

FIELD ACTION JOURNAL

DESIGNING
SUSTAINABLE
NOMADIC
STRUCTURES



SUSTAINABLE SYSTEMS

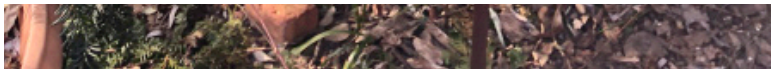
PARSONS THE NEW SCHOOL FOR DESIGN , SPRING 19
INSTRUCTOR: CAROLIN MEES STUDENT: LEXI O'NEILL

GLUE STRIP



GLUE STRIP

SOCIAL & SYSTEMS



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These are images of green spaces and flooding in the city I designed, with information from LivingLotsNYC.org and NYC Planning: Flood Hazard Map



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Image of the container in its original environment that I am going to be using to plant and grow produce/other natural things from our field trip.

Regarding social systems within a given town, community gardens and public open spaces can serve as vital means for upkeeping function. Both spaces provide local residents opportunities to engage with other locals in an eco-friendly way to promote better health, daily activities, and relationships between one another and the environment.

In a series of studies conducted by NC State Ex-

tension, they found various health and wellness benefits to community gardener members. For example, gardeners are 3.5x more likely to consume fruits or vegetables 5 times a day. Additionally, when looking at the practice of gardens, generationally, this informs kids about the choices they can make (to both eat and grow healthy foods) and understand how they play a role in nutrition and diet.

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When first growing the plants, I noticed that the ratio between soil and seeds was quite equal, which made me skeptical of how this gardening experiment would turnout. After soaking the seeds for 8 to 10 hours overnight, I noticed they slightly expanded in their size and opened up. When planting them, I placed them next to the sunniest spot in my dorm, but think the angle at which the buildings block the light, may account for the gradual sprouting rate.

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These are images from the community gardens in Alphabet City, open to the public, but run by a close-knit community (largely made up of squatters). The space uses various technologies to run itself, including solar energy and a composting cycle. There are several spots within the garden for individuals to gather, for bar-be-ques, shared meals, communal planting, etc. Additionally, the gardens vary in size, depending on the space of the original building that stood there previously.

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The medicinal plant plot, housing various coping agents, like Lavender, Aloe, Chamomile, and 10 other herbs is a component in both individual use, tea brewing, and recipes for the community.

Dan Ritz, a 67-year-old man, first began his involvement in the Sixth Street and Avenue B community garden nearly 45 years ago. In the early 1970s, his landlord walked out on their building. During the time, several residents accepted no doc loans, under President Lyndon B. Johnson's new program. The lack of insurance and necessary documentation to pay the rent fired back when Nixon took over and declared a moratorium

on subsidized housing programs. His previous building was burned down from the landlord weeks later, and the community gathered together to reclaim the space as a communal garden.

Participating in the garden allows Dan to feel and be with his community, along with growing produce to eat and cure himself. He personally grows various healing plants, such as aloe, and participates in group meals in the garden gazebo.

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GROWING WHEATGRASS

To successfully grow the wheatgrass, I had to soak the seeds for 8 hours before planting them in the composted soil. To meet all the necessary conditions to best grow the wheatgrass, one should lightly cover the seeds with the composted soil, place the plant in a sunny/warm spot, and water daily.

To grow my wheatgrass to be 3-4 inches tall, I grew it for 2-3 weeks. For the short term, the paper cup worked as a good plant holder, as it was translucent enough for the sun to shine through while being tough enough to prevent malleability from daily watering. If one was growing this plant longer, I would recommend a larger, more stur-



my plant after 1 1/2 weeks

dy container (eg. stone/terracotta) to grow the plant in, so that way the roots can really develop and branch out without the cup biodegrading into them. In general, a larger cup would be ideal for longterm growth as the plant shoots up quickly in height and its roots begin to get bunched.

