

**ENGLISH GUIDE BOOKLET**

**YONA  
FRIEDMAN —  
THE MOBILE  
EXHIBITION**

**GROUND FLOOR & 5<sup>TH</sup>**



# **YONA FRIEDMAN – THE MOBILE EXHIBITION**

## **DUNKIRK / MAUBEUGE / BEAUVAIS AND AMIENS**

CNEAI Collection = on deposit at the Frac Grand Large — Hauts-de-France.

Based on an idea by: Sylvie Boulanger, Keren Detton, Lucy Hofbauer

*“At the present time we build too much. Earth is over built, earth is over planned, earth is over farmed. This does not mean that we don’t need architects, planners and farmers but we have to change rules.”*

Yona Friedman

### **Life and Work in Movement**

The architecture of survival provides food for thought to Yona Friedman on our fundamental needs in an ecosystem subjected to the rarefaction of resources. Born in 1923 in Hungary, he had started studying architecture in Budapest when WWII erupted. As a refugee in Romania, he lived in camps for the displaced before finally settling in Israel where he lived in a kibbutz and returned to architecture.

It was in these conditions that he developed his original approach to habitat based on user experiences. In 1957, he founded the Mobile Architecture Study Group (Groupe d’Étude d’Architecture Mobile - GEAM) and promoted the use of flexible structures made of prefabricated elements. His ideas caught the attention of leading figures including Le Corbusier and Jean Prouvé, who invited him to move to France. From then on, he relentlessly transmitted his ideas throughout the most renowned universities in both Europe and the United States and wrote profusely, publishing over 500 articles and books.

## **The Mobile Exhibition, Architecture and Life in Common**

The title of this exhibition pays tribute to his major work *L'Architecture mobile (Mobile Architecture, 1958)*, in which Friedman develops his Spatial-City ideas. He imagines modular living spaces that evolve in function of needs that change over time. Since “human society cannot be planned”, Friedman recommends just allowing its occupants the freedom of changing their habitat. Raised constructions play in favour of urban agriculture and account for demographic evolutions as well as limited resources. These ideas were embodied in a multitude of models and unique drawings, which reveal a creative process based on savings, recycling and improvisation.

## **The Power of Images and Symbols**

More pragmatic than utopian, Yona Friedman was a man of dialogue and transmission; he developed a universal language using easily recognisable pictograms. His cartoon-like “handbooks” on housing, health, nutrition, urban environments and social structures were widely distributed in the scope of his work for UNESCO in the 1970s. They remain a powerful means to convey his positive humanistic ideas. Through his use of the slide-show and a few simple stick figures, complex logistics and networks can be easily grasped in a dynamic and playful manner, underscoring the difficulties humans face when communicating.

Painted on the floor of the exhibition space are pictograms taken from his *Dictionary* (to be completed by the reader). Friedman chose topics (“communication”, “group”, “improvisation”, etc.) and linked them to image-words. However, when asked how he would illustrate the concept of “freedom”, he responded: “Freedom on its own doesn’t mean anything. It can’t be drawn. One can be free to ... move about... speak... eat or work. I can draw that.”

The Mobile Exhibition invites each of us to repossess the meaning behind words, to place them together and in relation to each other. Yona Friedman also created an imaginary dreamlike universe from which his drawing *La Licorne (The Unicorn)* emerged. A poetic way of sharing his dreams, he drew inspiration from African, Indian and Native American tales and symbols as well as from his own personal mythologies.

*Dedicated to the artist, architect and urban planner Yona Friedman (1923-2020). A year after his passing, this exhibition draws from the extensive collection of works stored at the CNEAI = Frac Grand Large — Hauts-de-France in Dunkirk.*

*Exhibition produced by the CNEAI =, Frac Grand Large — Hauts-de-France, Idem + Arts, Quadrilatère and Frac Picardie. With support from the Denise and Yona Friedman endowment fund and RAJA patronage.*

**Follow the exhibition to *Pictograms* in the Belvédère (5<sup>th</sup> floor) and to *The Unicorn* in the Halle AP2 (ground floor).**

# FLOOR DRAWING IN THE HALLE AP2: THE UNICORN

*The Unicorn* is a monumental work of art designed by the urban planner, architect and artist Yona Friedman.

Alongside his numerous works from the 1960s, touching on urban planning as well as a novel form of language, Friedman also set about constructing new myths using cut-up coloured paper. Initially designed to decorate his Parisian apartment, this paper world took over his successive living quarters and ended in the production of one of his major works.

Inspired by the stories of *One Thousand and One Nights* and traditional African tales as well as Indian painting, the myth conjured up by Yona Friedman depicts an enchanting vision of the world, fostered by his theories on how to live better on our planet.

The unicorn is a recurring figure in this imaginary world. Present in many European, Oriental and Asian myths, this legendary animal embodies two of the most important values for Friedman: freedom and happiness.

Unicorns become the artist's alter-ego in the 1990s, steadily multiplying in number, reaching their height in the monumental work titled *Licorne Eiffel (Eiffel Unicorn)* produced on the island of Vassivière in 2009 and which has the same dimensions as the Eiffel tower. The version presented in the Halle AP2 has been adapted to the gigantic dimensions of this symbol of Dunkirk heritage.

Spray-painted on the floor, the drawing is, due to its size, best viewed from above.

# FLOOR DRAWING IN THE BELVÉDÈRE (5<sup>TH</sup>): PICTOGRAMS

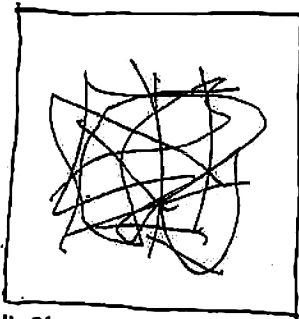
*“When I say a word, I don’t know what the other person understands.  
When I show an image, we understand the same thing.”*

These words by Yona Friedman perfectly sum up one of his feature productions: the invention of a new form of language. In 1974, Friedman started the project of his life, the creation and publication of a new type of writing using pictograms. His end goal was to create a universal communication system.

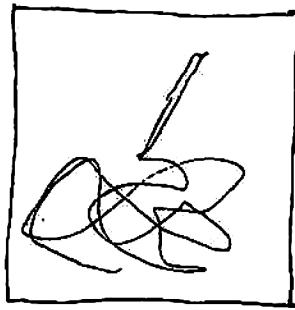
This new glossary was continually enhanced and published in the form of manuals, a type of dictionary that, in the scope of Friedman’s work as an information officer, was distributed by UNESCO in the 1970s. Reminiscent of hieroglyphs from ancient Egyptian or Pre-Columbian civilisations, the corpus created by Friedman is based on drawings and representations of concrete actions. Each concept thus takes immediate shape in a form that anyone can easily recognise, far from the abstraction of current language forms, of which Friedman was particularly wary. His pictograms constitute a true melting pot in which art and communication fuse together. Each idea becomes an artistic expression in its own right; its grand simplicity allows each and everyone to claim it as their own.

Through this utopian ideal of language, Friedman sought above all to renew connections and create a new form of exchange. The ultimate goal for him was to attain what he saw as a fundamental right: the right to understand, which he would have liked added to the list of universal human rights.

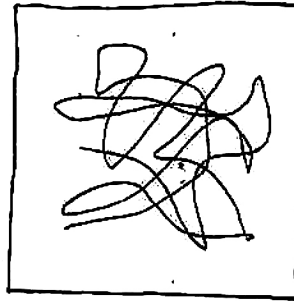
"GRIBOUILLE" 1



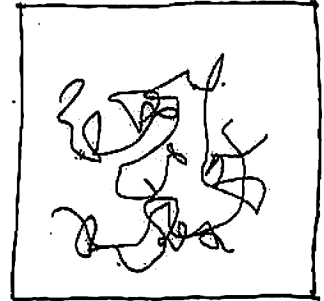
"GRIBOUILLE" MEANS IN FRENCH A "CRISSCROSSING" LINE



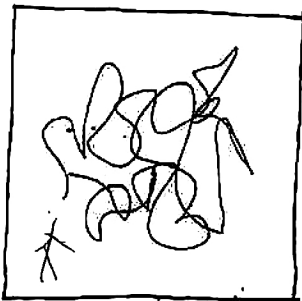
WHICH YOU DRAW ON A SHEET



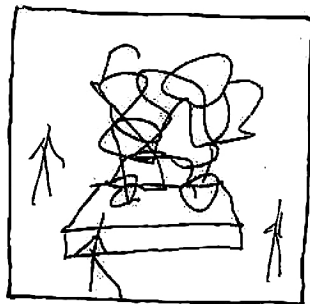
BUT YOU CAN DO A "GRIBOUILLE" IN 3 DIMENSIONS



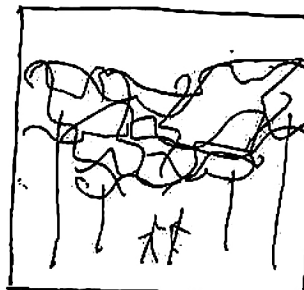
FOR EXAMPLE WITH WIRE



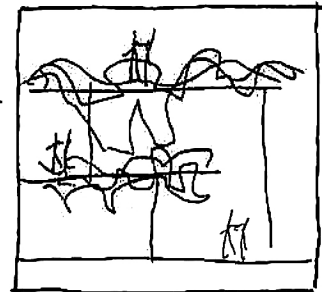
A 3-DIMENSIONAL GRIBOUILLE



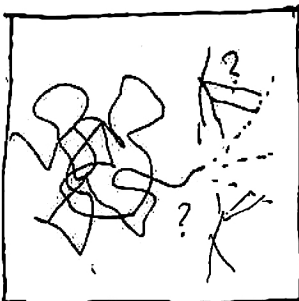
IS, IN THE SAME TIME, A SCULPTURE



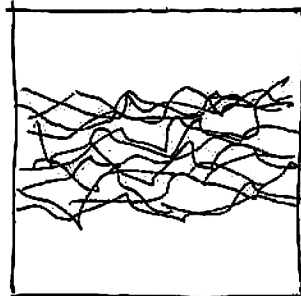
OR AN IRREGULAR SPACE-FRAME STRUCTURE



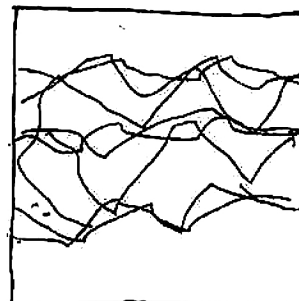
IMPLEMENTABLE IN ARCHITECTURE OR IN ENGINEERING



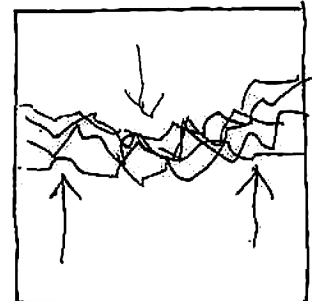
THERE ARE NO RULES HOW TO DO A 3-DIMENSIONAL GRIBOUILLE



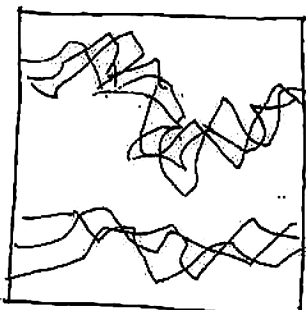
YOU CAN LOOK AT IT AS A MATERIAL MADE WITH FIBRE



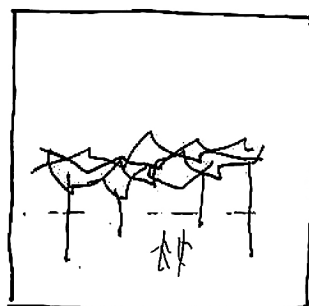
AND THE CONFIGURATIONS OF WHICH



IMPLY ITS SOLIDITY



YOU CAN MAKE ANY SHAPE WITH THIS MATERIAL



ROOFS

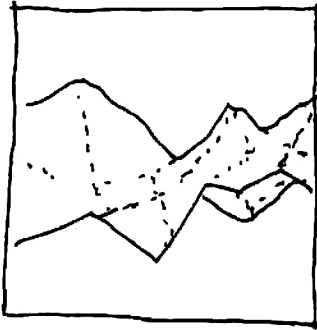


TOWERS

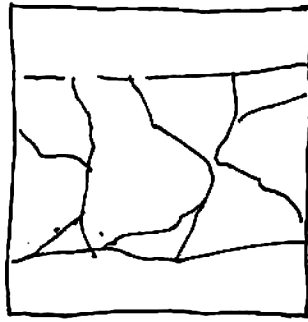


AND EVEN FIGURES

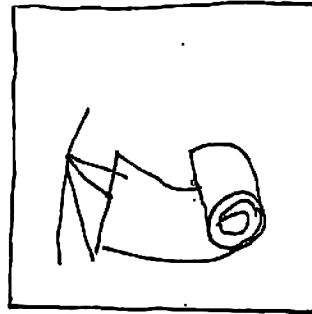
CRUMPLED SHEETS



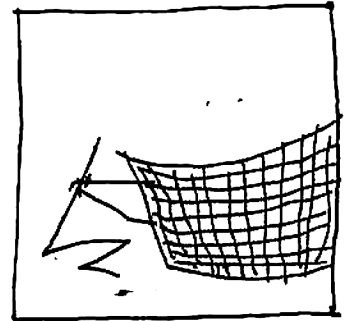
CRUMPLED SHEETS ARE A PLYWORK STRUCTURE



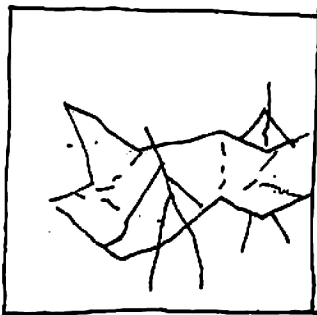
WITH NO REGULAR PATTERN



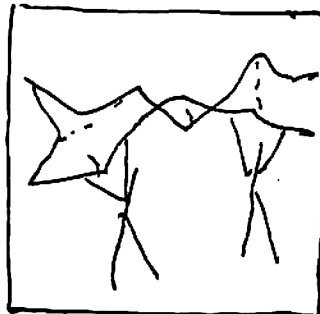
YOU TAKE SIMPLY A FOIL, OF A MATERIAL THAT KEEPS FORM



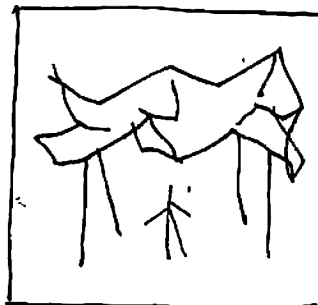
FOR EXAMPLE LIGHT METAL GRID



YOU BEND THIS FOIL AND CRUMPLE IT AT YOUR PLEASURE



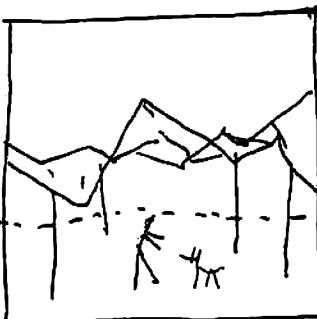
THE CRUMPLED SHEET RESULTING IS A STRUCTURE



