

<https://workarounds.hotglue.me>

Stephanie Simek

A thesis

submitted in partial fulfillment of the
requirements for the degree of

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Program Authorized to Offer Degree:

School of Art + Art History + Design (Photo/Media)

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Stephanie Simek

University of Washington

Abstract

<https://workarounds.hotglue.me>

Stephanie Simek

Chair of the Supervisory Committee:

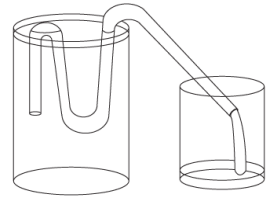
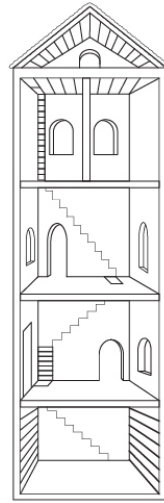
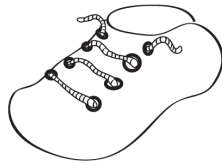
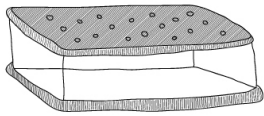
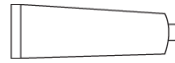
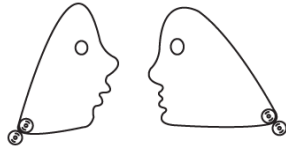
Rebecca Cummins

School of Art + Art History + Design (Photo/Media)

This document serves as a record of <https://workarounds.hotglue.me>, which is both an artwork and a thesis. It encompasses the approaches, research, and speculations of workarounds, broadly defined as the flexibility and adaptability of a material or system. This work was conducted and organized in an inquiry-driven, unprescribed, meander-based process. Its responsive and fluid approach underlies the method of operation in this artistic practice and the conceptual framework of its content.

For the purpose of this archive, it has been documented and flattened, resulting in a single, definitive outcome. Beyond the paginated presentation of this PDF, navigation of the website itself is unordered and unfixed. By design, it is intended to be easily edited, added to, and navigated freely (as new perspectives and information come into play). There is no end point, menu, or home button.

The bottom of each entry contains subject tags that link to a common index, bridging points of research that are seemingly unrelated with a bird's-eye perspective. The interactive index is the infrastructure that identifies and joins. While various pages connect to one another (some extend to external sites), with this index, a user could also choose to focus on a specific subtopic.



'Onstage... I'd been playing it real loud through these small, 60-watt Sears and Roebuck amplifiers, and the kids were hollering and screaming for it. But in the studio, the sound was too clean, too country. So I started experimenting, and I punched holes in the speakers with a pencil, trying to [recreate] that dirty, fuzzy sound I was getting onstage. And on the third take, there it was, just like magic.'

Released in the United States on March 31, 1958,... 'Rumble' utilized the techniques of distortion and feedback, then largely unexplored in rock and roll. The single is the only instrumental ever banned from radio in the United States... Eventually the instrumental came to the attention of record producer Archie Bleyer of Cadence Records, who hated it, particularly after Wray poked holes in his amplifier's speakers to make the recording sound more like the live version. But Bleyer's stepdaughter loved it, so he released it despite his misgivings.

communication

holes impurities

shape of sound (danger)

waves (implied, air)