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CLIMATE CHANGE & ENERGY



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To grow bioleather, growing microbes called SCOBY, or Symbiotic Community Of Bacteria and Yeast, feeds off of a fermented black tea mixture to spin several layers of cellulose. Once the SCOBY has produced a thick later of cellulose, it is harvested, and dried out on wooden boards to created a bioleather.

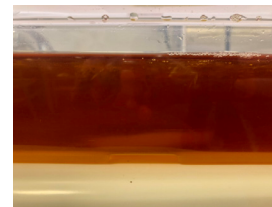
To grow bioleather, one should have a warm environment for the bacteria and yeast to feed and ferment, between 75 and 86 degrees Farenheit. Additi-



brewing the tea for SCOBY food fixture

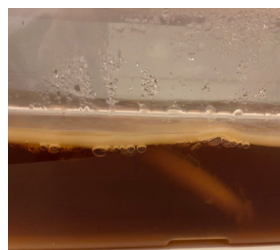
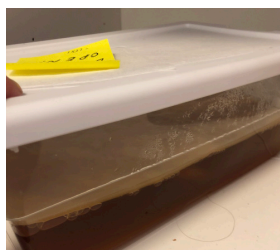
onally, the environment should be sealed air-tight so no anti-bacterial particles disrupt or stop the fermentation process and/or get people sick due to the bacteria/yeast fermentation.

For the bacteria, the metabolism needs a lower pH, best at 4, for the acidic mixture to ferment better and more quickly. For optimal growth, one needs to make sure the conatiner is near a heated source, closed at all times, and is in a dimly lit area for the best success.



day 3 of growing Kombucha leather

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This week, my SCOBY produced a cm (ish, maybe 1/2 cm) thick layer of cellulose.

In growing the bio-leather, within the first 10 days I have noticed major growth changes. At first, the SCOBY just rested at the bottom with no other microorganisms floating in the black tea mixture. However, overtime, the SCOBY has produced several small clumps that have been feeding off the fermented tea mixture. At first, these "spots", if you will, looked like mold, which is worrisome as the wrong type of fermentation can prevent proper cellulose production by the SCOBY. Though, after

a few more days, these discolored clumps were all colored white- a sign that it was indeed the SCOBY growing and developing within various parts of the container. The pigmentation of the tea mixture itself has changed, as the water has become less saturated in color, but more cloudy (due to the increase in SCOBY molecules. The growth of the SCOBY has been very gradual, as it is in the lower average of ideal temperatures (76 degrees Fahrenheit), as I do not have access to a heated mat or a warmer place to store it in my dorm.

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The electric grid, an interconnected display of the flow and consumption of electrical energy within a given area, is crucial to understanding the foundation of how our communities and infrastructure operate and how to make them for sustainable. Currently, the electrical grid uses coal, oil, gas, or nuclear reactors to power the generators to make the electricity in power plants.

Mainstream electrical grids greatly impact climate change and greenhouse gas emissions, thus off-grid energy options have come about (such as solar panels and using wind energy). There are several practices embraced in this concept, the idea being to create an environment that sustains itself, not relying on fossil fuels or carbon-emitting processes. The New School's University Center is a great exam-

ple of operating off of a microgrid, by wrapping machinery in insulation to control temperature to reduce air control energy, using runoff from condensation in a recycled water system, using blocks of ice to chill cold water in conjunction with cooling technology during the day so the machines can operate at 50%. Other ways of staying off the grid include absorbing ground water, recycling and repumping used water within the building (after cleaning) and using motion sensors to control excess light/heat machinery. The key to implementing these practices is to have enough money to invest into more expensive, but sustainable machinery, having the space for extra equipment to use the technology (eg. space for solar panels), and having the required man power to maintain necessary energy levels.

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HOW TO USE OFF-GRID TECHNOLOGY IN YOUR LIFE

To practice this concept in your own life, one could limit excess electrical use, install and use/ convince landlords (or other housing super) about using solar panels (eg. Brooklyn Solarworks) and reduce electrical use (eg. turning off lights, heat/AC, unplugging products, etc).