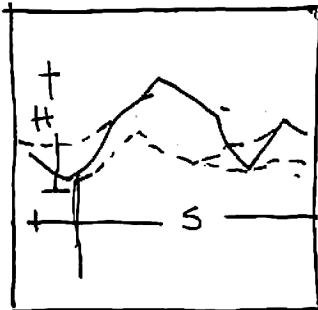
YOU CAN USE AS A SHADE ROOF



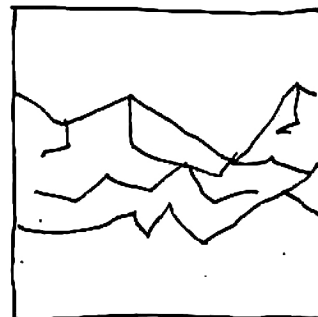
OR AS THE SUPPORT FOR THE "ROOF SKIN" FOR EXAMPLE, HANGING ON IT



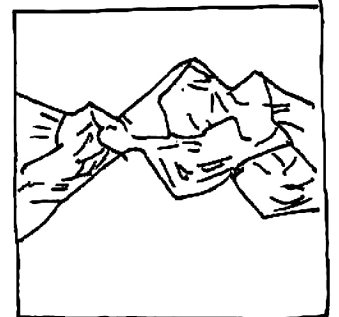
THE SOLIDITY OF THE CRUMPLED SHEET COMES OF ITS WAVE AMPLITUDE:



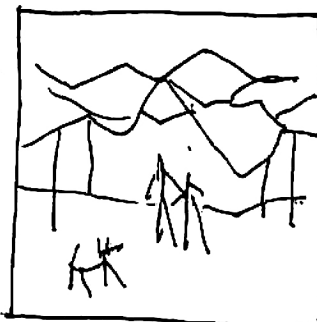
THE PATTERN SHOULD BE HIGH, FOR EXAMPLE  $H \approx 1/3 S$



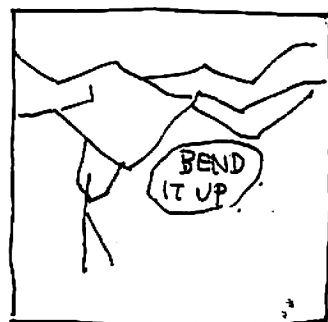
AND THE WAVES SHOULD NOT BE PARALLEL



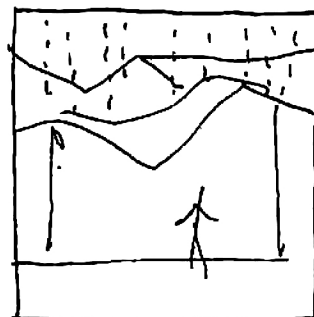
THE SMALL BENDS DISTRIBUTE THE STRESSES



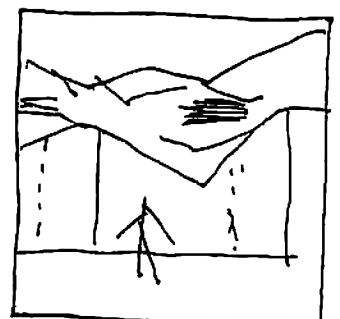
A CRUMPLED SHEET ROOF CAN BE BEAUTIFUL



AND STRONG. IT CAN BE EASILY REMODELED WHEN NEEDED



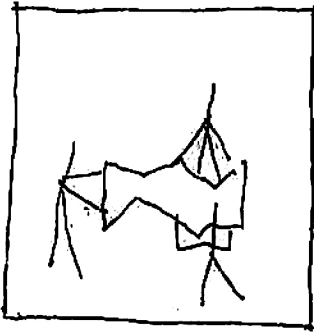
BUT IT CAN NOT SERVE AS ROOF SKIN ITSELF



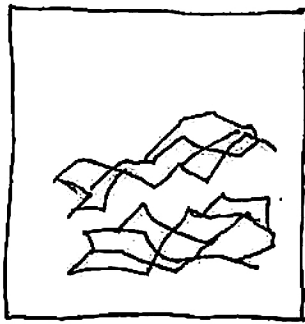
AS IN SPOTS THE RAINWATER WOULD ACCUMULATE



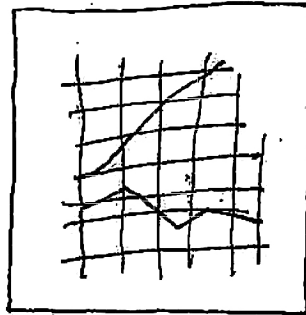
# IRREGULAR STRUCTURES



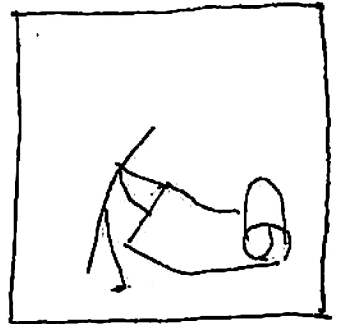
IRREGULAR  
STRUCTURES  
CAN BE BUILT  
EASILY



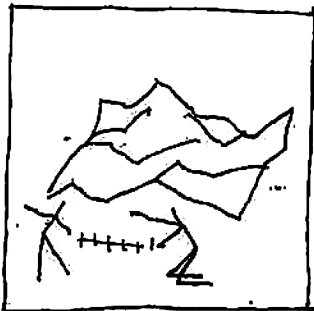
BUT IT IS DIFFICULT  
TO DRAW THEM  
ON PAPER



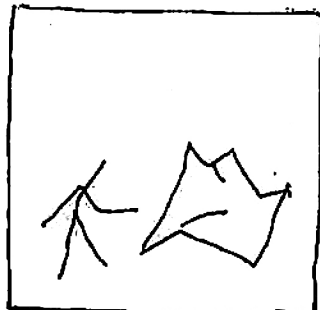
THEY DON'T FOLLOW  
RULES & THEREFORE  
EASY TO FORMULATE



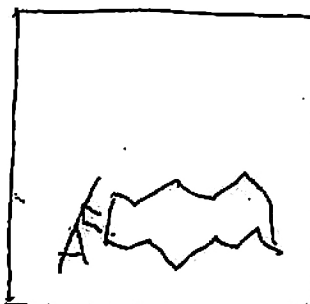
BUT THERE ARE  
METHODS  
TO BE APPLIED  
WHEN BUILDING



IT IS IMPORTANT  
THAT SUCH STRUCTURES  
DON'T ASK FOR  
PRECISION



THEY ADMIT CERTAIN  
NEGLIGENCE IN  
IMPLEMENTATION,  
WHAT THE PROFESSIONAL  
WOULD NOT TOLERATE



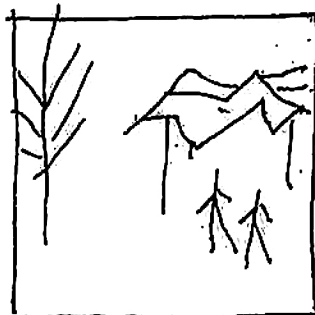
THUS LAYMEN ARE  
CAPABLE  
TO IMPLEMENT THEM



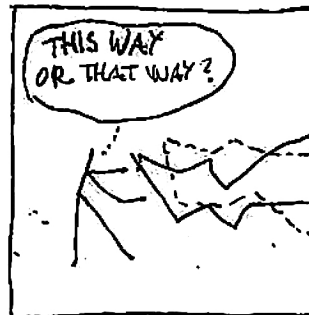
THESE STRUCTURES  
CAN NOT BE SHOWN  
COMPLETELY  
EVEN IN MODELS



YOU CAN TEST THEM  
ONLY IN FULL SCALE



ON THE SITE



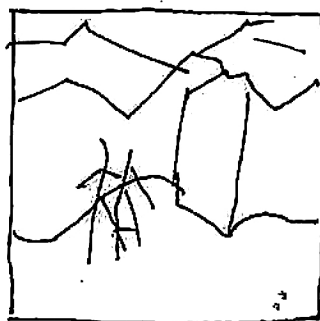
IRREGULAR STRUCTURES  
ARE OPEN  
TO IMPROVISATION



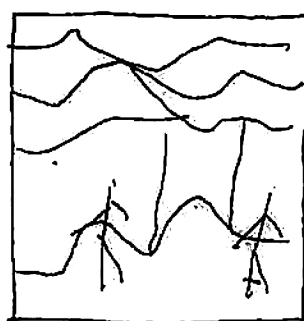
TO CONTINUOUS  
CHANGE



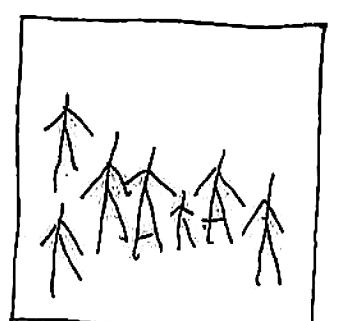
THEY HAVE  
NO FINAL STATE



THEY ARE  
ONGOING PROCESSES

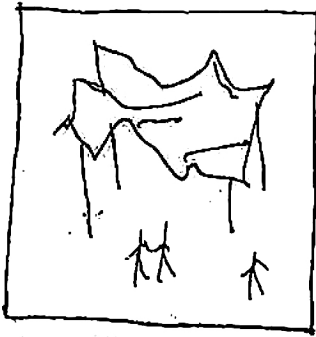


AND OPEN UP  
A "SOFT"  
ARCHITECTURE

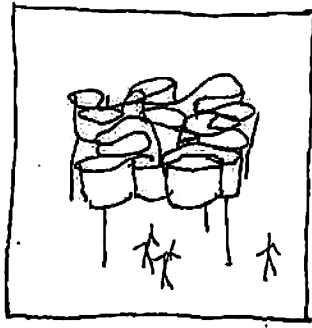


WHICH FITS BEST  
A "SOFT" SOCIETY

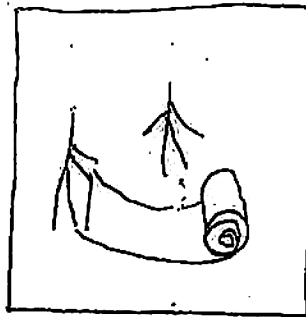
MATERIALS



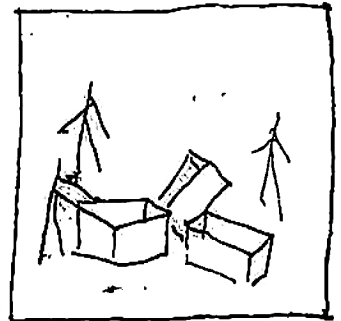
AS IRREGULAR STRUCTURES HAVE TO BE TESTED AT FULL SCALE



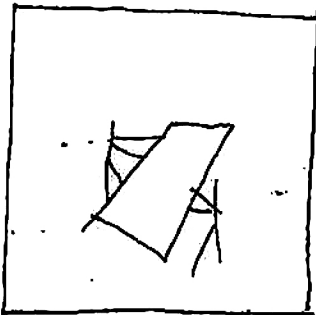
FULL SCALE MODELS CAN BE MADE WITH CARD BOARD



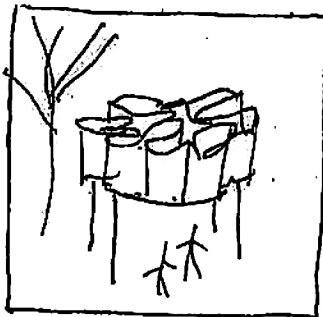
WITH ROLS



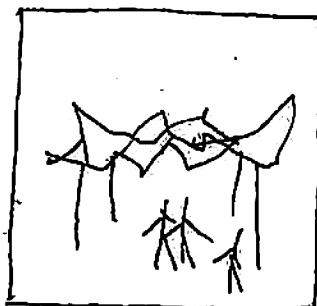
WITH BOXES



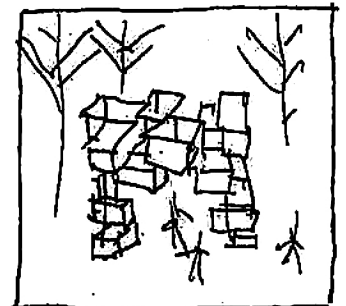
WITH PLATES



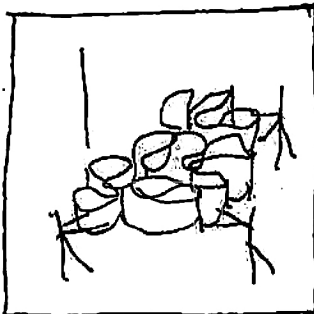
SUCH FULL SCALE DUMMIES INDICATE PHYSICAL QUALITIES OF SHAPES



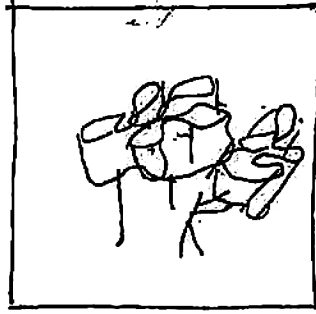
ESTHETIC QUALITIES OF THE ARCHITECTURAL OBJECT TO BE BUILT



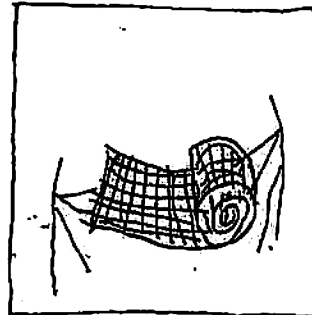
AND CAN EVEN BE USED AS EPHEMEROUS CONSTRUCTIONS



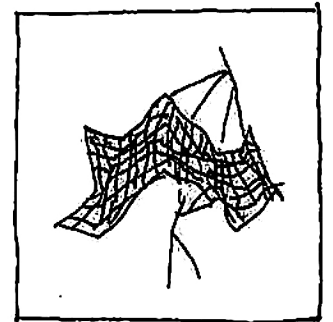
FULL SCALE CARDBOARD MODELS



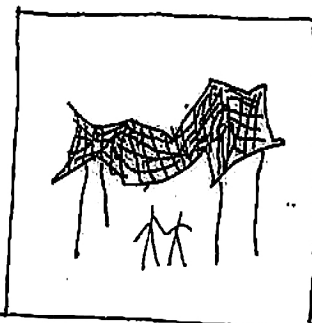
ALL THE MEANS FOR "TRIAL AND ERROR"



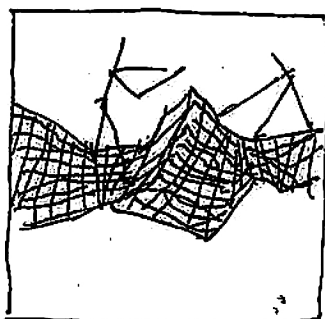
ANOTHER MATERIAL CAN BE USED: LIGHT METAL GRIDS



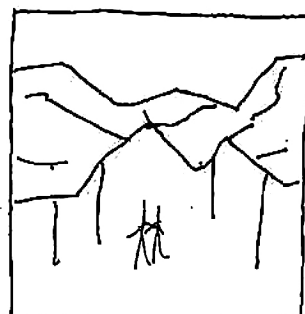
WHICH CAN BE FORMED BY BARE HANDS



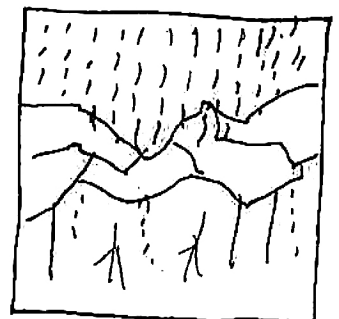
CONSTRUCTIONS MADE WITH METAL GRIDS



ARE LESS EPHEMEROUS: THEY KEEP LONGER

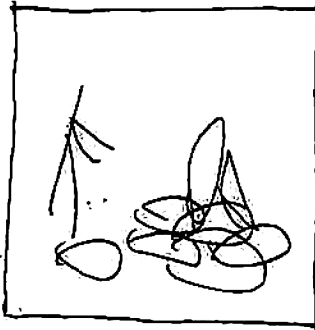


METAL GRID FOILS CAN BE COMBINED WITH SOFT PLASTICS

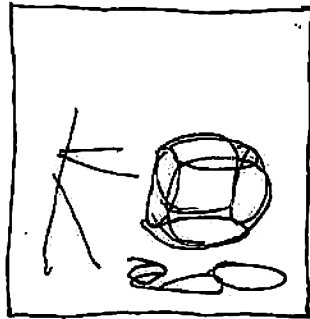


AND ARE ABLE TO BE USED AS OPEN SHELTERS

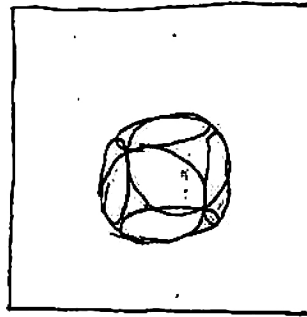
PROTEINIC CHAINS



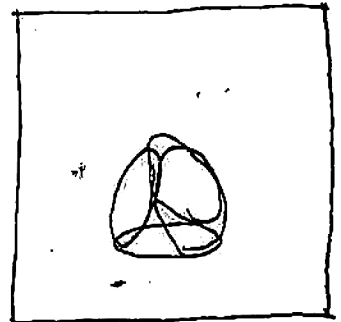
YOU CAN BUILD IRREGULAR STRUCTURES SIMPLY WITH RINGS



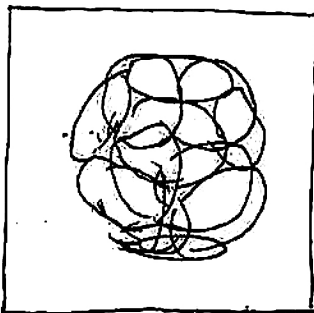
YOU HAVE TO START WITH REGULAR POLYHEDRA.



