

# CRYONICS INSTITUTE

## NEWSLETTER

Cryonics insights and  
information for members  
and friends of the  
Cryonics Institute



# CI BULLETIN



Hello Everyone,

I'm happy to report that we had another very successful AGM at the Cryonics Institute this past September. This year's meeting featured great speakers discussing topics relevant to the past, present and future of cryonics. For more on the 2019 AGM, see the gallery on page 14 or listen to our podcast of the meeting on [YouTube](#).

## 2019 BOARD OF DIRECTORS

One of the signature announcements at every AGM is the Board of Directors election results. I take great pleasure in congratulating our re-elected directors Alan Mole, Debbie Fleming and Kevin Doyle and our newest director Nick VanDerMuelen. Sincere thanks to everyone for stepping up to serve the interests of our membership and our organization. Being a CI director is an honor and a privilege and I am confident that you will all work very hard to defend and advance CI and its mission during your terms.

One of the first jobs of the board following elections is the annual vote for our Board of Directors Officers, including the President's position. All incumbent officers were re-elected to another one-year term to serve in their designated roles, including myself as President. I would like to personally thank the directors for entrusting me with the leadership role of serving another year in this important position. I believe we have made some great strides during my tenure thus far, and pledge to do my very best to see that CI continues to head down the right path moving forward. Thank

you for your continued confidence in me and the other officers on the board. We will not let you down.

## CI'S NEW FACILITY

One of our major projects moving forward will be retrofitting our new location and getting it ready to accept patients as we continue expanding our operations. A lot of work and overhead goes into preparing a new facility for cryonics, from the basics of improving an existing building with new paint, lights and other structural renovations, as well as installing the more specific and unique infrastructure needed for a functioning cryonics facility. These specialized requirements include a liquid nitrogen delivery system and cryostat maintenance considerations like climate control, bay doors, flooring and more that probably couldn't be done properly without experienced people on board. I am very proud of our staff and the work that they are doing to get our new facility up and running to CI's quality control standards. Special thanks to Andy Zawacki, Hillary Martenson, and Michael McCauley for the hard work, attention to detail and dedication they're bringing to this milestone project as well as to CI and our membership every day. We are truly blessed to have the outstanding and talented staff we have. It is not always easy to find great workers with a great work ethic and talent, so I am extremely pleased with and proud of our Facility Team.

On the subject of talented individuals and CI, I would also like to take a moment to recognize Douglas Golner who is largely responsible for the magazine you are reading now as well as the operation and maintenance of our website among other less high-profile but important contributions. Doug is a talented technical person, wordsmith and artist, and he really helps to iron out many technical issues as well as helping manage our digital presence and other collateral which serve as the front door and face of CI in many ways.

## DEDICATION AND TEAMWORK

I could go on and on thanking the many volunteers and donors that have helped us grow into what we have become, but the list is just too long and some of our best helpers prefer to keep a very low profile away from the spot light. To each and every one of you, whether publicly recognized or not, please know we really appreciate what you do and recognize that your efforts are a big part of where CI is today. Keeping an organization like CI vital and strong

for over 40 years takes a big team effort, and I am proud to say our team of members, Board Members, employees, volunteers and donors are the ones who make that happen. Thank you again - I consider myself very fortunate to have such a great team to rely on in carrying through on our founder Robert Ettinger's vision and goals.

### THE CI FAMILY

I consider CI to be an extremely professional and well-run organization but we have sometimes been characterized as a "mom and pop" operation as if that is a bad thing. To tell you the truth, we are proud of that dynamic in our organization's culture. To me, the term "mom and pop" is synonymous with "family business" and "family culture" where people care deeply about the business and one another rather than the term being some kind of insult. CI is truly a family and we care about each and every member with the deepest sincerity, which is not something you find very often dealing with many companies today. Sure, members may quarrel at times like brothers and sisters do, but in the end we are always united and ready to help one another when it matters most. We are all in the big cryonics life raft together and our very lives depend on our mission unity.

### YOUR FUTURE STARTS NOW

As always, I must reiterate the extreme importance of all cryonicists taking action now by re-examining and acting on CI's To Do lists and Standby Preparation materials available here in the magazine as well as in the [resources](#) section of our website.

It is not enough to just sign up for cryonics. It is crucial that each and every cryonicist examine his or her unique individual situation and planning. We will help you, and that is what the guides are for, but unfortunately CI cannot do everything for everyone. We just don't have the resources or the intimate knowledge that each member has about their own lives and changing circumstances. When the variables

begin to mount up, as they inevitably do in Standby situations, a certain level of decentralization and individual initiative is necessary to effectively address those challenges. Simply put, no matter how much CI tries to stay on top of every member's status, no one knows your own situation and needs better than you do. So as much as you depend on CI in a Standby emergency, remember we are also depending on you and your advance planning, communications and preparation to help the process go as smoothly as possible.

We all know that a lot can go wrong in cryonics and time and time again we see that those who plan and ask questions in advance have better success rates than those who simply sign up and then hope for the best. But isn't that the way it is with everything in life? There are no shortcuts to success, so please don't just read this and neglect to take action. Take the time right now to review the resources we provide and start running through scenarios of problems you might face if you get sick or worse. Print pages 5, 6 and 7 of this magazine, put them on your refrigerator and begin reviewing, addressing and checking off each item listed. Download and review the CI Standby Manual for even more information, tips and advice on how to best prepare yourself, and CI, for your eventual suspension. And if you have additional questions, don't hesitate to contact us for more help.

You will be glad you did as you empower yourself with the peace of mind in knowing that you will have the best odds of suspension success when the time comes. Good luck and best of wishes in your task. I have faith in all cryonicists that if they set their mind to it they will prevail.

Respectfully

*Dennis Kowalski*

*President - Cryonics Institute*

## CRYONICS INSTITUTE MAGAZINE

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## ARTICLE SUBMISSIONS

Cryonics Institute or cryonics-related articles are welcome. Submissions: [dg@cryonics.org](mailto:dg@cryonics.org)

## E-SUBSCRIPTIONS

As a CI member, you are automatically added to our email reminder list. To unsubscribe, please use the "unsubscribe" link at the bottom of your email.

Cover Illustration

"Future Cryostats" by Nicholas VanDerMeulen



# Membership Benefits

## Why join the Cryonics Institute?

### 1) **A Second Chance at Life**

Membership qualifies you to arrange and fund a vitrification (anti-crystallization) perfusion and cooling upon legal death, followed by long-term storage in liquid nitrogen. Instead of certain death, you and your loved ones could have a chance at rejuvenated, healthy physical revival through cryopreservation.

### 2) **Affordable Cryopreservation**

The Cryonics Institute (CI) offers full-body cryopreservation for as little as \$28,000.

### 3) **Affordable Membership**

Become a Lifetime Member for a one-time payment of only \$1,250, with no dues to pay. Or join as a Yearly Member with a \$75 initiation fee and dues of just \$120 per year, payable by check, credit card or PayPal.

### 4) **Lower Prices for Spouses and Children**

The cost of a Lifetime Membership for a spouse of a Lifetime Member is half-price and minor children of a Lifetime Member receive membership free of charge.

### 5) **Quality of Treatment**

CI employed a Ph.D level cryobiologist to develop CI-VM-1, CI's vitrification mixture which can help prevent crystalline formation at cryogenic temperatures.

### 6) **Standby Options and Assistance**

CI's use of Locally-Trained Funeral Directors means that our members can get knowledgeable, licensed care. Or members can arrange for professional cryonics standby and transport by subcontracting with [Suspended Animation, Inc](#) or [International Cryomedicine Experts](#) (I.C.E.) CI also offers Standby

Training Materials and Kits for members who choose to perform Local Standby.

### 7) **Affordable Funding Options**

Cryopreservation with CI can be funded through life insurance policies issued in the USA or other countries. Prepayment and other options for funding are also available to CI members.

### 8) **Cutting-Edge Cryonics Information**

Members receive a free e-subscription to the Cryonics Institute Newsletter, as well as access to our Facebook page, Twitter feed, YouTube channel and an official members-only forum.

### 9) **Helpful, Professional Support**

CI's professional staff is available to answer any questions and address any concerns you may have about CI, your membership or Cryopreservation.

### 10) **Additional Preservation Services**

CI offers a sampling kit, shipping and long-term liquid nitrogen storage of tissues and DNA from members, their families or pets for just \$98.

### 11) **Support Education and Research**

Membership fees help CI to fund important cryonics research and public outreach, education and information programs to advance the science of cryonics.

### 12) **Member Ownership and Control**

CI Members are the ultimate authority in the organization and own all CI assets. They elect the Board of Directors, from whom are chosen our officers. CI members also can change the Bylaws of the organization (except for corporate purposes).

*The choice is clear: Irreversible physical death, dissolution and decay, or the possibility of a vibrant and joyful renewed life. Don't you want that chance for yourself, your spouse, parents and children?*



To get started, contact us at:

**(586) 791-5961 • email: [cihq@aol.com](mailto:cihq@aol.com)**

Visit us online at [www.cryonics.org](http://www.cryonics.org)

# Member Readiness Checklist

*You've signed up for cryonics -  
what are the next steps?*

Welcome Aboard! You have taken the first critical step in preparing for the future and possibly ensuring your own survival. Now what should you do? People often ask "What can I do to make sure I have an optimal suspension?" Here's a checklist of important steps to consider.

- ☐ Become a fully funded member through [life insurance](#) or easy pre-payments  
Some members use term life and invest or pay off the difference at regular intervals. Some use whole life or just prepay the costs outright. You have to decide what is best for you, but it is best to act sooner rather than later as insurance prices tend to rise as you get older and some people become uninsurable because of unforeseen health issues. You may even consider making CI the owner of your life insurance policy.
- ☐ Keep CI informed on a regular basis about your health status or address changes. Make sure your CI paperwork and funding are always up to date. CI cannot help you if we do not know you need help.
- ☐ Keep your family and friends up to date on your wishes to be cryopreserved. Being reclusive about cryonics can be costly and cause catastrophic results.
- ☐ Keep your doctor, lawyer, and funeral director up to date on your wishes to be cryopreserved. The right approach to the right professionals can be an asset.
- ☐ Prepare and execute a Living Will and Power of Attorney for Health Care that reflects your cryonics-related wishes. Make sure that CI is updated at regular intervals as well.
- ☐ Review the [CI Standby Manual](#) and other materials designed to help you with you Standby Planning. Also, consider joining or forming a local standby group to support your cryonics wishes. This may be one of the most important decisions you can make after you are fully funded. As they say-"Failing to plan is planning to fail".
- ☐ Always wear your cryonics bracelet or necklace identifying your wishes should you become incapacitated. Keep a wallet card as well. If you aren't around people who support your wishes and you can't speak for yourself a medical bracelet can help save you.
- ☐ Get involved! If you can, donate time and money. Cryonics is not a turnkey operation. Pay attention and look for further tips and advice to make both your personal arrangements and cryonics as a whole a success. The stronger our organization is, the stronger your chances of success.
- ☐ Keep your records, contact information and contracts up to date. It is recommended you review your relevant information annually at a minimum. One way is to schedule time to review all your materials at the same time you submit your required Annual Proof of Funding to CI. Also, Be especially aware of easy to forget things like a new email, phone number or address. Remember, you can also contact us at any time to ask if you have any outstanding paperwork or other info that needs to be updated.

The online [CI Members' Information Form](#) is a great resource for updating your current information on file.

# 10 Worst Mistakes in Cryonics

## 1) Not signing up ahead of time

Becoming a member, having contracts in place, and having paperwork in order should not be a last minute decision. Waiting until the last minute or after death results in an unnecessary delay of care or worse- No suspension at all! Don't wait. Sign up here and be prepared. <https://www.cryonics.org/membership/>

## 2) Not providing proof of funding

Some people believe that they can worry about funding later or if they have funding, they have put off providing proof of funding to CI. This should be done annually. Failing to provide this can result in a delay of care while the funding clears, which can take weeks. Send your proof of funding to CI now to be prepared.

## 3) Not telling anyone your plans

Being reclusive or not telling family or friends your wishes is not recommended. You should not be afraid to tell those around you what your wishes are, especially your next of kin. Wearing a bracelet, necklace or having identification or other items in view can speak to your wishes. This is all you have when you can't speak for yourself. Disasters have resulted in the past from not sharing. Talk with your family, close friends and your estate attorney, so you can be prepared.

## 4) Not planning

Many think cryonics is a turnkey service where you can just sign up and let fate take over. No matter how much you pay for cryonics, you are the only one who can make sure that you will have the best chance by planning. CI has provided a lot of information on our website and in our standby manuals. Those who plan succeed those who don't fail.