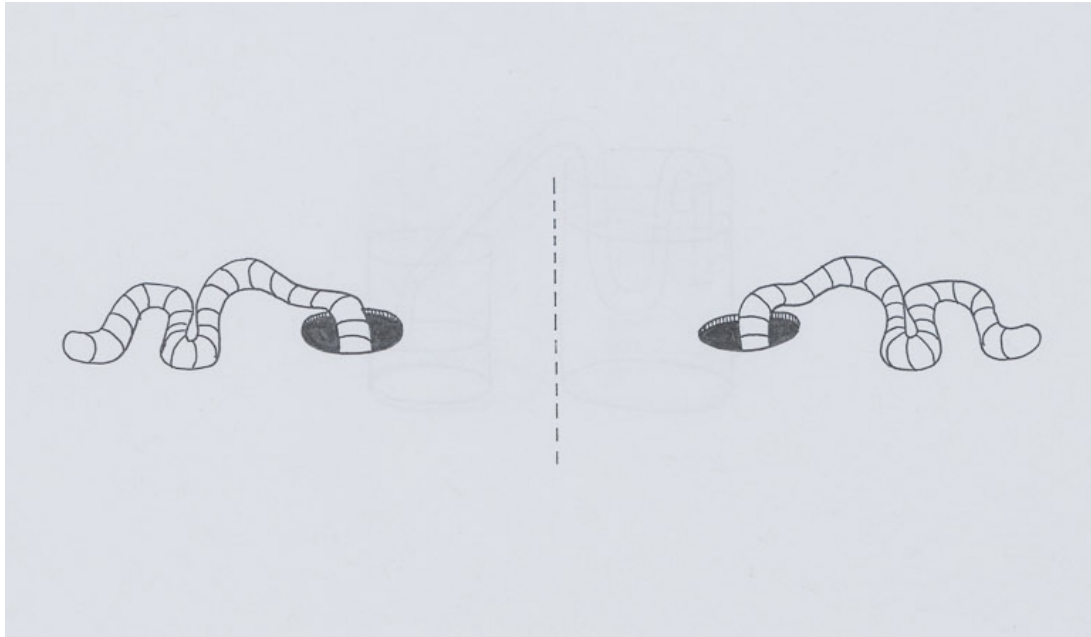
squeeze tube (one-way single-use communication device) and worm tunneling

Collected accounts of foxhole radio materials:

Bayonets into the ground
 Burnt tree bark
 Candle wax
 Cloth
 Clothes line
 Coke
 Contraband
 Flour with palm oil
 Nails
 Newspaper soaked in coconut oil
 Pencil lead
 Razor blade (rusty or "blued" by heat)
 Safety pin
 Scrap motors (and other found devices)
 Tin can
 Tin foil
 Wire
 Zinc trouser buttons

Each strand of corn silk is connected to a single ovule, or potential kernel, on an ear of corn. The ovule to which each strand is connected is identified and inventoried. The tassel at the top of the stalk contains grains of pollen. Fertilizing an individual silk thread with pollen ensures that the ovule to which it is joined will grow into a kernel of corn. The code is written by introducing grains of pollen only to the select silk threads. With this in mind, rub some of the pollen carefully onto the ends of select silk strands extending from the top of the ear. Over time, the message takes shape under the covering of the husk. After maturation, the ear is removed from the stalk and makes its way to the recipient who peels away the husk to decipher the message it holds.

*communication**encryption**protection**tube**worm waves (air)*



The comet, a severed starfish appendage, stores nutrients in its arm until it is able to regrow its mouth.

von Neumann probes

An efficient, cost effective method for space exploration, the "universal assembler" von Neumann probe builds itself from raw materials found on alien terrains. Nanobot probes are accelerated to near the speed of light by a future technology. Needle-like starships by the billions, propagating like a seed or a virus. Whatever survives copies itself and continues on or observes its surroundings. Molecules engineered like a nature-built factory, replicate on a distant moon.

Perhaps a one kilogram egg launched into space, made of a mix of electrical and biological components, hatches to build an energy collector to propel itself onward using solar power and extraterrestrial fuel sources from nearby rocks and gases. The astrochicken can send reports through radio signals back to Earth.

"Nearly 55 years ago it was demonstrated that planarians could be trained to learn a task, and following amputation of the head, the animals regenerating from the original tail sections remembered the original training."

Aphid reproduction

A female aphid is capable of reproducing asexually without egg fertilization through parthenogenesis. Not only can an aphid independently make copies of herself, inside of the offspring is another fully formed aphid embryo. The telescoping of three generations within a single aphid produces a copy of a copy of a copy.