For my studio project, this concept can provide inspiration for how the product will be universal and minimal in its role of the conservation process. The key to off-grid technology is its simplicity in its process, while be mathematically accurate and logical to individuals. In looking at this, I need to replicate the minimal processes within material and form construction.



Another way to conserve energy is to use the molecules produced by plants- eg. oxygen, as a direct source, rather than relying on air filter/purifiers to clean and provide fresh air. These plants are multi-purpose, as they collect and use water from the roof to prevent runoff. *photo taken by me earlier in the school year

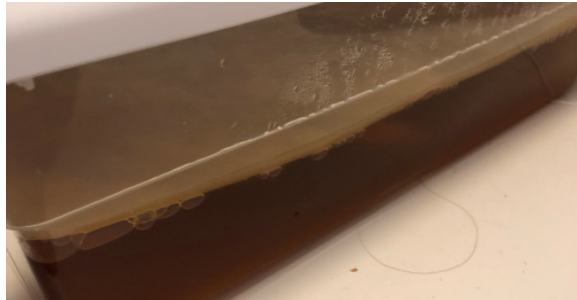
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WATER & MATERIALS

KOMBUCHA/BIO LEATHER GROWTH UPDATE:



This week, my SCOBY produced a cm (ish, maybe 1/2 cm) thick layer of cellulose.

In the last week of growing my bio leather, it has steadily increased in its thickness, almost ready for harvest. Overtime, the odor has began to get slightly more pungent, however, thankfully my roomates, all being from Parsons, are understanding as they will complete this assignment later this semester. Visibly on the container, there has

been an increase in condensation, creating a more mucky looking air, which scientifically makes sense since I haven't opened the container to preserve the bacteria's fermentation process. I have tried not to shake or disrupt any of the SCOBY's environment, being extra careful when examining the SCOBY's growth.

GLUE STRIP



Political cartoon by Paul Fell

The conflict between the government, people and climate surrounds the idea of capitalism and material wealth in relation to society's behaviors, and the behaviour in which it supports. At the moment, our economy thrives off of the known dependence of fossil fuels- a cheap fix for a long term issue in regards to future generations. The conflict surrounds the idea of scarcity and the present time being. While some suggest that financially

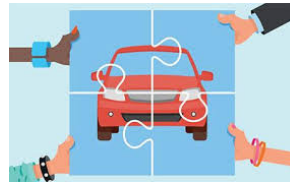
costly decisions now are worth protecting the future, the party and leader in power at the moment is disregarding any idea of future impact, creating a large controversy for protests, anger, separation, and even war within other countries.

To take action in preventing and climate change, we must work with nature, rather than against it, to preserve fossil fuels and other irreplaceable materials.

GLUE STRIP

ENERGY USE & SHARED MOBILITY

Shared mobility is a multi-use network designed to accompany users traveling on similar paths to share their transportation method to conserve energy. Essentially, shared mobility limits the energy produced by fossil fuels, like gas, by compiling people with trips all near each other together so we can mitigate the fossil fuel consumption. Shared mobility prohibits excess waste of people going on similar trips and is applicable to daily use, especially in large urban environments, like New York City. However, in order to share these resources, you risk individual safety in relation to corridors and comfort levels. The energy mitigation surrounding shared mobility immediately reduces our output of fossil fuels, slowing down the consumption



User sharing a common resource on a similar path
image by: itf-oecd.org

on the small remaining bits we left over. Many citizens in urban areas are affected by this, as the population is high and dense. Specifically, Uber and other car-service transportation companies are heavily involved in this effort, by offering "pools" or group rides with a discounted price, serving as an incentive for people to use. In regards to my own structure, I think the connectedness and usability of the car within the society can connect to how my piece operates, as in reusing someone's materials that they would dispose to collect rain water.

GLUE STRIP

KOMBUCHA/BIO LEATHER GROWTH UPDATE:

In my final week of growing the first round of bioleather, the SCOBY has continuously grown to be about $\frac{1}{2}$ of an inch thick. In this growth, the condensation of the box has increased and the water has become more cloudy/transparent. Also with this growth, the overall odor of the kombucha leather has increased. The development of a more pungent, rich smell has increased the remarks on odor in the kitchen by other roommates not growing the leather, though those also completing the same experiment seem to understand.

