### SPLIT-BRAIN L.Q. TEST WARS TO THE STARS RUTUBE WARS

### REPLICATING ROBOTS BRAIN-CONTROLLED COMPUTERS LIFE ON

SATURN



### EDITOR & DESIGN CIRECTOR. BOB GUCCIONS

PRESIDENT KATHY KUITON ENLIDENT KATHY KUITON ENLIDENT CONTON COOK TERESS ORAPHICS DIFFECTOR FILLADETH WOODSON ART DIFFECTOR ELEADETH WOODSON

CONTENTS			
PUTURE WARS	First Wood	Administ D. T. T. T.	Mug
CMNBU8	Costributore	HATTLE & COTAGE 3	-
COMM, NOCATIONS	Constructures		-
FORM	Daloose		
EARTH	Bownerser	Davad Manager	14
MNO	Babayor	for Mandau	2
SPACE	Conner	Onter Dances	20
LIFE ON SATURN	Stars	Owner Lawren	- 22
BRAIN CONTROLLED COMPUTERS	Arthois Intelegence	Jozift Backey	30
THE SCOY	Health	Acadia Econocci	-
SPLIT-BRAIN LD TEST	Commune	Contract Contract	- 30
SELF-REPLICATING ROBOTS	Article	Hobert Danse, to	
WORARDRY	Article	Dave Care	- 44
KALEIDOSCOPE	Echne	Change Giller	45
JUST & PRETTY MODE	Petroa	when I floorer	
WAY STATION TO THE STARS	Aducie	Denning C. Hooman	62
MARILU BENADERRAF	Interview	Anthene Long and	12
TIGRO STAR, WINTER OFBIT	Picton	Bruce Stering and William Caleson	84
OST IN THE DOSMOS	Ance	Weiker Doore	-
ANTIMATIER	UFOx etc	the start	
PRED/TS >			
ADYSUGS	Phenomena	Man Atlantice	123
AME8	Diversione	Seci Means	132
AST WORD	Hurrer	Randy Coher	138

The difficult and the first of the first is based to dispersive first the dispersive dispersi di dispersi dispersive dis



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By Admiral E. R. Zumwalt, Jr.

€Through 2000, antisateillité weapons are likely to prevail in space. Later on, offensive arms aimed at largets on Earth may be used ♥ http:// http://www.self-bit/collectiong/scale http:// http://www.self-bit/collectiong/scale almh/scalescelf-bit/scalescelf-bit/scalescelfpionring 10 make use of thread advances We row titled on the varge of almost advances We row titled on the varge of almost advances with rows titled on the varge of almost advances

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Future conflict will also see substantive thangos in the use of atostin technology (the design of alocal) that taker central obtact) and deception

In addition powers musices both Locker and concerned will be develgated. Letters Building the development and convertices a sequent Nuclear and convertices a sequent Nuclear and convertices and sequent Nuclear and convertices and sequent will be commented by the second second second convertices of the second second second convertices of the second second second convertices of the second is the first of an individual second by the first of an individual second second bits and second sec to other or shift on the other story of

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Future certeix set so a charage an establisg of way. Control will be haven these details of way and these details of the control of the intermediate of the one of the set of the and an orthogo will be an entrol of the and an orthogo will be an entrol of the and an orthogo will be an entrol of the and an orthogo will be and an orthogo will be an entrol of the and an orthogo will be an entrol of the and an orthogo will be an entrol of the and the an

 Arrest and graduate reproced by unmanned dranes, cruate mession, and factoral belietic mission, and

more integrally controlled as weapons under a control war-fighting organization

This by 2000, the Soviet command past could be bundd dwp in the Unit Mountains, controlling space-based stimetiliance, cruae messiles and tactos bilistor messiles and their syned as, sea, and tand philtome, while the U.S. command post, hidden deep in the Roddees workd notificial assets

X conflictuation escapeted to a decompositive field with which takes the provide the second faith on which both second would alterpt and mageing mapability by destroying applications of profession of balance metales with processor function and balance metales with processor function and balance of the destroy of composition approximation of the destroy of composition approximations balance apply contents, and massed among of the version protections.

This disactiption of listice confiel is not mean to suggest this location regional bathies will not balle place. They will resen in the SIDD sectors will not execution will occur. Downlant in which superpower confiers. It occurs, will not executively include the location configuration will be added to be added and the superpower address and superinter way. On Address Lowever (the) year using of Choice and Superint Choice Watch

# OMNIBUS











measure proposed launching an army

male cave and other groups has shown. of AUDS has not yet been determined. hope for a cure is high bocause of recent immune system. One man reaponable is Barul Benacorsal, of Harvard, wereau of the 1980 Nobel Poze in physiology and medicine. In this issue Benecernal

immunocenetics begins on page 78 This month's issue also includes the 1rst collaboration between 1982 Nebula Assard bright Wellace Gabson and Rease describes the picitit of a Russian cosmonaus, contract the motocland who is faced with certain death when the Soviet bureaucracy decides to allow

detenorate. This gripping tale begins on page 84 And Cherry Weder makes her swept into an atomate universe when their storm (see nana 56) DO

teve Wozniak perhaps more then any other man is response tie for the home computer the Apple computer such a surcess a simple, eleganic operating system and the There remarkable feats turned his galage

treelance writer Doug Gair speet months Garr "Waz doesn't return phone calls But blue Wozniak called only to get Garris meeting "Well I'd been hearing that lice for half a year leave Garr to I hopped Fortunately, Garr was maskeded for his a delightful host engeging Garr in enimated conversation for hights on end his tamily friends and associates, Gall paints an intimete portrat of the Wizard of Silicon Velley, Turn to Wozardry starting on page 48

In the Fifties visionanes at Coders 8 CMN

of workmen into space aboard a footballof a Station " Isestance writer Dava Sober platforms Already, major corporations you ever consider doing what you do in of the projects that respondents would like to see stationed in zero o Almost everydistinued to become way stations to the each wear addressing every concervation

lass about ourselves

Our excerpt from Percy's latest effort Book, bearts on page 52. It takes the form

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### BOY & published

Dr siderer

#### THE CORPORTION

#### ECKTORIA.

Alexandree K. Savara Davis and Construction of Construction

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#### FEREN ELITIONS

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# LET FERS

### COMMUNIC/ATIONS

#### Chattey's Poliston

Stame to you for your tack of research into the proposed of refronty to be built on Nigel Chattay a stand (Earth February 1963). There are two moon few in the article, one writen and the other unversion

It is disciptive to state that "the which bitwarp point the Chairie Barker are usually whicked cut to see," when just the opposite to it has being party or point of the the state of the point breades we from the point southeast. In additional these when we have and southwarp these works will be not more as impurious to the 20 million propies that point the south southeast forming a black cloud free the experitions and southwarp a southeast free.

Second and parhaps may emportant the Cheleni Mark's possible the main plottlowe conferences and nonsectional provide the second second second second provide the second second second second parts and the second second second second second the second secon

I tark that the construction on Chattey's stand will not actually improve the shard will not actually improve the shardwill distroy one of Softram's natural resources.

> Peter Murdock Allifysile NY

Need Chartery replies Mr Mundook is partially correct concerning the prevailing which of the later / however, for 62 percent of the year, the words of bite out in time. Westher Lough are statusted on the later / westher coups are statusted on the later date to determine the exact measurements.

Daring the summer manifes what the which blow howed papelinder area the coefficient will be changed here a chapter, high-south such as any expensive can with much here sufur formative summer power as publication transper from here to bus subject to the hard-here makes this amagement quality after and property.

In regard to Murdock's second point

We Cholem Bank had been one of the rohest habitias in New York until it came to be used as garbage along. This while it now one of the most polluted in the United States. The over underwater metric protecting the select will avaidably reliable issaaling to metric will avaidably reliable issaaling to metric will avaidably robbits obtains in turnery associators.

#### Parwheel Power

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> Marian Young Cincinneti

#### Pocketkrefe Scrieg

In Theorem Piter ( February 1960), Entret Veterminides a casally give sbock Rasewark withing cur. MHO (Insightedby, diodystram) ( patche, and ) and with actioning on the vessols with pobladivies actioning on the vessols with pobladivies affords it back. MHO backware of it. Bellow I have my coorgination for funding, however ( Vessol ( like to see our factor), potencies ( vessols) and and factor and action ( and the see our short account). Set more assures

A property transed expert can extract years of developmental work with late more than a quack general the outprent. If the Pusseans have been visiting our plants since 1956 I am not surprised that thos are alread in their research.

Not to worry. All we need a two days in free 500-megawatt facility and a couple of the light people with pocket/inves and we can calch up

> Charles St Clar Cuero, TX DO

# DIALOGUE

### FORUM

In which the readers, entrore, and correspondents decust theorem and spherosition around out of Umin. Readers are encouraged to obtain wrens and pose questions to Omin' the soundle constructly and the soundleconstruction. The operane published are not reconstruction to the adverse

#### Protecting Computers

I was pleased to read the ancie by Pater Oghbana. The Keeper of Socrets in your Match 1983 issue. As the author of computer crime legislation. I conguitaliai you for a good pot of exposing a subfe and potentially ecoloaries and/of

In a new world of high technicity and computies will also will expect a growne high technicity or similar tech computer internation and information destactors and happening new and new feedbactors and happening new and dependent of computers will dependent on computers internet to feedbactors and ensure proper internets to feedbactor and and offer andiquial process feed new and offer andiquial process million.

Ac Ognibure emphasized there is a lack of such protection. Therefore, I have spondorad the Fad verol Computer systems Protection Act of 1983 in the House of Representatives, which will protect the computarized information stored and used for fedral opermitter, aparties.

Your publicitions of the present lack o security and the easy accessibility to information transmitted by computers includes public awareness of this whole public meters.

> Hon Bill Nelson House of Representatives Weatington DC

#### Mird Medicine

I read Mike Edaihart's article "Furnors of the Psyche" (Mind January 1963) with some clamay

The encodote of a small boy "visualizing his ours mentally" is a story I have heard many times in my work, and I have no problem accepting the reality of the M. DMM. chida desar-me condition

Dr. Paul Roschie behave regarding the link between stress and illnass are not tenuous at all. This relationship has been scientifically documented over the part 50 years.

While concerns me is the tone of the while concerns me is the tone of the action of the article. Although Dr. Reach was allowed to propert a vew that auguorta a malacraship between stress and liness the author sought out five contisery opnions, registrang the studies of asvees attribute doctors and researchers in the field.

Terreiner sportes Dr. Joan Boryaenio, with states inspirocelly that concerchance develops sharing within eight mothst afters asseer basis is experienced. Sha item take any with about the concertence of the concert of the lange take to develop. If were to televing take to b develop. If were to televing take to base to conclude that hyrug all soft. Tread: any of barring take that they all soft. Tread: any of barring and soft.

In addition, attair learning more about the Dr. Borynerko s attautes about the dationalgains paraparakity and stress and cancer. I find it hard to believe that the aliatements accubed to her were not misquisted qualities out of corners! or dug up from some pasts the. They are not separatimitized by or the current verses.

I feel personally athented by this misleading article and question the amenty of 5/her articles in Onios Maniha Haber Director The Steels Institute Maning El

Mice Edelhart replies Dr. Barysenkols contributo wina faken from a speech she made in a conformance at the New York Academy of Medicine on April 25, 1962 We rapid the speech

As for the column's supposed tack of bakince: The prece was concerned as a countenength to the many stores in the popular press that speak of the shear cancer link is proven. On the consuly. many enumeral researchers field the ank hiss not been proved at all. A surrose is being loaded as though it wire is centerally

We are not saying that workly people are not incring in the field But we do believe they have not yet documented an environmental-behavioural factor the can be grin a chain of channels a precancerous sittle or cancer itself

#### Mecho Astroneuts

Where has Zenth R D Kright been [Forum April 1983]?

As is summittee who have reported on space issues more hars a low hows, I lead qualified to inform him that his chances of being accepted by MASA was an astronat, are very slim with his outmodes charavratem thinking feetings of selfworth, and passumptious athuble. His self-transition of passimptions and the astronation of the self-transition of the combination athubit of self-transition of s

NASA seeks not only healthy people with receiver educational credenials and professional backgrounds but men and women who are emotionally mature enough to work together without mature in tight quarters as access that team members Partie domains are not welcomed in order as womented

Kright is the one who needs the rude brush with reality—not Kathy Keston Worken (Bough relatively lew in number rolw) are in the space program and are then to stay

As a version 1 chocke at his represention work on the massive up to next in conditions that demand strength, troggednass, endurance, speed, and towery. The conductor flowed upon menand worken by zero' or minimum gravy neques to satis idengit, he mae rupportions, mainten endurane, or periodar speed. Space has been called the "grant equation" has been called the "grant equation" has been called the "grant equation" how seen

Rright should go back to college for a few lessons in fundemental physics A leader in human relations certainly wouldn't hurt him either

> Lesle Wolfe-Cundiff New York City

CONTRACTOR PROF. 25

# THE FREFLY ENTREPRENEURS

### EARTH

By David Monagan

International the inspect period of the inspect period of the inspect of the period of the inspect of the bothers keep and the inspect of the second of the inspect of the inspect of the inspect of the inspect of the second living peets (inspection) based on the inspect of the inspect become of a peets of inspect of the second of the inspection of the based of the inspection of the inspection o

The stary of how kins Articles and the behavior of the second se amount of ATP; whether it comes from a terrestrial truck also or microhes on Mars

The upshot, 16 years ago was that a lot of microlighting workers and schoolchildren took out than meaning bug bounty. The only trouble was that the indexts tended to come in paramed—and oo cheed up that their chomasty lost much of do up that the chomasty lost much

Enter Alsn Ansonk, a toublechooter to a Chasgo texmedical company. Artenic dev a guidan opportunity no collecting lighting stups for cube space. He also trad a brainistim Recerc dry the bugs is on you could assign sho and deliver a treefine product. That way you could also daal in uncrescedentedly—and politably—large bacthes of burs.