For more information visit: <https://www.cryonics.org/resources/ci-standby-kits-and-instructions>

## 5) Not notifying CI of Emergencies

There is no way that your cryonics provider can help you if they do not know of your emergency. Your family, friends, standby group or next of kin must immediately contact CI when you are having health issues or worse. It is also important for CI to know if you have up and coming surgeries or procedures, including terminal illness. Patients with a diagnosed terminal illness could enter hospice care, which might help your cryonics situation vastly. Any delay in notifying us directly could result in a poor suspension. Those helping you must have simple and clear instructions.

Here are some tips... <https://www.cryonics.org/resources/category/C57/57>

## 6) Committing suicide

Anyone who commits suicide who is not terminally ill or breaks a local law in doing so is potentially putting both themselves and our organization at great risk. CI will not risk itself for people who engage in behavior that goes against our mission to preserve life. Such activity will likely lead to an autopsy and long delays, rendering the suspension process substandard or impossible to carry out. Do not consider cryonics as a way out of your problems. You are likely to not get suspended under those circumstances. If you do not have a terminal illness and are considering suicide, you should seek mental health advice and treatment as soon as possible. <https://www.mentalhelp.net/articles/depression-hotline/>

# 10 Worst Mistakes in Cryonics

## 7) Engaging in Risky or illegal activities

Risky behaviors or associations that lead to the patient dying around suspicious circumstances will also likely lead to mandated autopsies that will also stand in the way of your cryonics wishes. It is best to use common sense and not put yourself in harm's way. Not only could your life be ended, so too could your chances of cryonics suspension or future reanimation. Use common sense and stay safe.

## 8) Providing financial or legal incentives that encourage your not being suspended.

Leaving all of your insurance or cryonics money to family if you are not suspended is certainly an option at CI, but ironically it does provide financial incentive for hostile family members to block your suspension. As often is the case, people will make sure you are not suspended to get a hold of your money. One suggestion is to leave family and next of kin some separate money from cryonics funding while suggesting that Cryonics funding go to cryonics as a donation no matter if you are buried or suspended. In addition, family or next of kin can be further compelled to cooperate if they will actually lose the money that is allocated to them for not cooperating. It is also suggested that your family be made fully aware of your wishes and stipulations, so they know what the results of their actions will be. You want to make sure you put incentives and disincentives in the correct place, so that your wishes are honored. It is suggested that your will and cryonics documentation reflect this and get reviewed by an attorney. See <https://www.cryonics.org/resources/protect-yourself-from-legal-threats>

## 9) Not removing a hostile next of kin from rights to your remains and finances

In many states and areas you can legally remove a hostile family member or next of kin from your estate. You can reassign someone who is sympathetic to cryonics and who has the legal authority to disposition of your remains, as well as your assets. In some states and locations there are disposition of remains reassignment documents, as well as powers of attorney, both in regards to financial as well as medical decisions. The executor of your will or anyone involved with making decisions should be sympathetic to your cryonics wishes. It is your responsibility to make your wishes very clear and to remove any doubt or potential legal resistance from family or next of kin. We suggest seeking legal advice to help you in this regard. Some members have even made a video statement of their wishes and given it to both their cryonics organization as well as their attorneys. Not being careful could mean that you don't get suspended, despite your wishes. Many are surprised to learn that they lose their rights upon legal death. See an attorney and prepare.

## 10) Dying under less than favorable conditions

This seems harder to control than the other situations, but there are some things you can do to make your situation more favorable. You can diet, exercise and follow the latest official medical advice to stay healthy longer. The longer you are alive, the better the technology will probably be for suspending you and the closer we will be to a future that may be able to reverse your condition. You can avoid travel to remote or hostile places where such travel is risky. Some overseas travel can result in long delays both logistically and bureaucratically. In general, dying near your cryonics provider or cryonics standby group helps your chances. Living a healthy lifestyle and staying sociable, while surrounding yourself with people who will act on your behalf is paramount. Building solid, positive relationships with good people is probably one of the most important things you can do to have your wishes honored. Take care of yourself and maintain social connectivity.





## 2019 ELECTION RESULTS

The Cryonics Institute is a member run organization, electing our leadership positions from among our membership. Board Members serve three-year terms, with four positions up for election each year on a rotating basis. Board positions are open to Voting Members only. To qualify as a Voting Member of the Cryonics Institute a CI Member must be age 18 or over and either be a Lifetime Member or have been a Yearly Member for at least three years. Additionally, only CI Members with an executed Cryonic Suspension Agreement and having full funding for the Cryonic Suspension Agreement may be Voting Members.

For the 2019 election, there were three incumbent candidates, Kevin Doyle, Debbie Fleming and Alan Mole with the fourth incumbent Marta Sandberg deciding not to run for re-election. In addition, two new candidates, Nicholas VanDerMuelen and Michael Gerstner also opted to run.

Although incumbents typically have an excellent chance at re-election, nothing in CI's bylaws stipulate automatic re-election for incumbents. In this case, however, Sandberg's vacancy guaranteed at least one of the new candidates a spot on the board.

Both candidates were excellent choices, but the membership ultimately elected Nicholas VanDerMuelen as CI's newest Board of Directors member. Our thanks to all serving Board Members and candidates for their willingness to take on the important job of helping to guide and direct the Cryonics Institute into the future.

Congratulations to the winners, and thanks again to everyone who participated in the election, either as a candidate or a voting member. Remember, we are a member operated organization, so your voice and your vote matter.

## Your T2019-T2022 Directors



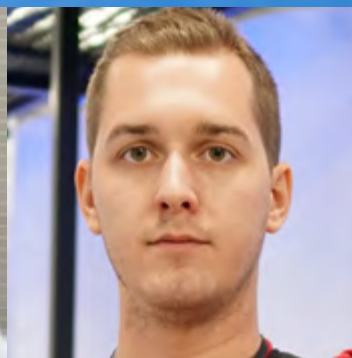
Kevin Doyle



Debbie Fleming



Alan Mole



Nicholas  
VanDerMuelen





## New CI Membes Message Board Replacing Yahoo! Groups

CI has always had an active and engaged online community on our private Yahoo! Groups message board. It is a place where our members can discuss all things cryonics and CI, as well as a great place to share ideas, solicit feedback and engage in discussion with fellow members and CI's Board of Directors. Unfortunately, recent announcements from Yahoo! indicate an uncertain future for the Groups platform.

In response, CI has moved to a new Discussion Groups Platform, Groups.io.

### JOINING THE NEW GROUP

If you were a member of the previous group, you have already received an email invitation to join the group. Please note, the email was sent to the address you use to receive messages from the Yahoo! Group, not the address you use for logging in to Yahoo!. If you didn't receive

the invitation email, please check your spam or junk folder first, and if it's not there, visit the new group page at <https://groups.io/g/cryonicsinstitute> and apply for membership (see illustration).

Please note, this private group is for CI Members only. If you apply for membership via the site, please use the email address associated with your CI membership that we have on file at CI headquarters. We need to approve all requests for membership, so we will need to cross-reference your email with our database to verify you are a member.

### Cryonics Community Board

If you are not a CI Member, please consider joining CI. Alternately, you can also join the Cryonics Community message board. This board is an open, unmoderated discussion group available to all.

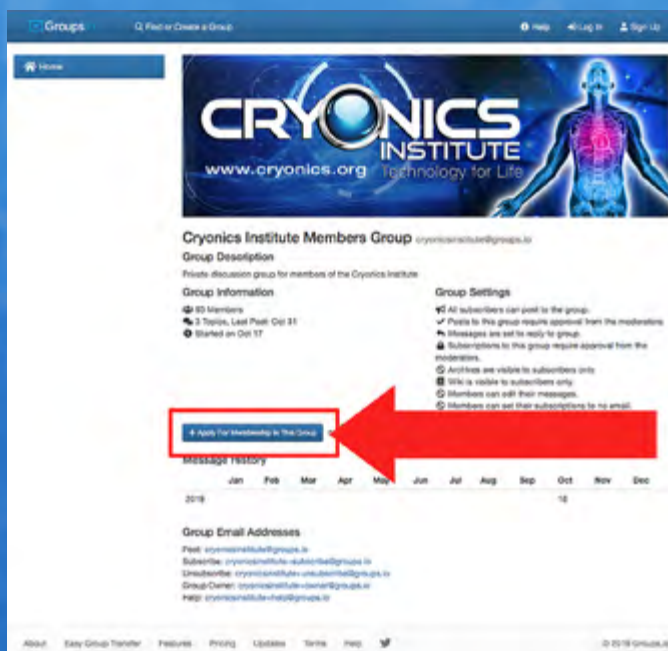
To join, visit <https://groups.io/g/cryonicscommunity>.

### A Note on Board Policies

All messages on the Cryonics Institute members-only group will be moderated by CI.

Topics for discussion must be related to CI, Cryonics or subjects relevant to cryonics. Politics, for example, would be rejected unless the discussion involved some kind of legislation (like Death with Dignity) that could potentially impact cryonics. Our intention is to keep this board very focused, so topics outside CI and cryonics-related subjects will be rejected by the moderators.

We're looking forward to the new features on groups.io and encourage members to join and participate. If you have questions or problems signing up, contact [dg@cryonics.org](mailto:dg@cryonics.org)





## Free Online Transhumanism Course from IAI



We recently received a message from The Institute of Art and Ideas (IAI) asking us to share one of their free courses with our membership. The organization describes themselves as "The TedX of Europe." Their website explains:

*"IAI Academy is a new educational platform offering courses from world-leading scholars on the ideas that matter. With a unique philosophical take on today's biggest questions, our courses are recorded at our annual festival HowTheLightGetsIn and made available online, to everyone, for free."*

The course is "The Future of Being Human," discussing the potential of technology to enhance and extend human life. The course is free, however it does require registration as a member of IAI.

If you're interested in the course, the link is here:

<https://iai.tv/iai-academy/courses/info?course=the-future-of-being-human>

### Course Description from iai.tv

#### The Future of Being Human

Anders Sandberg

Should we upgrade our bodies and minds? Fellow at Oxford's Future of Humanity Institute Anders Sandberg investigates the road we must take to reach the mind-boggling possibilities and of a transhuman future.

#### About the Course

Since the Ancient Greek legend of Icarus and Daedulus, humans have been fascinated by the potential of technology to transcend our biological limitations - to live longer, think smarter, and experience more. But what exactly could be achieved? Could we really do away with the nuisances of aging and death? Could our neural systems be put online, giving us the wealth of all human knowledge a thought away? Is this something we would even want? What are the dangers involved, and is it even possible to predict them? Are we in a position to even speculate about the effect of a transhumanist revolution would have on society, or is the uncertainty too great and risks too unpredictable? In this course, Fellow at Oxford's Future of Humanity Institute Anders Sandberg explains the history, motivations and goals of transhumanism, and offers predictions of what humanity might resemble in a trillion years.





## CI Board Member Pat Heller Wins National Numismatic Honors



Congratulations to Pat Heller, CI Treasurer, for his recent achievements in his numismatic career. You may recognize Heller from his presentations at the Annual AGM where he breaks down CI's financial standing for the membership, including detailed spreadsheets of our accounts. He has served as CI's Treasurer since 1980, and has also served as Vice President of CI.

Heller is a Certified Public Accountant, though for the most part he deals in Rare Coins and Precious Metals. He is the owner and chief executive officer of Liberty Coin Service, of Lansing, Michigan.

At the Numismatic Literary Guild (NLG) Annual Awards Ceremony on August 15, 2019, Liberty Coin Service's Communications Officer Patrick A. Heller was honored with awards for Best Investment Newsletter and Best Radio Report. The awards ceremony was conducted during the American Numismatic Association World's Fair of Money held in Rosemont, Illinois.

Said LCS CEO and owner Tom Coulson, "Competing against hundreds of coin dealer publications, the Liberty's Outlook newsletter that Pat writes

for Liberty Coin Service's customers and subscribers has been honored by the NLG three times over the past four years. His twice-weekly radio commentaries on 1320 WILS AM on Wednesday and Friday mornings under the title of 'Things You 'Know' That Just Aren't So, And Important News You Need To Know' have been honored by the NLG for Best Radio Report for the fifth time in nine years. Providing our customers, readers, and listeners with valuable information they can't find anywhere else has helped this company develop and sustain a growing and loyal customer base."

Over his career, Heller has now received a total of 15 national awards from the American Numismatic Association (including the 2012 Harry Forman National Coin Dealer of the Year Award), Industry Council for Tangible Assets, Professional Numismatists Guild (including the organization's highest award in 2010, the Abe Kosoff Founders Award), and the Numismatic Literary Guild. He has also received multiple honors from state and local organizations.