Yogurt recipe from memory

1 part yogurt with live active cultures (from previous batch of yogurt)

400 parts milk (whole milk is preferable)

To prevent scalding the milk, rinse pot with cold water. Add milk and heat until it begins to simmer and bubbles form around the edge of the milk. Remove milk from heat and cool until milk is warm to the touch. Scoop out some milk into a small bowl. Add in yogurt and mix until blended. Pour yogurt mixture into the pot and mix until blended. Wrap the pot in a blanket (such as a lightweight flannel receiving blanket) and keep in a warm place overnight (for 6-12 hours). Refrigerate.

communication

memory protection regeneration self-activation (healing)

structural anomaly waves (air)

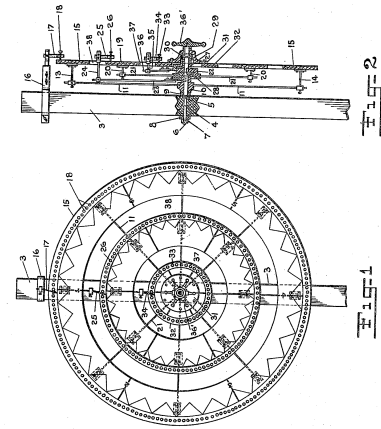
worm

wormhole

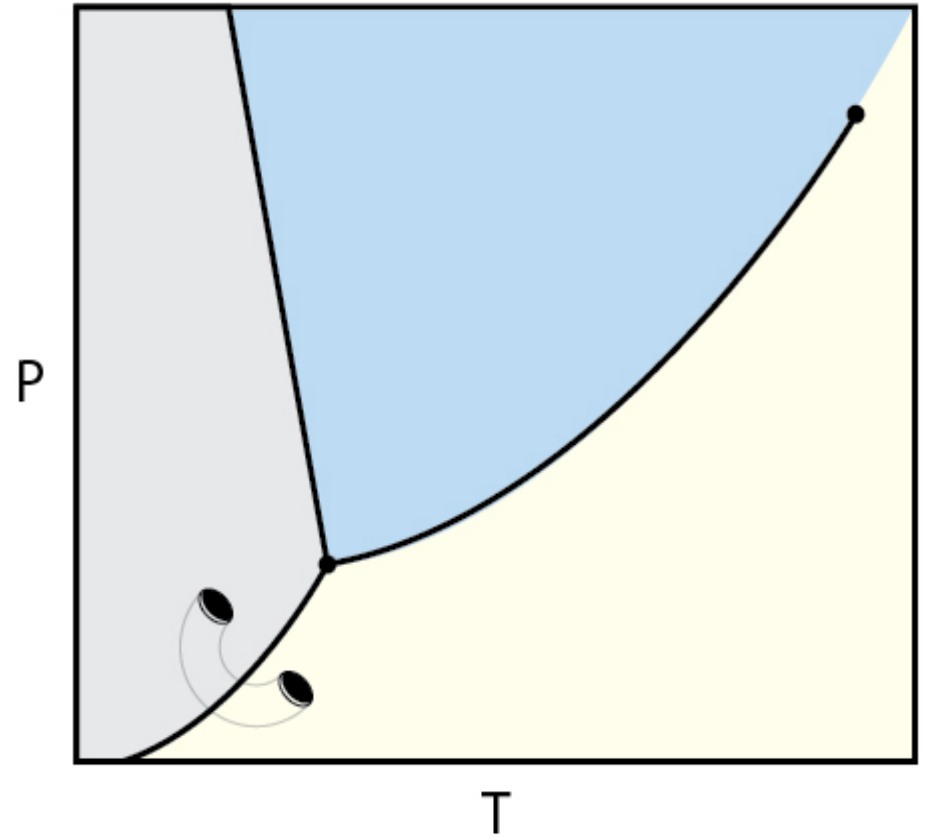
July 4, 1939.

J. MAHAWASH
 GAME OF SKILL
 Filed April 24, 1939

2,165,145



Joseph Mahawash, INVENTOR
 BY *Walter A. Hill*
 ATTORNEY.



wormhole

sublimation

On a Hole

The language around holes is a flexible one. To be considered a hole, must the opening fully pass through its host? From a topological perspective, a donut and a coffee mug are considered structurally the same, with both having only one hole. While engineers, on the other hand, recognize indentations, such as "blind" holes.

Holes are relational, referential objects. Their size, beginning, and end are dependent on the host material that surrounds them. While a hole is considered nothing, an absence, it is referred to in a physical way- for example, this shirt has a hole in it.