Antonic quickly bogan franchising troty collecting to his neighbors at a halfont a head (boday they go to 1.3 conts apaced). With the prospect of a steasty, high quality supply, NASA (bought and bought and within a year Antonic began collecting tenthes full imme

Despite the work from NASA, though



The firefly can be used to diagnose heart decrease paralyze sharks, kind analyze nervous page 15 CAN

Articoli was smart alcough to deverally from his market is work in boochamistry at De Paul investing in officiago to historie and the contribution of the investigation and the localization of the investigation and the localization of the investigation attracts the localization of the investigation attracts the localization of the investigation attracts the local for assumption of the investigation attracts of these needed, her soon formed attracts of these needed her some formed

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To meet the growing fretly quota, the Antoniks soon spread than harveeling indiversit over the breadth of northern lifnisis, and their collectors began netting communicationing to

# GUARDIAN AIVGELS

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By Bill Moseley

1. 1020 Curta Biles a former becomed under the registration of the Magnificant II is predictment by the point benefits of the set of the set

Popping response was so great however, then 1960 Silva reamed the group the Guardain Argets and expirated its ranks to accommodate the throngs of young men and women who focked to join the glamorous crime former. Today these are 38 chapters of the Guardain Angels in the United States and Canada with a total membership of just over 4000

But controving saved around the phenomenon of the Angela Awa they indeat aware or are they measure? Some social behavioristic wave the Davadian Angela is the embodiment of the publicity up to stem the randbogo of crime in this country. Davies see the Angela is all show well recommond to of the extremes they are trying to patient and the publicity and privile the angela the statement of the patients and the statement of the patient of the statement of the of all word an amounter-dav violated and angela the statement of the patients of the statement of the patient of the statement of the statement of the statement of the patients of the statement of the statement

The training of individual Angele runs for three monitor and consists of individual in black law martial lattic, consideration models and an experimental and an experimental function and providiant reentimes in the state of the state of the state of the Angelet are instructed to apprehend commit avapters. By force if necessary updat the appendix interval an exet

As a clicen's arrest group they may be more of a fundmance than a help say, 20 December 2010 some. One of this biggent problems with the kind of organization is that it has this potarinal to do durragely "porte out Lyfe Hallowelt, assistant proteiser of sociology at the State University of New Yeak at State University of New Yeak at State University of New Yeak at State Victoria at State State Toffers to is the vicilation of serrectines crief

Bina prolessa constelle confedence in his troops and points out have has plot to be a judgment agained the Angula an individual a confedence and an individual confedence and individual table and an Chruste police and points at table and chruste police and those tables to a plot and the angular and police and an angular and angular and police they take an experiment table of the tables that and the angular and secure based and secure tables and tables the section of the secure based in the section of the secure based tables of the section of the secure based tables to the section of the secure based tables tables to the section of the secure based tables tables to the section of the secure based tables tables to the section of the secure based tables ta

Police of locals are not pleased with the Angels phenomenon. Broaceek characterizes them as a "goon squad and adda "They re cleatelong on an emotornelism that is taking hold of the



Ark streat was Acoels a come determine?

country and the focus is on Stives. Go back and read how the brownshirts [Hits a presidential enforces] started in Munich The american

And White professor of psychology at inclinate that State University concedes there may be similarities, but they are superioral. Wearing a uniform a one of the most operation methods of gaining datus in any group. Just stand in the lobby of any major efficie building and court the three cedes suits. In reve

The Guirdan Angels six fair news symbol them as reads arms determing symbol them as reads arms determing broke, parts suit Nark H Moore, Outgareftem Tholoson of Chrimina Lasbae Policy and Management, at Highest Constructed The Angels do mike a contribution motive as they remind is they controlled the Angels do mike a controlled in the Angels do mike a controlled in a ordinary ottama a macromotivy as well as their of a public public travel in suggests. Because publicity trave fifth agrin control of the public travel fits agrin control of the million of the indication of them of the public travel in the significant indication of the indication of them of the significant of the significant of the significant indication in the indication of them of the significant of them of the significant of significant of the significant of sign

Are the Angels at heak social pile notivino or rise they a sign of the times? Hanvard's Meane thinks the latter. The Angels and groups like them have a saw because of the same of the presences against other and the preservation of order in commission. In the same the Wald separch theil meet to continue safer than ommash."

And an they registrates? Holowel lays they are not annow below optimizer method statics as these they applied they are not annow they applied the they are positioned to registrate method to a the policity of the method country if it lies anywhere autoon they are policity optimizer in the country if it lies anywhere autocet of the they are and any applied and any applied any applied the method applied and they are any any applied any applied any applied any applied and strates of the any applied any applied any applied any applied any applied any applied and any applied applied any applied applied any applied applied any applied applied any applie

# AND THE WINLER IS.



By Owen Davies

A clear the three three

Now at liast, the task is done. Our other proper physical Robert W Bussand has delevered the vendor. (The house lights dim: A beautiful young editor date in an evening goen walks dowly to the podum envelope in hand. The sudence hathes 1 And the vender is

Professor Partiel in H. Docks, of the departments of micrianical engineering and material's science at Duke Driversity, in Durhem, North Cerolina, for the first practical test of a venerable idea in space engineering.

More than 30 years ago. Wernher von Braun suggested that unique new strucLittle mätchlas rightereigh lend very trydic cauld femden metaler. V been moder bubbles in match til metaler metaler. V been moder soler behm of the same weight, "Code of tometer metaler orderweight," Code to a muth greater orderweightereinigen This is important in george construction bocasie in metaler with bubding something in order regulates muth less material to be haukas og hom (gerh 1).

It is possible to make a bauned meter here on Earth un to a not easy and backase gravity is constructly sympt to collapse the foart is impossible to govern closely the size and packing on the foarth of the size and packing that foarth the size and packing that foarth the size of the packing that foarth the size and packing that foarth the size of the size of the magnitude that the size of the size of the make and that the size of the size of the make and that the size of the size of the make and that the size of the size of the make and that the size of the size of the make and the size of the size of the size of the make and the size of the size of the size of the make and the size of the size o

He will fill the 2.5 cubic feet of Gree's Get Away Special carister with batteries



A varue space music we carry the found casts expendent designed by a Duke professor 22 Okte

and incutied glass velas loads the value a incutier of spacel metal sitys and tanking hydroid sits in a chamber appeal by an leader on the metal site of the ane used to met the alloy and velases bubbles insuit the index sity creet hydrogen gas form the hydroid The gas bubbles insuit the index sity creet bubbles insuit the index sity creet index sites and compare the chamal When Cocks a package returns from space is related thermal two towns

Yet he says, the chance to test spaceformed media in of his project is most important innovatori. The distinctive part of this supartment is the akeys i wort to use? The says "Several of them will be based on calcum. If there is one hing in this supartment that mission a performent comhorbor to the cause of space downlacement. I severe it to be that "

Calcium to one of the lightest metals and one of the most abundant, some 8 percent of the earth's crust is calcium. Not it is never used in construction "Calcium combines with water increably usably." Cooke asses "It turns to time amost white you's exacting. Anything built with it would immediately coincide No between slop can prevent thes

In spoor, there is no water to combine with the calcum, so contains would not be is poblier. A feamed alky of colours alumma and other mutals occide be quite strong and nearly one third lighter that an el-censmit hour is no maps construction project, such as a space station. The could sever millions of dollars in the could sever millions of dollars in the could sever millions of

Code will begin work on his GAS experiment during Daka's auriment worklow, their contraure its a polycic in a spocial class in Watenale Processing in Spocial' to be given jointly by the militatile scance and mechanicalanging angle of the course olicents have signed up for the course

After the shuffle experiment will come three months of heating to find cut which aloy makes the stundest foam. Then a should not take long to scale up the pocess for actual space construction DD TITAN'S SEA



By Patrick Moore

where the past has decades we have even men waik on the monon and machines land on Versus and Merca swell as tasked the pannets out to Jupter Untorautotic write the stark of invariant on the start of the to lark of invariant on the start of the Subject if the sub primetry executions where they would like to see the the rest option of the start of the start species depict. Then as in a class all no even the lark has many of the large based to first approximations on the start of the start and has many of the large based to first the large based on the large based to first the large based on the large based to first and has many of the large based to first the large based on the large based to first the large based on the large based to first the large based on the large based to first the large based on the large based to first the large based on the large based to first the large based on the large based to first the large based on the large based to first the large based on the large based to first the large based on the large based to first the large based on the large based to first the large based on the large based to first the large based to first the large based on the large based to first the large based to first the large based on the large based to first the large based to first the large based on the large based to first the large based t

Tain in the larged of Seumine sections (e) or convected by say of the cocontrol (e) or convected by say of the cocontrol (e) or convected by the say of the large say of the say of the say of the say of the went or the Soverchard and the say of the behavior of the Soverchard and the say of the behavior of the say of the say of the say of the behavior of the say of the say of the say of the behavior of the say of

This is parmanently shroughd in an impaintiable haze that soundsu have determined is a methane smog, the result of surlight interacting with skinosphere chamtesis. In this regard, the atmosphere of the stabilitie maint sciency resembles that of Los Anaples

Since Inter his a ritrogen och atmosphere, ocki d is einer thee? It is hand to say, because Tran's temperature is -168°C. For the reason Team is tometime described as an Earth in deep finare. No form of life that we know of ockid dewelop to any great extent in as of ockid dewelop to any great extent in as of ock and dewelop to any great extent in as of ockid a mass.

This tamperature is also significant because it is main what is called the mple point of methage, that is to say the foroportuble at which methage can axis a solid liquid or gas. The methage point of methage is -162°C, and its being set. call.

want a -155°C The -166°C surface femperature of Titan laks neatly between the two. The atmospheric conditions of weather conditions on the satellite Methane pould concerned the concerned into clouds near the frigid surface causing mothane rains or methane snowstorms on ony given day. In other words, this moon could routinely have a kind of gasolimetike high octane preceptation. As one planetary scientist succinctly put if, it pould be presumably comes from some stance on Teams surfaces and from what we linner about the moon's temperature and pressure conditions the source is likely sea of methane on Titan. The question is

Hare we come to some fascinating studies by Cornel University astronomers Cerl Segen and Starley Demost They began by celolating the tidal forces that would exist on a Tran sea and concluded



Server high octane airry on At moon Talan

that with each revolution accurd Saturn, there should be a 32-lost bole. A hole his immense could concavably create bitrandous friction between the sea and the surface of Tata. The exemute reflect would be to shift the satellists drat unb the base satellist most for zero.

But this has not happened. There are two possible experimences. Ether there is no occur on Trainer as Supprior and Ements Support the occurs in extremely date. If immitten the boccurs we show that states and state here on List that deep sets produce less farsten than obtain. Otherwise we could not experiately in the there has to be come obtain. Otherwise we could not experiately in the there has no be come obtain. Otherwise we could not experit the more plaunities they extrans the operand supprise a locuted 1.200 feet

Nearly all of Tsan's surface may be covered with an obain of mainstree an uncertainty of the solar system The only date societs with seed of any comparative second saddles buogsta temps, update second saddles buogsta temps, and the second saddles buogsta temps and the second saddles and the second saddles and the second saddles t

We obside herd out more about Tata to doing status from Earth We could been radiated at a land study the influence at that weeds the official modes is about a status of official modes is we did with Weice There is a parallelities, we did with Weice There is a parallelities, because Write, Weice Tates to the film we know shock Weice came to film an we know shock Weice came to film an extraw shock Weice came to film an entities of the shock that metagers in one the planet and boin the limited on the planet and boin the limited one with the Mosee that metagers to map he antice about the shock that we here any official the shock that we here any official the shock that we here the shock that metagers to map here any official the shock the shock the here to be shock that Tates .

In the present economic stuation, a Tran probe seams a long way off. Sadly, all funds have dired up. But once the probe is launched, the results will be of subpaced interact DC







### Robert Farber uncovered the natural expressiveness of the nucle with a very extraordinary film:

# AGFACHROME 200

The mode form requires a film with extraordinary qualities that will make the most of the image before the camera- in situations that are often less than perfect. Which is precisely why removined histographics Bobert Particle chose Agfacterines 200 for his most recent book, Parber Audor<sup>4</sup>

Adjustment 200% exceptional color responsiveness, while initiate and fine grain were just what he received for his demanding subject matter. And its higher speed enabled him to overcome difficulighting statisticans. It is truly a finit designed to meet the challenge of conditions from dawn to dusk

After exhibitive comparison tasks, shafting photographic megazines have present Affectivenes 200 for its desized events warmth, rich blacks, nature looker renditive, tiltra-fine granis and moderne contrast. Prived below other high speed films, Aglechrone 200 is sold with Agle's own processing. Shifes are returned encounted in orchivery glashic Bostmis.

For the photographer who will settle for nothing loss than the realistic portrayal of color that has made Agfa famous, the only choice in a high speed slide film is Agfachrome 200

### Preferred by those who know

AGEA GEVAERT

For more reformance and a lost reserve and a lost reserve on Agele annual 2019 with a Contenant Report Days, CM, Agin Greeneri, Jao, 273 North Storet, Teterboin, New Jensey 10143 Agin and Jadacharone are segmented instruction of Agis General, Javaniae Astronomy CD853.0.

### BRAIN COMIRCLED CONALTERS

# ARTIFICIAL

By Judth Becker

In Floarshinkovin Edype lisate Autrovas Ibr funar specie hara common han hitipa computer with hitin mind. Such separative consoling the second second decision away—I in its possible at all to its Miker Costs (researcher hara arready decision away—I in the possible at all to its Miker Costs (researcher hara). To common decision and the loss films; To common decision and the loss films; To common a

The new technique may help place, menouver that approve when high g foctors pri their arms. And helps on Earth severity handcapped people who can't specific may be anything but there eyes well use the system to communicate and to command light seventhes televisions, and meet centrying rabots.

Most of the hardware for a brain-wave interface has been on the market for some time, says inventor Ench Suffer, a scenaria at the Smith-Kettevel Instaus, in San Plancisco. The mago of the technology is in the software—the propasis that enable the computer to analyze the miumerable electrical patients of the human breen

To use the system, you simply don some electrodes like those used for an electrochosphalogner. Then just glance at a flashing light when you want something done

The system uses a suparare kpr for ach divice to be trinked on or of lor ter each divice to be trinked on or of lor ter each divice to be made — agy letters or a sotero tusk to spell use to message The light faster in a carefully chosen pattern a repearing sequence that takes ready these accords to be fictured with a weak "theorem to be fictured with a changes recognizably as the charged.

All the lights licker in the same pattern but not in step. As one light begins the sequence, the offees are pathwe through it. So to find out what the uper wards done the computer companies the uper's beam values with the patients in the memory. What it finds a patient that methods, it knows which light wais looked



Packeting lights set up drawn wave patters that can be used to control companyors 30 OMM at and operates the approximate alreed Developed to help the handlocepoid communicate the same transmission enables and the same transmission of the same telefal totals of numbers from a televation of the same total work of the same two as therefore the televal total and the angle character and a factoring tight to the same transmission and the same transmission of the same and the same telefal total and the same televal to a same transmission and the same televal total and the same televal to a same term and the same televal to a same televal te

In the outputs model, See characters appear on average to come with a special character processes the incurs on the two care can write the accuracy. Suiter will soon connect the information are more pressive processing and the come comprise speech hyperbrance to preterior are proceed to charact the system will proceed a character the system will be the the system of the two well.

The system offers the heredexpeed many conveniences. "The target light don't have to be in a chockerboard. Suffer anys," They can be all ever the open windows or lum the water on and open windows or lum the water on and "A proton outlig pour a glass of water and tell a robot to bring it, just by lowing at the lauser them at the robot

Earlier attempts to help such asvertely handicapped people used complex trackers to holikow the users were as they mainted from letter to letter on a beard. The systems required people to remain perfectly still while using them and needed property. Both requirements made them offered to use outload the laboratory.

Microsover, they were very costly "In rejectacity avanams, the exclusions are in the hardware." Suttar away i mort show the first the exclusion of the the thermal tability. The summary and the thermal very isolution: the unreasity displocated obtainet. The sum reasity displocated obtainet. The sum reasity displocated content on the part of the market for content on reaget

### DEATH DY ANESTHESIA

THE BODY

By Arielle Emmett

The surgery was routine, but the outcome was freekethly tragic More important, it may also have been preventable.