The Numismatic Literary Guild was established in 1968 to recognize outstanding written and other forms of communication about numismatics, the study of money.

Liberty Coin Service, founded in 1971, is Michigan's largest rare coin and precious metals dealership. Liberty Coins, as it is known locally, has been located in Lansing's Frandor Shopping Center since 1975.



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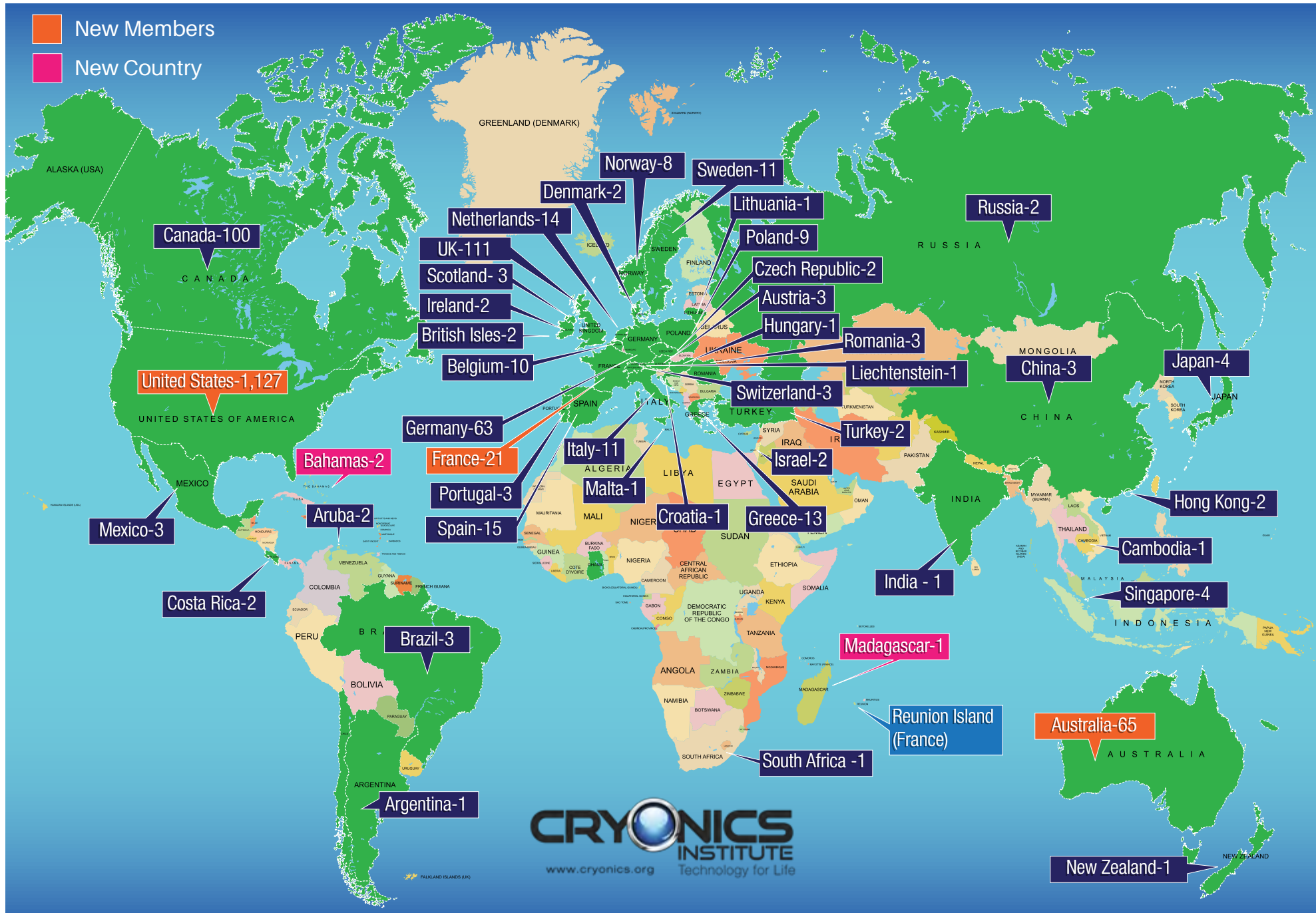
# CI MEMBERSHIP

NOVEMBER 2019

Members ..... 1,640  
Patients..... 182

Pets ..... 178  
DNA/Tissue ..... 297  
SA ..... 267

TOTAL  
**1,812**





# 2019

## Annual General Meeting



Available on YouTube (Audio Only): [2019 AGM PRESENTATION](https://www.youtube.com/watch?v=mw_InJ7Hy1Y&feature=youtu.be)

( [https://www.youtube.com/watch?v=mw\\_InJ7Hy1Y&feature=youtu.be](https://www.youtube.com/watch?v=mw_InJ7Hy1Y&feature=youtu.be) )



*Bravado Event Venue, Clinton Township, MI*





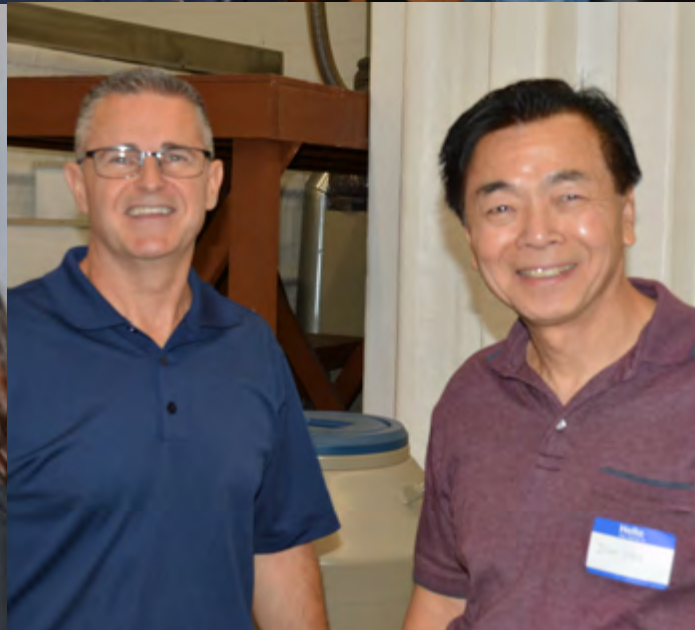
*The 2019 meeting was CI's 43rd Annual AGM.  
Our thanks to all of our guests, both members  
and non-members for making the trip to attend.*

*Thanks also to CI President Dennis Kowalski and our Facility  
Team of Hillary Martenson, Mike McCauley and Andy  
Zawacki for putting together the event.*





# CI FACILITY TOUR









*43<sup>RD</sup> ANNUAL  
CRYONICS INSTITUTE  
AGM PROGRAM*



*CI President Dennis Kowalski*

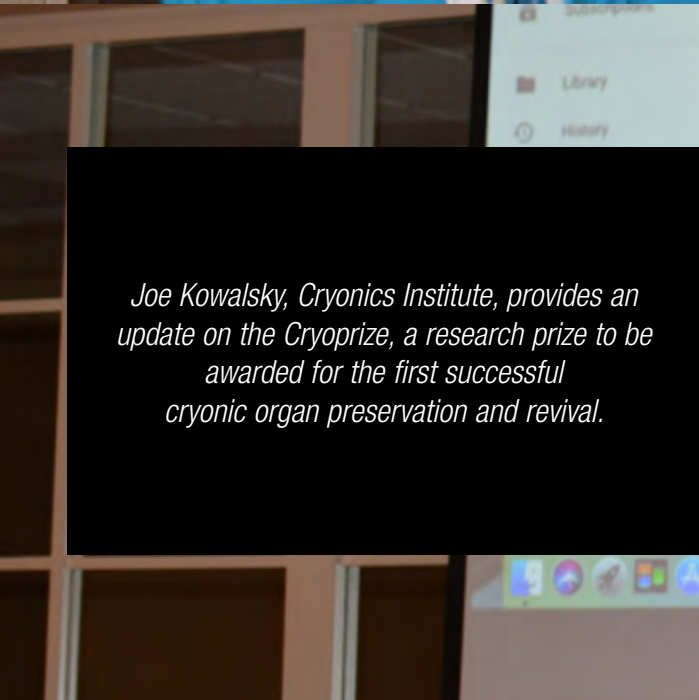


*Special Guest Joan Runkel shares a story about CI's first patient. Runkel's father Walter Runkel helped fund and found the Cryonics Institute with Robert Ettinger and John Erfurt.*

*Rudi Hoffman, CFP and Cryonics Insurance Professional discusses cryonics funding.*



*Joe Kowalsky, Cryonics Institute, provides an update on the Cryoprize, a research prize to be awarded for the first successful cryonic organ preservation and revival.*



*Sayer Johanson from Suspended Animation Inc. talks professional Standby.*





*Patrick Heller and Steve Lucyx of the Cryonics Institute deliver updates on CI's finances.*



*Professor Rudolpho Goya dicusses his reasearch on the feasibility of cryonics.*

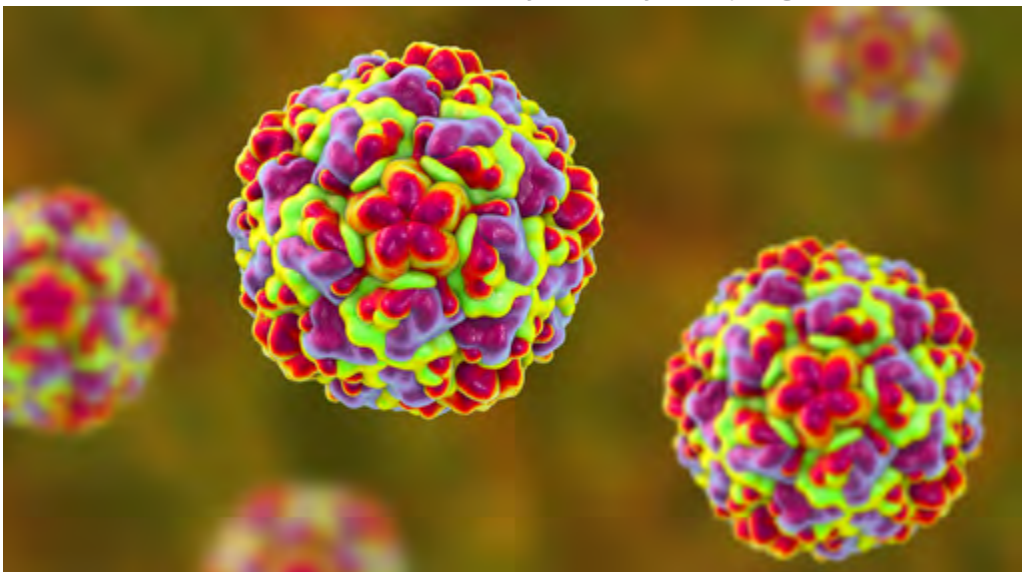


**ScienceNews**  
INDEPENDENT JOURNALISM SINCE 1921from **SCIENCE NEWS.ORG**

## Disabling one protein might one day lead to a cure for the common cold

*Rhinoviruses couldn't replicate in mice and human cells engineered to lack SETD3*

by Erika Hayasaki | Aug 8, 2019



*Rhinoviruses (shown in this illustration) are responsible for most cases of the common cold. New research suggests a way to stop these viruses, and others, from spreading in human cells.*

DR\_MICROBE/ISTOCK/  
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An uncommon way of thinking may be bringing scientists one step closer to a cure for the common cold.

Researchers have identified a key protein in humans that some viruses use to multiply inside of human cells. Disabling that protein, instead of attacking the virus itself, may prevent infections from spreading. In mice and human cells engineered to lack this protein, the viruses couldn't replicate, Jan Carette, a microbiologist at Stanford University School of Medicine, and colleagues report September 16 in *Nature Microbiology*.

"It's not quite a cure for the common cold, but it's an interesting step forward," says Ellen Foxman, an immunologist at Yale School of Medicine who was not involved in the study.

Colds are the most common infectious disease in humans. On average, adults catch a cold two or three times each year, while children get the sniffles even more often (SN: 2/12/09). Any one of a few hundred viruses, including rhino-

viruses, can cause these infections. That fact — and because these viruses can mutate quickly to become resistant to drugs — makes it difficult to find a cure.

So researchers at Stanford and the University of California, San Francisco focused on the human host rather than the virus. Viruses hijack cells and rely on humans' own cellular machinery to make more virus and sicken their host. The team wanted to see if it could identify human genes that make the proteins that many viruses hijack in order to replicate.