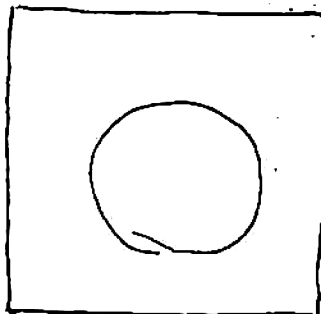
FOR EXAMPLE: A CUBE WHEREIN THE RINGS SUBSTITUTE THE SQUARES



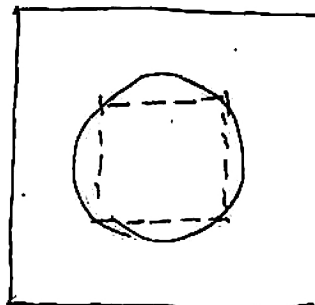
OR A TETRAHEDRON THE TRIANGLES OF WHICH ARE REPRESENTED BY CERCLES



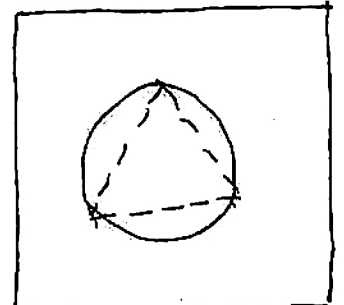
OR A DODECAHEDRON WITH CERCLES FOR ITS PENTAGONS ETC I CALL THIS TECHNIQUE "SPACE-CHAINS"



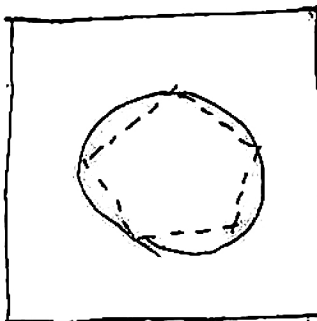
BUT A CERCLE IS AN UNDEFINED FIGURE.



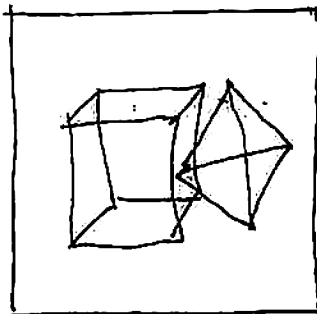
IT CAN STAND FOR A SQUARE



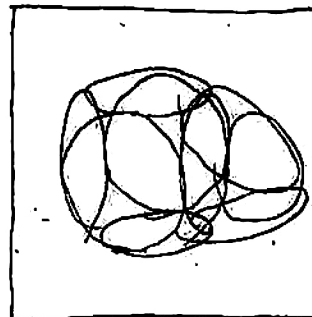
FOR A TRIANGLE



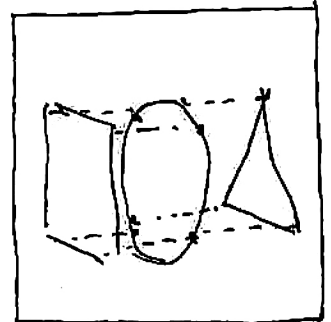
OR FOR A PENTAGONE



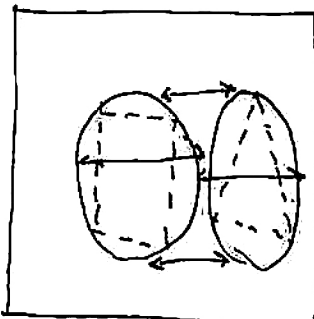
YOU CAN NOT LINK A CUBE TO A TETRAHEDRON (A SQUARE IS NOT A TRIANGLE)



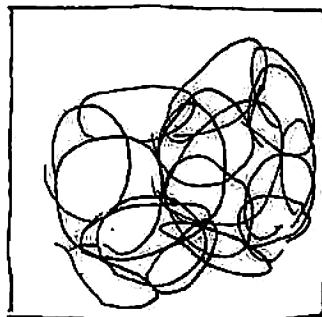
BUT, WITH THE SPACE-CHAIN TECHNIQUE YOU CAN DO IT



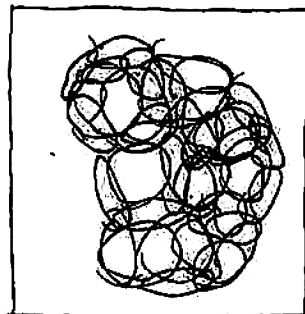
A RING IS A RING. IT CAN BE A SQUARE FROM ONE SIDE AND A TRIANGLE FROM THE OTHER



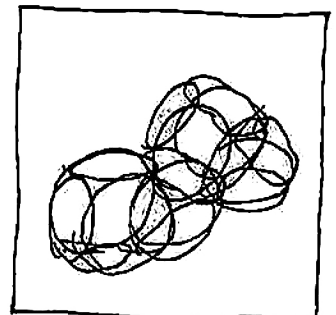
YOU CAN LINK ANY CERCLE-FACED POLYHEDRON TO ANY OTHER



THERE IS NO MORE GEOMETRIC RULE FOR SPACE-CHAINS

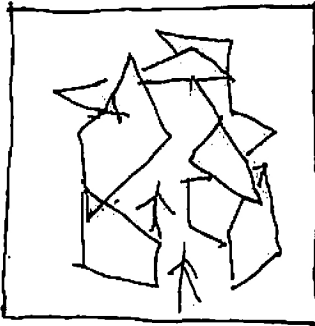


AND WILD COMBINATIONS BECOME POSSIBLE

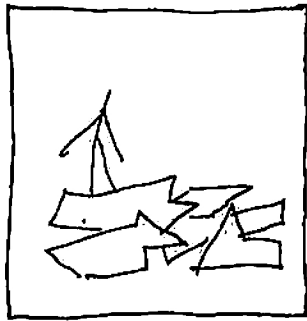


I CALL THESE WILD STRUCTURES "PROTEINIC" ONES

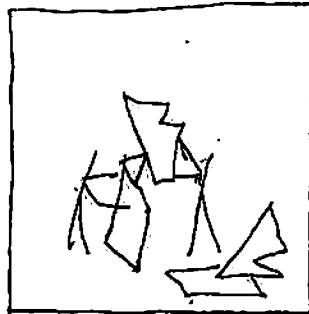
MERZ STRUKTUREN



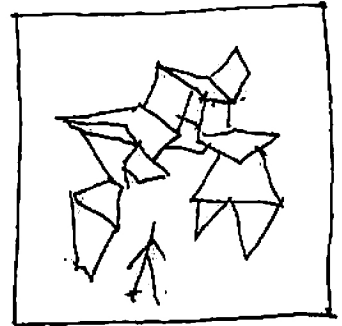
THERE ARE STRUCTURES I CALL "MERZ-STRUKTUREN" AS A HOMMAGE TO THE "MERZBAU" OF KURT SCHWITTERS



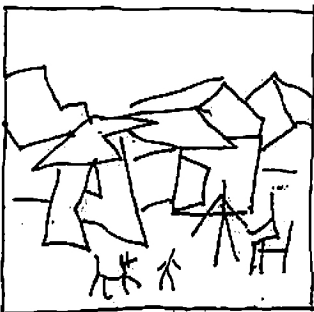
THEY ARE CONSTRUCTED FROM ODD PIECES OF ANY MATERIAL: WOOD, METAL, GLASS, CARDBOARD OR PLASTICS



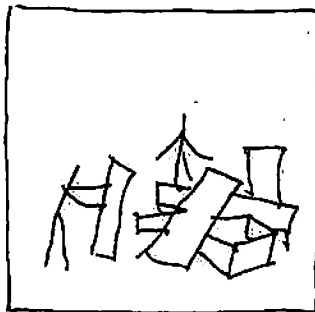
WHICH ARE ASSEMBLED IN WHATEVER WAY THEY CAN FIT



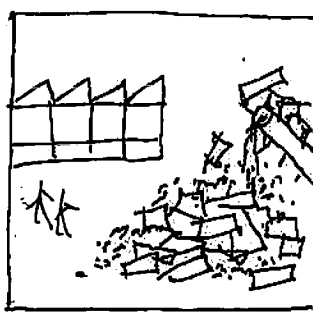
PROVIDED THAT THE STRUCTURE KEEPS UP STANDING



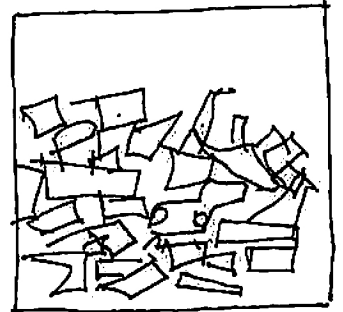
OBVIOUSLY, SUCH STRUCTURES CHARACTERIZE, FIRST OF ALL, THE SHANTYTOWNS



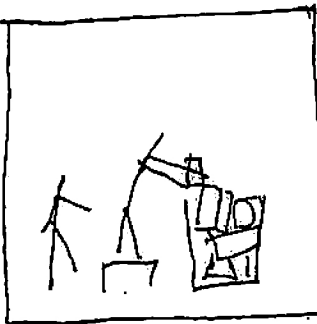
WHERE PEOPLE HAVE TO USE, FOR THEIR HOMES, WHATEVER THEY FIND



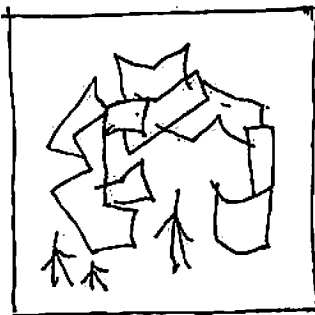
IN OUR INDUSTRIAL CIVILISATION THE PRODUCT PRODUCED IN THE LARGEST QUANTITY, IS REFUSE, IS INDUSTRIAL FALLOUT



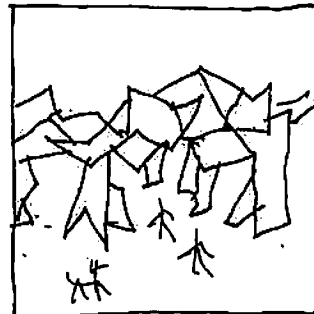
IT IS THE RICHEST RAW MATERIAL OF OUR EPOCH.



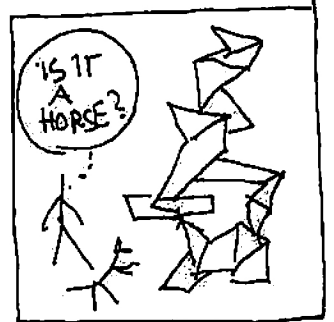
WHATEVER YOU WANT TO BUILD YOU CAN FIND MATERIAL FOR IN THE DUSTBINS



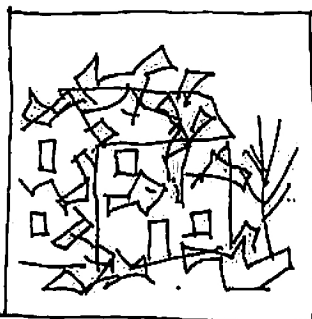
IT IS THE MOST PHANTASTIC SHAPES YOU CAN BUILD WITH



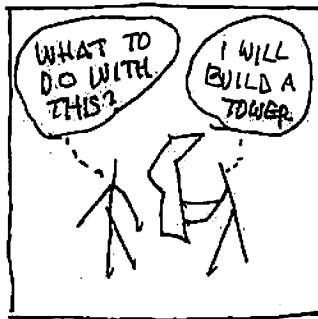
SHELTERS



MONUMENTS



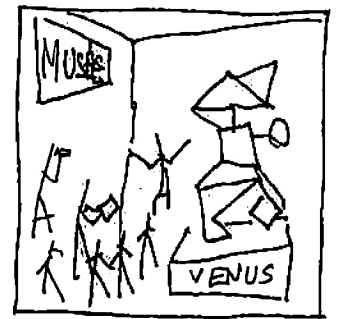
OR SIMPLY EMBELLISHMENTS



YOU CANNOT PLAN, ONLY IMPROVISE

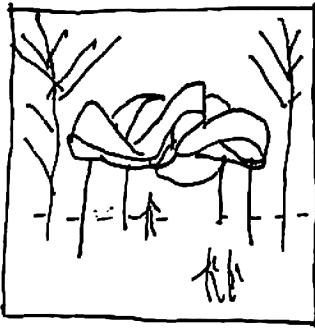


RANDOM COLLECTIONS OF THINGS ASSEMBLED FOR A SPECIFIC GOAL

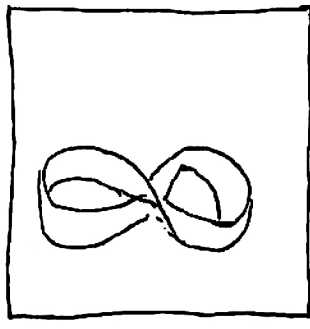


IS A WAY TO DEFINE "MODERN" (OR WHATEVER) ART

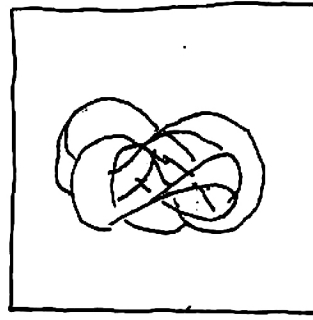
# MOEBIAN STRUCTURES



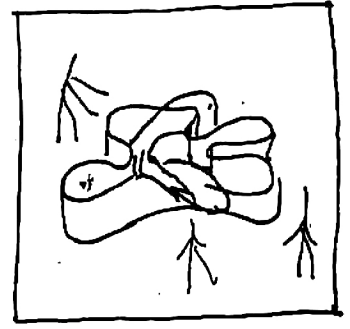
A PARTICULAR KIND OF LAMELLAR STRUCTURES MADE WITH RIBBONS



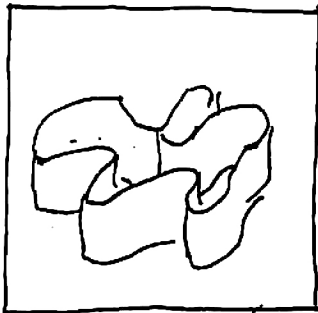
ARE BASED ON THE "MOEBIUS" BAND:



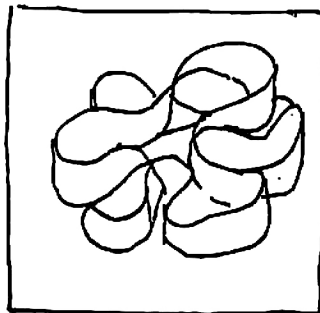
"MOEBIAN STRUCTURES"



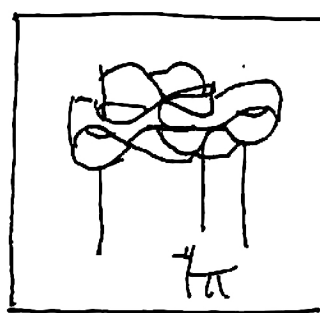
THESE STRUCTURES START WITH BAND CONFIGURATIONS, LIKE OTHER LAMELLARS



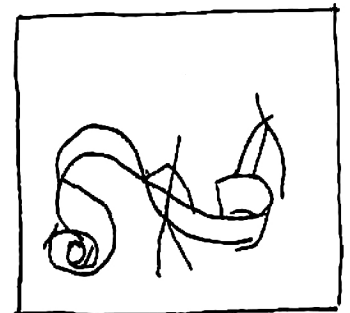
BUT HERE, BESIDE MAKING SIMPLE LOOPS



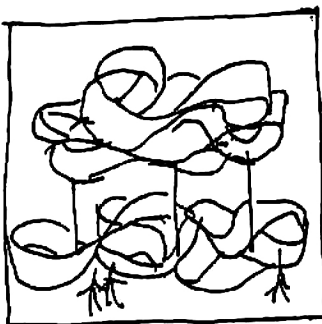
YOU HAVE TO TWIST THE RIBBON PERIODICALLY



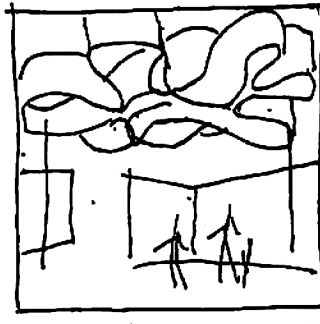
MOEBIAN STRUCTURES ARE NOT MORE SOLID THAN OTHER LAMELLARS



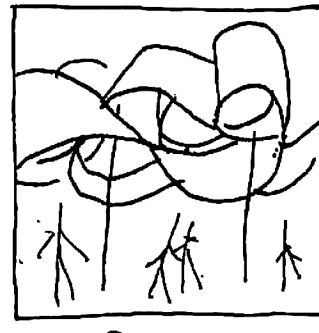
NEITHER MORE EASY TO BUILD



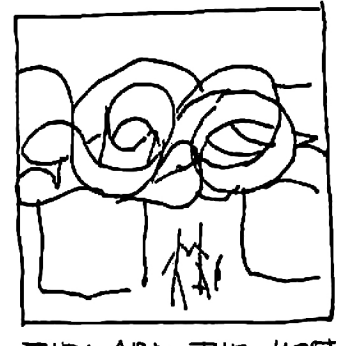
BUT THEIR ESTHETIC VOCABULARY IS FAR MORE RICH



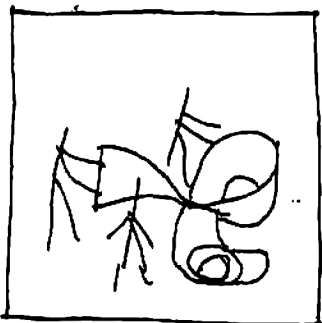
THEY SCATTER LIGHT INSIDE



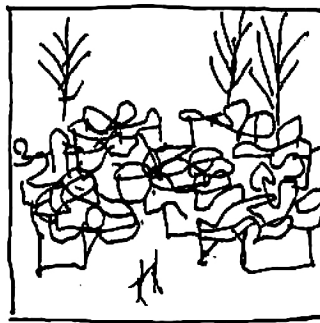
AND PRODUCE SPACES UNHEARD OF



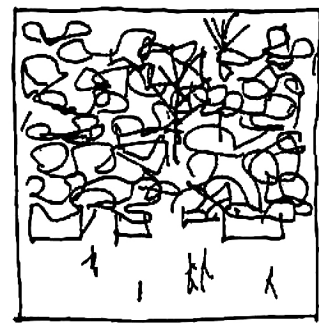
THEY ARE THE MOST BAROQUE STRUCTURES EVER MADE IN ARCHITECTURE



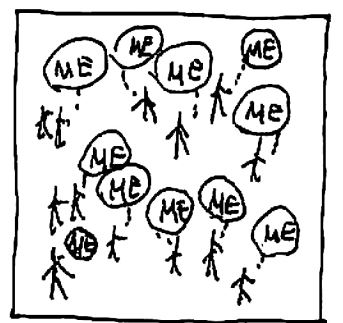
IT IS THEREFORE THAT THEY SERVE INDIVIDUALISM



BUT A VERY LARGE NUMBER OF THEM REDUCES THIS EFFECT

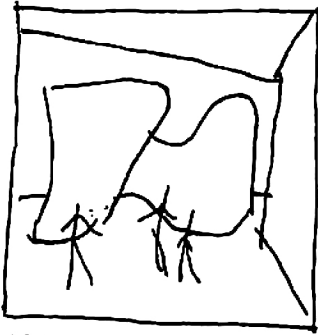


THEY PRODUCE (LIKE ALL BAROQUE) MONOTONY

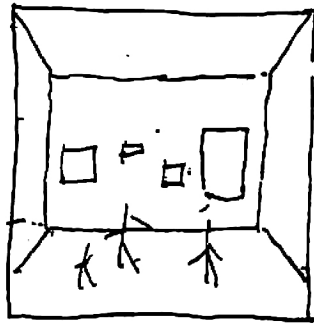


"MASS-INDIVIDUALISM" IS A BAROQUE PHENOMENON

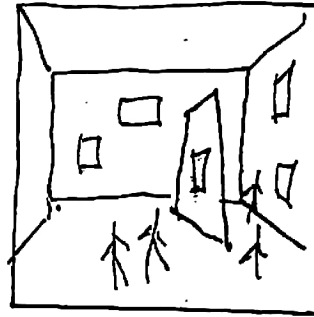
IKONOSTASES



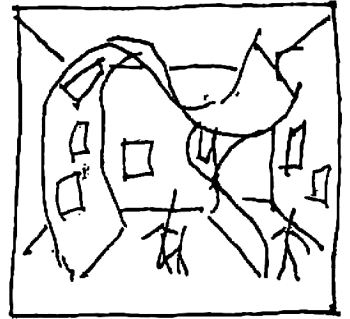
IRREGULAR STRUCTURES CAN COMPLETELY TRANSFORM SPACES WITHIN EXISTING BUILDINGS



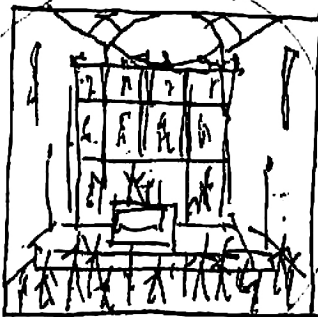
FOR EXAMPLE AN EXHIBITION ROOM



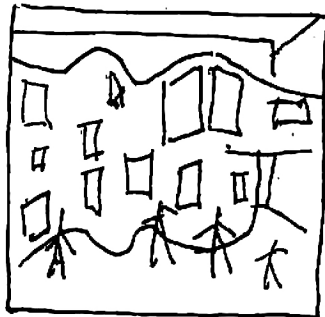
WHERE EXHIBITS ARE PRESENTED ON THE WALLS OR ON VERTICAL PANES



WOULD CHANGE COMPLETELY IF THE PRESENTATION SCREENS WOULD BE RESHAPED



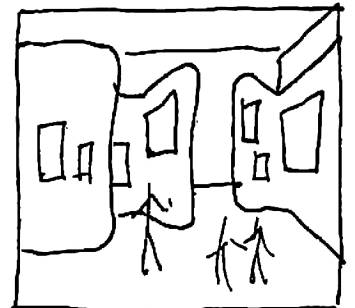
I CALL SUCH SCREENS "IKONOSTASES" AS THEY ARE CALLED IN ORTHODOX CHURCHES



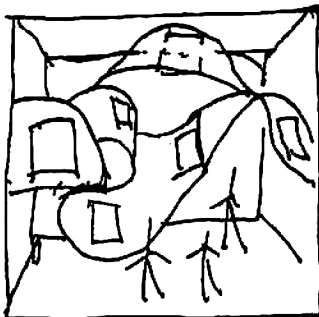
WE CAN PRODUCE EASILY IKONOSTASES OF ANY SHAPE:



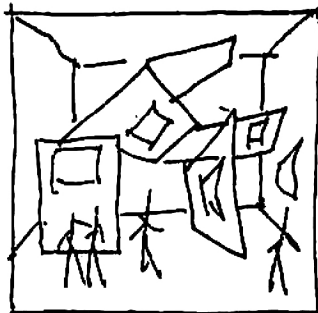
CRUMPLED ONES,



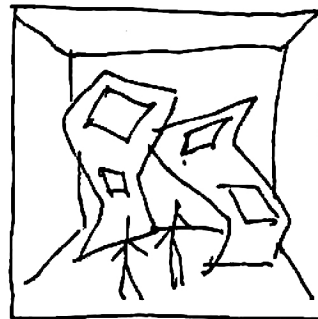
LAMELLARE ONES,



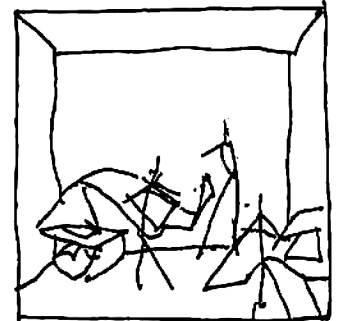
MOEBIANS



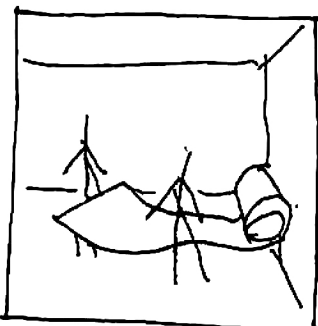
OR MERZIANS.



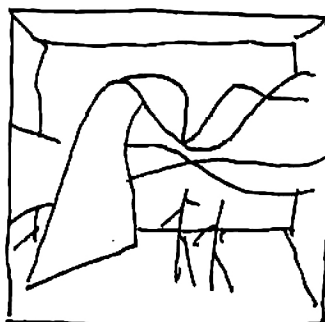
MAINLY VERTICALS



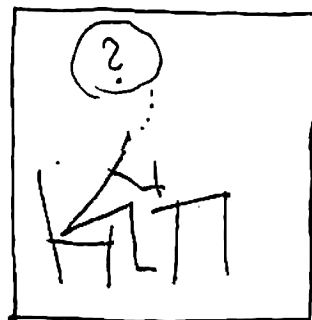
OR MAINLY HORIZONTAL.



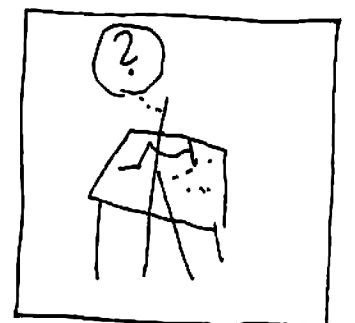
THE TECHNIQUES ARE THE SAME AS FOR ALL IRREGULAR STRUCTURES



BUT THE EMOTIONAL EFFECT OF SUCH SPACES

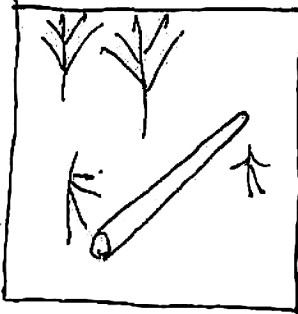


IS DIFFICULT TO DESCRIBE

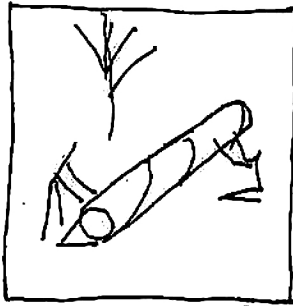


OR TO DRAW

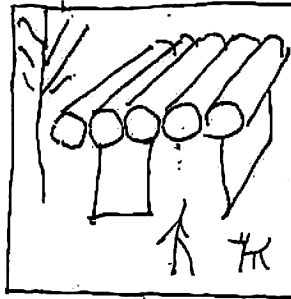
# TUBULAR STRUCTURES



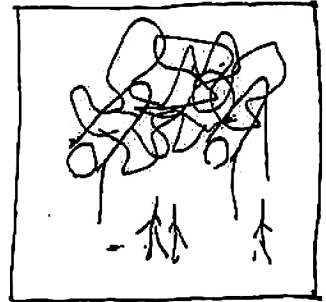
WITH CARDBOARD YOU CAN MAKE TUBES OF ANY DESIRED LENGTH



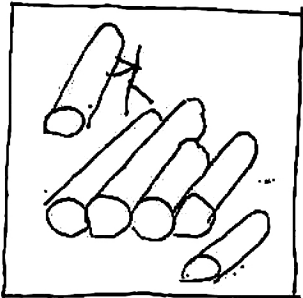
BY ROLLING THE SHEET DIAGONALLY



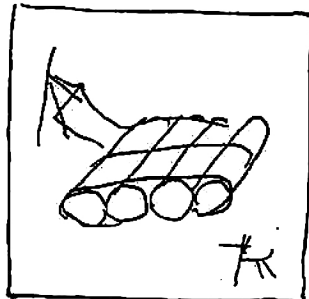
SUCH TUBES, ASSEMBLED, CAN FORM A ROOF SLAB



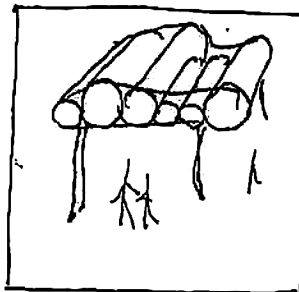
THEY CAN SERVE ALSO AS A GIRDER FOR LIGHTWEIGHT ROOFS



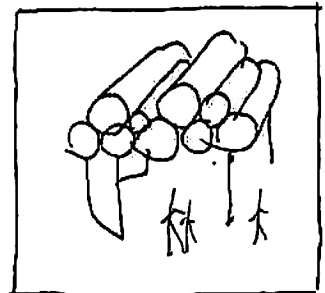
TUBULAR ROOF SLABS ARE EASY TO ASSEMBLE



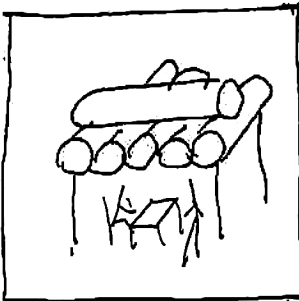
WRAPPING THE SLAB WITH TRANSPARENT PLASTIC FOILS TO MAKE THE SLAB WATERTIGHT



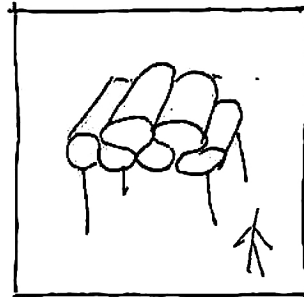
IT IS NOT NECESSARY THAT ALL THE TUBES BE OF THE SAME DIAMETER OR OF THE SAME LENGTH



