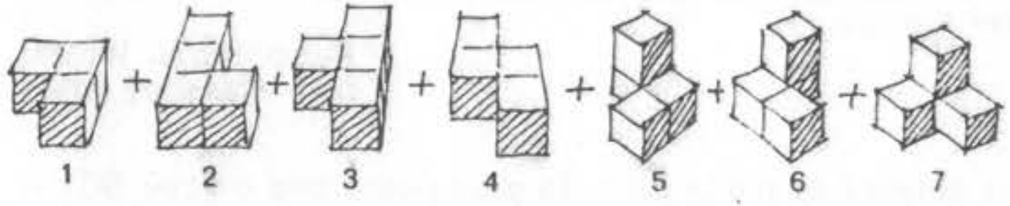


The Zig-Zag-Wall

SOMA POUR LES DÉBUTANTS

Français

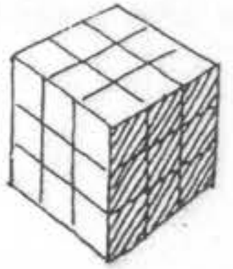
Jamais rien d'aussi facile n'a été aussi difficile. *Patrick D. Powerton*



Les 7 pièces SOMA:

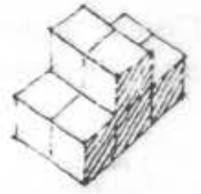
peuvent être assemblées à un hexaèdre de plus d'un million de manières.

=



Mais essayez – le vous-même! Il y a encore plus de manières dont on ne peut assembler l'hexaèdre

Le SOMA paraît facile.
Or, même avec 2 pièces SOMA seulement, on peut faire des figures difficiles.



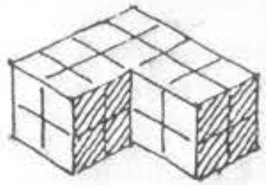
Cette figure:
peut être faite de 2 des 7 pièces SOMA.
Lesquelles? Et comment?
(Si l'on commence avec la figure montrée ci-dessus comprenant 2 pièces SOMA, il est extrêment difficile de construire l'hexaèdre.) . . . Et avec toutes les 7 pièces SOMA, on peut construire beaucoup de centaines de figures.

SOMA POUR CEUX QUI SONT PLUS AVANCÉS

Achetez le SOMA pour vos enfants – mais ne les laissez pas mettre la main sur lui!

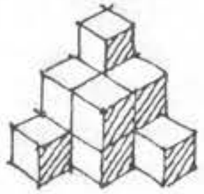
Humphrey H. Welder,
Inter-Planetary Steel Corp.

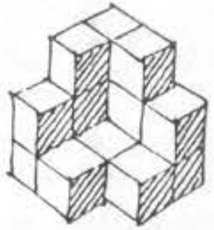
Si vous enlevez la pièce no 1, la plus petite des pièces SOMA on peut construire une figure tout à fait identique avec les 6 pièces SOMA restantes (deux fois plus grande dans toutes les directions).



Il paraît facile!

Il y a une manière particulière pour construire l'hexaèdre. Construire d'abord ces deux figures régulières:
en vous servant de 3 respectivement de 4 des 7 pièces SOMA.
Ces 2 figures peuvent être assemblées de 3 différentes manières pour former l'hexaèdre.





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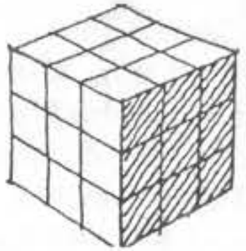
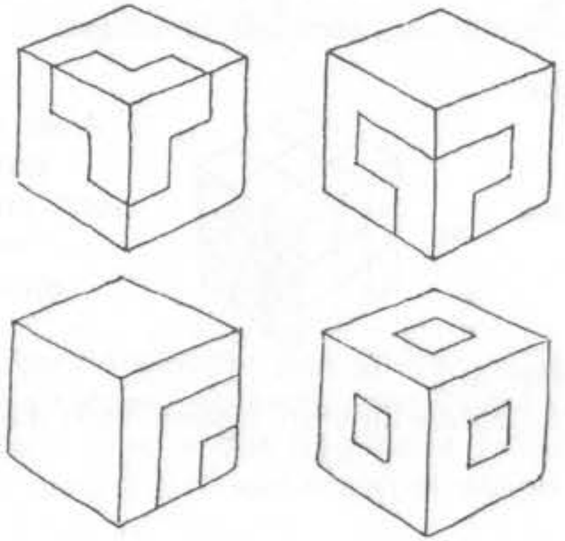