Using the gene-editing tool CRISPR, Carette and colleagues systematically deleted chunks of DNA to build a library of human cells, each missing one gene and therefore unable to make that gene's corresponding protein. The researchers then infected the cells with two types of viruses, one that causes colds and another that has been linked to ...

neurological diseases.

**ARTICLE CONTINUES AT [SCIENCENEWS.ORG](https://www.sciencenews.org)**

## Personalized diets may be the future of nutrition. But the science isn't all there yet

*People can react very differently to the same foods, research shows*

Healthy eating may not be as easy as following standard dietary recommendations. Fruits, vegetables, proteins and carbohydrates may affect people differently, although scientists still don't know exactly why.

JEZ TIMMS/UNSPLASH



By Tina Hesman Saey

SEPTEMBER 30, 2019 AT 2:37 PM

Microbiologist Lora Hooper wishes she had a good answer when her mother asks, "What should I eat?"

Hooper could rely on a familiar refrain. Eat plenty of fruits, vegetables and whole grains, and limit meat and fat intake. Try to eat foods low on the glycemic index, a measure of how high a particular food is likely to send a person's blood sugar after eating it.

Nutrition recommendations have focused on properties of food, debating whether focusing on calorie counts, carbohydrates, fats or proteins might be more important. But more studies are showing that people's bodies can react very differently to the same foods, and standardized nutrition advice doesn't fit everybody. Even identical twins can have varying responses to identical foods, new research finds,

suggesting that the variety can't be explained by genes alone.

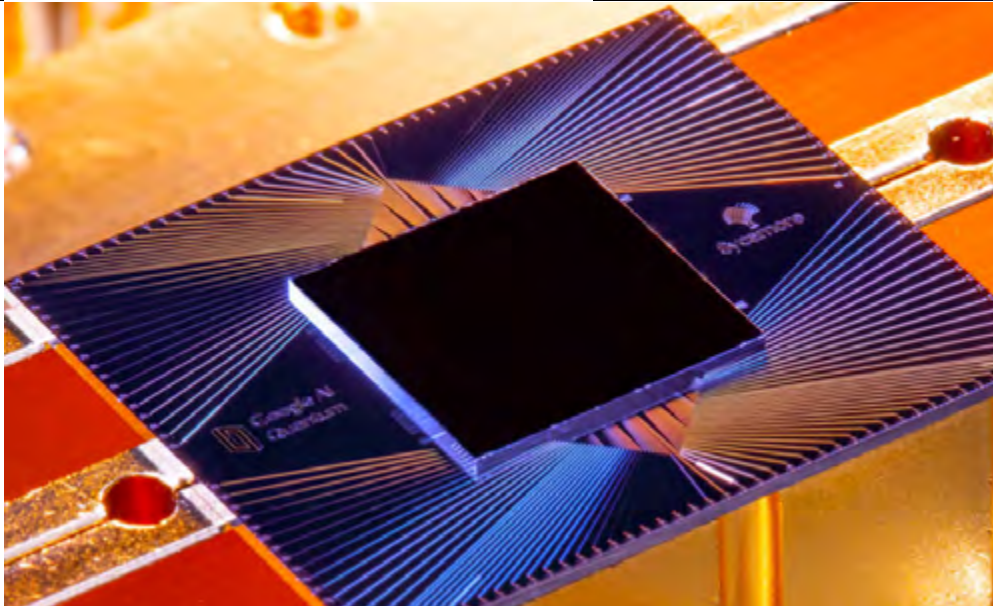
With genetics being put on the back burner, researchers are searching for other explanations for why a diet one person swears by may cause another to gain weight. One big player may be the friendly bacteria and other microbes in people's guts.

"Your microbiota really determines how many calories you take up from your food," says Hooper, of the University of Texas Southwestern Medical Center in Dallas. Without a better understanding of how gut microbes will react, she says, "I don't think I can read the number of calories in my food off a box."

So instead of focusing on the food, people like Hooper's mother may have to look within to their own gut microbes or other personal qualities to find the diet that works best...

[FULL ARTICLE AT SCIENCE NEWS.ORG](https://www.sciencenews.org)



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*Google researchers report that their quantum computer, Sycamore, has performed a calculation that can't be achieved with any classical computer. The quantum chip (shown) must be cooled to near absolute zero to function.*

*F. ARUTE ET AL/NATURE 2019*

## Google officially lays claim to quantum supremacy

*A quantum computer reportedly beat the most powerful supercomputers at one type of calculation*

*By Emily Conover | OCTOBER 23, 2019 AT 4:33 AM*

Quantum supremacy is here, researchers from Google claim.

For the first time, a quantum computer has solved a problem that can't be performed by a standard computer — at least not within a reasonable amount of time — Google announced October 23. This milestone, known as quantum supremacy, is a long-anticipated step toward useful quantum computers.

The researchers performed the task with a chip consisting of only 53 qubits, the quantum version of the bits found in everyday computers. "It's fascinating that we can do something so powerful with such a small chip," says quantum physicist Mária Kieferová of the University of Technology Sydney, who was not involved with the study.

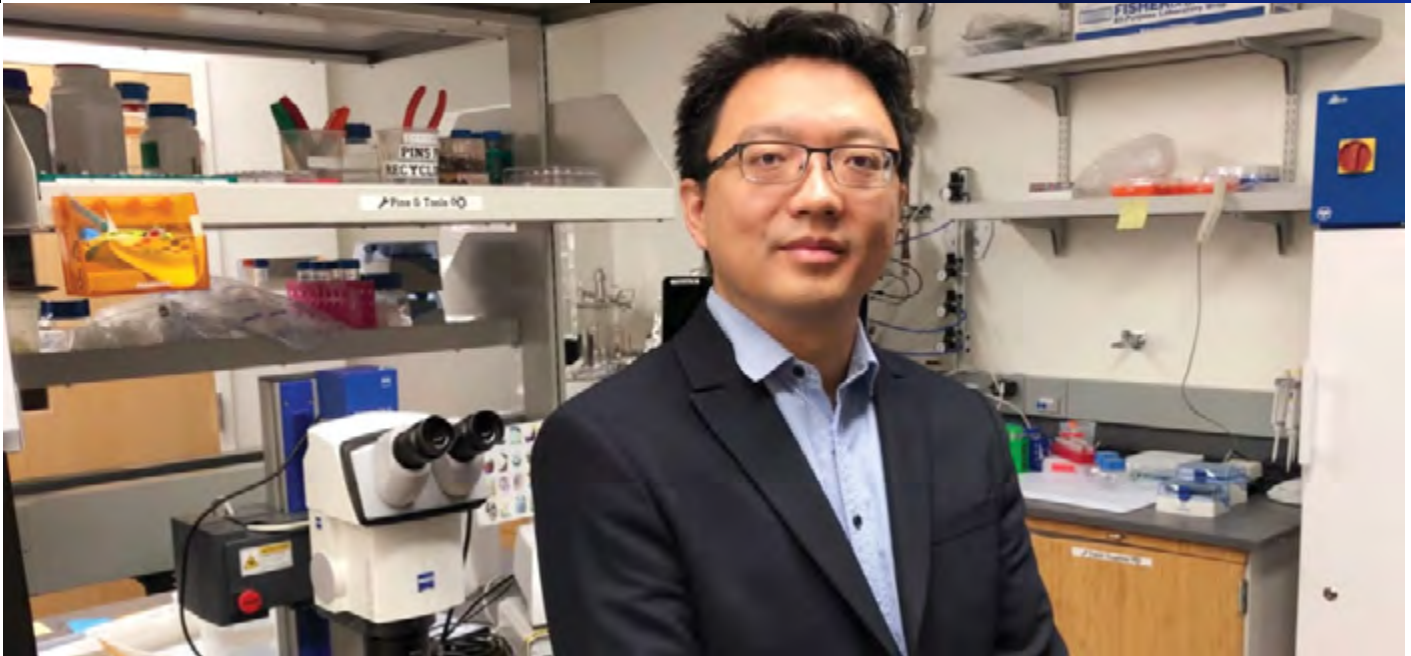
But don't expect quantum computers to suddenly take over.

The calculation Google's quantum computer performed was not a particularly useful one. Instead, the task at hand was one that was designed to play to quantum computers' strengths and to be difficult for a nonquantum, or "classical," computer.

What's more, some researchers are pushing back against Google's quantum supremacy claim, arguing that the milestone has yet to be achieved.

For about a month, rumors have been swirling among scientists that Google would soon report its achievement of quantum supremacy (SN: 9/21/19). The company's official announcement, in a study published October 23 in *Nature*, follows the apparently unintentional posting of an earlier version of the study on a NASA website in September. That paper was swiftly taken down, but copies of it persisted and were shared among researchers.

**[ARTICLE CONTINUES AT SCIENCENEWS.ORG](https://www.sciencenews.org/article/google-quantum-supremacy)**

**ScienceNews**  
INDEPENDENT JOURNALISM SINCE 1921from **SCIENCE NEWS.ORG**

*Stanley Qi hopes his editing tools will one day cure genetic diseases. "That's the real test," he says.*  
IMAGE COURTESY OF STANLEY QI

## Stanley Qi gives CRISPR a makeover to redefine genetic engineering

*Scientists now have the power to modify DNA in ways once unimaginable*

*By Tina Hesman Saey | OCTOBER 2, 2019 AT 8:59 AM*

It might seem that dulling a cutting tool is the last thing an engineer would want to do, but Stanley Qi is no ordinary engineer. By blunting the gene-editing scissors known as CRISPR/Cas9, he made them even more useful — the molecular equivalent of a Swiss Army knife.

CRISPR/Cas9 has become one of the most powerful tools in molecular biology since its introduction in 2012. It is composed of an RNA (the CRISPR part) that guides a DNA-cutting enzyme called Cas9 to specific places in an organism's genetic instruction book.

As a graduate student, Qi, now 36 and a bioengineer and

biotechnologist at Stanford University, disabled Cas9 so it could no longer cut DNA. The result was dead Cas9, or dCas9. Strapping enzymes, fluorescent tags or other molecules to dCas9's back has created an entire toolbox worth of DNA manipulators. Before dCas9, researchers could use CRISPR/Cas9 only to alter the DNA bases, or letters, within a gene. After Qi and colleagues' invention, scientists could turn genes on or off, up or down, says Rodolphe Barrangou, a CRISPR researcher at North Carolina State University in Raleigh and editor of the CRISPR Journal.

Qi not only develops the tools, he's also using them to study how cells sense the environment, how stem cells work...

**[FULL ARTICLE AT SCIENCENEWS.ORG](https://www.sciencenews.org)**



## Seth Shipman recorded a movie in DNA — and that's just the beginning

*He is developing tools that may reveal hidden biological processes*

By Laura Sanders | OCTOBER 2, 2019 AT 8:59 AM

Seth Shipman is a magpie of biological innovation. He collects useful parts — from bacteria, nerve cells, reams of genetic data — and transforms them into tools that do amazing things.

One of his best creations so far is a collection of living bacterial cells with DNA that carries an iconic movie of a running horse. Recording images, or any other information, in the genetic material of living cells isn't just for entertainment; it will give scientists views of processes that are usually hidden.

Imagine designing record-keeping cells capable of eavesdropping on the cellular destruction that precedes dementia in the brain. Or monitoring the elaborate genetic instructions that tell a brain cell how to develop. Or even seeing the exact moment when cellular missteps begin to create a disorder such as schizophrenia.

Scientists can't do any of this yet. But Shipman, 36, is patient. "If you're worried about what you can do right now, it's hard to take a big step forward," says Shipman, a biotechnologist at the University of California, San Francisco and the Gladstone Institutes, a nonprofit research organization on the UC San Francisco campus. To move forward often requires a pause, a careful reckoning to examine your tools and look around a bit, Shipman says.

His willingness to change perspective and cross disciplines — neuroscience, microbiology, engineering and even art — is unusual among scientists, says Roger Nicoll, a neuroscientist who oversaw Shipman's Ph.D. work at UC



*Seth Shipman builds new biological tools that could be used to answer big questions.*

LAUREN BAYLESS/GLADSTONE INSTITUTES

San Francisco. "I get really antsy when I get outside of my comfort zone," Nicoll says. "He has no comfort zone."