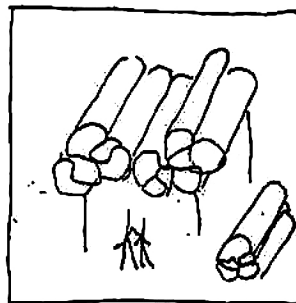
THE TUBES CAN BE DISPOSED ALSO IN SEVERAL LAYERS



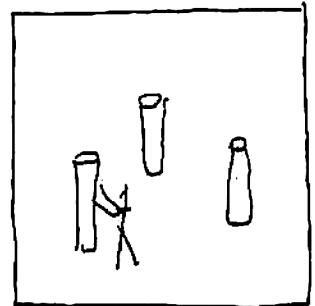
THE SLAB CAN BE BRACED WITH A TUBULAR TIER



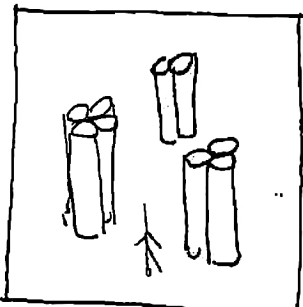
TUBULAR ROOFS ARE A SORT OF LAMELLAR STRUCTURES



THUS THE TUBES ARE NOT NECESSARILY CIRCULAR BUT OF A LAMELLAR SECTION



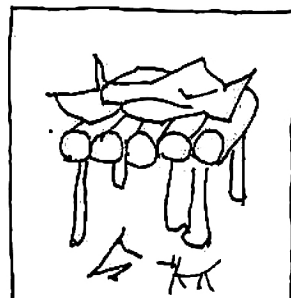
THEY CAN SERVE OBVIOUSLY ALSO AS PILLARS



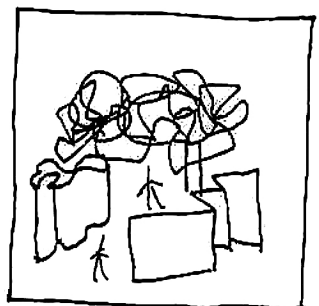
A BUNDLE OF TUBES



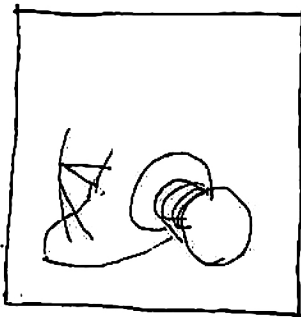
OR A LAMELLAR TUBE AND OTHER PILLARS



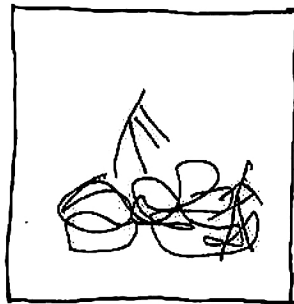
TUBULAR STRUCTURES COMBINE WELL WITH OTHER KINDS



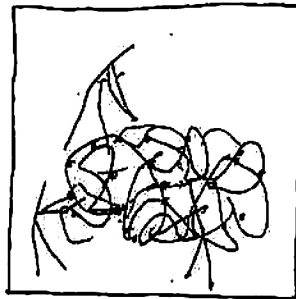
COMPLETING THE "FAMILY"



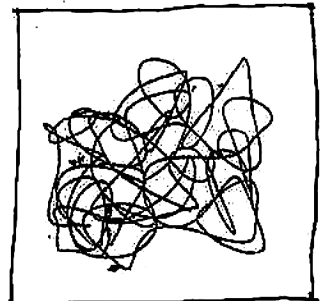
YOU SHOULD TAKE  
A ROLL  
OF THICK WIRE



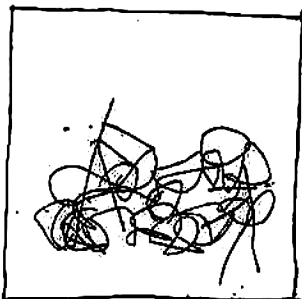
AND ENTANGLE IT



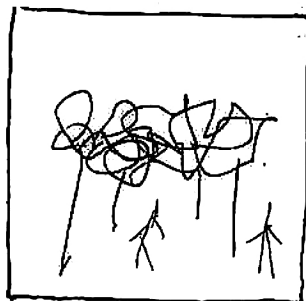
FASTEN  
THE CROSSINGS  
OF THE TANGLED  
WIRE



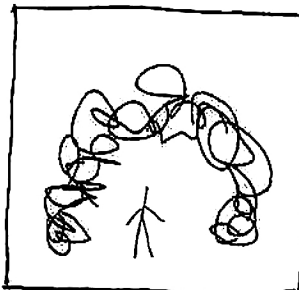
MAKE IT  
AS CAPRICIOUS  
AS YOU CAN



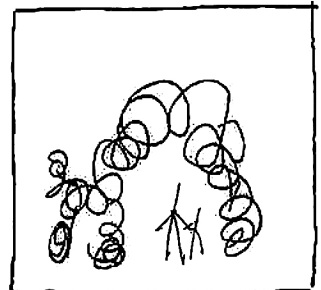
THE TANGLED WIRE  
FORMS THUS  
A SORT OF A SLAB



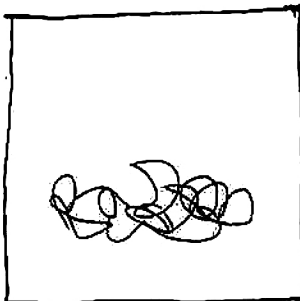
WHAT YOU CAN USE  
AS A FLAT  
ROOF SUPPORTING  
STRUCTURE



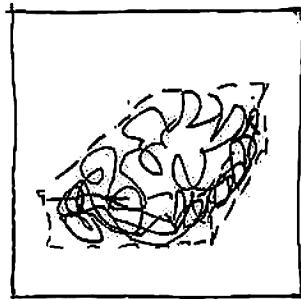
YOU CAN AS WELL  
BEND  
THE TANGLED WIRE  
SLAB  
AND HAVE A VAULT



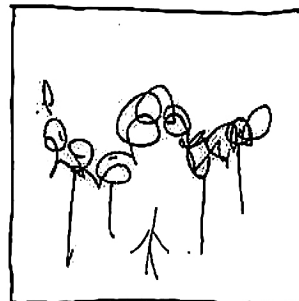
OR ANY OTHER  
SHELL STRUCTURE



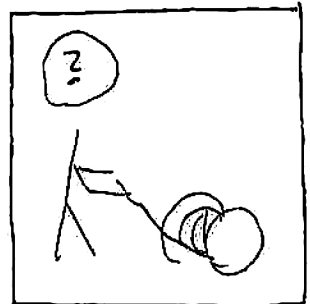
THE TANGLED WIRE  
STRUCTURE



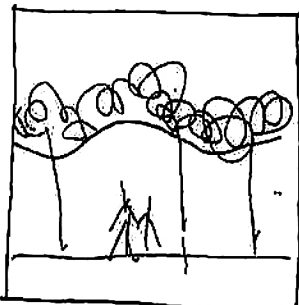
BEHAVES LIKE  
A THICK SHEET  
OF "MACRO-MATERIAL"



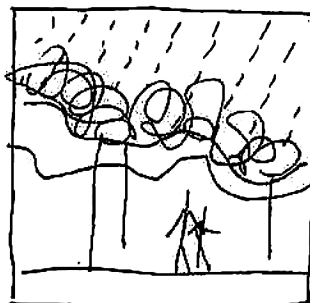
YOU CAN MAKE  
EVEN CRUMPLED  
STRUCTURES  
OUT OF IT



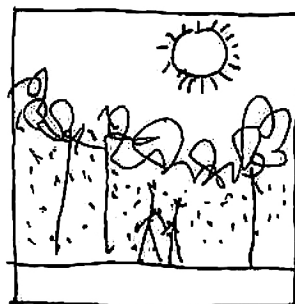
IT IS THE MOST  
IMPROVISED  
STRUCTURE  
WE CAN IMAGINE



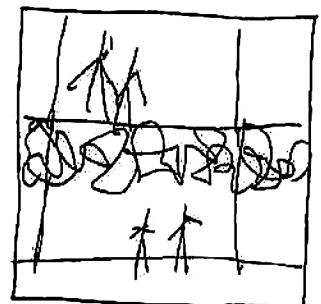
SUPPORTING  
SOFT PLASTIC FOIL



IT CAN SERVE  
AS A ROOF,



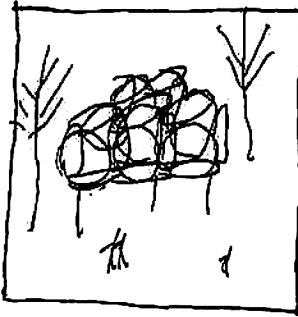
A SUN-SHADE,



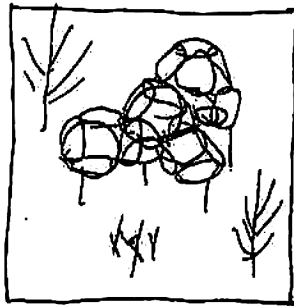
OR EVEN  
AS A FLOOR



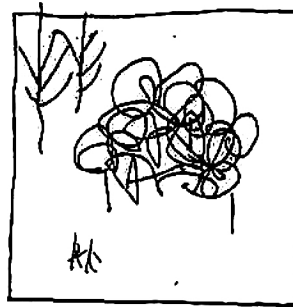
"PACKING"



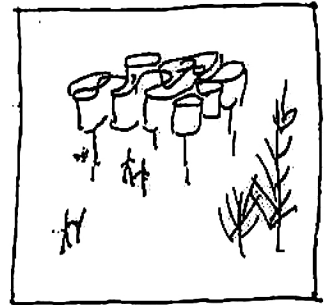
MOST IRREGULAR STRUCTURES ARE OF THE SKELETON TYPE:  
SPACE-CHAINS



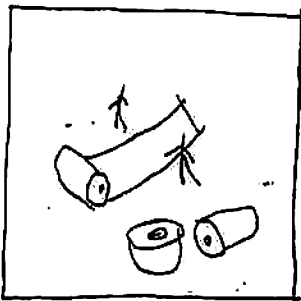
PROTEINIC CHAINS



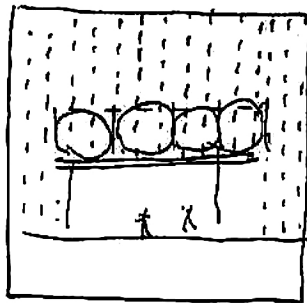
GRIBOULLI



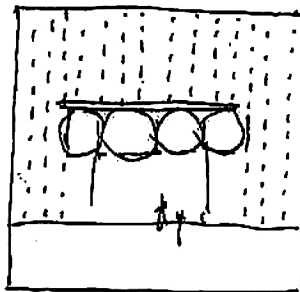
AND EVEN IN A CERTAIN WAY LAMELLAR STRUCTURES



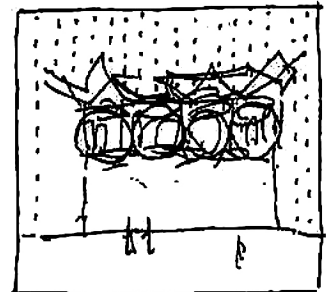
THEY ALL NEED A "ROOF-SKIN" FOR BEING USED PRACTICALLY



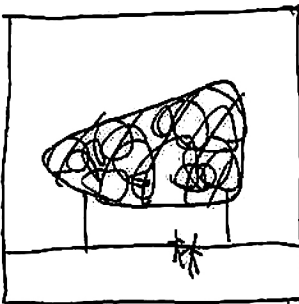
THE "ROOF-SKIN" CAN BE SUSPENDED



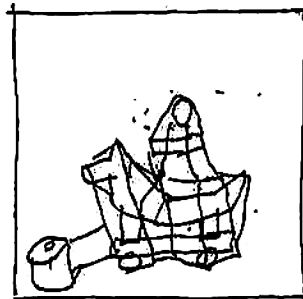
OR THE SKELETON CAN BEAR IT AT THE TOP



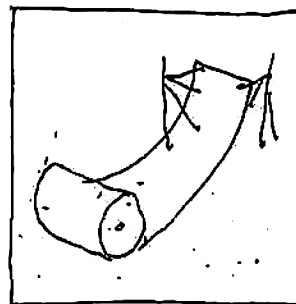
IN FORM OF CRUMPLED SHEET OR OTHER



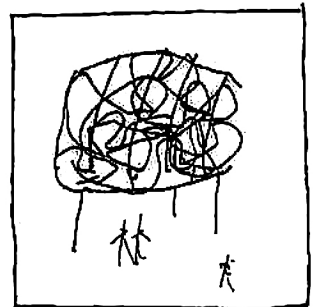
ANOTHER WAY TO TRANSFORM A SKELETON INTO ROOF IS "PACKING"



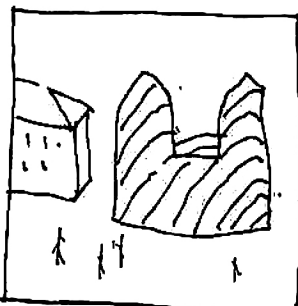
"PACKING" MEANS ENVELOPING AN OBJECT WITH A FOIL



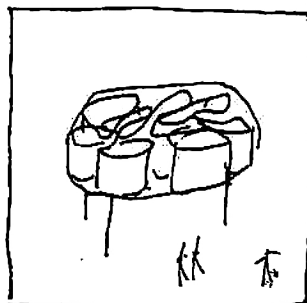
THE BEST WAY TO "PACK" A SKELETON IS TO USE TRANSPARENT SOFT PLASTIC FOIL



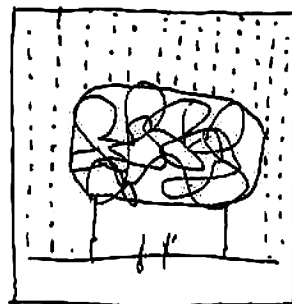
WRAPPED AROUND THE SKELETON



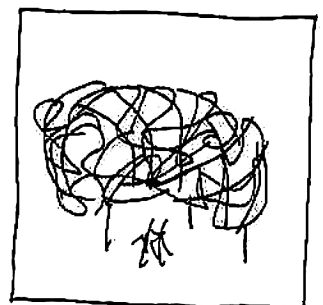
A WELL KNOWN ARTIST, CRISTO, "PACKED" EXISTING MONUMENTS AS A SORT OF ART



WE ARE "PACKING" SKELETON STRUCTURES TO MAKE THEM WATER-TIGHT

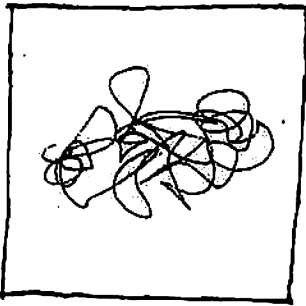


WATER-TIGHT

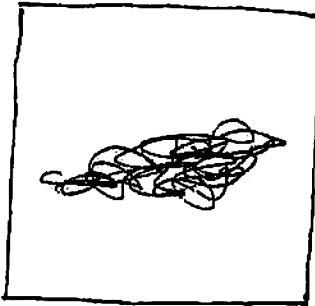


AND FOR MAKING THEM MORE BEAUTIFUL

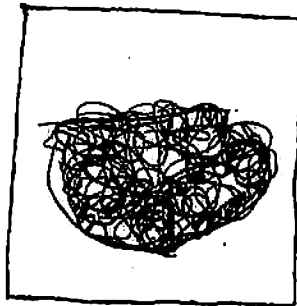
METAL - FELT



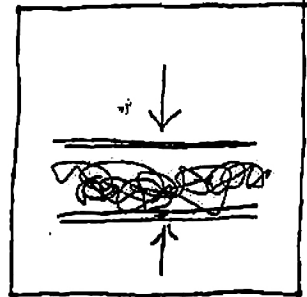
A PARTICULAR KIND OF THE "GRIBOUILLI"