I believe because of the resting position and container position of the box the SCOBY

is growing in, the actual SCOBY layer to harvest is uneven in terms of thickness, as some areas look a $\frac{1}{2}$ of an inch, while a seam close to the center looks caved in, only measuring around $\frac{1}{8}$ of an inch.

Somewhere in the middle is a divot with a less prominent SCOBY-spun cellulose, which will be monitored and carefully handled when harvesting. Interestingly enough, though the SCOBY usually sits at the bottom of the container, it is more so floating closer to the layer of kombucha leather developed. Additionally, it seems to appear that the leather is glossier than before, as it has been fermenting and developing for longer.

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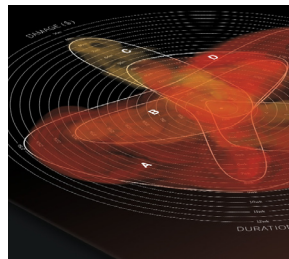
THE UN TRIP & LAUREN BRAWER

Wendy Brawer's amazing talk at the UN opened up many people's eyes as to how we can connect our creative passions to helping save the world, specifically to climate change, fossil fuels, and developing renewable energy. Using beautiful watercolor and digital illustrations, Brawer writes books surrounding pressing global climate issues and depicts compelling imagery to spark change, whether it be a giant crater from fossil fuel mining or miles of windmills to support statistics on wind energy.

Brawer's intense research, specifically in connection to the people affected by fossil fuel mining creates compelling narratives, supporting its legitimacy in all research accounts to consider.

In seeing how she connects the audience to both the global issues

and the people directly affected, I believe I could take this same technique and better design campaigns, products, infographics, etc in my field of graphic design. Whether it be raising awareness, criticizing companies, or illustrating horrifying statistics, I too support saving this world, and want to tie that passion as much as possible into my design field, no matter the medium, client, or project.



Lucia Vaughan's Wildfire Infographic beautifully illustrates the damage, CO₂ emission impact, global impact, and more in an aesthetically engaging way.

GLUE STRIP

THE RISE OF THE TIDES: THE INCREASE OF FLOODING IN 2019

THE SCIENCE BEHIND IT ALL:

As the global temperature slowly increases from greenhouse gases, terrain and water areas evaporate more water vapor, which causes the atmosphere to hold more water vapor. This ripple effect allows for an increased risk of heavy rainfall when it rains, which is a leading cause of inland flooding today.

Additionally, as our demand for greenhouse gases has increased, other developments occurring within our infrastructure have also increased, such as to urban development, deforestation, and increased use of impermeable surfaces, which shift our landscapes to being more susceptible to heavy flooding issues.

A NARRATIVE & POTENTIAL FIXES

In New York City, I believe that inhabitants affected by flooding would need adaptable, absorbent, and protective clothing to react to quick flashes in rainfall/flooding activity. Here, it is mostly on the outskirts of Manhattan, somewhat in the center near Alphabet City, that are majorly affected by flooding, as seen by Hurricane Sandy.

Some sort of expandable pant or accessory that could allow one to better walk through/get across areas with high water would allow the individual to collect and safely rescue other individuals needing evacuating could be a go-to.

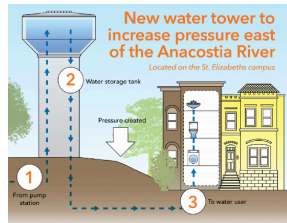
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WATER QUALITY TESTING LAB

An integral part of keeping both city inhabitants and the environment cohesively safe is testing the water quality throughout large reservoirs and supplies for mass resources. In testing the Gowanus Canal (and other waterways in NYC), it is important to pay attention to the timing of large precipitation and surges in toilet use, as a heavy influx of water could cause sewage to be untreated. The then contaminated sewage is unable to drain into the plant due to the large influx of water and is thus pushed out the other end of the pipes, contaminating the healthy water.