If the host material reveals only the visible, tactile dimensions of the hole (the area where the host and hole intersect), then can the shape of the hole beyond the intersection be open to interpretation? Can a hole continue past the "evidence" that we perceive in the host material? Can a substance riddled with holes, really just be one continuous, meandering (w)hole?

This flickering plasticity between physical and non-physical tangibility appears to seamlessly coexist in a cartoon universe. The portable hole, sometimes seen as a thin, rubberlike sheet and in other instances as a dispensable liquid, can be applied to any surface (even air, as seen in this Bugs Bunny animation) to open up a portal in space. Sometimes the holes make no sound when stuck to their host, while on other occasions they produce a distinct floppy thump, indicating once again, the variably physical nature of this phenomenon.

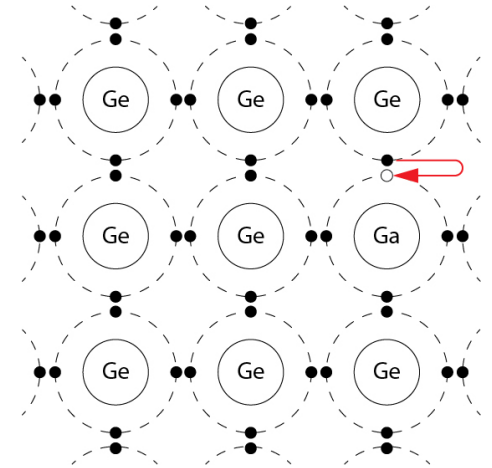
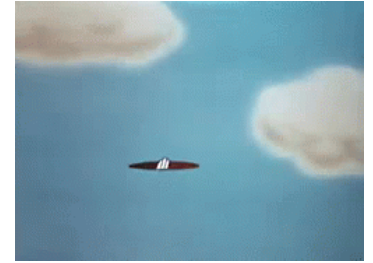
The portable hole, the absolute workaround, was made popular by the ultimate scrapper, Wile E. Coyote. When failure descends, Coyote is back at it again a few frames later with another ramshackle contraption up his proverbial sleeve. A true survivalist- never deterred, never defeated.

While *The Road Runner Show* arguably made the portable hole a recognizable cartoon trope, "The Hole Idea", a Warner Brothers animation from the early 1950s is credited with showcasing its wide-reaching potential to television audiences*. The main character, Professor Calvin Q. Calculus, invents portable hole technology which is dispensed from a syringe**. Professor Calculus' holes are able to penetrate all kinds of surfaces: steel safes, brick walls, glass windows, mountains, and the earth's crust. Holes can be picked up, slid, thrown, and folded. In this universe, portable holes agree with physical laws of nature, and all is in balance.

*Created not long after the deployment of atomic bombs on Hiroshima and Nagasaki, "The Hole Idea", portrays the "double-edged sword" of scientific research.

**Judging by the sound, the holes' consistency before drying ranges from non-viscous liquid to that resembling pancake batter.

holes
impurities soap film
structural anomaly



to impurities and (moving) holes

P-type semiconductor: Doping crystalline germanium with an acceptor impurity, gallium, results in an electron deficiency, causing a moving "hole".

When there are not enough resources for a large house to maintain psychological and social health, build a smaller one that winds around:

"There is widespread evidence to show that overcrowding in small dwellings causes psychological and social damage... Privacy for individuals or couples is almost impossible...

It would be simple to solve these problems by providing more space- but space is expensive, and it is usually impossible to buy more than a certain very limited amount of it. So the question is:

For a given fixed area, which shape will create the greatest feeling of spaciousness?

There is a mathematical answer to this question. The feeling of overcrowding is largely created by the mean point-to-point distances inside a building. In a small house these distances are small- as a result it is not possible to walk far inside the house nor to get away from annoying disturbances; and it is hard to get away from noise sources, even when they are in other rooms.

To reduce this effect the building should have a shape for which the mean point-to-point distance is high. ...The mean point-to-point distance is low in compact shapes like circles and squares, and high in those distended shapes like long thin rectangles, and branched shapes, and tall narrow towers. These shapes increase the separation between places inside the building and therefore increase the relative privacy which people are able to get within a given area.