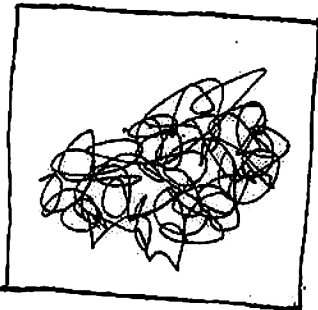
IS WHAT I CALL A "METAL-FELT"



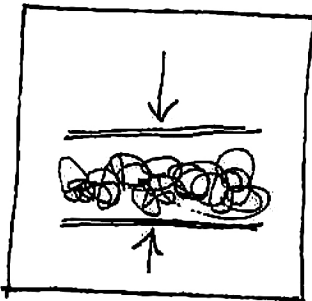
"FELT" IS THE NAME OF A TISSUE



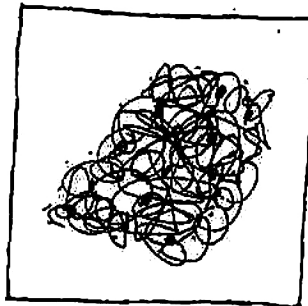
WHAT YOU CAN OBTAIN BY PRESSING ENTANGLED WOOL INTO A SHEET



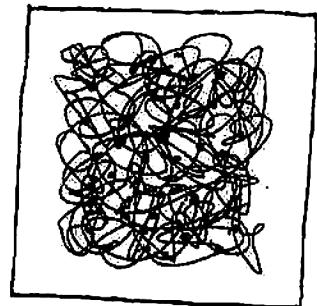
AS THE "GRIBOUILLI" IS NOTHING ELSE THAN ENTANGLED WIRE



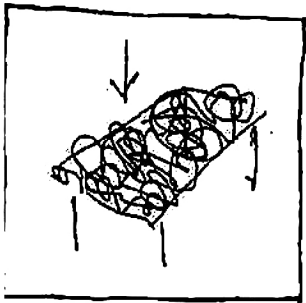
YOU CAN PRESS THAT TANGLE INTO A SHEET



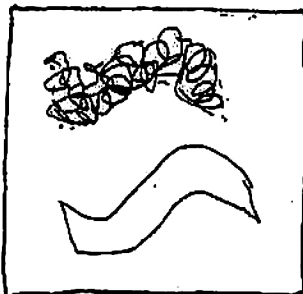
YOU SHOULD FIX THE TANGLED WIRE IN MANY SPOTS:



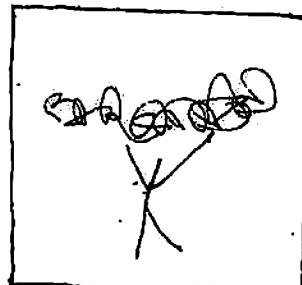
THE RESULT WILL BE AN IRREGULAR FELT



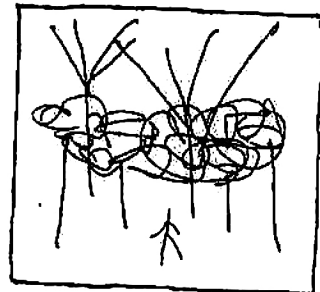
THIS "METAL-FELT" WILL BE FLAT AND VERY RESISTANT



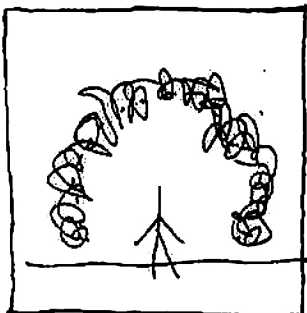
YOU CAN USE IT AS YOU WOULD DO WITH A FULL METAL SHEET: BEND IT, STRESS IT: ETC



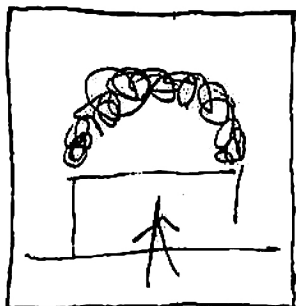
IT HAS THE ADVANTAGE TO BE VERY LIGHT AND SOLID



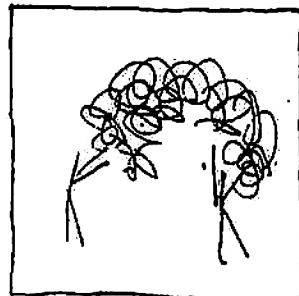
AND (OBVIOUSLY) TRANSPARENT



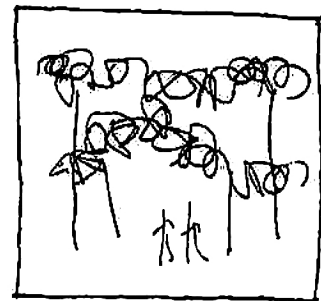
BUILDING A SHELL OF WHATEVER SHAPE



OR A DOME

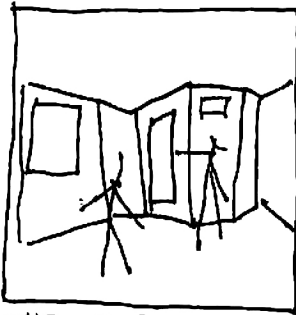


WITH "METAL-FELT" IS EASY TO DO

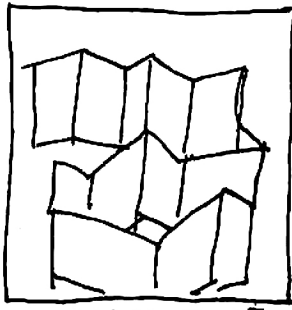


AND THE RESULT IS SURE TO BE BEAUTIFUL

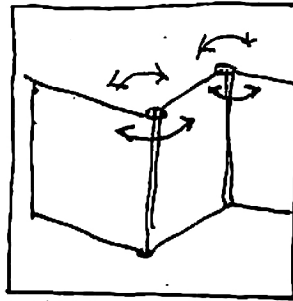
PANEL CHAINS



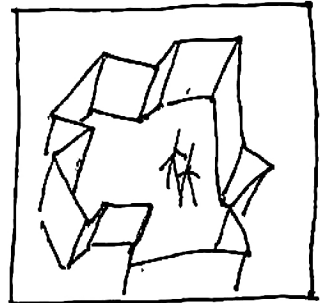
THE SIMPLEST  
IRREGULAR STRUCTURE  
I CALLED  
"PANEL-CHAIN"



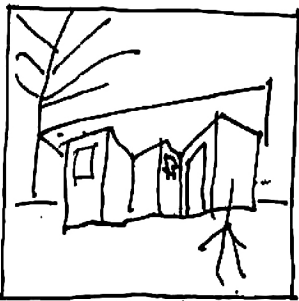
IT CONSISTS OF  
A RIBBON  
MADE WITH PANELS  
OF VARIOUS SIZES



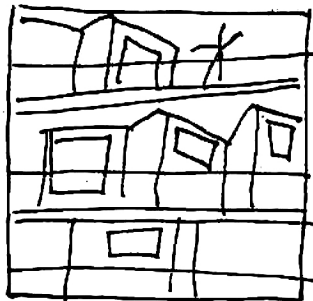
WHICH ARE LINKED  
TOGETHER  
WITH ELASTIC JOINTS



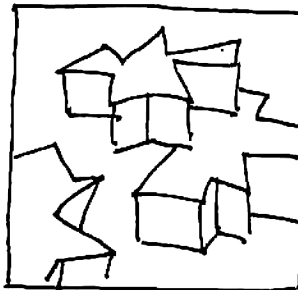
THUS THEY CAN BE  
DISPOSED  
ALONG ANY OUTLINE  
YOU WISH



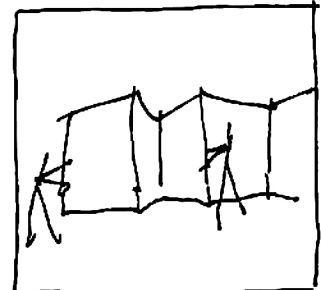
THE PANELS  
OF A PANEL-CHAIN  
ARE NOT NECESSARILY  
STRONG ENOUGH  
TO SUPPORT A ROOF



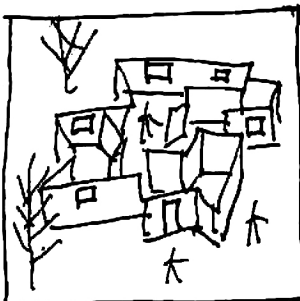
A PANEL CHAIN  
SERVES TO DEFINE  
AN ENCLOSURE



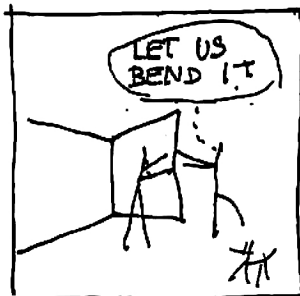
WITHIN A LARGE  
SKELETON,  
LIKE THE  
"VILLE SPATIALE"



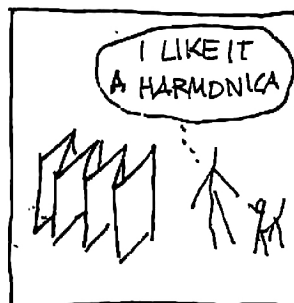
IT IS LIKE  
A FOLDING SCREEN



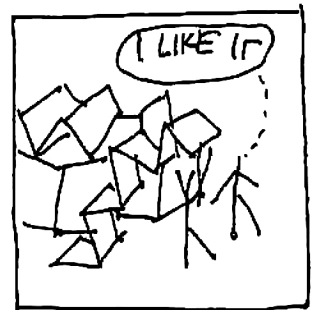
WHICH PERMITS  
TO INSTALL YOUR  
FLOOR PLAN



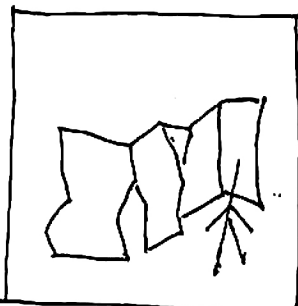
AND TO MODIFY  
IT WHENEVER  
DESIRED



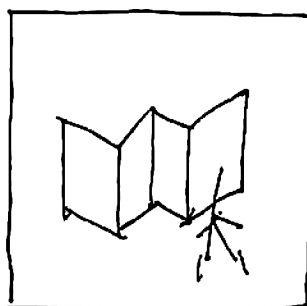
THERE ARE NO RULES  
HOW TO PUT  
THE PANEL-CHAIN



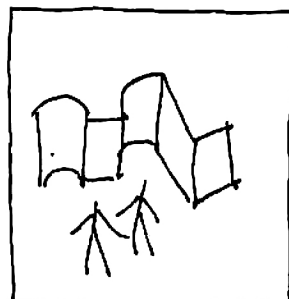
EXCEPT THOSE OF  
YOUR PREFERENCE



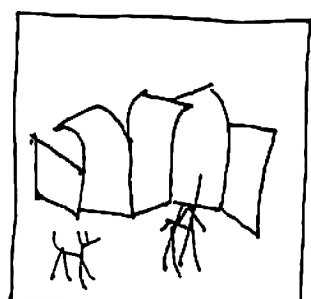
OBVIOUSLY THE PANELS  
OF THE CHAIN  
CAN BE OF ANY KINDS



PLAN ONES,

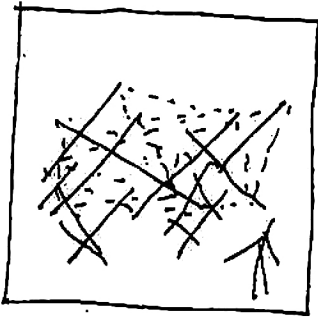


CURVED ONES

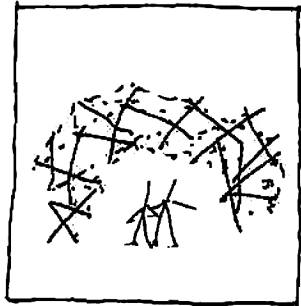


OR WHATEVER YOU  
WANT

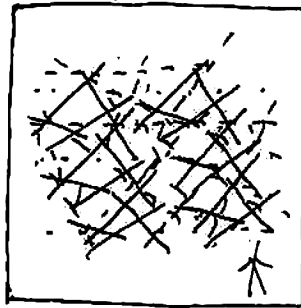
IRREGULAR TENSEGRITY



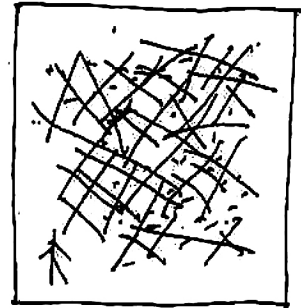
TENSEGRITY STRUCTURES WERE FIRST PUBLISHED - AS I KNOW - BY BUCKY FULLER



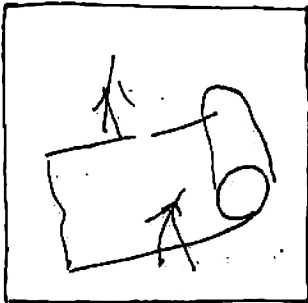
MANY RESEARCHERS WERE DEVELOPING FURTHER THAT IDEA



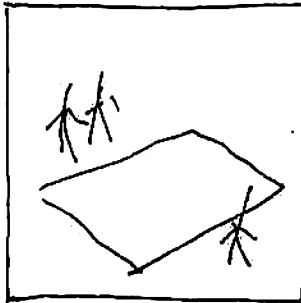
ALL THOSE STUDIES WERE BASED ON STRICT GEOMETRY



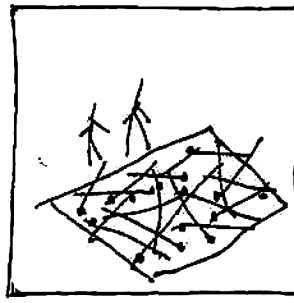
BUT IRREGULAR TENSEGRITIES CAN BE PRODUCED



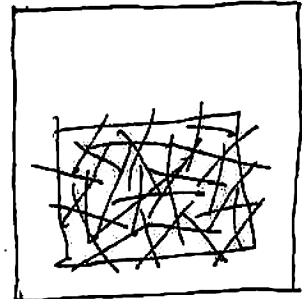
FOR IRREGULAR TENSEGRITIES MEMBRANES ARE USED INSTEAD OF ROPES



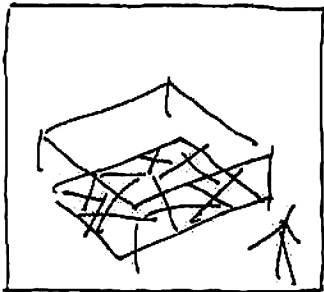
STRETCH OUT A SHEET OF SOFT PLASTIC FOIL