In May 1999, a six-fact, 170-paint reachant motion named Washin Fahrg chocked who a U.S. Public Heath Service Hostard on Station Halan A war Vork to have a minor eye muty reparted Anashhotad by a skuler munor dynace hang energied from his operation a quarterplage moute and brief Service Jun to ded di kidikey infection, a completation of his pantyses

Noatty a disease tase in 1978, seventeen-year old Donaid Loubert antined Toronto a North York Blamaon Hospital to have a noise inpury corrected The operation was considered noutine, amost nak fee Yet his heart atopped during the operation. Although doctors invived him. Loubert lapaed with a correct and died althout here there.

What worth wong? Physicians is both classic sorthworth of the risk model in the been violation of a name and undetected perieotic classes called miligrant (spatialities, which use merely toggared be safe and effective Party & classic was that physicians that failed ways a claim has already and the failed ways a claim has already and the classic to advisor effective.

Among tutter doctors the sequence is givening that given is another as may be the more hazardow that they could assume a fact year more has 1000 dotther. In North Amenica are alreedy instructive to an advect the second ansative existing and the second ansative existing and another ansative existing and another ansative existing and another ansative existing and an advect ansative existing and an advect ansative existing and an advect and a second an advect and a second and a second cylital and and a second advect and a second advect advect

According to one Carlaction physician Dr. James B. Formet, of Hermiton, Onlinic many of thesis clearly across the private that the clear the private that the membroad objustment at McMaster University Health Science Centre III ~ 20 Oke Isouching the first large-scale antry test of the four most common agents used to mantain general unvertises, helpframe first shift in recossory Forumat agues because "the relative satisfy of these agents is not known. He adds thet "very limited information is suitable on a wate range of large simular test".

The closer postaneathous complaints include distinguishes loss of concentration, and occasional hair basic year these one intil poonly understood. Format aign Such hausted is bronchial apaim loss of blood proslums and imprend train and liver function are incognized but have invel beam systemisticity suched

Forrest's plan is to called information from ten university health canters where once 38 GOB patient volunteers will receive randomly one of the atrestheops being studied. Forrest belowes the drugs will abov significant offerences in safety but he concestes that 1 dan t know what will find."

Some other doctors doubt that it will be much Only a massive study of inundrade



of thousands of patients -- design exceedingly difficult cost autonomous?" would yield the information Ecrops is after says Dr. Herman Tumport, channan of anesthesiology at New York Linversity School of Moderin. We stratistication why small diffuences of montality. The points out

To Tarrison agrees that anothesis must be studied must more casely. But he says that more knowledge mgt be galada by conspaning perinal and regorant or local amathesis. Wany doctors, fundant onys foar that general aniethiesis a used to orther where other local-anothesis math be part as arthrothe.

Bit The limitabilities are not the only hazard in ora an ship the west Acute-saw hospitals perform roughly 30 million operations each year. To hence this load there are only 16 000 instaltheatogetail and 1.800 resolutions in an estimation of the shift of the similar of whom have little or no transing in areatheatogeta.

A receive fetter hore an official in Growtia B starts of Montal Devromhandon Protocolor B parts in June Handon Protocolor B parts in June bench receive B parts in June bench and a worker in Indiana and the start of the start of the start of the mail and an entropy of the start of the star

This have been many other equally spectracture—and unfortunitie—cases - Chance Gentrude Gelowa... a Vancouver Bissish Columbia worren, died in 1978—after a burnen operation. The apparent cause was outfloation. The placht tube maint to carry caygen to contence on wag is



# CONTINUUM

### SPLIT-BRAIN LO TEST

drinny couldn't nead. He couldn't even behave. So uncontrollable were his outburste treit his heaches had he table on 10, test to determine whether he was retried to a count of the set of the set. In black eight-year-old performed pony his heaches had all by lashibation they resided to place him is special education.

In the leads After hearing about activity a group of black perchologists in San Prancesco surveyed several solutions, including johnny s, and bourd an unusually large proportion of black chides in spocial education. The group suad the school system is store usero levels the value diverses white model-class locks

This publicized court case in the Seventiss marked a high point in a controversy that still regise. Can standard 10 tests be valid for minoritias? How do you know whether you're mass unto intelligence, achievement, or simply lised-taking skills?

Now two popythologies husband and with claim they vellowed is wey to require the contraverse, Allen and Nakeen Rikufmain say hay have developed the first chickenik intelligance tossis that don't judge whice is chick lowed built have the chick regardless of the cuture or educence. Their is the claim firle ductor. If those work is made the Kanfaran Assessment Battery for Chicken (KAUC) one of the most significant advances in melanocon battery. Is work made the Kanfaran Assessment Battery for Chicken (KAUC) one of the most significant advances in melanocon battery is decided.

Both Kautmans had worked in estuational testing and hild seen the level of transformation based could produce Ore woman. The example had paper 20 years in merical initiations bacalaud also had socred considently law on workal initiations bacalaud then. Alan Kautman braigh seads on hist no merical residence tests where Alan Kautman braigh seads on hist no merical residence and the analysis of the seads of the normal range at language daiorder, nor had relianzans, had bean her read condem.

Board a standard intelligence tota, says Real-them are bailcally antrayos board on censes of this from white white bornd a grosser majority. The guardiant bernadives pools withing probtients Chen questions for complex sais what you in a flight (gross groups assessed as a conset, a segment and a set of the constant on the constant a conset, a segment and the constant of the other operation and white the with other and the common feature and back where it you are set of 10 board are no common. Not Input across report. But it is final information to the second inter extransmission and account to an entry the second instance of the second interaction in the second interaction in the second of the second interaction in the second interaction in the second of the second interaction in the second interaction of the second interaction in the second interaction in the second of the second interaction in the second interaction in the second interaction in the second interaction in the second of the second interaction in the second interaction in the second of the second interaction in the second interaction is and and the second of the second interaction in the second interaction is an extra second in the second interaction into a second is an extra second in the second interaction and the second is an extra second in the second interaction into a second is an extra second in the second interaction into a second is an extra second in the second interaction into a second is an extra second in the second interaction interaction into a second is an extra second interaction interaction interaction interaction is an extra second interaction interaction interaction interaction is an extra second interaction intera

This new text appeals to some preychologistic, but OTMAI wolde whether in really is better than situatical 10 texts. No text can truly separate achievement ition is carring, strys traversity of Colorado psychologist Kenneth Hopkins, he adds that cuinaal tamesa wil always be unattainable. Others say he sequentay-emulancias model to thinking has noter been provid-

But in proliminary reports the KAIIC nanowed the LO tool difference between blacks and whites tion 15 to 7 points—a result, asys Alan Kauhan, of placing the culturally dependent inguage and achievement portons in separate callegoins. He adds that enough televentonia have demonstrated the transtechtermout anture to use in of determining intelligence.

It is to early to tell whether the KABC will addeed in the mitimitian decisionships and an addeed and the addeed of the misses areacythomake psychologist intervely ther pondering with addeed and addeed and the second addeed the with addeed addeed and addeed addeed addeed addeed addeed when addee consolvery the of "these wort intelligences, so they are simplify to misse it easist " agas one ponement psychologist to pay to make it easist " agas one ponement psychologist for pay addeed and addeed addeed addeed addeed the pay addeed addeed addeed addeed addeed to pay addeed and addeed add

### CONTINUUM



A sperilises down actions long cats well code wate a behaviors. Solicites if they are brought up together as cube

#### TIGON + LION -LITIGON

When the Calculta zoo crossbord a male Bangal Iger with a Bernale India Ion in 1972, the result was a brand-new hybrid an mal—a tigon it looked like a bgar with labdid simple and a lond stawy coloing Serven years later, in 1973, the advantasius zoo staff went one step further and constraint a benatio

and characterial is female opportunity and/opportunity producing another new annual-the stapportunity approaching motivity approaching motivity approaching the approach and powerful call segretation and powerful call segretation and the approach and approach and the approach and approach and the approach and a half beat longer than a line higher. Catalandean fast a ward about approx white higher catalandean fast a which grows, Cubanaban bare, though his roars are not so deep. froquant, or long as those of a ten Big date with a different species it they are trought up together as buts. Daa replans. Mee opons are said to be sterile opons are said to be sterile

a's four tigons are tensile t's been impossible to with the legend. The zoo with however, backcross a male and terrate it gon to last whether both ascess of that animal are fertio

that ingrow sould be set tree at widthe sanchares and might take root in nabue With the enormous power these anmals display atsking their capes, is adds, it looks as if they might be capable of oompating for survivil —Ban Barbe

Why always, Wot yet ? Do dowers in the spring say Not yet?

-Norman Douglas

#### PAIN MACHINE

The partnet is in excucaring pain but notices of dispensing morphina, his physician parkhesis on Alpha-Sim 2000. The new tabletop medical instrument exupped with reterroots, directs a sense of gante electrical waves through the patter's body. The Bin minute treatment bings in medicate classes of gante and unitize morphism, Alpha-Sim 2000 leases the patient alext.

It actually represent the brian and nervous ayatem says neurobiologist Dan Krisch Aphae Stim s revertor Aphae Stim a two electrocies are placed as acquientaries points or all the spots where the patient experiments the most pain. Kinsch see The second secon

"Many ideas grow better when transplanted into another mind than in the one where they spring up ' ---Qiver Wordsh Holma



All Agent open courses are provided any proceed and a reaction at account of an analysis of any the course of a reaction and a second and an and a second and as second and a second and as second and a second and as second and

36 DMM



Analize Impeasance of the Anazons, the mythols all women acce of warrans. In the animal kelopoon, all famale cases are very real

#### AMAZON CLONES

Scientists have always secured that the Amazons is race of warnors composed entrely of femalas, write mythical flow an evolutionery biologist claims there are many precidentia in the animal kengdom for a differnele race

More than 3D versite/table process produce only formale program (accessing within which are an experimental processing) in the processing within the sector and provide percession to these with the provide percession to the sector the sector and the with the persector and the sector and the the sector and the sector

To team more about these involution creatures. Moore is currently studying Peecke Someose an Amazon Ish swimming the Son Mercos River in Texas: Though these breakcais must have intercourse with males of a neerly identical appears in order to conclave. They give birth only to carbon concer of hormatives.

The formosans. Moore has found are extremely puccessful. They waske no energy producing makes and their potential populatio growth is entitimbus letted each individual can colonize new watas on its own.

Severings now have an array of adminuses (indusing rotation and chemical athosis) that can singler embryonic development and very batter in the unlike social species. Judging how the success of the Ban Marcos chores, Moore adds sperm, and the make the product them may be more dispensable than we have — General R Japanes

#### POLLUTION ALERT: DON'T RUN

If you pop in a city like New York Los Angeles, or Derver you implif wark to finite bases about your heathlai obsession. An invine, California, physiologia has found that evenorang in politied ar might do you more balem thas good.

Secretate have long known that are polition causes long demage but neve had infect such damage to the amount of eastcaing bone in politid and colleagues at the University of Calatorian have shown that laboratory rate secretaring in politiest is write in more lang damage than those that is shift

In this experiments, Mailab exposed experit groups of rats to the same levels of extrato-an initiating byparotact of auto errassons --lound in Los Angeles and other targe cates. He then singulated the animate executes levels by having them sin a model/with Indexing while benefities (the optical at a "basic of the 40 primes) tang space of the 40 primes) by basic that the tangent tangent at had to become in the air had to become in the archad to become in the poly of the tangent tangent alwater walls. What's worse secores in the poly and the tangent tangent areas and any magnitud alwater walls. What's worse secores in the poly and any tangent tangent areas and any magnitud alwater walls. What's worse as across the any and the second second alwater walls. What's alwater walls are the second any any any alwater walls.

Moutz thinks that deep breaking during associate may override the fitering mechanisms of the nose and break and suck politikars deep into the large. He costores that rait results do not always upply to proper hold warms that it might be wren to forgo associate wren to forgo associate wren to forgo associate wren to forgo associate but warms that it might be might be stay append of tables. In Devide Sim-



If we pay we interact to rets an independence seconds, sampting in an ophyted areas is less healthy than sining use

### CONTINUUM

#### HORSEFLY EYES FOR ROBOTS

The human syst captures only 601 b61 of a given scane all any angle moment And bocause certows and most ofter optical instruments are disagred like the human syst. They softs tom file same limitston Hostalika on the other hand have a 210<sup>th</sup> held of west, siloway from to see listelity in front and birland themselves of once

The most amoung aspect of the homely exp. forwever may be an astounding 2000 individual Twylets abids have applied with temperature or odds sensors plus a unique surface conting that abouts just a forw-astwering this of the forw-astwering this of the forw-astwering the the individual the major may be described as a "was pattern of reformation abids them a picture

Nuclear engineer flockard Schneider might newer heike atumbiled on these fundamental locks in his seiken for a better robud ogk buf for a better robud ogk buf for a better robud bufter Roburgs a fow cellular and the schemeter atumbilitet and the schemeter atom with colleague Richard Welforston, developed a hold enve performed after flad of the horser/v

The new robot eye Schnaider explains 1 resembles the built and of a motophone 1 its rounded liens captures 3807 of a given scene (in other words, the whole thing). And light



A sive model for robot buildes? The hereafty's 212 least of vision and 20 000 " vicios" k and logge and a new relative set.

to sett to a computer ver optic fibers that break the maps into 100 different parts for careful analysis

We see the type being used initially in systems where there is a need to definity size shepe and torm. Butter explains the need in conjunction white a medic-react of the system while a medic-react and the problem designed to pack earnings. If coursi identify the position of the fruit at different adapts to development and guide the size of the nge storage.

### HELANOMA VACCINE

#### Melanoma is just about

the clearcheat human cancer Once it spreads from the primary site (usually a malignant mote) to the tym photo system the woom a new valcens offers hope a new valcens offers hope to the church

According to metunologist William Cassels the veccine is made by combining Newcastle virus—which tocate detects in critics are—and twentiments cells. The wrus-melanoma cells the wrus-melanoma optimentation is then intechnoses the wrait particles as fortegen and guidely mainulcatures antibodies to destroy them Becates the melanoma cell the manuinclused embadies can recognas—and destroy the canoet also

Rested at Elency University in Adians, the vaccine kept 28 of 32 metanoms allowed and a spacericality and disease free for three years. Nevertheless Casels and colleague Douglisk Murry, a surgeor, coulton against permuture propriates of a metanoma to me any bein were reference on the set of the metanoma colls for a coupt of years."