Of course, in practice there are limits on the long-thinness of a building. If it is too long and thin, the cost of walls becomes prohibitive, the cost of heating is too high, and the plan is not useful...

A small building can actually be much narrower than people imagine...

And a long thin house can also be a tower, or pair of towers, connected at ground level. Towers, like floors can be much narrower than people realize. A building which is 12 feet square, and three stories high, with an exterior stair, makes a wonderful house. The rooms are so far apart, psychologically, that you feel as if you are in a mansion.

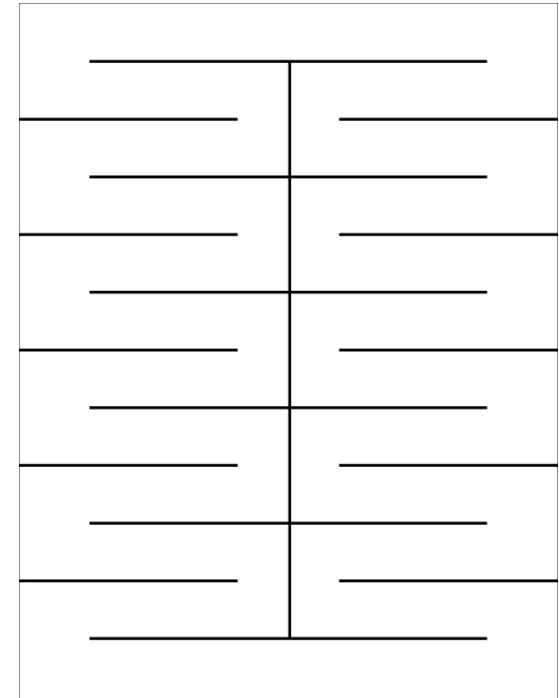
Therefore: In small buildings, don't cluster all the rooms together around each other; instead string out the rooms one after another, so that distance between each room is as great as it can be. You can do this horizontally- so that the plan becomes a thin, long rectangle; or you can do it vertically- so that the building becomes a tall narrow tower. In either case, the building can be surprisingly narrow and still work- 8, 10, and 12 feet are all quite possible."

-Excerpts from *A Pattern Language* by Christopher Alexander et al.

expanding

holes

meander



Crawling glaze experiment notes:

Initial glaze recipe (Glaze #4)

Borax 264.00 grams
 Gerstley Borate 132.00 grams
 Lithium Carbonate 86.00 grams
 Magnesium Carbonate 350.00 grams
 EPK Kaolin 152.00 grams
 Silica 16.00 grams
 Zircopax (as color additive) 60.00 grams

Applied to Cone 06 bisqueware with terra sigillata in 8 staggered layers on the interior and 8 full coats on the exterior of a curved bowl shape. Fired to Cone 04. Results were underwhelming. Terra Sigillata turned from black to brown. Thick outer coating on the exterior flaked off nearly entirely. On the inside, it resembled lichen (dry platelets) but was matte and inconsistent in color (yellowing, impurities). Fired to Cone 1 in an attempt to encourage softening/curving of the "islands" but made little difference.

Modified above recipe with an additional 102 grams of magnesium carbonate for more crawl.

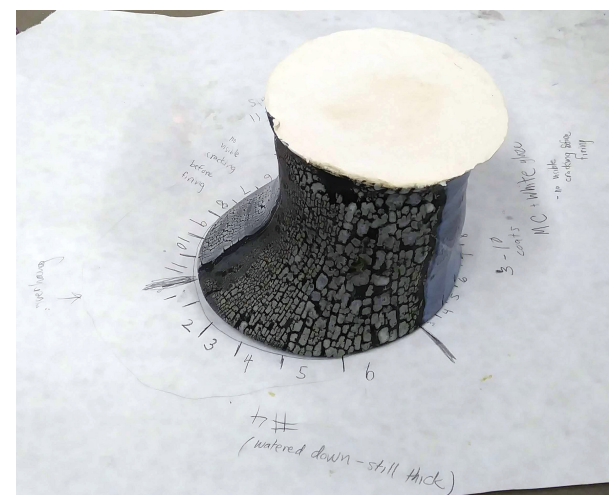
Applied 8 very thick coats of modified glaze to inside of new bowl-shaped bisqueware with terra sigillata. To the outside, sectioned off 3 areas and applied 6 staggered coats of modified glaze, 3-10 staggered layers of 1 part Mayco "Classic Crackles" white glaze to 1 part magnesium carbonate, and 3-11 staggered layers of 1 part matte clear glaze to 1 part magnesium carbonate. The bottle glaze mixtures had no visible signs of cracking before firing (this would indicate a likelihood of crawling). The modified glaze displayed prominent cracks before firing. Fired to Cone 04. Modified glaze had more platelets on the inside than on the exterior portion, but was inconsistent and still dry in look and feel. The Mayco mixture produced no visible cracking or crawling whatsoever. The matte clear mixture resembled more of a "tree bark" texture than a meander.