As designers, when we look at this contamination issue, there are a couple of areas to address: the design of the pipe system, the technical component of how flushing toilets during stor-

ms affect the pipe system, and the lack of awareness amongst the public to prevent this problem. I think firstly, some sort of separate structure needs to be constructed to prevent sewage from infiltrating key access points that cause contamination. I also believe the better design and awareness needs to be seamlessly designed, advertised in most places and entice users to follow.



DC is an organization funding a series of water life clean up projects across the globe.

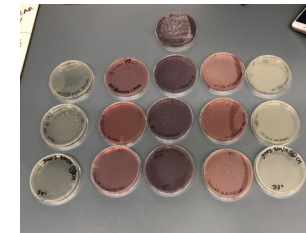
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COMBINED SEWAGE OVERFLOW LAB REFLECTION + DEBRIEF

Upon receiving the results for the tested samples, every sample resulted in the hypothesized outcome. The Gowanus Canal sample did not have contamination from the sewage drain, however, we did prepare solutions for addressing the problem in the future.

When addressing how the sewage contamination works, it is vital to understand that when it rains significantly/reaches flood levels, a divot in the sewage pipe leads to the outflow pipe. Our group proposed a series of the automated filter system, controlled from a computer that allows for various levels of screens to be lowered and raised every few minutes. The staggered system of staging filters would allow for some of the sewage to be filtered out/redirected while preventing flooding

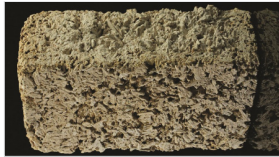
out from the other side of the drainage pipe. The staggering time difference would also allow for protection of the filters, as a constant filter could be hazardous and subject to creating a collection of unfiltered material that either molds/erodes the filter, causing flooding back onto the street, or breaks the filter system. Overall, the exercise made me realize how interconnected and wide this problem is.



These were the tested Petri dishes after 1 week of testing the Gowanus water + other reference standards, the water showed no signs of Sewage contamination.

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MATERIAL EXPLORATION



STRUCTURAL MATERIAL
Biomatteone is natural Belton bricks made from Cannabium, wood on Hemp + lime binder



FOOD PRODUCTION
Eco Pulping allows for grain to be repurposed to make a green planing product- great for composting.



SOLAR ENRGY
Pinatex is a light absorbing lightweight material made from pineapple leaf fiber



WATER PROOFING
Sulapex is a high water resistance material made from natural binders and wood chips



THERMIC INSULATION
Recycled polyester made from marine pollution. can be threaded + knitted to make heavier clothes.

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FIELD TRIP REFLECTION: NEWTOWN CREEK CRUISE

As of right now, the current state of New York's agricultural wellbeing in relation to our waste management system is alarming and shocking. Each time the city receives over 1/4" of rain, the storm drains flood, causing a CSO event. The waste treatment takes place in Greenpoint, amongst other areas, where the city collects the methane to be used back in the city's energy again.

The reason Newtown Creek is well-known and popular amongst our discussion is because of the amount of waste it treats- 18% of the city's water supply, or 700 million gallons.