If you want to be unloved and forgotten, be reasonible "

-Kat Venneovs, Ja

#### SEEING RED

Pleak a red cloth in front of a buil and hest charge Now a group of Colorado scientists might be able to account for that election The ocior rod, they have lound, actually mokes you stranger. And the relation through any power to attructive accounts

To conclude their sear the scentrals put 30 subjects in nooths with colored webs and related acade one to squeeze a dynamorneler hail would reasourch the loose of his grup. Red walls made the average grup nos to 86 5 pounds Blue wells brought the average grup strength down to 84.8 pounds and the color prix ingreed a mise 84.8 pounds of squeeze

Why the difference? Bold ed (arouses) people



Physical solarigh may be enhanced by the color real

stmuting ther macrice propose physical education protectory D. Aran Philipa, who conducted the unusual study at the University of Neithern Golorado, in Strategy Dias in contrate, is heutist" and park is neutral and park is neutral and park is of color, "he arys" hare probably social. I don't thin there's anything bacheristal about the "

Since grp is the "teopy best indicator of overall body stergth," according to Philips, individual dayms could probably help weight litters rate hervier loads Pregne, on the other hand should have prik wells, designed to soche inmites

#### "Honesty is presed and starved " ---Decimus Jovenal

### NAZI BONE MENDING

When American obcesses decovered metal local among heruph the borner of the local terms of the local of here is attractive. But in the surgeone metaload the next The German had local sea fundpie had used a strand log whold metalog the large maarce or whollying the local sea of a strand log metaload of the large maarce or whollying the local sea of the large maarce their imped blood four anonymous the large maarce here in procedure is but have here 169 accesses

Enter Michael Chapman an Army doctor assigned to NATO Chapman had heard of the technique and amanged to meet with the



Phonostope shows standard steel rod maarted in hacture

German surgibit who pronected it. After a series of take be realized that modern X-ray and computenzed image-enhancing technology would allow him to refive the process.

Now an orthopedic surgen at the University of Calitorine at Davis, Otap men routinely triats complete fristanes by purcharing the akin, then solding a stender stanfest-listed not through the unision. The rod is pushed through the center of this torken bane tragments, realigning and freegithem in place Chasmentions the optiestan

The prior says, is less trainable, the prior says, is less trainable than its difficult surprises that the says the surprises and the says the says

-Brik Bolin

### DYING PLASTIC

#### Israelis have long pt-

createred the use of plastic to bring marginal desart lands into use. When lard detectly user the ground, the synthetic covering instants source soft mosture and lawage planty desart reghts. In the way sound summer crope care to planted as much as as works anty

been one problem with Learne plastic Picking up the sheets before harvest is a terrible job," explains langel polymer engineer Can Giread And misled pecks newtably loal up the harsection sections.

College and brugs industry Deleted and Brugs outputs with the perfect solution while versing at Kribute histories, communal term in northtron issue. While solution time block while solution time block while solution time selectly attalies. But ances while solutions and sources while solutions. the material's slow decomcoston begins

The researchers modified the sheeting by adding a chemical called term chally! diffucationate to an ordinary plastic. The additive protects the plastic from those destructive ultravolet may but only for one to seven months, depending on the lamacit nearly.

When its chemeal clock inaly use down the inaly use down the altering gats britis and carls, the packs down naivees with harvesting, and farmers can plow the ceadue under, where it exemusity downlegables into amore carbon compounds and where the downley.

The new Israeli plastic, called Plaster is now being tested on larme in the United States Australia, and Puerto Rico

-Mercin Bertusiek

"If you would learn the secrets of nature, you must practice more humanity than others."



Deventouses that conversi autode "Jankeli vgnouktural place" Is alrown clausiagrilding on ose under the sun's ultimodel rays

# CONTINUUM



The actistic romain withdrawe form reality deoughout their lives. The problem may be an already to their own brain protein.

### AUTISM ALLERGY

When scientists fruit classified submit as a disease in 1943; they beleaved a werk toought on by a cold and astart mother. Dwe had astart mother Dwe had postphilitists now say be autopost, who remean which we have a solar to photographic who remean which we not reakly photographic who remean which we have a solar photographic solar to the head to be possible as the photographic solar to phot

Recently, longly psychiatrust at the Gene Psychiarus batue for the Argunation of reary may be at taut. The advantage of the Argunation of the Argunation of the Argunation the control advantage of the Argunation of the Argunation of the Argunation allerge to a brain protein To detect the allering, the inspecthol trunt 28 patients, 17 whe subtet and 11 softward trun other mental diseases Each blood semple was then included with macrobringse scaverger cells that attack and devour foreign substances in the body Franky, the metare was exposed to myster, a protective protein that coult nerve price

In 76 percent of the autobic patients macrophages surrounded the mysles presembly thinking it was a longer substance that needed to be descroyed. The autoimmune, or allergic, response was absent in all the control subjects.

The elilogic reaction, summers Waternamic could have been caused when a brean repry made the body solitative to far own nerve tassee Yot the learn readt, if a costo, orreans al large We are gatting nervy to coptor the what blocd cells to proteins present in only sportific anals of the brain " says Witeman. The brain " says Witeman. The by a series of positive and negative subormeure inceparases will lead to the locater of the leaders if it fully exists. Whether such a taken could be treated, however is still unknown --Marce Bartusan

In a centain sense every single human soul has more meaning and value than the whole of history."

### AQUATRAIN

Minoria di pidopia bom Derrarci lo Sam Dego vely co ha Colorado Programo de Intochanis Sin watar Unitor Lurettay hor more si berg obcar terrar di politachnicata angenga, rebartas delarito terrar di politachvacionato andi guardi solo delarito programo de guardi delarito delarito delarito del delarito del delarito del guardi delarito del delarito del guardi delarito del del regione del delarito del delarito del del delarito del delarito del del delarito del del del regione del del delarito del del del delarito del del del delarito del del della della del del della della della del del del della della della del del del della della della della del del della della della della della della della della del della dell

Sating is outlinear whoming and unring 1 Step imites through Calanato una the popeline would remove ashwater from pairlocately pollutes mouth then stated on to a coating the state would then stated on to a coating the state would be used to cool the bolics doceting to Aquatian docetory to Avaita at docetory to Avaita at docetory to Avaita to many to state the state of the bolics docetory to Avaita the do



The Dalarada River: X new alars to gat od of the salt

"Transport of coal vouid bring a profit," McKenver explains "and that would help to pay for removal of the walt."

A ministere plot plant uning a two-inch character pippine to carry the cosh less encody been built F Acualiain attracts sufficient rivestats and the U S Department of the Intensor sportwes a soute the pippine could be open for business as early as 1989 ——Prix J Combern

"After the most optionable Bhog is finds we are stif here? We have attained the capacity to destrue the planet and haven't done it. The bager we don't do it, the batter chance we have."

#### SLEEP AND WAR

Modern high-rack wars like the one in the Tabilition stands have been first packed allowing military despen makers and people who opcasts crucial electonic celemis systems little me for stage. Determinities of this, the U.S. Army asked University of Plands researchie: Was B. Webb to see whether people could be immunicat against the effects of seeples could

To conclust the study webs deproval paper of varying amounts of sloep than asked them to add columns of numbers at operate termines. Among the could all sloep inght there applicables and all sloep inght there applicables and all sloep inght there applicables applicables and applicables applicables and applicables applicables and whou takeps and it you've and takeps and all paper and behaviors the subTo help exclaters function whost silves without and voses 'planners should find, usys of motivating that Their assess helping that the silves is a silve challings U.I.I. for matter how inneat personnel parts he adds' you've got to give the solitons some time of I — Frank H. Adams

The rand of possible man to actual man is overwhelm incluition

### LIFETIME LENSES

Bod eyesight often gets worse with time faicing the valuely imparted to buy new glasses every few years. But if the invention of a Mane engineer pans out, glasses might soon one equipped with is//smatically adjusting tensos that learns the tenso.

The new, computerized lenses recordly patented by John Warren Senders, professor of engineering at both the Linevests of Marre



to go without along far first average of stored at a word so.

and the University of Teoreto involutional and ensure entractical in the frame interface and the frame tow light entries the syst and the postion of the inte They would then signal a compater to calculate the compet adjustment. Imports an electronic dowle that would curve the lenses to reactions or the frames to

The class says Benders is to put whoever you're looking at in class focus whather it is close or its anay. The glassess would slow those who are both reassighted can't faregring to see over a range of distances without bifocals benders to ridereloping the project — Bobart Roudy

#### HIGH-TECH TACKLE

Superbowl 1993 Don Stude the graziled head coach of the Miami Dolphins pages rervourily on the societines. With timin laft for one more play, the Dolphins load by five points but the New Orieland Starts are just a yeard away from a wriging loadshown.

What does Coach Shrup co? He adds the computer which oversite that 90 percent of the Sams one-yeard touchdowns have been scored by one Fullback. Mu hammaid Muhammad Shuta alerts his oldense and Muhammaid is gingtacked momanta later Vectory for Mam

This scenario could occur within the docade predicts Hank Stram of MSS Osintel Inc. More than half of the Nances Postal Lagges 5 28 bases sixed/ have computers, and 15 use MDS Carried a: Sporte Packs These bases, says Sham is former coach himself could be using alloch shatages during games right nos----fit waren't that the league has not yet approved such coacters.

Even eslegated to the clubhouse computers like the Sporte Plack handle a same social same college restruting and public relations maining. What is more, they store scouting reports on opposing least for instant interval by the coaching still.



San Diego Cherger cosching staff plans sileon skelegy

## 



A socconin betalen-same



# ROBOCLONE

### A robot that duplicates itsell? It's entirely possible, says this expert

### BY ROBERT FREITAS, JR

The next 20 years may withose the both of a man-made life form that could lead us into space--- and eliminate most human intor here on Earth Much almady been done Picture one possible. result of these efforts From a rocket that left Earth several years before an anormous ego drops to Saturn's los moon Enceladus and cracks

open, rokesarg the robot made 3985g spectrake, on the unixers surface, the automation ammediately sets about reproducing abset, using only the materixia of hand and factor left energy from the destant on the starts. Soon the robot and its descendents begin their real task: mining Enchledue's loo and building small light-sell tags to cerry the churks toward the inter solar

opan, releasing the robot system. For a time, earfuly asprovences see nothing unmust, but eventually a new mg begins to appear around Batam, istroventing the old cons at about twee the distance A cloud of repleating-robat vasents specia cotward from Encelectas and then spile in a long Their stepments of ice tall like sparking meteors only the Merken surface, meting on impact and



PAINTINGS BY MARSHALL ARISMAN

whole sees form The ar grows thick and

According to Robert A. Frosch former NASA administrator, such missions are not celob he lold his startled audience that to support purseives in apace, we will need self-reproducing robots. They would be declared "provide every access to the re-

The key to the scheme is a machine that can use solar energy and local stategals human ourdance. Since generation after constation of offseting would be built the ponentially the way biological populations

NASA is taking this concept very senously in 1980 ¢ held a ten-whek summer Clara, in California. My group, called the Replicating Systems Concepts Team raw lunar sol and manufacture anything

ful of machinery on the moon. The first 100 vards across. Then they would install

The fectory has these major and yours. Only another forms them into mechine parts tools and electronic components and the enough materials to clupticate tast! If al-

we need "It could build a few thousand meter-long robot rovers equipped with hauten assistant director of the Advanced Systems Office at the Marshall Space Fight Center, in Huntsville Alabarries and a member of the replication systems team "They could cover the moon tike ants mapping it in just a few years By conventional methods it might teke a

theiwing the frozen ground. Rest every then confury or more to do the same thing How soon could such a system he in tme in perhaps a billion years. Within a within 20 years after the project is begun. decisie of this transformation human col- the United States could produce the trat tensis Former NASA administrator Ercecht is even more potimistic. "We are very close chines' he says "I believe that the techfoldor is already available and that the necessary development could be apport-Long before NASA became interested in

self-replicating machine systems, the besic theory had already been worked out in some detail much of it has been around

It began in 1948 with the late John von Neutrans, a britiant Humanian methometician famod for his early work on electransport computing in a series of lectures.

According to Von Neumann a self-repicating machine must have at least four mands the builder to construct exact replicas of all mechanical systems accordstockroom and assemble them in order coper to duplicate the blueprints, insert the copy into the replica, and aim the new

Other scientists have also given serious tute for Advanced Studies, suggests that a small robot adapted to earthly deserte mont duplicate itself from the secon and by surright, if would manufacture electricelectrical output of the United States Thrush the robot is openial for detiron-

western United States, probably after lotter debate in Concress. The robot would restore the site's appearance whenever a

ture within a few weeks into a complete system of basic industries, along with the molt be the urban-renewal list incurned.

tascinating ideas for the future of space This offers a way to create a set supporting economy by robot labor the observes. Immigrants from Earth could set

Michael Ariolo of the department of mateliar communication. A sel-rapid synthesis from the interstallar cas he of-

ing aphere of explorers moving outward

of Tulane University in New Driesing has exist. If they did they would have had to dence of these machines all around us Some machines have already managed

written in nearly a dozen different len themselves from simpler parts have proved

sgo by British geneticiet L. S. Pennoee at University College London It is an ince arrangements of springs lavers hooks and





After practically creating the home-computer industry, what can Steve Woznisk do for an encore?

# WOZARDRY

BY DOLLG GARR

Chuck Neuro was un-Denk Advanced Logic beginning to wonder if his fim a maker of add-Velley After all lots of with good products-Only in his tevanees Mauro had never run a

block to build a computer An avid mediar of Byte, the mediatine for computer bulls, ite was perceutarly feepinated by the tophnical anticles written by Sleve Woznink, the optounder of the Apple Computer Compeny. In the apring of 1978 Mauro then a teen-ager, sum-

computers, and some time later Wozniak called back.

By 1980 Mauro was on his own. The weeks had signed by and suddenly he restured he hadn't seen Woz thought it was a creet idea. The two could talk shout the old days before Apple had become a halfhe was peeching himself to ask Woz for a chunk of investment capital sometime during their lunch

PHOTOGRAPH'S BY MARK HANAUER



uncharacteristic, be neced and the lunch burginesis if wasn't until Waz was on his way out e solto ad tes office.

vanced Logic?" Mauro Snally asked htm "Sunt," Wog replied

Mauro continued, more

"Fina." Wbg answered outckly "How much do you

considered it a great compliment to be asked." Wos office for Wox as that one of Siloon Vallay's most fe

In the small way, Simphen Gary Woznak is remended him only for having stepped a hupe outdoor rock concert leat Labor Day weekend or that millions of others derreas him as ust another mitor celebrity who does a Dateur commercial. And it makes no difference frat. his former partner Steve Job's, twenty-seven, was the be Apple's charman, the boy-wonder hopie-turned-To Misuro a surprise, Woz showed up on time. Very ibusinessman who made the covers of Time and ForAre built people who court—the pice grammatic the impression the organization of the product the impression of the product of the product the reasons of the motion of the product the maximum of the motion who do not only the reasons of the motion apple the mension of the operative data through some haid advars apply new computer the cell sufficient of the operative computer the cell sufficient of the operative computer the cell sufficient of the operative computer the cell sufficient of the motion singled handbody built the machine, these singled handbody built the machine, to set

Compare industry scands that say that bottoms and above who stropp on the right place at the right inter—The market was inady to applied. That the tether—but the injust post to the limit of the strong the injust post type. It industry the tether is the force comparer market What Weat was also examined with the tether is about any strong particular dark the industry and any strong and the industry and any strong and any then have compared that the say of the have compared to the industry the ind

It will also the who single-handedly redatined the maga of the Bitcon Walky ungreet. Beton the end the bitcon twill your paint the inclusive and the four pool of types in suits and the four pool with deprese from such pitcos as Calledo Sanitasi of MT they worked in teams on throug they called precets

We didn't fit intal moto he was more comfortable pass and boost bank when this and to he lowed meth and electron to, but alter flying college leveral times to mere really come to terms with adadema. At the sociatema her was a bore and most of this creative boretis care leve in the right, when convertional engineers was here. An an adreso

Wex all rules structured environments. Parity because of thick he is now unvelcome at the very company he helped to create life is not even a children these. In contrast to the souty here and eavy days, when it began is a garage with a handbal of people Applications and any cargo companies balesactery, with more than 3.300 emcleaves sectioned.