Did further testing with discontinued Amaco "White/SP Crawl" glaze and Western Ceramics "Ice Floes". Divided Cone 04 fired bowl-shaped bisqueware with black underglaze in half with wax resist. Applied 9 staggered coats of Ice Floes to the inside and 6 to the outside. Applied 4 staggered coats of SP Crawl to the inside and 8 to the outside. Amaco glaze was much thicker compared to Western Ceramics glaze. Fired to Cone 05. Amaco glaze was glossy and showed many degrees of meander between coats. Western Ceramics flaked off in areas, the islands were more square than curved, and the texture was matte.

Outcome: 1-2 coats of Amaco "White/SP Crawl" glaze yielded meanders with the most definition and control. In the future, another possibility is to use a high fire clay (Cone 4-6) with a high fire glaze (higher temperatures yield "beadier" results).

meander

self-activation (assembly, healing, organization) tube



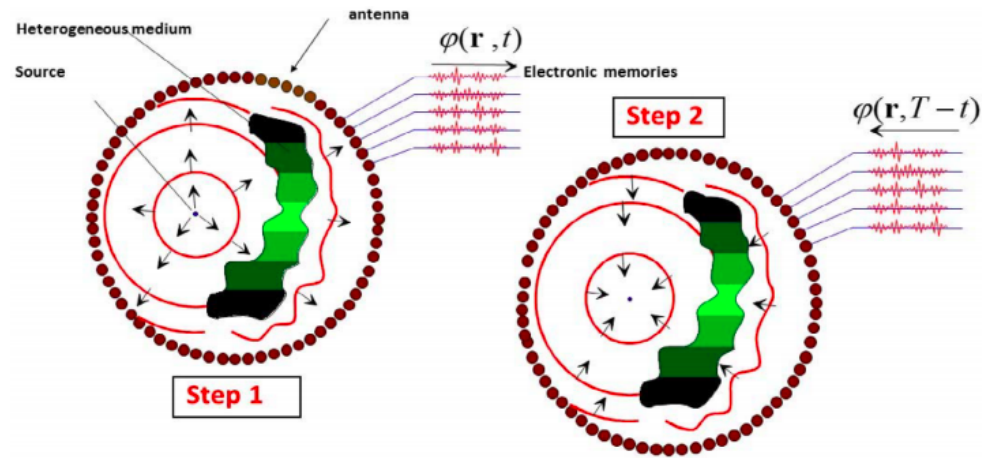


Fig. 1. Schematic of the time-reversal mirror. (a) Recording step: a closed surface is filled with transducer elements. A point like source generates a wave front which is distorted by heterogeneities. The distorted wavefield is recorded on the cavity elements. (b) Time-reversed or reconstruction step. The recorded signals are time-reversed and reemitted by the elements. The time-reversed field back-propagates and refocuses exactly on the initial source.

A material that has self-healing properties is capable of repairing damage such as cracks, punctures, and tears automatically, intrinsically, and independently. In a way similar to biological systems, self-healing materials can sense failure and repair it automatically. Such materials can be found in the form of fabric, concrete, ceramic, polymers, and metals- a number of examples are outlined below.