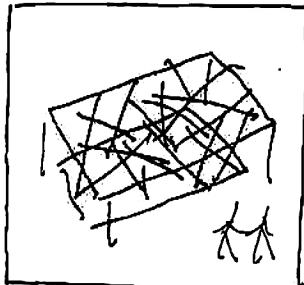
FIX THE PRESSURE RODS (I CALL THEM TENSORS) ON THAT SHEET BY ONE OF THEIR EXTREMITIES



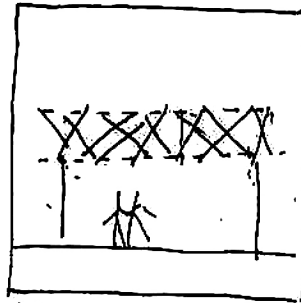
IN A CRISS-CROSS ORDER YOU LIKE



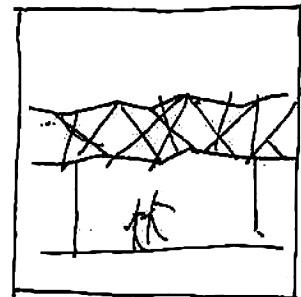
STRETCH A SECOND SHEET AT SOME HEIGHT ABOVE THE BOTTOM ONE



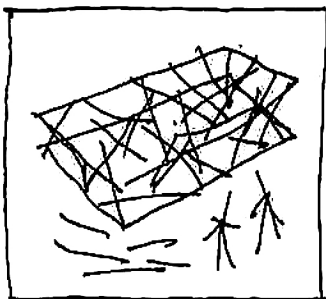
AND FIX THE FREE EXTREMITY OF THE TENSORS TO THE UPPER SHEET



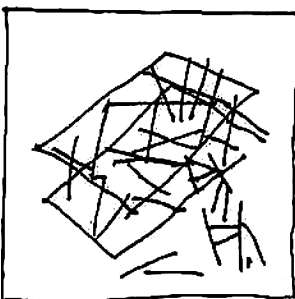
YOU GET THUS A STRUCTURE WITH THE RODS TAKING THE PRESSURE



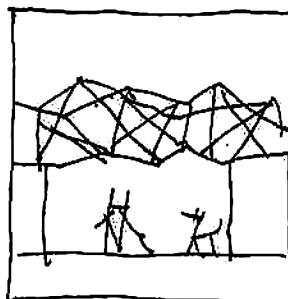
AND THE SHEETS THE TENSION SERVING IN THE SAME TIME AS ROOF-SKIN



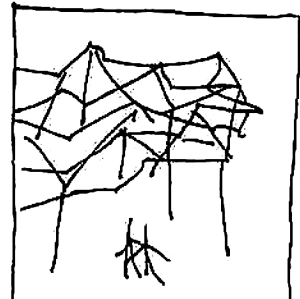
THE PATTERN OF THE RODS CAN BE



WHEN BUILDING YOU WILL SEE WHERE ROPE MIGHT LACK

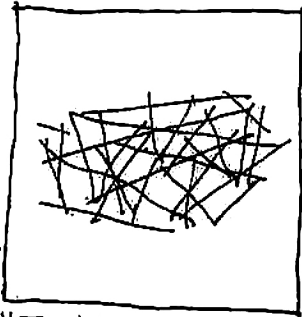


IT CAN BE A FANCY STRUCTURE

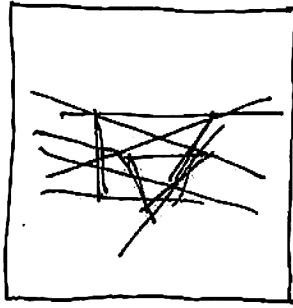


ON THE SITE HAVE BEEN BUILT IT

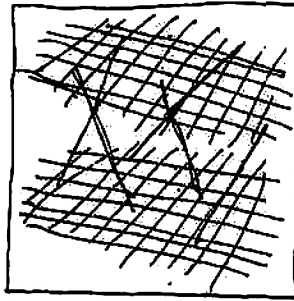
PSEUDO-TENSEGRITY



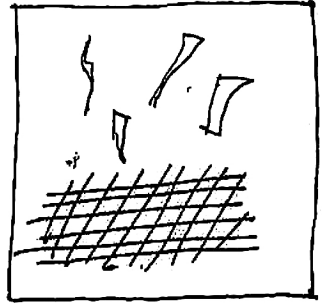
"TENSEGRITY" MEANS A STRUCTURE OF TENSION AND COMPRESSION MEMBERS



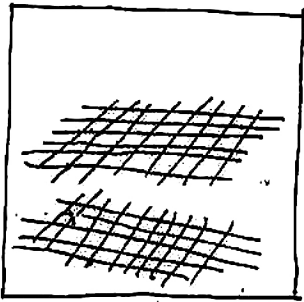
USUALLY IT IS MADE WITH ROPES AND WITH RODS



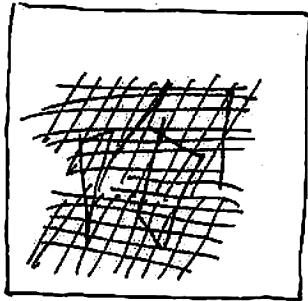
BUT IT CAN BE MADE ALSO WITH SOFT GRIDS AND STIFF COMPRESSION ELEMENTS



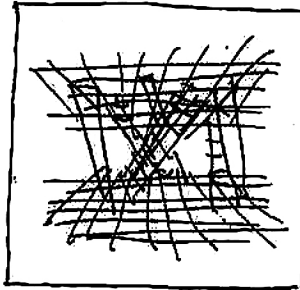
THUS GRIDS SUBSTITUTE THE ROPES AND THE RODS CAN BE OF ANY SHAPE



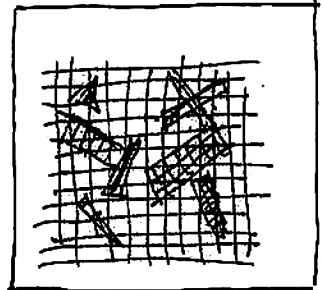
COMPOSITION OF A PSEUDO-TENSEGRITY STARTS WITH TWO LAYERS OF GRIDS



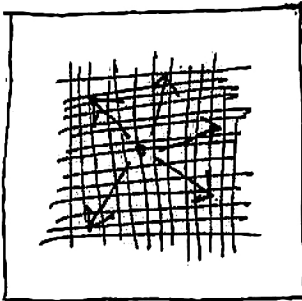
SPANNED WITH THE COMPRESSION MEMBERS



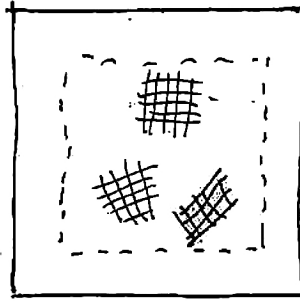
KEPT IN THEIR PLACE BY SMALLER PIECES OF GRID



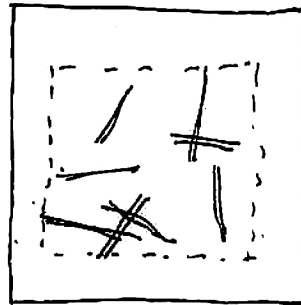
A PSEUDO-TENSEGRITY DOES NOT FOLLOW STRICT GEOMETRIC ORDER



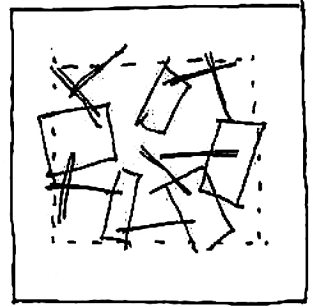
AS A GRID OPPOSITE TO A ROPE-NET DOES NOT IMPOSE PRIVILEGED AXES



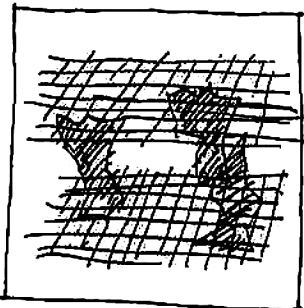
THUS ... BOTH THE TENSION MEMBERS



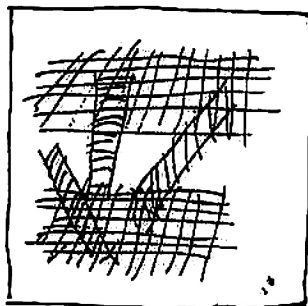
AND THOSE FOR COMPRESSION



CAN BE DISTRIBUTED IRREGULARLY



COMPRESSION MEMBERS OF ANY SHAPE



TENSION NETS ALONG ANY PATTERN

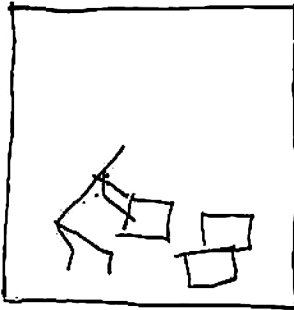


MAKE SUCH A STRUCTURE

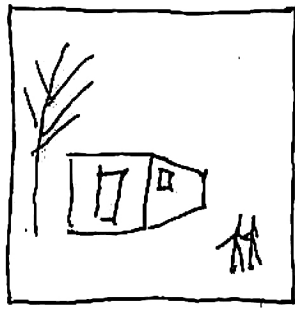


INTO A SORT OF ARTIFICIAL JUNGLE

THE "TRAIN"



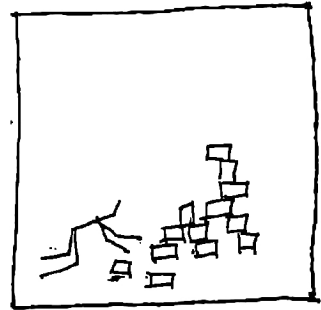
YOU CAN BUILD  
IRREGULAR STRUCTURES  
ALSO WITH REGULAR  
ELEMENTS



FOR EXAMPLE,  
WITH CONTAINERS



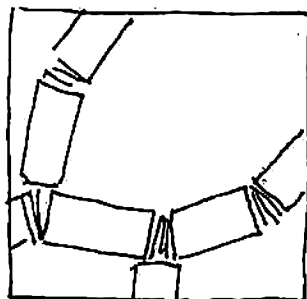
CONTAINERS  
CAN BE STOCKED  
IN HEAPS



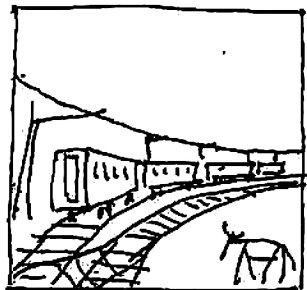
YOU CAN BUILD WITH  
THEM CONFIGURATIONS  
LIKE WITH CHILDREN'S  
BUILDING BLOCKS



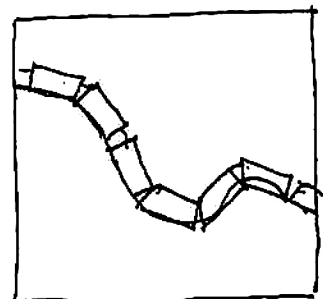
ONE INTERESTING  
CONFIGURATION  
IS WHAT I CALL  
THE "TRAIN"



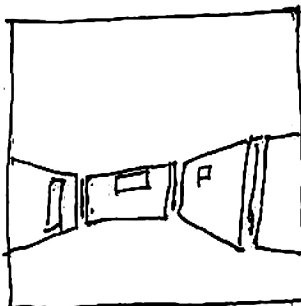
IT IS A LINEAR  
DISPOSITION  
OF CONTAINERS  
LINKED THROUGH  
SOFT CORRIDORS



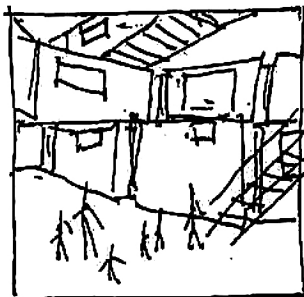
LIKE THE WAGONS  
OF A TRAIN



SUCH A "TRAIN"  
CAN FOLLOW  
COMPLICATED CURVES



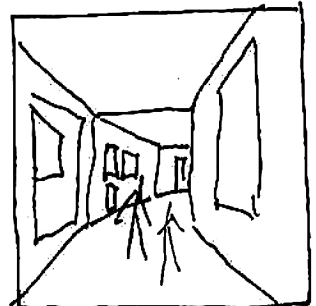
IN ONE LEVEL



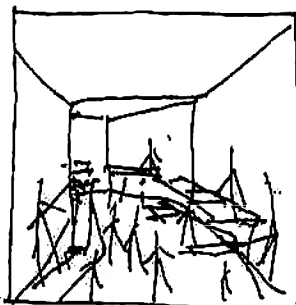
OR IN LOOPS  
AT SEVERAL LEVELS



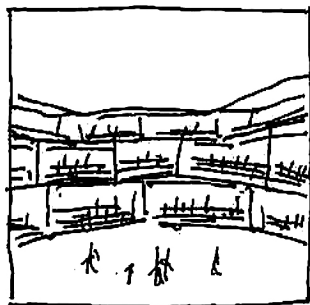
THERE ARE, IN  
ARCHITECTURE,  
TASKS IMPLYING  
LINEAR LAYOUT



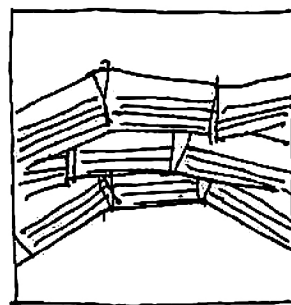
FOR EXAMPLE,  
EXHIBITIONS



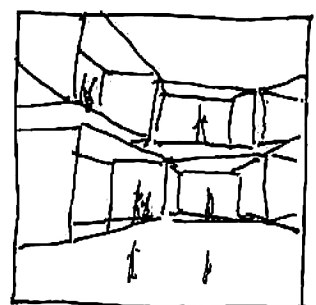
BAZARS,



EVEN TRIBUNES



ALL WHICH HAVE  
NOT TO BE  
DISPOSED REGULARLY



AND CAN BE  
DESIGNED AS TRAINS

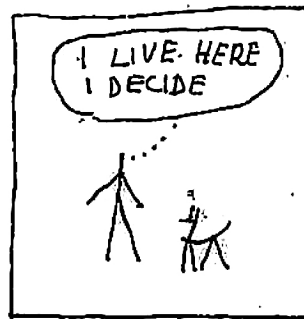
SOCIAL IMPACT



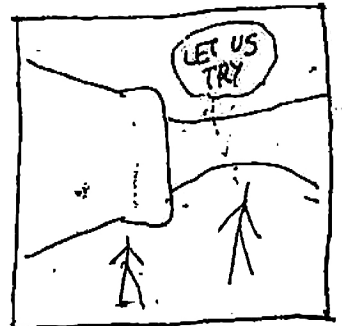
IMPLICATIONS  
IN ARCHITECTURE  
FOR A SOFT SOCIETY



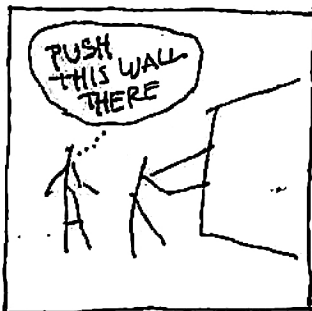
CONCERN, FIRST  
WHO MAKES  
WHAT DECISIONS



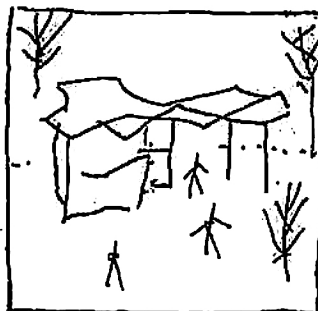
MORALLY IT IS CLEAR:  
IT HAS TO BE  
THE INHABITANT  
TECHNICALLY  
THIS IS MORE DIFFICULT