Wearrisk worders how the executives metric words words that the teachs one high-teach meaning where they were complanning shock the last of supporting they are of Wearrisk projects. They yearried the the couplet and prosecute time . Wearrisk labels, he recents They wearried to the the object and prosecute time. Wearrisk find. His theoght the share were not crossly works on theoretication with mostly drawn works on theoretication with an object drawn

Wozniak talka about gorig black to Agple someday but in naith the is just bong sentemental. He knows he wouldn't hi in adjuttere And Bough he never says anyhas cooled, according to these modifies both men. They stroly stat to each other

That was not silways the case. 'They had two things in common They were both into the case. electronics and both level to pull prantis, " explains Bill Fernandez: a franti who has the distinction of having been Apple Computers Instremployee Fernandez had gone to the same high school Homestead High as Jobs and Weanish had Fernandez had also intraduced the two

One of Jobs and Womstein the colloconstrain not supportingly was their infamous Take box? They got the sida aller tracking a magazine astrole abox? John Draper AAC Gape Durch a technologiol outsive with oab built an electronic do lotte with the built and infactor and about the second lotte and the built and lotter thread in long bafee Womste highered out how to built a blas box. Ioo

Harwart on to characretinate the blue box is potombal once by calling the Watcom and asking to speak to the pope. Or he dimake a call from one phone to another by using

Although some half-dozen people claim they were indispensable to Apple Computer, the truth is, if Wozniak hadr't built the machine, there would have been nothing to self 9

Te line that stretched excind the world. His bother Mark remembers how they di try to bully out ories by twing up the local trunk lines so rebecty obuld call in

For a white Jobs and Wax wert reforms blau-bob twinness Nationally their enterprise was frowned on Margaret Waxmak told bee son. I forbial you to use my soldphrine for legal purposes. And she imcalls, "Every sime the phone rang bein at a formy hour. I foculat it was the poleon

Becknock had biorened Weerliek from childhood Fitting //e gates up a Bibon Vallwy in a mfolde-cleas ranch house in Sunhysika whiten is family all lives. Jarry Woomek his father is an angineer of the distance of the mission and said works for Lockhead / He surght his som form sike bis talter his Woomersymmetry hordfillhart the bis tacion computer his som made in unsteel ranches.

But it was a low blocks away at Hometead High in building F-3 the electronics shop, where Warnek's procedulares hing began to bloch. The shop is sameting of a legged in the computer industry. Four of Ivas of Apabia's their doesn employees learned about electronics here from John McCollum the shop teacher. Now in his twentieth year of teaching. McCollum has a clear recollection of Woz ist a hightichol student in the Skites.

He remembers, for example, how Wac built a boath Wac had gather held of a criccut degram showing how to built an exclusion that made a chip dap dap mase like the scure of a leavy facet. When Wac like the scure of a leavy facet. When Wac like the scure of a leavy facet. When Wac support is not in an fail to gave a supprovide and put in a facet slow a a supprovide and put in a facet slow a

He here railed the principal is office and have a boats there is indigine the bombs location. When the principal isotrates a pool larger the principal isotrates was a people and arrested. After the matter was handly actived in entimeter to be an indiginating the entimeter to be an indiginating of the entimeter of the people and arrested to be severificated to official and the work of the severification to be and the work of the severification to be and indigination. The lack to be the Works that it he look to have observed the dimeter functions.

In conversion prantice Woomen was also a serious ansulant one of the solution is lew who excelled in body many and search ones puters MCGolum test hum to a computers weethadly became an obsession with Woot has a significant one a weak of computers weethadly became an obsession with Woot has being possibles in my became with many and the possible of ministering between Beet had possible of ministering between hom Date Comment

Fernancize who lived across the tasks from Way, has a similar interest in electronics. One of this first fileign Way laught means have to ognoritis for their "his sign fernancize was amanded at how Was could arrange out an alrege electronics limit the Faacht and get it to sing him thousands of thimmetine. (See to you him thousands dend me some reject maggaad circuits release and cadee?).

When a while Wate menaged to procure a small mourtain of parts—counter multiphonon latches thit registes and other essential eladoretic masks—from here are Monsanto He and Fremandoz dumpade them on the Invig room floor and begin bedrig them with the aid of catalogs. When they were done Wate amounced they had in the medical to baild a normality.

During the ensuing summarities the two potential calls the substantial of the workbench in content calls describe on the workbench in chine. Freenercitics unremetters if as the practically all help substantial on during the practically all help substantial on during the matter called using the first mark the workbench matter called using investigations and these produce temporture that and the work work freenerate transfer to the during works and distribute failure build work the subduring the substantial substantial works and distribute failure build when a compared comprehension that all results in works distribute failure build when a compared does in the substantial works and distribute failure build when a comAfter high school Waznak wont to callege He treet several schools-\_Behreley the University of Calcinada, and even to calbe Artas College—but lound the rights of student life unappealing. Once he discipled out of college for good an cikin gh acheol chum After Baum, pol him appl no a tachricular helping to cleage tabulation for Hewith Rachard (H-P).

Destructive Wate became bored with celculaters and the advad Baum to try to get him transferred to the tim's research and development divecin. He was turned down observatly because he was in dri an enprest, only a technician. "They daid i cich't have ensugh educatori. Weznek ave-

Their means there was only one trang to do booste a michight engineer. He had seen Hewell Proclam's HP 6800 a cload, top computer and he flowup's about designing his can water with a clifferent the corprocessor. He worked late at right on he machine. The propie there who have mit best wine the right security guards he readils of house days.

In float months ("allowed one man-years of the Note And Inshido the inshift of the inshift of any any computer. He took it to the H H approximation and set water the company weeks to set it. They call not water toos water of to set it. They call not water too water of the tops in set of the dename and it water happing parallels. Even to the test is applied by the company is hardly. The tags, it is date to water their too call.

Alter Baam had alto told Wormsk about the Homebrew Computer Collab all informal proto or Dimputer holdsysta who met regularly all the Stanfalot Linear Accessator Certere Homebrew footby has a cult task usis among computer altopratos Nany members seen of o baccompageases of the home computer industry. Two of the molable instructs were War and Jobs

In the mul-Bevenos when you built your own olimpuler, the timp to do was to show it. off. Woo wented only to take her treaters to the Homebrow meetings to improve his fellow hackers. Solve Jobs thought they should on the builties selfing it.

Althoutment berrer ware directly a substatutial hoboyow marker for home computing, so when that Terrel the bundler of Byte Steps a chare of computing terrers, was what was to be the Apple 1 ha tool Woo and Jobs that if they could delete 30 of ther cricial boards in a month he would pastiment Skel to call, not not although the baseds for \$2006.687 Totay the Apple 1 to Sto Could Water is they mind an original boards for \$2006.097 (Water is they mind an original boards on page 49)

Wez and Jobs took Tarral Is purchase order to an electronice supplier and asked the Starky sould. The supplier asted therel! Did you give those two hippens a bona bale order? In warmed boxwo Tenel sad yes. And so Apple was in business. (The mee Apple was chosen because Jobs had areas warched in an apple orchard) Jobs chared the broycles and junk out of his garage and they want to work By the end of the month, they made they linst delivery to Terrell 20 boards

Both Waz i dati and Jobs urgad Waz to go all the way with the Apple LPI is in a case and self it as a genuine density of problet. Jeny Waznak all hala a good dhudke when he remarkers what the two Bases basines goed was. They wanted to be a five hundred-thousand-action company in the refers. The apple - thought. How make can you park "It have the out of a gazde".

This the read few months Wee was a workable Those who inverse the manufacture through the manufacture and the source of the sour

Woz hates
structured environments.
Because of this
he is unwelcome at the
very company
he helpod to create
He is not
even a director at Apple

that a new board was coming togethat

Encreases where weld, undering the conony of the X-perior law data measurement perior to underscale in the reprint limit of the X-perior limit and a the X-perior limit of the X-perior limit was an extension of the X-perior limit of the was an extension of the X-perior limit of the X-

Designing and building a probatyse was one hing. Getting up a production line to chain out finished reliable models was quite another. And since Wice was not this type to foregr an eye on an assembly line. The obtains of numing the business were left to Jobs. The only problem was Jobs had no business experience efhili

In these days Apple will burg, but it was also beveretly undersphattend. And that's when Mee Markkula expensed Netsky, and under wareaution find it the computetion insultations, and the had been the insultations, and the had been "combined insultation (it had been to been the load on the labers and Wormak medical heigh Flowage printed to a dpate it was miking to merel also of the out cost it was miking to merel also of the out cost it to excluse other whole word and all to excluse other whole word all all to excluse other vertices capital and allog efficiency of the total word of the efficiency of the cost of the labers of the efficiency of the total of the out cost it to excluse other vertices capital and allog efficiency of the total of the out of the out cost it to excluse other vertices capital and allog

Waafikat, meantime had one more eargenering marks to perform for the computer to be easy to operate it needed a sportmo to last perguinar au-out/of that bet users of the Apple That to aprother softakel on transported taps a method that is soft to use it did drive, a box that reads in strong and the Apple That is to be the terration reasonal from a where gives of magnetised from a where or may seeveled for those computers.

Since a disk dave dwegn can be as complicated as the computer rised. Apple official and kinds of computer they said awas going to take all upper number of manhours. Jobs and Markkaka drinn have the time they needed it now Was would have to invest one.

Once again the shifted into this computlow work moves assurement the immed for days as a time. Around this imme he had maned Alos Relations. Around again wearner, it wasn't be beet time for a women of bits involved in this site. We would guid all sorts of later optiers at Apple woming all computer says his latter. Eventually a computer says his latter. Eventually women and here were even

We find a sector was proceeding over whether the sector of the sector of the sector whether to be the late, the sector of the used three is an end of the sector of the from a wonderful to be a sector sector for the from a wonderful in compact life box about the of the the sector.

Cree the dark drive were into production the Apple Intocame an instanti best safer Move than 750 000 moved were wold before Apple phased in our in have of a staged up version. the life (for ehanded) Watershink is labore received professioned as well as instructule accountion in 30% have Apple shared and the phase of the Apple and Apple and Apple Structure and Apple and Apple and Apple and Structure and Apple and Apple and Apple and Apple and Structure and Apple and Apple and Apple and Apple and Structure and Apple and Apple

Apple Computer soon became a monumental success. Within two years of its morphon it had become one of the Portune 500—the only company in American Itstion to do that. And when Apper writing Loss on 1980 it was not in the Article new scales and the Article new scales and the Article new process associated with Appe The Migsen model with Appe The Migsen model worth approximative Missi Markola worth approximative State and and State and State and circulater Missi Article worth approximative State and an the State previous scale previous the article State and Article Article State and State Article State and Article State and Article State Ar

Waz also became the new model of the American drafes. Since he had model to his own torns and on his own hours he was the imperiors of other works he imprements. Of ourse Waz never really aspected to get nch. He originally designed the companier pair to show off

Movey heal immad maning to him (xid)gring toom is given length of entry end uspateporeig generasity to hends and formy long sigh legital length of the side of the neighbor father horths and side. When the fund to the same of the card is deplicable employees were shortcharged he tode and of them, too "Anybork who scheme me "War asays "scheme that is need to be anybore parayose expectivity me himste

Wate appends much of his money on compoter augment. His brother calls him a computer salesments dream. It is hard for here to drive the a computer stored without scopping in and buying comething. One of his ambitions is to own every preced of Apcia-respect hand/ware over built.

He also loves to travel. He is been to Bis Lorks, where he visited Arthur C Clarke and for shorter trips he has he own an outrie a \$250 000 Beechcrint Bonierun.

The Workse component infty in the sector of the sector sector in the sector were reading to a stability of the memory is and the sector sector sector sector in the sector sector in the sector sector were reading to a stability of the memory is and the sector sector in the sector sector were as a stability of the memory is and the sector sector in the sector were as a stability of the sector is the sector sector in the sector is the sector sector in the sector is the sector sector in the sector production of the sector sector sector and the sector sector and the

We have also made several high tech investments with his money. In addition to Advenced togic his has additional to Advence body and the second several tobologism a software company and a small obody stim. Company Unison (software) his have company Unison (software) togic UNite Usin SCMp | which premote most concerns. Last were its first U.S. togi



A SLIGHT DISTURBANCE of the earth created the Jack Daniel's cave spring some 400 million years ago.

The disturbance, so say geologists, caused a crack in the surface of the earth and allowed a stream of iron-free water to spring up from underground, Luckily, lack Daniel discovered

the stream in 1866 and we've been using it to make our whiskey ever since. Today, a second movement of earth could seal off our water entirely. Which, to a Jack Daniel's drinker, would be no slight dissurbance.

CHARCOAL MELLOWED DROP DROP DBY DROP

Tenessee Wholey - 90 Proof - Detilled and Batted by Jack Daniel Detillery Les Bollee, Prag. Inc., Boule 1, Spotherg (Pop. 341) Tenesses 37555 Phone In Internet of Industry Managine Inter United States Government Inel in Southan California drev 200,000 orthusabol brei by Wort standards rwss a subcess—weryone had a good tree Bot by Inances Januards a two a cub He steled out \$18 million of no own innow and table abadeb informat kinase he wort say hew moch Shi it frain to interest on the subset of the most interest on the subset of the most interest on the subset of the most inco operands in 1963. This time he as parts to make meny.

This new vocation has been devident of hose losse to him. Never the herd of late who advants in the mass barred in a pretection could beard. Why, for fords saw, is he universe in the same share and the late has a computer stress in the same share and have the same barret and the late is compared and the same share is an elegation computers and in throwing lock consets burk says. "Whole here are react barret which says the read in the late to barret with a strendom of to be lated by a laters of percent

Others feel Woz is simply using his muarc business as an excuse to invoid service work and act out leaders for model service along Alter Bourn states. Save Wozne he can alford to do anything The rock tostwal was membra an exclusione

Curpuly Wat his another obeamon to finish college. Two years ago he returned to Berkeley to get a degree in electotal engineering. He envolved under an assemed nerve Pools (Dak frie dags hind) nerve combinad withins present wells is laid nerve) so hit predessors would's tig vie hen any special trainment. Though he mon aged docting trains, he found the occursas difficult and he was particularly bothered by being shift cull of advances to simpularsorence occurse. (He doch undestand the negatisficier procedures 1)

Although I thas been reported that he earned his degree, he hasn't He has all the ordets reasestary for practicetion, if you ocurt his courses taken at other schools. To transfer them to his apactemic record he arrestly held to perform the various the cubics But on his farther says. "Knowing Steve To be the linever if is out any forms

Woomak engine he calculate yields yields in a solid to speak at some computer show atmost every week and he continually receives aneke of an mail the califorms whout being seked for the subgraph. "Yesh Take in the admits. Who weaken?"