Self-healing materials like concrete and polymers may contain pockets of restorative chemistry that upon breaking, integrate into its host. If a material is stressed, tiny capsules of catalyst (such as an adhesive or a monomer that reconstitutes into its original polymer material) are broken and spread out to repair the damaged area. Coatings with embedded microcapsules of resin can restore scratched surfaces in the affected area. Longer-lasting architecture and infrastructure may be achieved with a limestone-producing microorganism embedded into the cement which becomes activated when water leaks into the structure.

Another type of self-healing material operates in a similar way to the human body's vascular system, where a pressurized reactant is circulated through a network of tubes and released only where needed (and in larger quantities compared to the microcapsules). This can be effective in slowly deteriorating materials, where the healing solution has time to spread out to the affected area.

Memory shape alloys can also be used as a self-healing material. Exploiting its two distinct crystal structures, a memory shape alloy (commonly made from nickel and titanium) can be "programmed" to hold its shape with heat, be deformed, and repeatedly "remember" its original shape when the set temperature is recalled. Memory shape materials have widespread practical applications, such as in surgical instruments, where they can be used to expand and contract in minimally invasive procedures. Another example of a potential shape memory material is in a fiber optic application, where the broken tube can be repaired by the heat from the localized area that is leaking light, and correct its shape to its original form.

NASA has worked to develop puncture-repairing materials for use in protecting satellites and spacecraft. Thermoplastics designed to heal themselves find use in absorbing bullets. In this situation, the plastic is engineered so when it is punctured, the heat from the bullet wound breaks the polymer down into its constituent monomer. The hole closes as it restores itself back into the polymer while cooling down.

The area of self-healing materials is a relatively new field, and faces a number of engineering challenges. A main drawback of the microcapsule design is, once activated, those now empty cavities create a weaker structure. Could any solutions be found in pockets that also store a material that behaves like a hardening expanding foam? Or if the position or shape of the cavities were designed to support weight better, like the way foam or a seashell does? Another issue is once the initial repair has been made, the healing agent cannot replenish itself, so it is incapable of further repairs. Perhaps there are more biological alternatives like the limestone-producing bacteria that can regenerate itself. As the field advances, materials like self-healing glass, rubber, and paints are expected to be introduced, whose healing-systems more closely resemble those found in nature.

bubble holes

memory protection

regeneration self-activation (healing)

soap film

Even though they have an open hole, they tend to inflate rather than [deflate] when bounced up by hands. According to Ichiro Fukumori of the Jet Propulsion Laboratory, 'Despite the open hole visible in the silver patch, the kamifūsen stays inflated when bounced on the palm of one's hand. Moreover, repeated bouncing causes a deflated kamifūsen to swell by itself to its fully inflated condition. The elastic rebound of the balloon paper is not enough to explain the full inflation; a batted kamifūsen actually sucks in air from the atmosphere.'

The 10:1* paradox

The tile tool

A curved mirror is the key component to any reflecting telescope. It's precise curvature allows one to see into the depths of space. The tool used to shape the glass mirror is an assemblage of randomly shaped shards of broken tile glued to a disc typically made of sealed plaster or concrete. The ceramic fragment disc (with abrasive applied to it), will create a sagitta, a perfectly concave depression, when brought in contact with the glass blank over time.

The secret to producing a perfectly shaped mirror lies in randomness. The size and spacing of the ceramic fragments when assembling the tool, and the stroke numbers and rotation of both the tool and glass when grinding, will yield the best results.

*According to industry standard, tools used in the manufacturing process should be ten times as precise as the tool being produced.

expanding *holes*
self-activation *structural anomaly*

bubble protection

communication pushing a string regeneration toothpaste out of the tube

encryption reversal toothpaste out of the tube

expanding meander structural anomaly

holes holes meander protection pushing a string structural anomaly

impurities holes pushing a string

meander meander self-activation

memory protection regeneration

protection protection regeneration reversal toothpaste out of the tube

regeneration protection regeneration reversal

reversal regeneration reversal

self-activation protection regeneration self-activation structural anomaly

shape of sound pushing a string

soap film holes protection

structural anomaly

holes

regeneration

reversal

structural anomaly

sublimation

sublimation

tube

self-activation

toothpaste out of the tube

waves

pushing a string

regeneration

reversal

toothpaste out of the tube

worm

regeneration

toothpaste out of the tube

wormhole

regeneration

sublimation