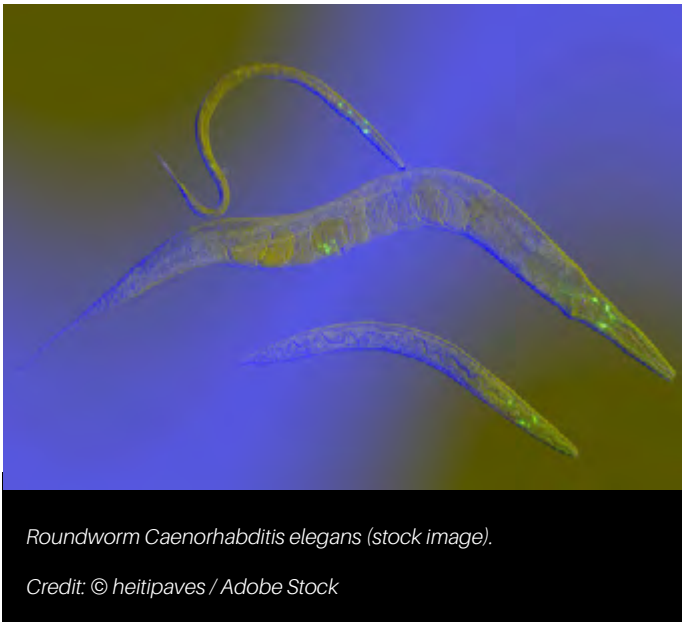
Shipman combines "this ability to step back and get deep insight with an incredibly high level of rigor to pursue that vein of gold that he comes upon," Nicoll adds. The bacterial movie feat, for instance, came from Shipman's frustration with a lack of good tools. He wanted to monitor genes' behavior inside cells as time passes, but one of the only ways to track that behavior requires killing the cells. "That destruction is something that's really incompatible with something that happens over time," he says. So instead of hammering away with the wrong tools, he backed up and thought about what the ideal tool would look like.

The perfect system would unobtrusively monitor cellular events from the inside and provide a record of those activities. During a postdoc at Harvard University, Shipman and colleagues figured out how to best use the gene-editing tool CRISPR to get bacterial DNA to accept foreign snippets, a technique described in 2016 in *Science*. Once that was achieved, "it was off to the races," he says.

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The brain's neural activity -- long implicated in disorders ranging from dementia to epilepsy -- also plays a role in human aging and life span, according to research led by scientists in the Blavatnik Institute at Harvard Medical School.

The study, published Oct. 16 in *Nature*, is based on findings from human brains, mice and worms and suggests that excessive activity in the brain is linked to shorter life spans, while suppressing such overactivity extends life.

The findings offer the first evidence that the activity of the nervous system affects human longevity. Although previous studies had suggested that parts of the nervous system influence aging in animals, the role of neural activity in aging, especially in humans, remained murky.

"An intriguing aspect of our findings is that something as transient as the activity state of neural circuits could have such far-ranging consequences for physiology and life span," said study senior author Bruce Yankner, professor of genetics at HMS and co-director of the Paul F. Glenn Center for the Biology of Aging.

## In a first, scientists pinpoint neural activity's role in human longevity

Date: October 16, 2019 | Source: Harvard Medical School

Neural excitation appears to act along a chain of molecular events famously known to influence longevity: the insulin and insulin-like growth factor (IGF) signaling pathway.

The key in this signaling cascade appears to be a protein called REST, previously shown by the Yankner Lab to protect aging brains from dementia and other stresses.

Neural activity refers to the constant flicker of electrical currents and transmissions in the brain. Excessive activity, or excitation, could manifest in numerous ways, from a muscle twitch to a change in mood or thought, the authors said.

It's not yet clear from the study whether or how a person's thoughts, personality or behavior affect their longevity.

"An exciting future area of research will be to determine how these findings relate to such higher-order human brain functions," said Yankner.

The study could inform the design of new therapies for conditions that involve neural overactivity, such as Alzheimer's disease and bipolar disorder, the researchers said.

The findings raise the possibility that certain medicines, such as drugs that target REST, or certain behaviors, such as meditation, could extend life span by modulating neural activity.

Human variation in neural activity might have both genetic and environmental causes, which would open future avenues for therapeutic intervention, Yankner said...

All roads lead to REST

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## A blood factor involved in weight loss and aging

Date: October 22, 2019

Source: Institut Pasteur

Aging is a process that affects all functions of the human body, particularly brain function. However, aging can be delayed through lifestyle changes (physical exercise, restricting calorie intake, etc.). Researchers at the Institut Pasteur and CNRS have elucidated the properties of a molecule in the blood -- GDF11 -- whose mechanisms were previously unknown. In a mouse model, they showed that this molecule could mimic the benefits of certain calorie restrictions -- dietary regimens that have proven their efficacy in reducing cardiovascular disease, preventing cancer and increasing neurogenesis in the brain. The results of this research were published in the journal *Aging Cell* on October 22, 2019.

Today it is possible to maintain a healthy brain in the long term. For the past 30 years, it has been generally acknowledged that certain diet restrictions such as intermittent fasting can improve cognitive performance and extend life expectancy in several species. It has also been proven that calorie restriction (a reduction in calorie intake of 20% to 30% while preserving nutritional quality) reduces the risk of cardiovascular disease and cancer, while increasing production of new neurons in the brain.

In a previous study using mouse models, scientists observed that injecting aged mice with blood from young mice rejuvenated blood vessels in the brain, and consequently improved cerebral blood flow, while increasing neurogenesis and cognition. Scientists in the Perception and Memory Unit (Institut Pasteur/CNRS) put forward the theory that, since calorie restriction and supplementation with young blood were effective in rejuvenating organs, they most likely have certain mechanisms in common.

They therefore examined the molecule GDF11, which belongs to the GDF (Growth Differentiation Factor) protein family and is involved in embryonic development. GDF11



<https://www.pexels.com/@pixabay>

was already known to scientists for its ability to rejuvenate the aged brain. "By injecting this molecule into aged mouse models, we noticed an increase in neurogenesis and blood vessel remodeling," explains Lida Katsimpardi, a scientist in the Perception and Memory Unit and lead author of the study. The scientists also observed that the mice administered with GDF11 had lost weight without changing their appetite. This observation led them to believe that GDF11 could be a link between calorie restriction and the regenerating effects of young blood.

The next step was to confirm this theory by studying adiponectin, a hormone secreted by adipose tissue which induces weight loss without affecting appetite. In animals that have undergone calorie restriction, the blood levels of this hormone are high. "In animals that were administered GDF11, we also observed high levels of adiponectin," emphasizes Lida Katsimpardi, "and this shows that GDF11 causes metabolic changes similar to those induced by calorie restriction..."

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## Assembler robots make large structures from little pieces

Date: October 16, 2019

Source: Massachusetts Institute of Technology



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Today's commercial aircraft are typically manufactured in sections, often in different locations -- wings at one factory, fuselage sections at another, tail components somewhere else -- and then flown to a central plant in huge cargo planes for final assembly.

But what if the final assembly was the only assembly, with the whole plane built out of a large array of tiny identical pieces, all put together by an army of tiny robots?

That's the vision that graduate student Benjamin Jenett, working with Professor Neil Gershenfeld in MIT's Center for Bits and Atoms (CBA), has been pursuing as his doctoral thesis work. It's now reached the point that prototype versions of such robots can assemble small structures and even work together as a team to build up a larger assemblies.

The new work appears in the October issue of the IEEE Robotics and Automation Letters, in a paper by Jenett, Gershenfeld, fellow graduate student Amira Abdel-Rahman, and CBA alumnus Kenneth Cheung SM '07, PhD '12, who is now at NASA's Ames Research Center, where he leads the

ARMADAS project to design a lunar base that could be built with robotic assembly.

"What's at the heart of this is a new kind of robotics, that we call relative robots," Gershenfeld says. Historically, he explains, there have been two broad categories of robotics -- ones made out of expensive custom components that are carefully optimized for particular applications such as factory assembly, and ones made from inexpensive mass-produced modules with much lower performance. The new robots, however, are an alternative to both. They're much simpler than the former, while much more capable than the latter, and they have the potential to revolutionize the production of large-scale systems, from airplanes to bridges to entire buildings.

According to Gershenfeld, the key difference lies in the relationship between the robotic device and the materials that it is handling and manipulating. With these new kinds of robots, "you can't separate the robot from the structure -- they work together as a system," he says. For example, while most mobile robots require highly precise navigation...

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## A swifter way towards 3D-printed organs

*Sacrificial ink-writing technique allows 3D printing of large, vascularized human organ building blocks*

*Date: September 6, 2019*

*Source: Wyss Institute for Biologically Inspired Engineering at Harvard*

20 people die every day waiting for an organ transplant in the United States, and while more than 30,000 transplants are now performed annually, there are over 113,000 patients currently on organ waitlists. Artificially grown human organs are seen by many as the “holy grail” for resolving this organ shortage, and advances in 3D printing have led to a boom in using that technique to build living tissue constructs in the shape of human organs. However, all 3D-printed human tissues to date lack the cellular density and organ-level functions required for them to be used in organ repair and replacement.

Now, a new technique called SWIFT (sacrificial writing into functional tissue) created by researchers from Harvard’s Wyss Institute for Biologically Inspired Engineering and John A. Paulson School of Engineering and Applied Sciences (SEAS), overcomes that major hurdle by 3D printing vascular channels into living matrices composed of stem-cell-derived organ building blocks (OBBs), yielding viable, organ-specific tissues with high cell density and function. The research is reported in *Science Advances*.

“This is an entirely new paradigm for tissue fabrication,” said co-first author Mark Skylar-Scott, Ph.D., a Research Associate at the Wyss Institute. “Rather than trying to 3D-print an entire organ’s worth of cells, SWIFT focuses on only printing the vessels necessary to support a living tissue construct that contains large quantities of OBBs, which may ultimately be used therapeutically to repair and replace human organs with lab-grown versions containing patients’ own cells.”



SWIFT involves a two-step process that begins with forming hundreds of thousands of stem-cell-derived aggregates into a dense, living matrix of OBBs that contains about 200 million cells per milliliter. Next, a vascular network through which oxygen and other nutrients can be delivered to the cells is embedded within the matrix by writing and removing a sacrificial ink. “Forming a dense matrix from these OBBs kills two birds with one stone: not only does it achieve a high cellular density akin to that of human organs, but the matrix’s viscosity also enables printing of a pervasive network of perfusable channels within it to mimic the blood vessels that support human organs,” said co-first author Sébastien Uzel, Ph.D., a Research Associate at the Wyss Institute and SEAS.

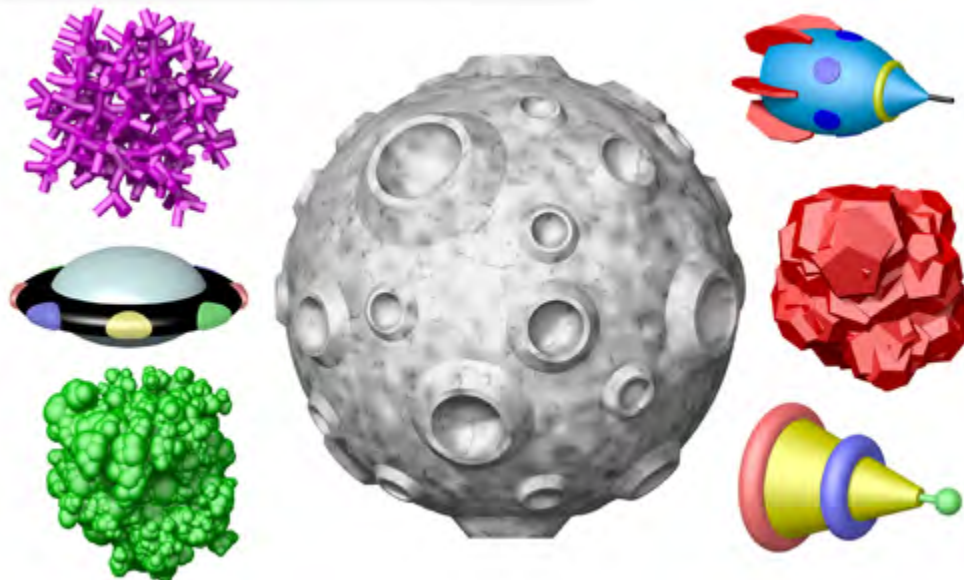
The cellular aggregates used in the SWIFT method are derived from adult induced pluripotent stem cells, which are mixed with a tailored extracellular matrix (ECM) solution to make a living matrix that is compacted via centrifugation. At cold temperatures (0-4°C), the dense matrix has the...

consistency of mayonnaise - soft enough to manipulate

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*Scientists are exploring new ways of navigating through the human body using tiny "rockets" and a biologically-friendly propulsion system.*

© Can Stock Photo / PandaWild

## Microscale rockets can travel through cellular landscapes with precision

*Date: October 25, 2019 | Source: University of Pennsylvania*

A new study from the lab of Thomas Mallouk shows how microscale "rockets," powered by acoustic waves and an onboard bubble motor, can be driven through 3D landscapes of cells and particles using magnets. The research was a collaboration between researchers at Penn and the University of San Diego, the Harbin Institute of Technology in Shenzhen, and Pennsylvania State University, where the study was initially conducted, and was published in *Science Advances*.