Bill one of his bogget term is letting the whathor charged him for a search tog thoring charge huncle for the worke and his source that the search of the worke and his source hat permitting to thim. And so he keeps the unitable tillsed in the phone book and continues to run the Dati A John service the bog of man. The one about the mean who the search hear the one about the mean who we had hatbace and held hourd? He medie we had hatbace and held hourd? He medie we had hat and held hourd? He medie hear search and held hourd? He medie hear search and held hourd?



henself an offer he couldn't understand?" Then there s Woz is staccalo he-he ()

These days to spands as to there will be added to the the set of t

And babyathing. Cance adds acitly ea she holds that son in her lap

Of all his heards, the one who knows Wat best is ready Wagnition. Applie shift programmer All beenty two he is already a mitionare. He is enrolled in a local college but admits he is on the twenty seven year plan, and will probably never got a degree he was finane years old when he met Woz. Ho spert a record attrinoon reminisering black gearies heve of pulse.

Dot you peer here should Zeller? He adeath the here that the total has had an water the here where the total here has and worker were dot a non-based assistant advectory hystic about 1 d a chipping above more than to boot program. The comparison of the more comparing Zellar to Apple and other real in concompany Sellar to Apple and other real in the comp conto to here of year and the comp cont to to here it you have been on control to be there have a been been on control up to the mering the program of the comp control to here have been been to more activity base

When I lake Approximation concerting UP any obtained it here accounting the conway here an integration whether Wate in any obtained it here accounting the contract of them in here and any operation of the Minis before in here accounting again the share designs anything again. This shares of it is the doesn't here it here any operating the constraints whether any operating account when ever anything worked to account a computer company. All here ever wonted was to operate boards for Heredit 1-2004rd

It starts to ram in Sama Clean and Waggraften gate up to excuse Immedi Hass working on a word-processing program for Mackintech, non- of Apple's new computers Aa Imgetting ready to leave. Wiggridon maniforms he has in been able to tak to Witz in dysty. Whenever the calls Wusseemsto be in his patter room. Thref he is going to expend II. Wingerien notes

Thead up Route 101 and the rain finally stops. The sun begins to peer from behind a cloud and a huge rainbow expetitions. Storewhere above me in the hills of Lee Cates. Stow Wathins in playing Defending or playing with his son and wondening what his is going to do hist DO

# FICTION

BY CHERRY WILDER

the closero years of the twentieth century. down on Parker's Key. He had everything he needed. He had never been a and now, at fifte-live he couldn't take too much of that anymore. The lounch brought in food and the magazines he nooded for his collages. He walked and overang looking for found objects Parker's Key was a small island, dull and sullen, with few interesting features After a month Gus decided the place was soman He lead in a low, gray weathered house among somerry pains There was a sheck at the other end of the beach, and It was protter, covered with bougastwiles. like a avarm of butterfee A woman lived in this shack, and Gus watching her at first with the naked eye, hoped for another joke-lade at least. But Sophie Moller was something more like a female counterpart of Gus himself. and when he looked through his binoculars he was disappointed Dann, she

PAINTING BY CHARLES PEAHL



looking at a solid, sun-tarihed weighernevertheless, and set off, walking. The over her Bermudias until he was heltway down the beach

As he came up she should at him. "Get He peeted, stung by some memory, but he clicit i recoonze her until she pernaved Hey, you were Clawson's green girff

green in the sides of my toenals

Too small. What was that the other day

"Just some crazy art film " said Gus

"Famous by now" said Sonbie, wishill

but without envy "Clewson was a good painter but he never sold. Hell, in the end.

it was on six travel books. Her lacket phoincluding one of the oreen ori series, the

"Bure," said Sophie, "Eat your leasence," or twos a month and ran into each other when the launch called Sophie was writand eat it. Gus carried the date on its shell

On the last day of October a storm warnshed, he want to get Sopher. His house

Sophie, camouflaged in single greens, was typing on her tumbledown porch

It's Helloween/" said Gus, crititing like

about Humpane Victor By the time he es-

clutching a rucksack of manuscript, the EST. Parker's Key was under a low root of terpret, lasted for twelve hours

They crewled out wanty into suration A still wannahid watch was blowned in and out of the damaged house. A corner of the roof had lifted, windows wine gone. Soofiel down the beach looking for her shack. It was only a kitle worse than it had been the neatly only the directly. Two of the pairs

something in the air, or rather there was nothing at all in the air. Sea and sky who globe of turguouse-blue. The mainland had

partly in shock for several days during the quickly expecting some bad harvesi, then he went back and combed scan He trees. Found objects.

Gut claved around with a purp any ap-

What do you mean by an apport any

to be where it is ' said Sophie

She reached over the workable and racked up a kind of buttochook in velcar again it was oblong in shape and made

Mind you the said. It's what we don't different-

diesel fuel. No bri aluminum steel or chome No ordinary fragments of small rubber price in a rope ner? No cons. watches demunes sunclasses finsibles

"No planes" said Sophis. Do you re-

see a plane for weeks on end

atmost a vision. Parker's Key, with search happening nott now if only they could see beads the shards of blue pottery the

She plucked at the scraps of woven fab-

or, dark owen, turguree and other-a of polished black wood and moved on to linen. She picked up a handful of golden We have suffered a sea change she

went on cheamly 'we have come mo a

What is that supposed to meen? be

attention to the lights, he looked once and

craft. He told himself every perfect morn ng, locky a rich haul, two whitewall trees this trickle of artifacts

"Nets-produced) he should at Soof this stuff ian't mass-produced

I parit say anything sayd Sochie exoppi that we re healthy and as same as we ever were and we have food water shel-

Then after some moments imperion a bone button and a long great feather she

Now get on line and enjoy one.

"It serves us noht" said Sophie "Whet Don't worry about it. The launch will be tury and now it's cone. We deserve it



Watting: The Surgeon General Has Determined That Cicerette Smaking is Dependies to Your Health



You're crazy" said Gus - Since when Next day he was all alone fishing when He held on to her sweating and burred his

Sophie guickly went out on the porch

"it was a saring ship right

So they worked on it palley canavel

slarboard side

of pabibles and plastic preenery and pa-The peet? eeed Gus trying to keep it

his worklable class woods labno and Future? he reked | common energy

tolocaust saud Sopher Titletk not

But you said-

Not cuite "whe ward," because he never 2 took his breath away

was broken by a loud boom and a has, a

was harrying another vessel. The second that fell segmed to dip down like a peth-

close ' sad Gus

Who is Jesus? asked Sophie " Is he a

magazine maste

Gus was apathetic in shock He watched.

A flicketing light lived and died in the thing flat, a reft or a piece of whickage. It came on steachly with a faint light aboard

Gus above the torch and they went shaped handle. It was a pecial raft. The

off his seat. He was sturdy pale-skinned in the light, his hast and every dark. All oping closk of dark wool that brushed the scooping cesture with a flattened hand

He reached out and the boy realed a but he did not any out. Gue cought frem as he fell and Soche ran to take over the





Fish snouts Brzare assemblages of scales, jave, and teeth worthy of Star Wars' alions nuzzio insuestively on set coral timekes (etc) and furtively pelko around shelves of the reef (below). Steped by natural selection, each has a unique tale o teil.



JOSEPHIS LEVINE

Fangs, beaks, and vacuum cleaners devour hapless prev ?

For strates, the left on these proves (i) protographics in the field with recent properties of the protographic strates in the strategies of the strategies









●Some jaws rely on hinged joints; others use levers and pulleys ♥













Lepid apple is a direct indexed by an insulab interclation, non-activity fram power for in straining particular time yound private balance frame contact, appropriate model on training particular time point of balance frame contact, appropriate and an annual plan contact time private and an annual time. Although the appropriate and an annual plan contact time private and annual time and an annual experiment plant training on the point of time. Denote the appropriate experiment plant training on the point plant of time of the plant of the private material contact time annual plant plant of the plant of the plant of the private material contact time. Although think plant of the plant of the plant plant plant of the training of the plant plant plant plant of the plant of the plant plant training of the plant plant plant plant plant of the plant plant plant plant plant training of the plant training of the plant training of the plant training of the plant training plant training plant plan

Drugged up to their eyebails, fish sit still for the camera ?

- 64

#### It is as delicate as a web, but the orbiting outpost could help us lay claim to the stars

#### hev

head it described in very dreams aince I was a child, with its international—even interplanetary—community of brave paneers, its fooling gardens, emerate towers, and highdomed othes of perfect clean/iness orbiting mewatcally above the obsolete Earth.

The species lipiton has a doubt in tellary here a tubopous and use one had walked on the moon Abit buppend reality, white semiphing was now anything was possible. Whose we appointed us preserved is washed happend in amender here foremaning culturely garding to Coller's in the invasidy garding to Coller's in the invasidy garding to Coller's in the invasidy free pairs and otherwhere of a circuit appare trans cisco ben in densets in the verticel, list a tage bupper writes, cut to be some of the pairs and otherwhere size of the circuit and the pairs and otherwhere of a circuit and the pairs and otherwhere in the verticel. New ball the pairs of a circuit pairs the pairs of the

is a line dam in NASA's budget most of the grand

THE BIRTH OF A STATION

BY DAVA SOBEL

PAINTING BY VINCENT DI FATE


If access have despetied in their place, the agency is wheating a workhorse to be writin the gales of space. It promises to be all utility utiliarian creasure, devoted to memory the needs of science, indusity, and rational defense. Not this space economcal space station embodies America beet hope for teaching in the high forehait.

No one on KASA's Space Stateon Table Potece don table you precisely what the elatern will look indi only that it will start out small joant metanety cheap) and be copable of evolving rife something grander over the decades. Whatsher it is, find by now Sant orden-roughly do Netwerless up-white the space shuffle can baild it servers it and be startood in Joint

The embryonic statum entroper motion relative particles from the data online relative particles from the data online relative unrearing patients. These unrehibble data data statum with entropy particles and its descriptions with the code and the relative transmission of the code entropy to the individual watch to code entropy to the individual watch to the general watch outside and the term and the individual back to the general watch will full at the motion patient with individual back to the general watch will full at the motion patient with individual will full at the motion patient with individual of there will table the term of the individual back to the general of the patient the term of the statement of the term of term of

The painmost transition before the task the experiment of the space states of another boot of the new however does not involve about 15 centre of the space states of another such a leafly dry The 25 members of the lask loses dimension that have been the source of the approx a split field caviers and before to themesters, there compare and before to the composite event at large me to the acting pose states of a large the scareff to community and branches to the atmost forces to an exerce

Another discovering in for improving source more security of any contrast of common terms of the security of any contrast of common end intercention. Some size is as a more communication security and the security of any contrast of the security of the security of the security and the security of the security of the security of the security of the security and the security of the security of the security and the security and the security of the security and the sec

The ocular be functions of the space startion will dictate its anchetecture. And by aadventave, NASA people do not mean \* construction details. They mean such best: concepts as manned versus unmanned and

whether is high-indication output over the equator is the most useful path to accounplinh (specific mesons) goals. Dely after NASA researchers of noise from such cartients own the detailed design wich begin—and than only if the President and Department. Amnicas presence in space.

How much many would in take to built ow? That operates an answers to made than 300 contrast questions wheaty atom with What is the best graden to powering operating "Audies accured "y Wwall" the same provide the second statute of "The top charact invery category have to be grade that and the second statute of the second field of a second second second second second is measured to accurate the second second is measured to be second second second second to the second second

We don't know what the darm thing's gorna look like," Firin wals "Don't think of it as a couple of ans with some men in them, or some warman

Tenence T. Firm and a price tag of about 96 bition should cover all of the appartees from tree to these

Traffic a wall rember if no mentario and the compares it floorably to past acpenditures in souce. Apolo cost twentythe finite distance is the source of the finite source in the source of the source that is not an experiment of the source of the distance of the source of the source of the part source of the bit work distance of the source of the source of the bit distance of the source of the source of the bit work distance of the source of the source of the bit work distance of the source of the source of the bit source of the bit source of the bit source of the sou

First is builars on the presetting for some beaution to one thing. Arranicana ball a approximation before that was 30 the provide the source of the source of the tegriting entremanding one which the tegriting entremanding was well as a source of needs to be a source on the source of the source of the source of the source of the needs to be a source of the source of the needs to be a source of the source of the needs to be a source of the source of the needs to be a source of the source of the needs to be a source of the source o

The developed Protocol and the second process of the second proces

Amont dametecially opposed is the stars, assemptiation suggested by another perdit NAMA that Manshall Source Trajer Carriers (Why pole proceeding only or dametecially another ment, and asstude and thermal control for process of againt's linearies set System owner instrument incollege that sharp used for process of againt's linearies and system owner entrol asticular that sharp and perform entrol asticular that sharp and perform entrol to deliver their cargo and perform entrol biotechart berr cargo and perform the abilition barrow aurity to reset

First suppose this the utensis design will incorporate a litle of both approaches the utension concept of working in space temperad by the Masteal austerity Above all it will be user friendly. Wheneau in the part NASA technic to design final and worry about use and users later it will design the space attract to be the child of the users needs. There is a struct the evolution to provoling a service that, according to task focus director John Hodge, "represents elmost a cultural charge" for the space opency and the perspective industry.

We engresses and to revent an assessbuttore wave cload on or the custorion." Hodge spys. Dut what we to readly driving why it is up to them to foll up what the obegn requirements are. To this end the operative of the second second second second contributed assesses to the second second particularly holes who show not approximate and the worders mindle potential by the optimized assessment to the second second of the worders mindle potential by the particularly holes of the second by the optimized assessment to the second second of the worders mindle potential by the particularly holes of the second second by the optimized and presents.

"Part of the commences are: Horge stars "Is to fail the commencial world that it's not that thoky it's part into space to change their attracte about space from the goe which to something more rectime."

Bob Bharples who manages the specestetion study project at TRW seys his group wrote to the heads of many large corpotations asking in officer. "Did you guys even find or doing what you do in specie?"

"The answers we got Sharples reports ranged from No and don't bother me' to they that bounds live is tentitio deal Tail ma more '

Buth maskin-baking efforts may lead to happy marranges, lie the entries patientstable between ArcDionical Douglas Alticompanyant and the second second second companyant and the second second second companyant and second se

Spatial-station planners are looking bit beyind the thirdhore user community to get tidea tor possible measure X-way as memberating on the task, force with incentric usive and the Goddind Space Fight Center in Greenbalt, Maryland heads a program specificality designed to plants previously neglected toucros for suggest previously neglected toucros for suggest torial about specimizers and

"NASAs attempt is really exhaustive. Hot says: We didn't gut after rounding up all the usual suspects.

The program, called Innovative Utilizal transfithe Spice Station, digit quite reach out to the main on the state. Holt says, inthough it indivertently attracted proposals from housewwear in Pitaburgh and numerous croups of schoolchiden.