SOMA POUR LES EXPERTS

Le SOMA est une sculpture qu'on peut sculpter ultérieurement.

Maurice Ferrière



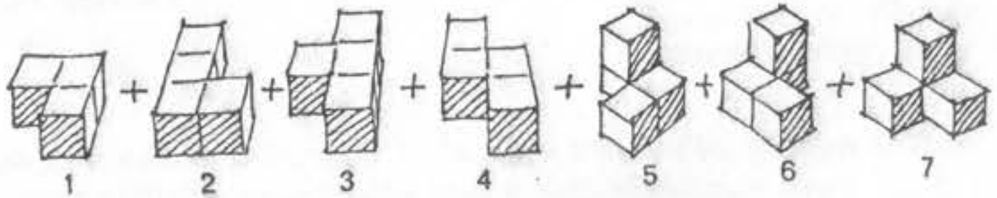
La pièce SOMA no 7 peut avoir théoriquement 4 différents emplacements dans l'hexaèdre. – Quels d'entre eux sont possibles?

SOMA FÜR ANFÄNGER

German

Noch nie war etwas so Leichtes so schwer.

Patrick D. Powerton



Die 7 SOMA-Steine:

lassen sich auf tausenderlei Weise zu einem Würfel zusammenbauen.

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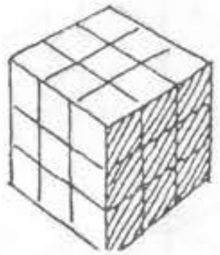
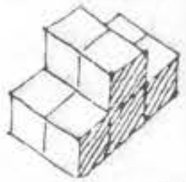


Aber machen Sie selbst den Versuch! Es gibt noch mehr Möglichkeiten, wie man den Würfel *nicht* zusammenbringt.

SOMA sieht einfach aus.
Aber schon mit 2 SOMA-Steinen lassen sich komplizierte Figuren bauen.



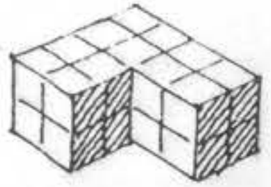
Diese Figur:
lässt sich aus zweien der 7 SOMA-Steine herstellen – aber welchen? Und wie?
(Beginnt man mit der auf dieser Seite gezeigten Figur aus 2 SOMA-Steinen, so ist es ganz besonders schwierig, den Würfel zu bauen.)
. . . und mit allen 7 SOMA-Steinen lassen sich Hunderte von verschiedenen Figuren herstellen.

SOMA FÜR FORTGESCHRITTENE EXPERTEN

Kaufe SOMA für deine Kinder – aber lass es ihnen nicht in die Hände geraten!

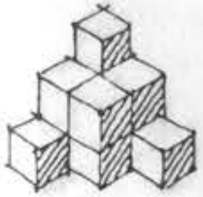
Humphrey H. Welder
Inter-Planetary Steel Corp.

Entfernt man den kleinsten SOMA-Stein (Nr. 1),
so lässt sich aus den übrigen 6 SOMA-Steinen genau die gleiche Figur (nur überall in doppelter Grösse) zusammenstellen.



Ist doch einfach!

Es gibt eine besondere Methode, den Würfel zu bauen.
Erst baut man diese beiden regelmässigen Figuren:
und verwendet dazu 3 bzw. 4 der insgesamt 7 SOMA-Steine.
Die beiden Figuren lassen sich auf dreierlei Weise zu einem Würfel zusammenfügen.