The origin story of the tiny rockets began with a fundamental scientific question: Could scientists design nano- and microscale vessels that use chemicals for fuel to travel through the human body? Fifteen years of research by Mallouk and others showed that the short answer was "yes," but researchers faced significant barriers for using these vessels in biomedical applications because the chemicals they used for fuel, like hydrogen peroxide, were toxic.

An "accidental" discovery led Mallouk and his group to focus on the use of a completely different type of fuel: sound waves. While trying to move their rockets with acoustic levitation, a process used to lift particles off a microscope slide with high-frequency sound waves, the group was surprised to find that ultrasound made the robots move at very fast speeds. Mallouk and his team decided to investigate this phenomenon further to see if they could use high-frequency sound waves to power their tiny vessels.

The group's latest paper details the design of the microscale rockets, resembling a round-bottomed cup 10 microns in length and 5 microns wide, or about the size of a particle of dust. The rounded cups are 3D printed using laser lithography and contain an outer layer of gold and inner layers of nickel and a polymer. Treatment with a hydrophobic chemical after the gold is cast causes an air bubble to form and become trapped inside the rocket's cavity...

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## Beating cancer: How viruses are being used to infect and kill tumours

*We've long known that viruses can target cancers in our bodies. Now, thanks to gene editing, we're using them as tumour search and destroy agents - and getting our immune systems to join the fight too*

*Date: 23 October 2019 | Michael Le Page*

TEN years ago, Randy Russell found out that a small mole on his shin was skin cancer. He got it removed, but then he found another, and more after that. Each time he had the tumour cut out. "After 10 or 11 surgeries, I got aggravated because it was beginning to bankrupt the family and it wasn't working," he says.

Ultimately, he was told it was the end of the road. "They said, 'You've got maybe six, seven months to live. Just go home and die.'" Then, as Russell was leaving the hospital to return to his home in Rock Spring, Georgia, one of the doctors shouted down the hall after him: "Try Vanderbilt!"

A few weeks later, Russell was having an experimental drug injected into his tumours at Vanderbilt University Medical

Center in nearby Nashville, Tennessee. Each time he went back, the tumours were half the size. "It was just amazing," he says. "Finally, the doctors said, 'Look, there's nothing more we can do for you. It's just gone.'"

That experimental drug, called T-VEC, was actually a live virus that researchers had tinkered with to make sure it was safe for Russell's healthy cells, but deadly to his cancer. It is the first ever virus to be approved for treating cancers, and many more are now being tested. These anticancer viruses could give us a powerful new way to kill tumours, not only because they target tumour cells directly, but because they spur our immune systems to do so too. That could make them particularly potent when...

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Forbes

from FORBES.COM

## AI Chip Boom: This Stealthy AI Hardware Startup Is Worth Almost A Billion

By: Aaron Tilley

In the past few years, a family of artificial intelligence techniques called deep learning has taken the tech industry by storm. It's being used in everything from helping organize your pictures in Google Photos, to giving smarts to digital assistants like Amazon's Alexa, Apple's Siri and Microsoft's Cortana, to helping cars drive themselves.

But the deep learning models require huge amounts of computing power and the latest algorithms are pushing on the limits of what current chips can handle. That's why semiconductor companies, from established giants like Nvidia and Intel to a slew of startups, are racing to develop new, AI-specific chips that could fundamentally change how computers are built.

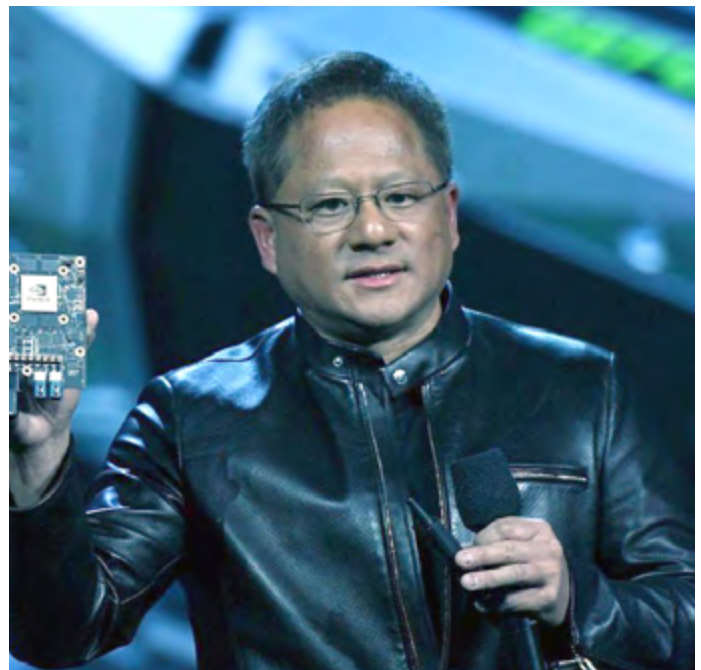
Perhaps none of the startups is better positioned to go to battle with the giants than Cerebras Systems. Little is known about what kind of chip the Los Altos, California-based startup is building. But the company has quietly amassed a giant war chest to help it fund the expensive business of building chips. In three rounds of funding, Cerebras has raised \$112 million, and its valuation has soared to a whopping \$860 million, according to fundraising documents pulled by PitchBook.

And Cerebras has yet to release a product.

Cerebras is still in stealth, but people familiar with the company say its hardware will be tailor-made for what deep learning specialists call "training." That training typically involves a computing model "learning" about something -- say, how to distinguish between an image of a Siamese cat and one of a Maine Coon -- by analyzing giant data sets. The process requires massive amounts of computer processing power.

The company declined to comment.

Founded in 2016, Cerebras is full of chip veterans with



Nvidia CEO and cofounder Jensen Huang. The GPU maker is currently the dominant force in deep... [+] CREDIT: ETHAN MILLER/GETTY IMAGES

storied pedigrees. Cerebras cofounder and CEO Andrew Feldman previously founded SeaMicro, a maker of low-power servers that AMD acquired for \$334 million in 2012. After the acquisition, Feldman served as a corporate vice president at AMD for two and half years, according to his LinkedIn profile. Feldman started Cerebras along with other former colleagues from his SeaMicro and AMD days. They include Michael James, Sean Lie, Jean-Philippe Fricker and Gary Lauterbach. Notably, Lauterbach was ...

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# Worldwide Cryonics Groups

**AUSTRALIA:** The Cryonics Association of Australasia offers support and information for Australia & nearby countries. [caalist@prix.pricom.com.au](mailto:caalist@prix.pricom.com.au). Their Public Relations Officer is Philip Rhoades. [phil@pricom.com.au](mailto:phil@pricom.com.au) GPO Box 3411, Sydney, NSW 2001 Australia. Phone: +6128001 6204 (office) or +61 2 99226979 (home.)

**BELGIUM:** Cryonics Belgium is an organisation that exists to inform interested parties and, if desired, can assist with handling the paperwork for a cryonic suspension. The website can be found at [www.cryonicsbelgium.com](http://www.cryonicsbelgium.com). To get in touch, please send an email to [info@cryonicsbelgium.com](mailto:info@cryonicsbelgium.com).

**BHUTAN:** Can help Cryonics Institute Members who need help for the transport & hospital explanation about the cryonics procedure to the Dr and authorities in Thimphu & Paro. Contacts : Jamyang Palden & Tenzin Rabgay / Emails : [palde002@umn.edu](mailto:palde002@umn.edu) or [jamgarnett@hotmail.co](mailto:jamgarnett@hotmail.co) Phones : Jamyang / 975-2-32-66-50 & Tenzin / 975-2-77-21-01-87

**CANADA:** This is a very active group that participated in Toronto's first cryopreservation. President, Christine Gaspar; Vice President, Gary Tripp. Visit them at: <http://www.cryocdn.org/>. There is a subgroup called the Toronto Local Group. Meeting dates and other conversations are held via the Yahoo group. This is a closed group. To join write: [csc4@cryocdn.org](mailto:csc4@cryocdn.org)

**QUEBEC:** Contact: Stephan Beauregard, C.I. Director & Official Administrator of the Cryonics Institute Facebook Page. Information about Cryonics & perfusion services in Montreal for all cryonicists. Services available in French & English: [stephan@cryonics.org](mailto:stephan@cryonics.org)

**CHILE:** Community oriented to provide reliable information on human cryopreservation, as far as technical scientific as well as other practical aspects. Dissemination, awareness and education on issues related to the extension of life in general and cryonics in particular. Contact José Luis Galdames via [galdamesjoseluis@gmail.com](mailto:galdamesjoseluis@gmail.com) or via Facebook at [Cronica Chile](#).

**FINLAND:** The Finnish Cryonics Society, (KRYOFIN) was established in 2008 and is an organization collaborating with all nearby groups and organizations. Contact them at: [kryoniikka.fi](mailto:kryoniikka.fi) Their President is Ville Salmensuu [ville@salmensuu.fi](mailto:ville@salmensuu.fi)

**FRANCE:** SOCIETE CRYONICS DE FRANCE is a non profit French organization working closely with European cryonics groups. For more information: J.Roland Missionnier: phone: 33 (0) 6 64 90 98 41 or email: [cryonicsnews.inpi@yahoo.fr](mailto:cryonicsnews.inpi@yahoo.fr) • [Facebook group](#)

**GERMANY: DGAB** There are a number of Cryonicists in Germany. Their Organization is called "Deutsche Gesellschaft für Angewandte Biostase e.V.", or short "DGAB". More information on their homepage at [www.biostase.de](http://www.biostase.de). If there are further questions, contact their Board at [vorstand@biostase.de](mailto:vorstand@biostase.de)

**GERMANY: CRYONICS-GERMANY** is an active group providing cryonics support, including a special 8-member Standby Response Team. Members from Germany or Internationally are welcome to join. at <http://cryonics-germany.org>. Direct inquiries to [contact@cryonics-germany.org](mailto:contact@cryonics-germany.org).

**INDIA:** Can help Cryonics Institute Members who need help for the transport & hospital explication about the cryonics procedure to the Dr and authority in Bangalore & Vellore Area. Contacts : Br Sankeerth & Bioster Vignesh / Email : [vicky23101994@gmail.com](mailto:vicky23101994@gmail.com) Phones : Bioster / 918148049058 & Br Sankeerth / 917795115939



**ITALY:** The Italian Cryonics Group (inside the Life Extension Research Group (LIFEXT Research Group)) [www.lifext.org](http://www.lifext.org) and relative forum: [forum.lifext.org](http://forum.lifext.org). The founder is Bruno Lenzi, contact him at [brunolenzi88@gmail.com](mailto:brunolenzi88@gmail.com) or Giovanni Ranzo at: [giovanni1410@gmail.com](mailto:giovanni1410@gmail.com)

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**JAPAN:** Hikaru Midorikawa is President Japan Cryonics Association. Formed in 1998, our goals are to disseminate cryonics information in Japan, to provide cryonics services in Japan, and eventually, to allow cryonics to take root in the Japanese society. Contact [mid\\_hikaru@yahoo.co.jp](mailto:mid_hikaru@yahoo.co.jp) or <http://www.cryonics.jp/>

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**NEPAL:** Can help Cryonics Institute Members who need help for the transport & hospital explanation about the cryonics procedure to the Dr and authorities in Kathmandu. Contact : Suresh K. Shrestha / Email : [toursuresh@gmail.com](mailto:toursuresh@gmail.com) Phone : 977-985-1071364 / PO Box 14480 Kathmandu.

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**THE NETHERLANDS:** Dutch Cryonics Organization is the local support group since 2002 and able to provide advice, standby, perfusion and shipment 24/7, in case of need. We are an active group utilizing the latest equipment. New members from The Netherlands welcome.