NASA public aftains people let 'it be known to salected professional pumals, Hot explains, 'that we had four hundred

## LIQUORE-LTALIANO

Tradition Winter of the the control of the control of the control of the second of the control o

proposals, these would receive grants of press as a NASA-sponsored contest, of for the best twenty-live-word description In space all the time to take care of emer-

Desofe that setback. Holt save with occo and announced the 18 worthrest ones in everything from managing trauma and emergency surgery in space to the effects went to a soulptor who proposed to exleagues in the art community to see what knds of extral enveloal aeathetics a station

In the traditional scientific arena the space station would of course provide im X-ray astronomy which cannot be done

ter astronoms" Holt says. "We use satellaunched in 1985 and will be serviced inmens aboard to skin the instrument, the optical gear has ever peered before

The only two areas of science that could and space biology, and laboratory myes-

Maanwhile informal invitations for par-Scace Agency (ESA), Canada, and Jathere is no firm policy yet on the appropriate way to collaborate with foreign proups. selectric research tacilities under the

nearestial terms of an international acros

We've got a long history of cooperating with NASA' says John E. Harrison sci form of You make your halt and wo'T make

Appointing to lan Pryke assistant direcwhere they might be able to make impor-

"There's on possibility of an ESA-built station. Pryke said "We could not do this purselves. But if the United States decides

Pryke also said that ESKs convention American plans include the presence of of its member states would be free to ne Military spokesmen had little to say about the space station: A service Air Force offipotential utility of a space station. Cur ment or use-pending additional evaluation

too 1 But it is interesting to note that Lasnew Space Command, pined the Space

og s permanent installation in space meny Wwthristomars feel since there seem to space station now in the sky the closely

have a cood resperch program and it's lary aide. But the stones I hear malor me

century" Without one NASA would cent

Diractor Hodge agrees "What do you

seclaring the clarets some kind of perassume a space station came first "

experience of mastering a space station before we can progress to more auda practical necessity of a space station to between stars. Nothing rusts. In spece out tipships. Someday it may sinke our aud-

"We're not ready to commit ourselves to the need for a station, says Victor Res. and Sector/orgy "We re women to see what one could get from it. And the evidence is

on a series of mundane discussions and Research Center in Hampton Virginia for science and applications those that are molas new technologies. With the first

should lake them another two years to will we be needy to pay the bills? DO

Canada

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While others panic over the epidemic of AIDS, this Nobel Prize-winner searches calinity for the cure he's convinced lies within the body's mysterious immune system

# INTERVIEW

BARUJ BENACERRAF

Anothing carbon restled. The Tanophaning of TeeT- dawn in that yields and carbon restled. The Tanophaning of teeTangeno peers into the mouth of a participation. These analysis and the mouth of a participation of the term of the assistant and the term an angeof of the fourth of a participation of the term of the term of the term of the term of the carbon of the term of the carbon of the term such magnetic dominance of the term of the term of the term of the such magnetic dominance of the term of the such magnetic dominance of the term of the term of the term of the term of the such magnetic dominance of the term of the term of the term of the such magnetic dominance of the term of the term of the term of the such magnetic term of the such magnetic dominance of the term of te

while the few theft is only provide was soon donationed. This techrage was popular and about the same time Educate Lenner modulated his analysis vacance. Both the transplants and the vacance involves the inviture payteen, which governme has way the body decides to target hanplanded happe and here it defends their against foreign organisme. But wasn't unlife with this decides the against foreign organisme to the longet of the same technical set of against the set of the longet in the same technical in the scentry that immunities the set of the longet.

PHOTOGRAPHS BY JEANNE STRONGIN



▲ As we become successful in overcoming the barriers to transplantation, human tissues will become scarce relative to individual needs. Then the problem will no longer be medical, but ethical ♥ what was happening at the microbiologcal level in each case. The most rapid prograss in understanding the immune system has taken place in the last two decades, much of it owing to one met, Baruy Benacerral of Harvard Medical School

One of the early maps discoversewhen came out of the tareat Jacsoon Laboratories, of Mourt Desert Hand, Mane-west the settilization in the Thetos, by researching Googe Small of the tamos gene of the 2 m mice. Otherwise Nown as the MHC or impect halosceptably of nasae-engrability compare, thdilly of masse-engrability compare, the 2 m the most module controlling whether thermiseums to controlling whether include target indexed as that moment

When Stell was pomental baladed matchard ha baladed hms in physiology and matchard ha baladed hms in physiology and has table mitmaked hms in physiology and has been matchard balance and has 1956 mitmace a same Dausse. Inform has been said attraction of the physiology and has been model significant, the physiol has been model significant, the physiol has been model significant, the physiol has been model significant. The physiol has been model significant, the physiol has been model significant.

Because alread the Nate House is using the sector of the thete closes is using the sector as the net of the sector of the sector of the sector as the net of heirs have sectors is the sector of the sector of the sector of the the sector of the sector of the sector of the the sector of the s

Bestacentif saw that each indexual twautera interreptivition antigene coded do by his of hier immune-exposes genes thus, here immune exposes genes from inclinicitati to indextaat. The effect of the inspose science some management of the inspose science some management of the spose will have an effective immune respose even if most succurity dura comes atomics, steelicite, interview respose even if most succurity dura comes the difference inservices and the difference inservices and the difference inservices and the difference inservices and has expanded understanding of the every. day working of the intrunce system. And what much of the picture retrains incompice what has been ascertained is so med-begging in its minacy that is deties, as Benavioral emphasizes are beyond the grasp of the unmitated Nevertheties immonifying potable who its and in the works of medicine body for as potering impact on turnan health.

The start-we-pare-of-Bertopent in now charmon of the department of parthology and Fabyun Professor of Comparative PSand Pabyun Professor of Comparative PSand Departicular of the Dana Fabrica Cancer Institute operation of the Dana Fabrica Both positions are portage sopocially satisfy into a smark who, because of the Venecular on the operation of annot introdetion of the NML because of a smart introdeschool in the United Babas

The sound at Caracase testel mechanitemation and the series in Pane, Youn Tree New York Color in 1990 where his solution memory and caracterised metadoxi ectroal regulatements and Colaritase Linversal y test and, howevers tained down by every school towher these planets and at the planet langer of Vagnam in Rohmond. After planlager of Vagnam in Rohmond After planet when it is assessed in the LS Arms before them at Clearest Borneal Hospital in New York. He assessed in the LS Arms before the interneo clearest tester to be interned clearest the hospital of interneo clearest the hospital testers and the solution of the langer and the solution of the solution of interneo clearest the hospital testers and the solution of interneo clearest the hospital testers and the solution and the solution testers and the solution testers and the solution and the solution and the solution testers and the solution and the solu

Benacomal surveyed a second republic of the hands of the models a statistic result with working in the sits of contener phenmodelgat Benacomal Happen (a the Boosteense a a row y supported a system) of between a row y supported in the test and the second and the result of the second benacomal to the second second and the second and the Benacomal test and the New York to teach at New York (however) WinV) Second of Neethers A housed of anfeder many of the Second had and tablet many of the Second had and tablet many of the Second had and tablet many of the Second had and the Second Second had and the Second Second Second had and the Second Second Second had and the Second Second Second Second Had and the Second Second

Where II V/V, Benzacerol alternamped damyb pairs, haw tork, but he soon docted to concertate exclusive on the mere minimization callinging pursuit of science. It was during this pursoit that me manzgaretistic By the time he list IV/U as they had the Tobersemining work in immanzgaretistic By the time he list IV/U as the based in the posterior of Pofeess of Philotogy. After a start as clinetistic bits alter alter and the time of the theorem intenties of Antopy and the Nahorem intenties of Antopy and Infection clinetistic of Antopy and Infection.

Benoems was interviewed in his office at the Dark-Patien institute by sensorwriter Anthony Livesidge who confirments. Benacensi is policibuseredike, a great stocker for accuracy. His firmity nessite at offorts to tempt him into apeculation Usecting, confinise at fraid. and then one begins to the his reliability. He is most anclease that beacting fuelowers.



# LAST NIGHT, COMPUSERVE TURNED THIS COMPUTER INTO A TRAVEL AGENT FOR JENNIE, A STOCK ANALYST FOR RALPH, AND NOW, IT'S SENDING HERBIE TO ANOTHER GALAXY.

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pases of turnaniand will soon varish. Are you more ophimida??

Benecenal, He's releting to the fact that russe beaidee our own mittune system. Certain viruses have the potential to beuse as ambiotos. But realistically it is unin relation to virules that we were to such is, taborculosis, or dighthena, those many will overtually develop ways to deal with for some diseases, others will anive that

viruses are always liable to arrive but as

Onter How complicated a subject has im-

Benscensi. Immanology is one of the more complex Talmudic areas of biology The only lopic more complicated in under

Great When you won your Nobel Price you impact in this docade as immunization did

vancus requisiony mechanisms of the imponents and we are beginning to learn order to regulate the immune response and general defanses. These requietory molof DNA technology it will be possible to make them in large amounts in the fullure

numbers of biological products that will permit us, for the first time to requisite the in which the immune system plays a key and is responsible for the disease itself eases that have an externation comporheumated arPrits-will be within our portiol in the peak future in addition we are slowly coming to possess the tools to permit transplantation of many more bs + ognize those lew amino-acid differences state. We are now inarrang how to transelant historeconstituia bace marros-

possible to transplant four or five years app

abodies-reagents that can be specificelly targeted for one or another form of efficient immunosuppression to protect such conventional types of grafts as kid-

that is able to elicit an immune response anluger. The antigen is defined by its prod-

6AIDS is a disease that has appeared in certain populations known to be sexually promiscuous have numerous contacts with one another-from blood donors to homosexuals

interacting with and killing the foreign orcan mount a hupe number of definition Other How meny pomobio articodes an

to the #th or size power (one million). The protty much a quees it's enormous Antibodies can be formed against almost al do that without haiming ourselves by re-For instance, human serum al bursin differs albumn produced by cows it you med human albumn into a pow this now will sell That's autommune disease

in addition to antibodies, there are sets of immune cells that contain receptors on of defense and its specificity is enormously varied. Through the work of many have ascertained how the diversity in our enabodies is generated right down to the

Onver What might we achieve in mmu nalocy in the next filleen years? What if nesses might we concuer

Benacemat I think we will master the au-

Benacemal. The best way to protect ourgarram We are now developing belter guned immunocleheiencies, which are so

Omst. Are you referring to the current cira-

peared recently in certain populations his resource and prostitutes who have targets are people who have received hu-

We will have to contend more with the

In the populations at risk, there is a

The encienc is probably the corequence of vital mections effecting the its role-disturbing the balance between suppressor and inducer T cells in colular proportion of suppressor T tymphocylas and a very reduced humber of inducer T cells in their blood (T tymphocytos procluce mojecules that regulate initiana issignmers. Smark suppriss a Cohers help or induce response) The reservor for this base not been assortismed build may be due to infection with a particular virus.

Only Do you believe the epidemic is caused by a you?

Benacemil, As a scientist, I don't have any bolds unless there are process but it a the common selection one - a general science process and the science of the science and the the does not science of the science and are finded ways with a production for contain costs of the terminant or address of the bot is to four costs and the science to the terminant or address of the bot is to four costs and the science to the science of the science of the science and the science of the science and the science of the science of

Benacement Has, because we alroady know the nature of the damage from the internat of the losion or the internation system. The damage is due to the inability of centain T cells to function and to the initialized to therein the inducer and suppressor. Table, The weber the inducer and suppressor. Table, the weber to baractify an initialized of the requirities?

One of the protection reported in a first roproperties and the protection in the time well and evolved in a protection in the time well and evolved in a protection in the context of the route the time intervention in the context of the subject the protection intervention in the subject the protection intervention in the subject the protection of ADIC Dich exits and a subject of the protection in the subject of the subject of the subject of sub

Owner, if ANDS turne out to be a conseguertee of vital infection. do you have in might be related to so celled slow entrop vruges, which some people theories has on in celle levy years: acruently attack by the immune system and protesty tragperio cerne acatemizare descelles of aprig?

Benacemark Brooke do not receiver what the ADD sport, a far were hand to associate however a set of the second s

Deen/ Well, could you at least say thet as a speculation it events to be a possibility? Benacement I imnet going to be included to contrain cervan as

# Wolfschmidt Genuine Vodka The spirit of the Czar

Wollschmidt is made here to the same a supreme standards which elevated it to sport appointment to his Majesty the Char and the Imperial Romanov Court-



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### BY BRUCE STERLING AND WILLSAM GIRSON

Council Konstev Invested shows in this hormons, directing of all the Showlet Transpill in which of gravity for spatial statistical of participation of the Showlet Transpill in accoss the Table Norvember with the Norvel Table Showlet independ at Kateria strategies with Table strategies and table Table Showlet and the Showlet Showlet and the Showlet Showlet and the Showlet Showlet accoss the Table Norvember with Table strategies and table Showlet Showlet and the Showlet Showlet and table Showlet and the Showlet Showlet Table Showlets to thought -the showlet Showlet -table Showlet Showlet -table Showlet Showlet -table Showlet Showlet -Showlet Showlet Sh

PAINTING BY GREGORY MANCHESS

thudding itsythmically Hooves in the anow

Projection of the second secon

He chaved with a suction razor A patchwork of basien veins bitched his left cheek and temple another legiscy from the blowout that hard priported him.

When he entroped he tours that the adjacence top the bended Romaneliko was adjacence top the bended Romaneliko was ear web valences has topped the adjacence top the prove coveral has whete arms were search with his seek of their reences her adjacence to their reposed correspond to the register in the posed correspond to the relegation and comparisonal. See what we verment of content-

She handed him a trry write bottle of cogress

Saurned Korolov binked at the An France logo embosted on the plants cap

"It came in the last Soyuz In a cucumbar my husband said. She grogled "He cave if to me."

"We decided you should have # Colo net." Romanerico seud granning broadly When all we can be kincughed at Brythm " Korolev ignored the sidelong ember respective light and the striveled legs and one dwarting feet.

He operate the bottle and the nch enormal brought a subtler highling rule in Delot to subtle out a term ingering rule in Delot to subtle out a term millitere of brandy. If burned the subtle out and the subtle of the been years. If it git platterod' He task, isophing even burning his vision.

My father salls me you disark i iko a hero Colonial in the old days

Yes, Kordev eed and ispace applied applied to detail to de The organic special through him live layed gold He dehead Romanization and lied anew social this toy satisfies where other an assigning hardy man, long smot eth del not social costs a decision and the Black See American logist, Fernin suits I falam abost. The boy had the efficient looks the some clear gray may utility unitsutiled by doubt.

The Block I sugget through Karclev II fim block "You are too generical. The Black Ho blocked once getty and anned bit his corr olde "You must take tome samisatility. American cabe tendedocts", freshly nichapped Placy stuff Wested on an old men like mo. "He statted a blank cabaletti and caracterial pre-missioned ablank.

"Ti give ito the gun crew, Romananio said, grimming. "They can run it on the tracking consoles in the gun room, The particle-beam station had always bean of crews.

known as the gun roam. The solders who manned it were particularly hungry for the solt of tape. Koroley ran of a second copy for Valentina.