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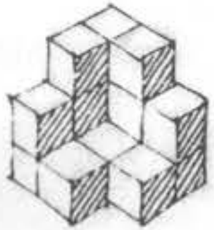

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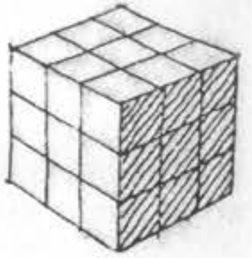
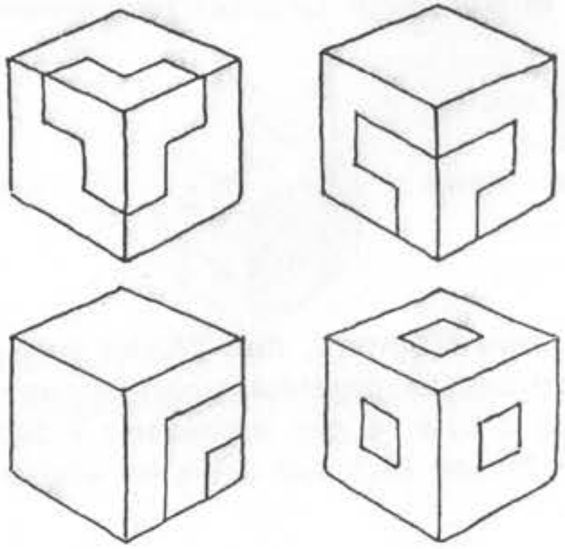


SOMA FÜR EXPERTEN

SOMA ist eine Skulptur, an der man selbst weiter skulptiert.
Maurice Ferriére

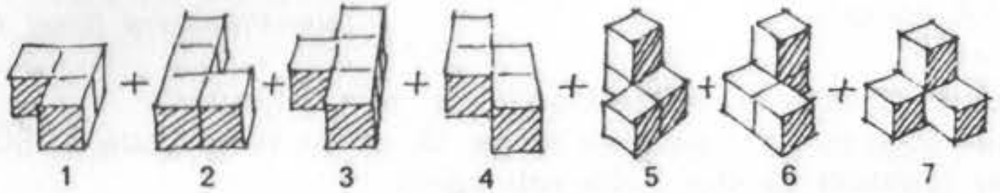


Der SOMA-Stein Nr. 7 kann theoretisch auf viererlei Weise im Würfel angebracht sein. – Welches sind die praktischen Möglichkeiten?

SOMA FOR BEGYNDERE

Dansk

Aldrig har noget så let været så svært. *Patrick D. Powerton*



De 7 SOMA-klodser:

kan samles
til terninger
på mere end
en million
måder.

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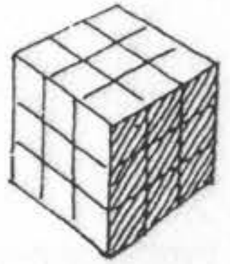
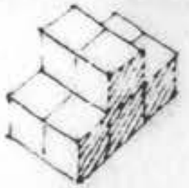


Men prøv
det selv!
Der er endnu
flere måder,
som terningen
ikke kan samles på.

SOMA ser let ud.
Men selv med bare 2 SOMA-klodser kan der laves vanskelige figurer.

Denne figur:



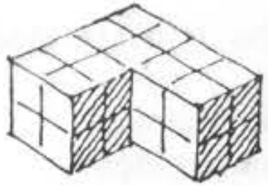
kan laves af 2 af de 7 SOMA-klodser.
Hvilke? Og hvordan?
(Hvis man starter med den ovenfor viste figur bestående af 2 SOMA-klodser, er det særdeles vanskeligt at bygge terningen.)
. . . Og med alle 7 SOMA-klodser kan der bygges mange hundrede figurer.

SOMA FOR VIDEREKOMNE

Køb SOMA til Deres børn – men lad dem ikke få fat i det!

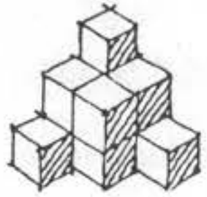
Humphrey H. Welder,
Inter-Planetary Steel Corp.