E-mail: [info@cryonisme.nl](mailto:info@cryonisme.nl)  
website: <http://www.cryonisme.nl>

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**NORWAY :** Can help Cryonics Institute Members who need help for the transport & hospital explication about the cryonics procedure to the Dr, funeral home and authority at Sandvika. Contacts : Gunnar Hammersmark Sandvika Begegravelsesbyraa / Phones : 011-47-2279-7736

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**RUSSIA:** KrioRus is a Russian cryonics organization operating in Russia, CIS and Eastern Europe that exists to help arrange cryopreservation and longterm suspension locally, or with CI or Alcor. Please contact [kriorus@mail.ru](mailto:kriorus@mail.ru) or [daoila.medvedev@mail.ru](mailto:daoila.medvedev@mail.ru) for additional information or visit <http://www.kriorus.ru>. Phone: 79057680457

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**SWEDEN:** [www.kryonik.se](http://www.kryonik.se) or Facebook: Svenska Kryonikföreningen. Initially, the society will focus on providing information and assistance to those who wish to sign up for cryonics. Eventually, we also hope to provide practical assistance in cases, possibly in collaboration with other European groups.

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**SWITZERLAND:** [www.cryosuisse.ch](http://www.cryosuisse.ch)

CRYOSUISSE The Swiss Society for Cryonics is an active group with over 30 members. To join, [email info@cryosuisse.ch](mailto:info@cryosuisse.ch)

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**UNITED KINGDOM:** Cryonics UK is a nonprofit UK based standby group. [www.cryonics-uk.org](http://www.cryonics-uk.org) Cryonics UK can be contacted via the following people: Tim Gibson: phone: 07905 371495, email: [tim.gibson@cryonics-uk.org](mailto:tim.gibson@cryonics-uk.org). Victoria Stevens: phone: 01287 669201, email: [vicstevens@hotmail.co.uk](mailto:vicstevens@hotmail.co.uk). Graham Hipkiss: phone: 0115 8492179 / 07752 251 564, email: [ghipkiss@hotmail.com](mailto:ghipkiss@hotmail.com). Alan Sinclair: phone: 01273 587 660 / 07719 820715, email: [cryoservices@yahoo.co.uk](mailto:cryoservices@yahoo.co.uk)

Can help Cryonics Institute Members who need help, funeral home, transport at London. Contact : F.A. Albin & Sons / Arthur Stanley House Phone : 020-7237-3637

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**INTERNATIONAL:** The Cryonics Society is a global cryonics advocacy organization. [www.CryonicsSociety.org](http://www.CryonicsSociety.org). They publish an e-newsletter *FutureNews*. Phone: 1-585-643-1167.

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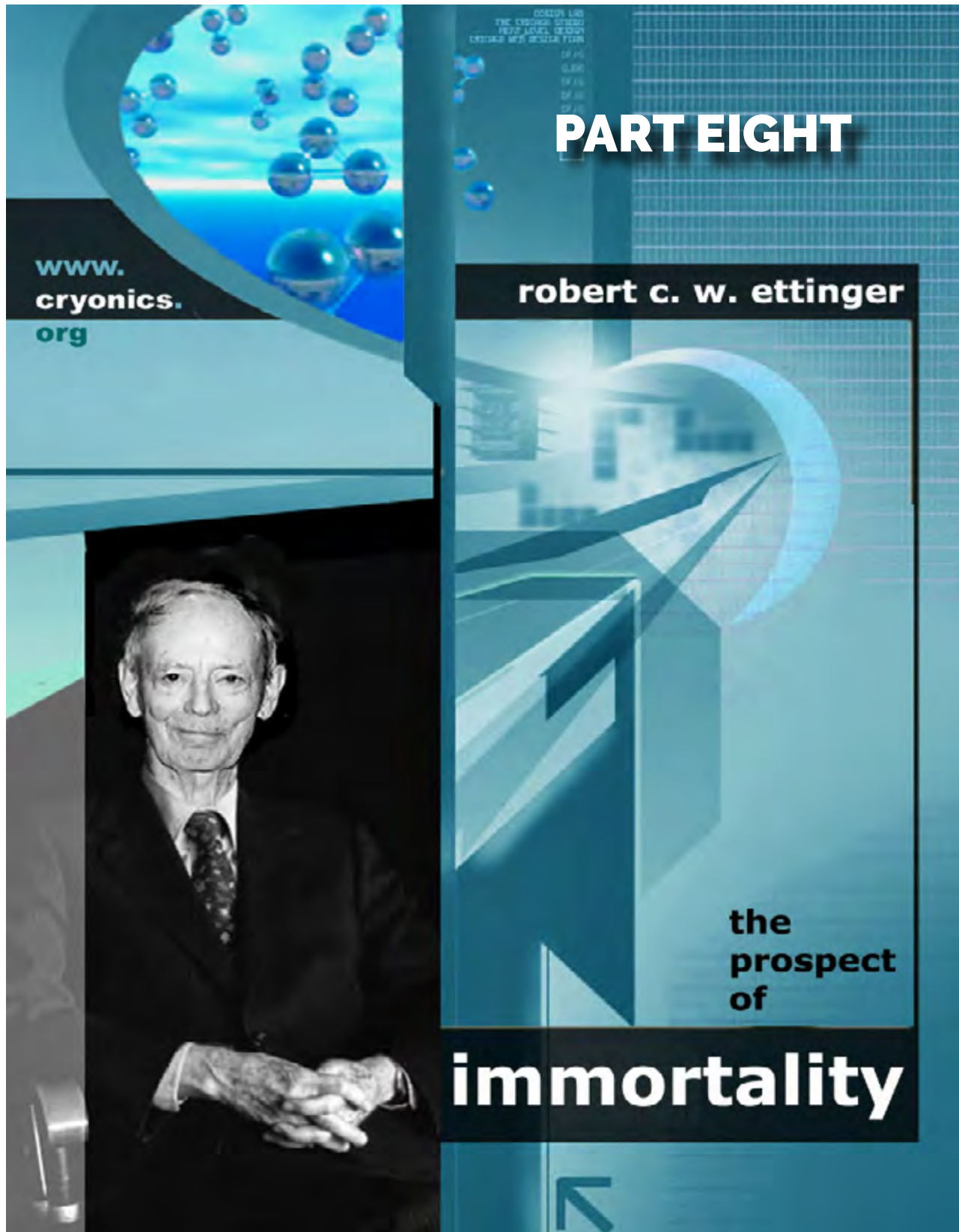
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# CI Reading Room

*Serializing essential works on cryonics*



## CHAPTER VIII

### The Problem of Identity

In considering the chances of reviving, curing, rejuvenating, and improving a frozen man, we have to envisage the possibility of some very extensive repairs and alteration. This leads to a number of very perplexing puzzles.

As an extreme case, imagine an elderly cancer victim who is not frozen until several hours after death, and then only by crude methods. Almost all the cells of his body have suffered severe damage and are thoroughly dead by present criteria, although some would grow in culture and we assume a small percentage of them have degenerated relatively little. But after enough centuries pass medical art at last is ready to deal with him, and for the sake of emphasis let us assume a grotesque mixture of techniques is used.

When our resuscitee emerges from the hospital he may be a crazy quilt of patchwork. His internal organs - heart, lungs, liver, kidneys, stomach, and all the rest - may be grafts, implanted after being grown in the laboratory from someone else's donor cells. His arms and legs may be bloodless artifacts of fabric, metal and plastic, directed by his own will and complete with sense of touch but extended and flexed by tiny motors. His brain cells may be mostly new, regenerated from the few which could be saved, and some of his memories and personality traits may have had to be imprinted on or into the new cells by microtechniques of chemistry and physics, after being ascertained from the written records.

Striding eagerly into the new world, he feels like a new man. Is he?

Who is this resuscitee? For that matter, who am I and who are you?

Although most resuscitees will not represent such extreme cases - we hope most of us will be frozen by non-damaging methods - nevertheless we cannot sidestep the issue. We are now face to face with one of the principal unsolved problems of philosophy and/or biology, which now becomes one

of prime importance in an exceedingly practical way, namely that concerning the nature of "self."

What characterizes an individual? What is the soul, or essence, or ego? This seemingly abstruse question will shortly be seen to have ramifications in almost every area of practical affairs; it will be the subject of countless newspaper editorials and Congressional investigations, and will reach the Supreme Court of the United States.

We can bring the problem into better focus by putting it in the form of two questions. First, how can we distinguish one man from another? Second, how can we distinguish life from death?

Later I shall offer some tentative partial answers. First we can illuminate the question, and perceive some of its difficulties and subtleties, by considering a series of experiments. Some of these experiments are imaginary, but perhaps not impossible in principle, while others have actually been performed.

**EXPERIMENT 1.** We allow a man to grow older

Legally, he retains his identity; and also subjectively, and also in the minds of his acquaintances (usually). Yet most of the material of his body is replaced and changed; his memo-



ries change, and some are lost; his outlook and personality change.

It is even possible that an old acquaintance, seeing him again after many years, might refuse to believe he is the same person. On first considering this experiment, we are apt to feel slightly disturbed, but to retain a vague conviction that "basically" the man is unchanged. We may feel that the physical and psychological continuity has some bearing on the question.

**EXPERIMENT 2.** We watch a sudden, drastic change in a man's personality and physique, brought about by physical damage, or disease, or emotional shock, or some combination of these. Such has often occurred.

Afterwards, there may be little resemblance to the previous man, mentally or physically. There may be "total" amnesia, although he may recover capability of speech.

Of course he retains, e.g., the same fingerprints, and the same genes. But it would be absurd to say the main part of a man is his skin; and identical twins have the same genes, yet are separate individuals.

Although the physical material of his body is the same stuff, he seems - and feels - like a different person. Now we are more seriously disturbed, because the main continuity is merely physical; there is a fairly sharp discontinuity in personality. One might say with some plausibility that a man was destroyed, and another man was created, inheriting the tissues of his predecessor's body.

**EXPERIMENT 3.** We observe an extreme case of "split personality."

It is commonly believed that sometimes two (or even more) disparate personalities seem to occupy the same body, sometimes

one exercising control and sometimes the other. Partly separate sets of memories may be involved. The two "persons" in the same body may dislike each other; they may be able to communicate only by writing notes when dominant, for the other to read when his turn comes.

We may be inclined to dismiss this phenomenon by talking about psychosis or pathology. This tendency is reinforced by the fact that apparently one of the personalities is usually eventually submerged, or the two are integrated, leaving us with the impression that "really" there was only one person all along. Nevertheless, the personalities may for a time seem completely distinct by behavioral tests, and subjectively the difference is obviously real. This may leave us with a disturbing impression that possibly the essence of individuality lies after all in the personality, in the pattern of the brain's activity, and in its memory.

**EXPERIMENT 4.** Applying biochemical or microsurgical techniques to a newly fertilized human ovum, we force it to divide and separate, thereby producing identical twins where the undisturbed cell would have developed as a single individual. (Similar experiments have been performed, with animals.)

An ordinary individual should probably be said to originate at the moment of conception. At any rate, there does not seem to be any other suitable time - certainly not the time of birth, because a Caesarean operation would have produced a living individual as well; and choice of any other stage of development of the fetus would be quite arbitrary.

Our brief, coarse, physical interference has resulted in two lives, two individuals, where before there was one. In a sense, we have created one life. Or perhaps we have destroyed one life, and created two, since neither indi-

vidual is quite the same as the original one would have been.

Although it does not by any means constitute proof, the fact that a mere, crude, mechanical or chemical manipulation can "create a soul" suggests that such portentous terms as "soul" and "individuality" may represent nothing more than clumsy attempts to abstract from, or even inject into, a system certain "qualities" which have only a limited relation to physical reality.

**EXPERIMENT 5.** By super-surgical techniques (which may not be far in the future) we lift the brains from the skulls of two men, and interchange them.

This experiment might seem trivial to some. Most of us, after thinking it over, will agree it is the brain which is important, and not the arms, nor the legs, nor even the face. If Joe puts on a mask resembling Jim, he is still Joe; and even if the "mask" is of living flesh and extends to the whole body, our conclusion will probably be the same. The assemblage of Joe's brain in Jim's body will probably be identified as Joe. But at least two factors make this experiment non-trivial.

First, if the experiment were actually performed and not merely discussed, the emotional impact on the parties concerned would be powerful. The wives would be severely shaken, as would the subjects. Furthermore, Joe-in-Jim's-body would rapidly change, since personality depends heavily on environment, and the body is an important part of the brain's environment. Also, we may be willing to admit that Joe's arms, legs, face, and intestines are not essential attributes of Joe - but what about his testicles? If Joe-in-Jim's-body lies with one of their wives, he can only beget Jim's child, since he is using Jim's gonads. The psychiatric and legal problems involved here are formidable indeed.

Some people might be tempted to give up on Joe and Jim altogether, and start afresh with Harry and Henry. In one sense, this is an impractical evasion, since the memories, family rights and property rights cannot be dismissed. From another view, it may be a sensible admission that characterization of an individual is to some extent arbitrary.