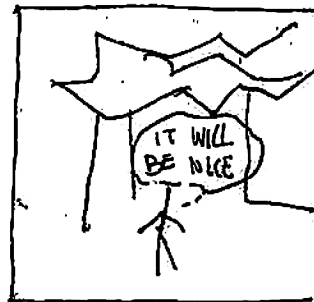
HIS NATURAL METHOD  
IS 'TRIAL AND ERROR',  
WHAT IMPLIES  
ULTERIOR  
CORRECTIONS



CORRECTIONS  
DEMAND TECHNICAL  
FACILITY  
FOR THE 'LAYMAN  
TO PERFORM



'TRIAL AND ERROR'  
IS POSSIBLE  
ONLY IN FULL SCALE  
ONLY ON THE SITE  
IT IS MORE  
THAN A GAME



CORRECTIONS ARE,  
IN MOST CASES,  
IMPROVISED



(LIKE EVERYTHING  
IN LIFE)



IRREGULAR STRUCTURE  
ARE THUS MOST  
APPROPRIATE



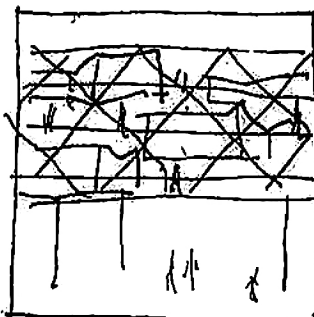
TO CONTINUOUS  
CORRECTIONS



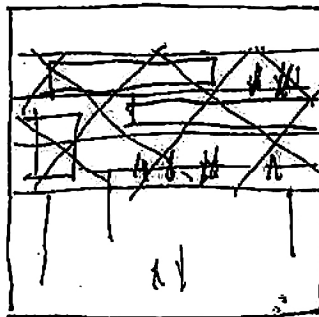
EITHER SPOTWISE  
IN A COLLECTIVE  
FRAMEWORK



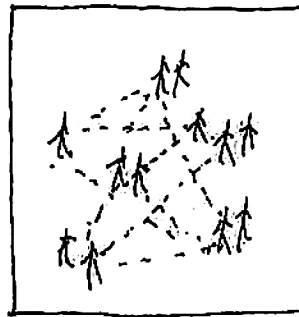
OR IN ISOLATED  
INDIVIDUAL HOMES



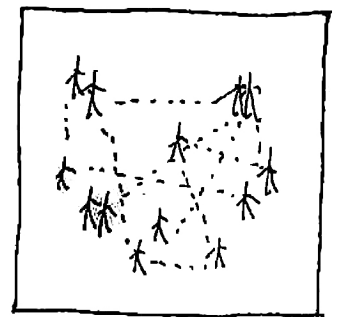
MOBILE ARCHITECTURE  
IMPLIES IRREGULAR  
RANDOM DISPOSITIONS:



THE ARCHITECTURAL  
OBJECT CHANGES  
WITH THE INHABITANTS'  
LIFE PATTERN

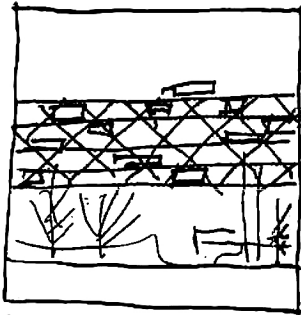


SOCIETY IS NOT A  
MECHANISM  
BUT A PROCESS

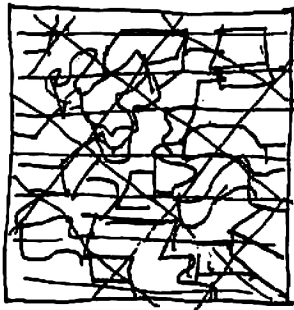


WITH NO FINAL STATE

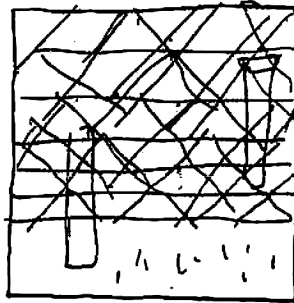
THE "VILLE SPATIALE"



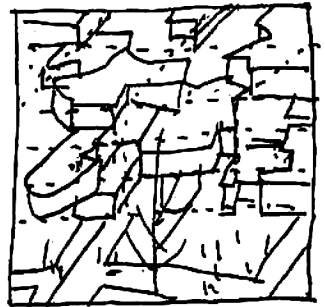
LAST, BUT NOT LEAST, I GET BACK TO MY FAVORITE IDEA: THE "VILLE SPATIALE"



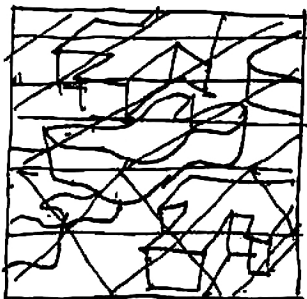
IT MEANS A PARTICULAR MIXTURE OF RULES AND IRREGULARITY



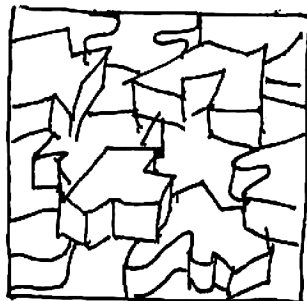
THE "VILLE SPATIALE" CONSISTS OF A MORE OR LESS REGULAR RIGID SUPPORTING GRID: THE "INFRASTRUCTURE"



WITHIN WHICH INDIVIDUAL HOMES ARE INSERTED FORMING AN IRREGULAR PATTERN



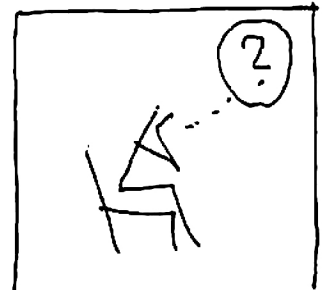
AS FOR THE SHAPE OF THOSE INDIVIDUAL HOMES ANYTHING GOES



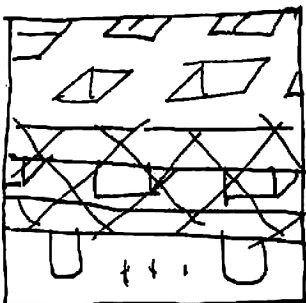
THUS THE "VILLE SPATIAL" IS A "MERZSTRUKTUR" AT URBAN SCALE FOR A MASS-SOCIETY CONSISTING OF INDIVIDUALISTS



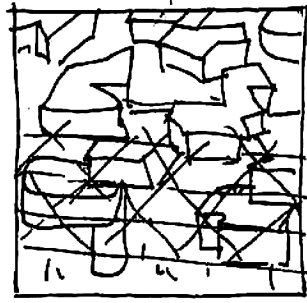
THIS IS OUR SOCIETY TODAY: A CROWD



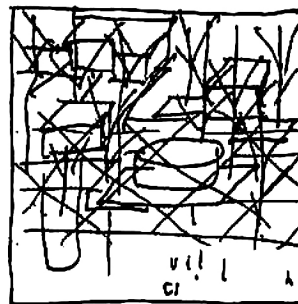
I DO NOT KNOW HOW A "VILLE SPATIALE" WILL LOOK



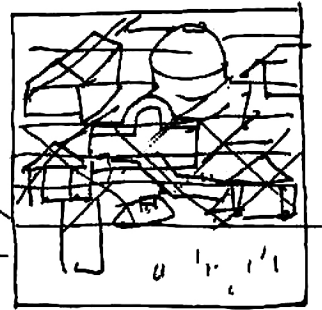
IT CAN BE THIS



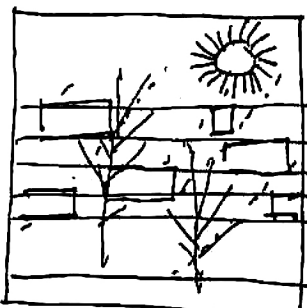
OR THIS



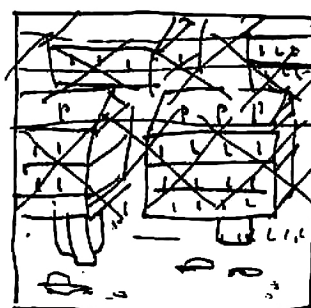
OR THIS



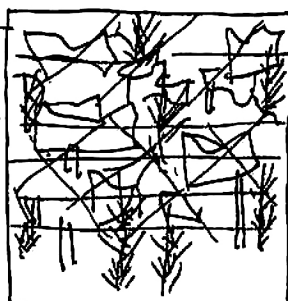
OR ANYTHING ELSE



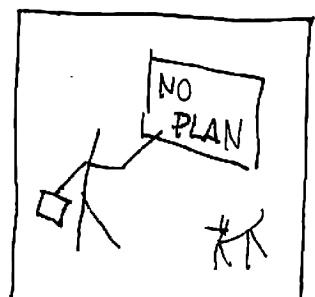
THERE IS NO GRAMMAR TO THE "VILLE SPATIAL" EXCEPT RESPECT



IT CAN LOOK AS WELL AS THE CITY YOU LIVE IN



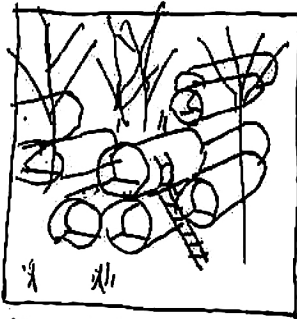
OR IT CAN BE COMPLETELY UNLIKE TO ANY CITY



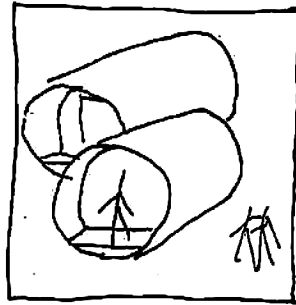
IT CAN NOT BE PLANNED, IT CAN ONLY HAPPEN



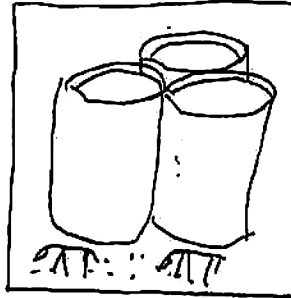
# CYLINDERS



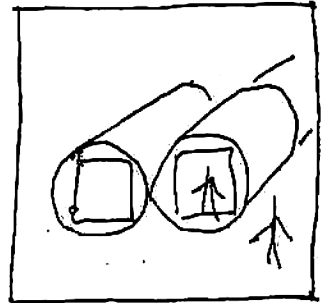
ANOTHER IRREGULAR ARRANGEMENT OF REGULAR COMPONENTS



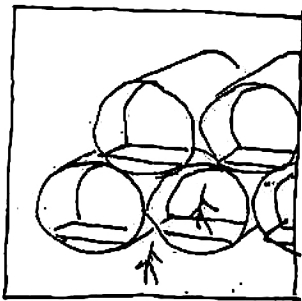
CONCERNS CYLINDRIC CONTAINERS



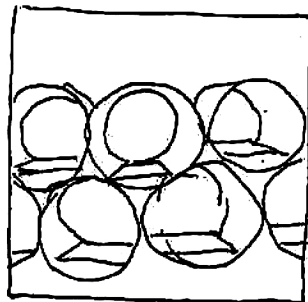
CYLINDERS ARE USED IN FARMING AS SILOS



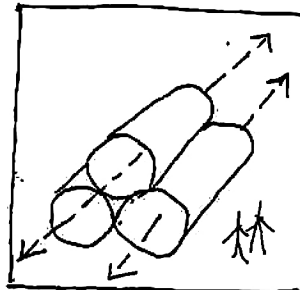
FOR STORAGE, FOR PASSAGES ETC



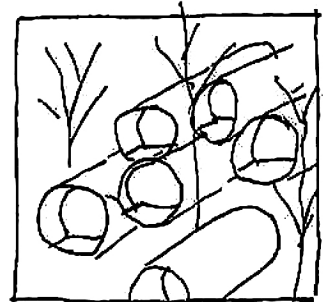
CYLINDERS CAN BE RANGED AT SEVERAL LEVELS



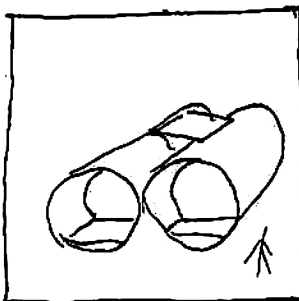
FORMING THUS MULTISTOREY SHELTERS



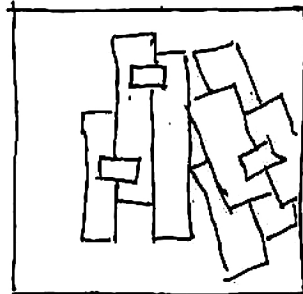
SUCH ARRANGEMENTS FOLLOW DEFINITE AXES THIS IS A CONSTRAINT



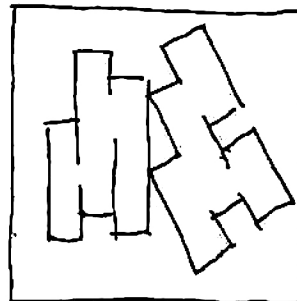
BUT SHIFTING THE CYLINDERS ACCORDING THESE AXES STAYS FREE



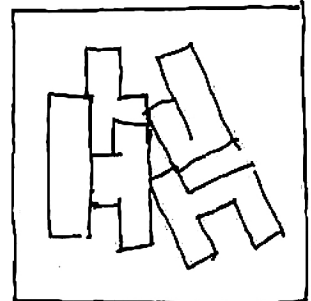
IT IS TECHNICALLY NOT TOO COMPLICATED TO LINK CONTIGUOUS CYLINDERS



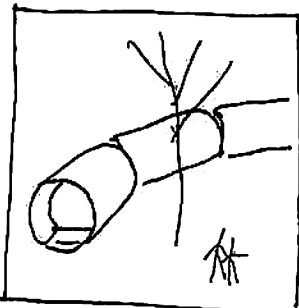
SHIFTING AND LINKING CYLINDERS



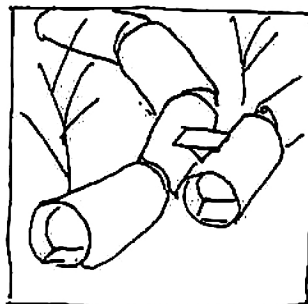
PRODUCES A LARGE VARIETY OF FLOOR PLANS



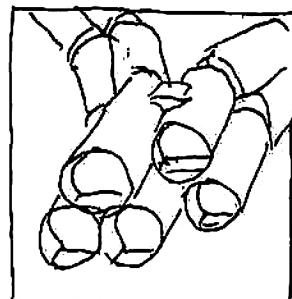
WHICH CAN BE CHANGED EASILY



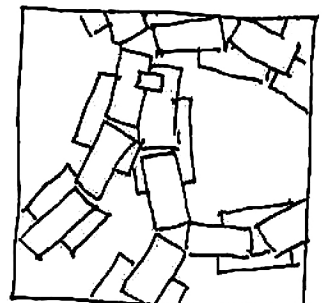
CYLINDERS ALSO CAN BE LAID OUT IN "TRAINS"



WHICH CAN BE EXTENDED THROUGH LINKING



SEVERAL TRAINS HAVING ALSO MORE THAN ONE FLOOR



THERE ARE MANY ROADS TO NEW URBAN PATTERNS