Hvis den mindste af SOMA-klodserne, nr. 1, fjernes,
kan der bygges en figur helt mage til af de resterende 6 SOMA-klodser (dobbelt så stor i alle retninger).



Den ser let ud!

Der er en særlig måde at bygge terningen på.
Byg først disse to regelmæssige figurer:
ved at bruge henholdsvis 3 og 4 af de 7 SOMA-klodser.
Disse 2 figurer kan så sættes sammen på 3 forskellige måder og danne terningen.



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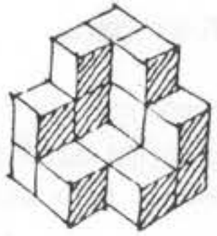

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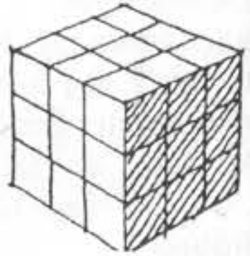
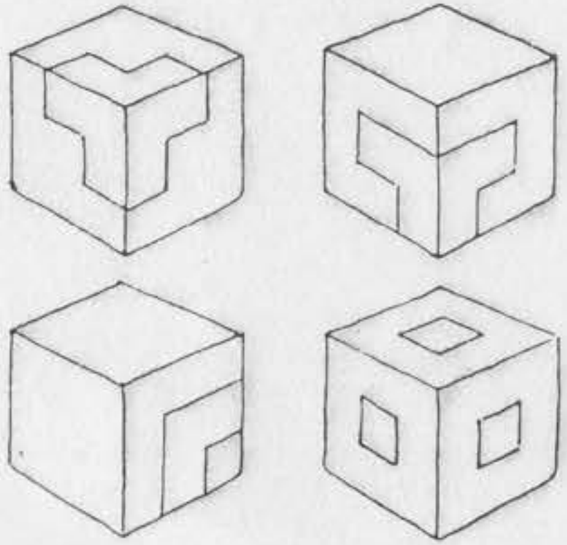


SOMA FOR EKSPERTER

SOMA er en skulptur, som man selv skulpterer videre på.

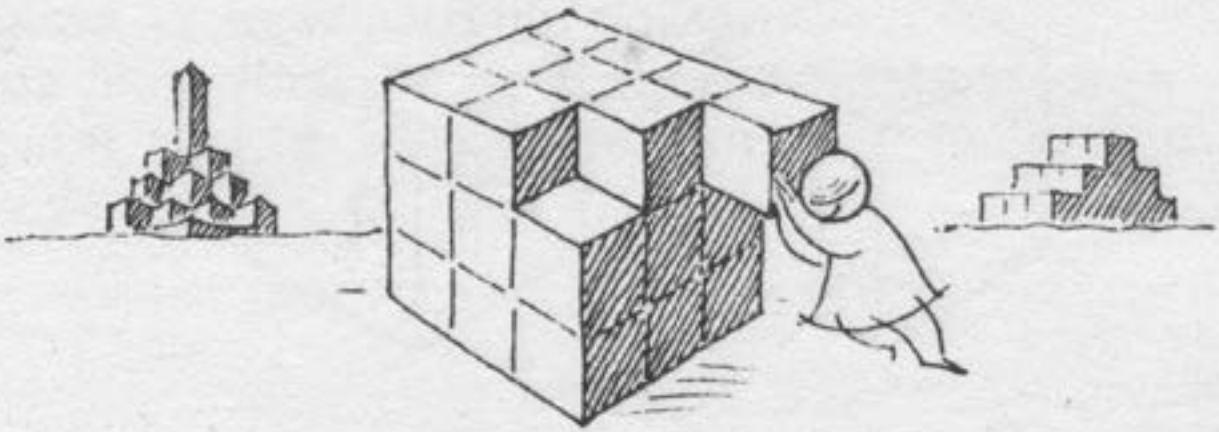
Maurice Ferriére



SOMA-klods nr. 7 kan teoretisk have 4 forskellige placeringer i terningen. – Hvilke af dem er mulige?

Problems worthy
of attack
prove their worth
of hitting back.

Piet Hein



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