Once again, the suggestion is that physical systems (i.e., real systems) must in the end be described by physical parameters (operationally) and that attempts to pin profound or abstract labels on them, or to categorize them in subjective terms, cannot be completely successful.

**EXPERIMENT 6.** By super-surgical techniques (not yet available) we divide a man's brain in two, separating the left and right halves, and transplant one half into another skull (whose owner has been evicted).

Similar, but less drastic, experiments have been performed. Working with split-brain monkeys, Dr. C. B. Trevarthen has reported that "... the surgically separated brain halves may learn side by side at the normal rate, as if they were quite independent." (121) This is most intriguing, even though the brains were not split all the way down to the brain stem, and even though monkeys are not men.

There is also other evidence in the literature which we can summarize, with certain simplifications and exaggerations, as follows. Either half of a brain can take over an individual's functions independently. Normally, one half dominates, and loss of the other half is not too serious. But even if the dominant half is removed, or killed, the other half will take over, learning the needed skills.

There is presently no conclusive evidence that so drastic an experiment as ours would neces-



sarily succeed; but in principle, as far as I know, it might, and we are not at the moment concerned with technical difficulties.

If it did succeed, we would have created a new individual. If the left half was dominant, we might label the original individual LR; the same skull containing the left half alone after surgery we might call L, and the right half alone, in a different skull after the operation, is R. L thinks of himself as being the same as LR. R may also think of himself as LR, recuperated after a sickness, but to the outside world he may seem to be a new and different, although similar, person.

In any case, R is now an individual in his own right, and regards his life to be as precious as anyone else's. He will cling to life with the usual tenacity, and if he sees death approaching will probably not be consoled by the knowledge that L lives on.

Even more interesting is the attitude of L, the formerly dominant half, now alone in the skull. Suppose that, before the operation, we had told LR that the dominant half of his brain was diseased, and would have to be removed, but that the other half would take over, albeit with some personality changes and possibly some loss of memory. He would be worried and disturbed, certainly -- but he would probably not regard this as a death sentence. In other words, LR would be consoled well enough by the assurance that R would live on. Yet after the splitting, and transplanting operation, L would regard his own destruction as death, and it would not satisfy him that R lived on, in another body.

This experiment seems to suggest again that, psychologically if not logically, the physical continuity is an important consideration.

**EXPERIMENT 7.** A man is resuscitated after a short period of clinical death, with some

loss of memory and some change in personality.

This experiment has actually been performed many times. (97) Death was real by the usual clinical tests (no respiration, no heartbeat) but of course most of the cells remained alive, and most people would say that he had not "really" died, and that he was certainly the same person afterward. This experiment is important only as background for the following ones.

**EXPERIMENT 8.** A man dies, and lies unattended for a couple of days, passing through biological death and cellular death. But now a marvel occurs; a space ship arrives from a planet of the star Arcturus, carrying a super-surgeon of an elder race, who applies his arts and cures the man of death and decay, as well as his lesser ailments.

(It is not, of course, suggested that any such elder race exists; the experiment is purely hypothetical, but as far as we know today it is not impossible in principle.)

The implications are apt to shake us. If decay is to be regarded as just another disease, with a possibility of cure, then when may the body be considered truly dead? If "truly" dead be taken to mean "permanently" dead, then we may never know when we are in the presence of death, since the criterion is not what has already happened to the man, but what is going to happen to him in the (endless?) future.

**EXPERIMENT 9.** A man dies, and decays, and his components are scattered. But after a long time a super-being somehow collects his atoms and reassembles them, and the man is recreated.

Once more, the difficulty or even impossibility of the experiment is not important. We also disregard the question of the possibility of identifying individual elementary particles.

Is it the "same" man, in spite of the sharp physical discontinuity in time? If memory, personality, and physical substance are all the same, perhaps most of us would think so, even though we are disturbed by the black gulf of death intervening. But if we so admit, we must open the door even wider.

**EXPERIMENT 10.** We repeat the previous experiment, but with a less faithful reproduction, involving perhaps only some of the original atoms and only a moderately good copy. Is it still the same man?

Again, perhaps, we wonder if there is really any such thing as an individual in any clear-cut and fundamental sense.

**EXPERIMENT 11.** We repeat experiment 10, making a moderately good reconstruction of a man, but this time without trying to use salvaged material.

Now, according to the generally accepted interpretation of quantum theory, there is in principle as well as in practice no way to "tag" individual particles, e.g. the atoms or molecules of a man's brain; equivalent particles are completely indistinguishable, and in general it does not even make sense to ask whether the atoms of the reconstructed body are the "same" atoms that were in the original body. Those unfamiliar with the theory, who find this notion hard to stomach, may consult any of the standard texts.

If we accept this view, then a test of individuality becomes still more difficult, because the criteria of identity of material substance and continuity of material substance become difficult or impossible to apply.

**EXPERIMENT 12.** We discover how to grow or to construct functional replicas of the parts of the brain - possibly biological in nature, possibly mechanical, but at any rate distin-

guishable from natural units by special tests, although not distinguishable in function. The units might be cells, or they might be larger or smaller components. Now we operate on our subject from time to time, in each operation substituting some artificial brain parts for the natural ones. The subject notices no change in himself, yet when the experiment is finally over, we have in effect a "robot"!

Does the "robot" have the same identity as the original man?

**EXPERIMENT 13.** We perform the same experiment as 12, but more quickly.

In a single, long operation, we keep replacing natural brain components with artificial ones (and the rest of the body likewise) until all the original bodily material is in the garbage disposal, and a "robot" lies on the operating table, an artificial man whose memories and personality closely duplicate those of the original.

Perhaps some would feel the "robot" was indeed the man, basing the identity in the continuity, on the fact that there was never a sharp dividing line in time where one could say man ended and robot began. Others, well steeped in democracy and willing to apply political principles to biology, might think the robot was not the man, and ceased to be the man when half the material was artificial.

The subject himself, before the operation, would probably regard it as a death sentence. And yet this seems odd, since there is so little real difference between experiments 13 and 12; 13 merely speeds things up. Perhaps sufficient persuasion could convince the subject that the operation did not represent death; he might even be made to prefer a single operation to the nuisance of a series of operations.

**EXPERIMENT 14.** We assume, as in the



previous two experiments, that we can make synthetic body and brain components. We also assume that somehow

we can make sufficiently accurate nondestructive analyses of individuals. We proceed to analyze a subject, and then build a replica or twin of him, complete with memories.

Does the identity of our subject now belong equally to the "robot" twin? It might seem absurd to say so, but compare the previous experiment. There is scarcely any difference, especially since in experiment 13 the subject was under anesthesia during the operation; experiment 13 was virtually equivalent to destroying the subject, then building a robot twin. The only real difference between experiments 13 and 14 is that in experiment 14 both the original and the duplicate survive.

**EXPERIMENT 15, 16 AND 17.** We repeat experiments 12, 13, and 14 respectively, but instead of using artificial parts we use ordinary biological material, perhaps obtained by culturing the subject's own cells and conditioning the resultant units appropriately. Does this make any difference?

In logic, one would think perhaps not, but blood is thicker than water. Some people might make a different decision on 15 and 16 than on 12 and 13.

**EXPERIMENT 18.** We assume the truth of an assertion sometimes heard, viz., that in certain types of surgery a patient under certain types of anesthesia suffers pain, although he does not awaken and afterwards does not remember the pain. The experiment consists in performing such an operation.

Most of us do not fear such operations, because we remember no pain in previous experiences, and because authoritative persons assure us we need not worry. Even a

warning that the pain under anesthesia is real is unlikely to disturb us much, if we are not of very nervous temperament. Still less do we fear ordinary deep anesthesia, in which there seems to be no pain on any level, even though for the conscious mind this gulf is like that of death. Yet a child, or a person of morbid imagination, might be intensely frightened by these prospects.

Thus again we note a possible discrepancy between the logical and the psychological.

**EXPERIMENT 19.** A Moslem warrior is persuaded to give his life joyfully in a "holy war," convinced that the moment his throat is cut he will awaken in Paradise to be entertained by houris.

We draw the obvious but useful conclusion that, from the standpoint of present serenity, it is merely the prospect of immortality that is important.

**EXPERIMENT 20.** We pull out all the stops, and assume we can make a synthetic chemical electronic mechanical brain which can, among other things, duplicate all the functions of a particular human brain, and possesses the same personality and memory as the human brain. We also assume that there is complete but controlled interconnection between the human brain and the machine brain: that is, we can, at will, remove any segments or functions of the human brain from the joint circuit and replace them by machine components, or vice versa.

In a schematic sense, then, we envisage each of the two brains, the biological one and the mechanical one, as an electronic circuit spread out on a huge "bread board" with complete accessibility. From the two sets of components, by plugging in suitable leads, we can patch together a single functioning unit, the bypassed elements simply lying dormant.

To make the picture simpler and more dramatic, let us also assume the connections require only something like radio communication, and not a physically cumbersome coupling.

We might begin the experiment with the man fully conscious and independent, and the machine brain disconnected and fully dormant. But now we gradually begin disconnecting nerve cells or larger units in the man's brain, simultaneously switching in the corresponding units of the machine. The subject notices no change - yet when the process is completed, we "really" have a machine brain controlling a "zombie" human body!

The machine also has its own sensory organs and effectors. If we now cut off the man's sensory nerves and motor leads and simultaneously activate those of the machine, the first subjective change will occur, namely, an eerie transportation of the senses from one body to another, from the man's to the machine's. This might be enjoyable: perhaps the machine's sense organs are more versatile than the man's, with vision in the infra-red and other improvements, and the common personality might feel wonderful and even prefer to "live" in the machine.

At this stage, remember, the man is entirely dormant, brain and body, and the outside observer may be inclined to think he is looking at an unconscious man and a conscious machine, the machine suffering from the curious delusion that it is a man controlling a machine.

Next, we reactivate the components of the man's brain, either gradually or suddenly, simultaneously cutting off those of the machine, but leaving the machine's sensors plugged in and the sensors of the human body disconnected. The subject notices no change, but we now have a human brain using

mechanical senses, by remote control. (We disregard such details as the ability of the human optical center to cope with infra-red vision, and the duplication of the new memories.)

Finally, we switch the human effectors and sensors back in, leaving the man once more in his natural state and the machine quiescent.

If we perform this sort of exchange many times, the subject may become accustomed to it, and may even prefer to "inhabit" the machine. He may even view with equanimity the prospect of remaining permanently "in" the machine and having his original body destroyed. This may not prove anything, but it suggests once more that individuality is an illusion.

**DISCUSSION AND CONCLUSION.** In discussing these hypothetical experiments we have touched on various possible criteria of individuality - identity of material substance, continuity of material substance, identity of personality and memory, continuity of personality and memory - and seen that none of these is wholly satisfactory. At any rate, none of these, nor any combination, is both necessary and sufficient to prove identity.

One cannot absolutely rule out the possibility that we have missed the nub of the matter, which may lie in some so far intangible essence or soul. However, such a notion seems inconsistent with the ease with which man can instigate, modify, and perhaps actually create life, and with several of our experiments.

The simplest conclusion is that there is really no such thing as individuality in any profound sense. The difficulty arises from our efforts first to abstract generalities from the physical world, and then to regard the abstractions, rather than the world, as the basic



reality. A rough analogy will help drive home the point:

The classification "man" is useful, but not sharply definable. Is a freak a man? Is an aborted fetus a man? Is a pre-Neanderthal or other "missing link" a man? Is a corpse a man if some of the cells are still alive? And so on. A label is handy, but objects may be tagged arbitrarily. In the physical world there is no definite collection of objects which can be called "men," but only shifting assemblages of atoms organized in various ways, some of which we may choose to lump together for convenience. Let us then cut the Gordian knot by recognizing that identity, like morality, is man-made and relative, rather than natural and absolute. Identity, like beauty, is partly in the eye of the beholder. It is only partly existent, and partly invented. Instead of having identity, we have degrees of iden-

tity, measured by some criteria suitable to the purpose.

The result is wonderful: we have lost our souls, but gained heaven, in a certain sense. Perhaps few of us, even if intellectually convinced that identity is an illusion and death therefore unimportant, may be able to translate this into emotional acceptance, or will want to. But we can now persuade ourselves that death need never be regarded as absolutely final - since it is always possible, at some distance in space, time, and matter, for reasonably close duplication or resuscitation to occur - that is, for physical reincarnation, with memory or without. This possibility can dull the edge of desperation for those unable to obtain first-class freezer accommodations for themselves or their families.

## *NEXT ISSUE:*

### *Chapter IX: The Uses of Immortality*