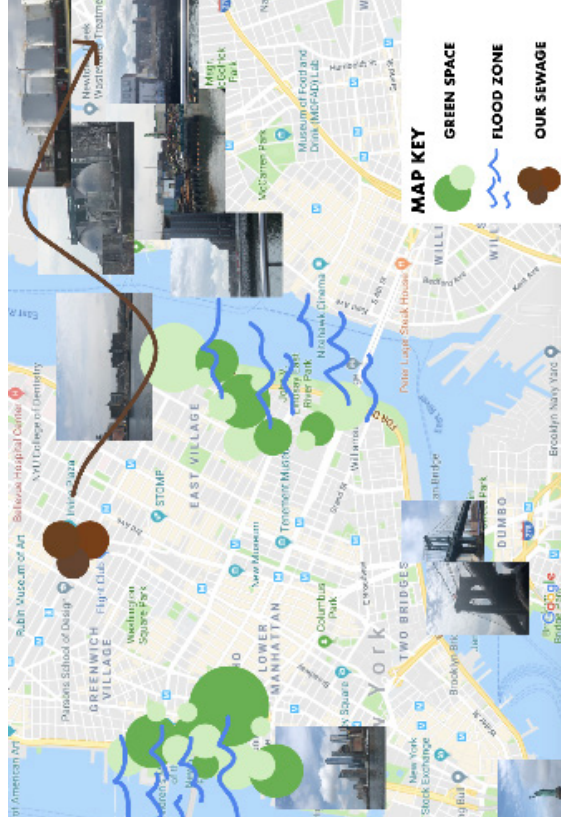
The pollution created from CSO events aren't all we have to worry about. Historically, and still today, Manhattan was a large trading

harbour and relied off of importing/exporting goods to make money. The toxic waste from operating boats and management of factories/facilities was residually left in the water as well.

In combating and trying to aid the waste management/pollution issue, I believe we first need to tackle flooding to prevent CSO events. If we were able to make buildings more resilient/adaptable to flooding (eg. Whitney Museum), alongside installing a Green Belt in Manhattan where flood zone areas are bad, water will be absorbed by the greenery and avoid flooding storm drains that will then cause CSO events.

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FIELD TRIP: CIRCLELINE CRUISE & NEWTOWN CREEK



A map composed of photos from the circleline cruise about key areas + my proposed solution regarding our current waste management system.

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ECOLOGY FIELD TRIP REPORT

From visiting the Lower East Side Ecology Center this past Friday, we learned about several ongoing projects regarding the maintenance and protection of the 57 acre park they take care of. The trip comprised of understanding two parts of their operations- marine life and composting, which both play an integral part in protecting the city with flooding.

New York City, once supplying 50% of the World's oyster supply, now serves as a harmful and largely uninhabitable place for oyster growth due to industrialization and the development of black menthonic mud on the river's floor. In conjunction with the Billion Oyster Project, working to replenish oyster counts in NYC, the Lower East Side Ecology Center has several cages with ceramic tiles covered in sea squirt

along the park's perimeter to allow a place for oyster repopulation.

The center also specializes in a composting site, collecting woodshavings and shavings from local companies, alongside 24 hour composting drop off to create a healthy soil amendment. In operation since 1990, they use a 2:1 browns to greens ratio to produce donated soil compost to local areas.



The richest compost takes 3 months to develop, becoming a dark brown color.

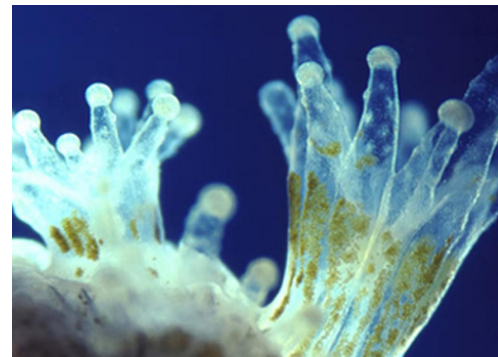
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LIVING SYSTEM ORGANIZATION

Contrary to popular belief, coral is actually made up of thousands of tiny organisms, not just one organism with many parts. Coral reefs are made up of coral polyps, which arrange themselves in colonies and provide resources to 25% of the ocean's fish. Coral relies on a symbiotic relationship with zooxanthellae, which live in their tissues to help with photosynthesis.

The structure and relationship between the

coral and photosynthetic algae inspired me to create a growing system where the pocket holding the poncho would also provide as a growing space for seedlings. The zooxanthellae lives within the coral, visible to some as the polyp is translucent, and helps attract and absorb sunlight for the plant to further use. Similarly, my backpack uses the bioplastic cutouts to attract sunlight that is then used by the seeds on the paper pulp material.



Taken by Smithsonian Ocean, the photographer captured the embedded nature of the algae within the polyp.