"It's dirty? She looked alarmed and in Ingued. May we come again. Dalonal? Thursday id 2400?

Katoliki smiled at her She had been a hadory worker bettee she'd been singled out for spece. Het bezug match her ureal as a propagants tool a role model to be protestrat the pland her now with the cogrese bounding his years and found it moospile to deny her a time happines. A mengets menanous in the museum watering it menanous in the museum watering its menanous.

She kased his cheek wabbling in free tal. "There you my Colone!

Youro a pimos. Colonel. Romanerko said stapping Korolevis match shok shouter as gérty as he could. Alter oburtios hours on an exerciser, the Dors arms buloed live a Disclamatria

Koroky watched the lovers carefully

 He was suddenly and very intensely atraid.
He shock violently
He couldn't remember over having been this ingittened. The switches and their cables
were somehow threatening ?

make their way out into the outfill docking goteen. The unitor of thide aging Salvus and two considers Romatonice took the north coerdor to the guil soom Valahtes went in the opposise andot to the revit unction sphere and the Salvut where her hubbend relat.

There were five docking spheres in Kommograd each with its three initial Sabata. At opposite and/or of the complex west the military installation and the satellite launchees Papping, humming, and whereing the station has the feeloit a using whereing the station has the feeloit a using shearent.

Kossiw had another pull at the bottle Now it was helt empty. He had it in one of the museum a which a MASA Hassed bad recovered from the set of the Apolo tanding. He hadn't had a direk since his last function. He hadn't had a direk since his last function. If a badre the bishort has badre to swarin a present partful ouriert of direktion contribution.

Drifting back to his console he acpassed a section of memory where the collected speeches of Akowa Kosygin had been coverby erased and repleced with his personal collection of samsdata, dig-

toget prop music his boyhood favorites from the Eighteer, He had Enterh proupe taped from Weet German stade. Wantaw Ploc heavy metal, American imports from the block market. Putting on its headplones he punched for the Casitochowa registe of Broada Cruzes.

After all the years he no longer (early teach hermans, but honger, compared and year longer, and the second and the second and the Explore tend been a tend hermal data of the teach of the second and the compared teach of the second and the compared teach of the second and the compared teach of the second and the local and provide the second and the local and the local derivative of the local deri

Until the right she didn't turn up at the oofbe bor. Whepeni of paralitists of anti-Soviet activity, of the waiting chemical horrors of the pseusite-

Koroley started to tramible. He wood his face and found it bothed in sweat. He tool: oil the headphones.

It has been first years, yet to was cover here and very intervent lower. The was researched main fractional and the researched main fractional and the second second second second second second lower the second se

The cognue. His wears in the fail had warpeal his metabolism. He waaril the man he diopo been But he would remain calm and try to ade it out. If he threw up, everyone would list of.

Someone-knickad at the entrance to the mateum and Nikts the Plantber, Koerro gald's permet hardynini executed a perfect size mateu one through the open hashs. The young owhen engineer iscuide angry Korolev fett coverd. You te up early Plumber. The said antikous for some te cape of normalier.

Partield leekage in Data Three He freenest "Dayou indestand Jeparees" The Pulliber tugged in baselite from one of the dozen pockass that builged on his standed walk vast and waved if in Kotolevis table the word caselity laundered Levis as and claspidated Addap running shoes "We properties that inclini-

Korolev cowenid as though the cascette



wine a waapon. No, no Japanoso "The meekiness of his own voice stanted him "Only English and Polish." He felt himself blash The Plumber was his hend, he knew and buyled the Plumber but---

Are you well Colone?" The Pumber loaded the tape and punched up a lexcom program with delit, callused Imgers, "fou loak as though you just ate a bug I writ you to hear this.

Kerelev witched univarily as the tape tickered into an ad for baseball gloves The lexicon's Cyrilic subtiles recet entries fre monitor as a Japanese voice over ratsed manually.

"The newscast's coming up." said the Plumber grawing at a cubcle

Kerelev squited anxiously as the transtation sid across the tack of the Japanese announcer

AMERICAN DISARMANDIT ORDUP DLANS PREVAMINES IN SANCINAR DOMADDADAS PROVE RUSSIANS AT LAST READY ANERD SINCE STATISTIC COMO OTH

Coemic the Plumbar mutared 'Glitch in the feedoon

BULL AT TURN OF CENTURY AS INKEDISHI/AD 10 INVOL AMERICAL PROJECT CERPTLED IN AGLIERE OF LUMIN MININE CONTRACTOR TOM OUTPERFORMED IN EUK LIMIN/NED OR INVA. INCTORES DYN'SYLLS SEMICONDUCT TOB AND PLEY CHURS.

Smup bestends The Plumber snorhod 1 hell you it's that goddamred KGB man Yaliamov He's had a hard in the?

STADDARNO SOVET TRADE DEROTS POP-ULAR OBCONTENT WITH SMODE CFCORT. HE COAT DECISIONS BY FOUTBUILD AND CENTRAL COMMITTEE INCREMENT.

They re shutting us down? The Plumber a lace contented with sage

Korolay twisted away from the screen shaking uncontrollably Sudden trate peeted from his leanes in free-fail droplate Lawy me alone? I can do nothing?

What s wrong. Colone?? The Plumber grabbed his shoulders. Look me in the face Borneore's closed you with the Feer?

"Thet troe spock bastard! What has h

Korriev studierent Ubert a dintk-

The gave you the Feat' You a sick old mar/ Libroakins tace' The Plantier privad his knoes up, exmensurated backward koleid off from a handheld ovorhead and categolid out of the room.

West Plymbert' But the Plumber had apped through the docling sphere like a squared versiting down the constant and new Konstev tell that he couldn't bear to be along in the classoce, he could here metalls be chose of classification andry shouls.

Trempling he closed his eyes and waited for someone to help him

He diasked Psychiatric Officer Bythkov to help him direct in his old unform the one with the Sar of the TaceSovelay Order swin above the left breast pocket. The black dises books of hearing suited rythm with their Vector solars would no longer fit

64 Chill

his twisted feet, so his feet remained bare

Bychov Surgeson has basignaried him out when an hour leaving him alternately depressed and funciety angry. Now his wated in the massum for Vehamov to anwalt be surmons

They called his home the Micesum of the Soviet Trianght in Bacias and as the rage subsidied, to be replaced with an ancient biophones he bit very match as it for ware sample another one of the certains. He saturd grantly at the gold hismod points of the fractionary at the gold hismod points of the fractionary at the gold hismod point fractionary and the fractionary and the fractionary and the fractionary and when a Goldania, and O'Neil

In memorial of extende depression here that science manyared that here could detect a correrror strangenisms in their syste particularly in the dyse of the true Arrencars. West is proly cristication the corretions thought in this most syntaxic model? Cer was he able to glarge a subter mentiostation of team subgested of being herman evolution in obtoin?

Croce and only croce. Kosolav had asset has look in his own cysta--on the day hot support onto the social the Coperise Baser the Maxima suckets, ginting within his himsi visus had shown him the reflection of two stoody after eyes—footies yet devers—and the quest, assett shock of the his none waikated had been his file o most imemorable, most transcenterize increment

Above the particle of and their we a parting that depicted the indiana obve that extinded tim of borech and gave the Martan landscape reduced to the depicte strength of Sovet Sovethe reasen. The artist had posed the sured figure boease the landsc with all of the official style's depict allocate video if the sured figure bo-

Feeling samed, file awaped the arrival of Yahamov, the KGB man. Kosmograd s Po-Mical Officer

When Yelvamov finally enhand the Satyut, Korolev noted the spin hp and the freeh bursees on the memorit final. He were a bake Kanasi jump suit of Japanese sife and styl ah Isaam deck shoes. He coughed poleek "Good momma Coemade Colornal Hey" Social momma.

Korolev stared He allowed the stence to lengthen "Yelremov" he said heavily if am not happy with you."

Vehamov redidened but he held he gaze "Let us speek frankly to each other, Colonet as Pussian to Russian It was not of ocurse, intended for you

The Fost Veterray?

"The beta-carboline yos ill you hadn't panciated to their antisocial actions if you hadn't accepted their brite. If would not have happened."

So I am a pimp. Yehemov? A pimp and a drunkard? You are a cubkold, a simugglex and an informer I say this. The added "so one Russian to another."

Now the KGB marks face assumed the official mask of bland and untroubled ophicialmesi

"But toil me. Yefremov, what it is that you



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### ANOTHER INFORTANT DIFFERENCE

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### FREE KON OFFECTORY

A FIELE remote an detector comes with even COLLECTOR to each and compare couped thread pay place the consolar root to the COLLECTER and a comparison of coupling the COLLECTER and a comparison of coupling pay the comparison and

### SADERACTION CRIMEANTERO

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### ADOLTIONAL OBALERSHIP'S ANALABLE

Reconstruct and polying on Conference while . Means imposing the results of the fault proceeding on the ordering here mays. So J B: M C == CA. This is that builder to these other oper compares is and have to any Limit achieved a entraneous exercised. The = CA.

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are really about. What have you been doing in store for the civitan crew when they re-

These will be interrogation certainly in certain cases there may be hospitaliza-

Korriev was plent

'Kosmograd was a dream Colonel A dream that failed Like space. We have no to put in order. Moscow is the greatest power in history. We must not allow our

ty What do you contribute assis from not bloefed black markateers trafficiang in turn to Balkonur. The weapons are capa cosmonsults Adricana South Americana Boace still resams a degree of its former

Koroley gritted his teath. "What have you

"Nur Pursbar? The Polanai Olicar lowned 'He has assaulted an officer of remain under guard until he can be taken

Koroley attempted an unpleasant leughyoursell to press charges. I'l sprak with

The KGB man alrugged. "The gun crew are under orders here Balkonut to know the

"This isn't Kabul, Coloriel These are dif-Icuit times You have the moral authority

Kosmograd service out of Earth's sharing . Satvut popped and created like a nest of veins at his temple, were always the first

Young Cashiat seematito have the same thought. He drew a tube of caulk from an

"We must now yote." Korokiy sect wear ly Beven of Kosmograd's twenty-four ci- , pointing lowend the earth "Look!

That left throam who were either unwilling sources gun crew brought the total num ber of those not present to twenty "We've hand Three others raised them Grishkin

Karolev sighed There are lew enough as it is. We dibest have unanimity. Let us

The term muldary custody " said a trosible for the situation." The man looked acutely uncomposible. We are in sympethy otherwise but will not sign. We are Partymembers. He seemed about to add something but fell wheet. My method, his

Koroley nodded but he east nothing

GHis shoulder began to ache Stoically nounding, remembering the din a real blowout caused. It had had to fool the gun crew.

Glushko the botanet. No ther he nor has man's metabolism in the absence of gravity blood tended to concept in the face and

"You see a bolarust Visula," his wile said

"I will not support this states" " Glusten peled him from the room. His wife to lowed complaining bitterly in the grating under-

"Eve are willing to sear. ' Koroley said

her dark her chown back and held with a braded band of open rylop withing. You

he sun balloons! cried Gration

dorma now clean shoreknes intensely

green fields, visit cleasing offee whose names sand with a strande made: High spove a fleece of stratocumulus floated two solar balloons, marored geodesic spheres tethered by power lines, they had been a The things worked. Korolev supposed, be

Wrid they say that people live in those

Korolev remembered the pathetic flurry the wake of the Treaty of Vienza. With the oil flow, the Americans had seemed wilking had permanently soured them on reactors For more than three decades they dibeen dustriel decline. Spece, he thought ruoyes of will that had seemed to gro their prilight early offorts. Or perhaps if was arrow a faiure of magination of vesori really should have fired to som us here in

Who would want to live in something ise the? Stoke asked purching Greh-

"Yourse unking " soud Yethermoy "Burely

"We've not joking. Political Officer Yet remov and these are our demands. The ing form the back of a tractor Valertina wein Rommersko making the straps creak requiarly managed to avoid his duty shifts in the our room

Yelremov strugged He glanced down the list of demands. The Plumber must remain in pustody I have direct orders. As

You are guilty of unsuthorized use of

That was extend a private maller and

A criminal act issed Tatisma

ton have is the station's most active same isclate pratel We are all criminals, don't you ape? That's the beauty of our system. rant it? His surliden twisted smile was shocking's cynical. 'Kosmograd is not the konur. And you demand to communicate ister is leading the purger. With a decisive

### Why is it that of all the strange objects in the universe-novas, pulsars, black holes-you are the strangest?

# LOST IN THE COSMOS

BY WALKER PERCY

where he contracted indercu-Mountains By the time he was ded by the New Age don his career in medicine for THE ENVIOUS SELF (in the texted in Sexual Scandals. e Me of reading and writing locit sonse of envy invidere, to Embezzlements, and other Parcy spon began turning out look at with malice) Why it is Despresses novely (The Moviegoer, The that the Self-though it Pro-Least Gordeman, Love in the feases to be Lowing Garina, to - Questions Imagine yourself Rianal advantation of Protect to War. Concerning a place most listing to you

Editor' note Walker Porcy Lost in the Cosmos The Last III—in fact Secretly Rehabed discovered the pook-Sait Help Book. The sectors West and Functs of Walk News of Plane Crastee Asteroma-arome some 40 years ago, Set The Lands Sait and The terms, Maila Munker, Othi-Demotrac Set, use a gues kas and was confined to a tion-and-answer format to News about Acquaintances senatorium in the Adrondack guide those who feel bedes- Dropping Datad in the Streat,

arres to say nothing of Local Gossip about Neighbors Get-

men Today Percy Aves quely to Discord, Life to Death to and therefore most rugatory, in Locational His folgost work is With Other Solves Well not egi standing on the platform

PHOTOGRAPH BY MICHAEL BADENCICH.

Or walking across your front ward in Mont-

Now imagine that in these circumstance way of a newspaper heading by word of mouth from a neighbor or perhaps by

any change in mood e.g. whether as a manning depression deepens or lifts

news is unrelevably bed. (b) The news is ordena should be bad but in which you news is unrelievedly good. (d) The news is putstively good that is rears which by

(1) News bulletin: A LIFO has londed in

(a) Unskevedly bad. After all there is

(b) Putatively baci but secretly not so bad

(2) While you stand at the easer-tube reading the morning head nos a highly localized yet extremely violent tornado de-Wowd of Oz. Your wife is n the house Nothing is ever heard again of the house

an and helpmale for these twenty years

THE enough with the entire truth be known. ife. Since your wife has varished through deed have been set down in a new place and a new life of her own life Juck you are the to begin a new life without guilt

GI You are a woman whose husband fellow a combet veteran of Korea and has been a cood provider for thirty years. Money without louching you and hardly speaks do you want? (What do women want?) You a lesurely barge voyage through the car Authitum Scicitiv, He won't no Why do I

You have designed a starship that will accommodate a crew of ten, chasen ' for technological skills and sexuel hong-ups, for a journey to the vicinity of Alpha Cantauri 9

thatched root-optiage tour of England and have dropped out of sight and disap-

man, a good husband is gone You a good

(b) Putatively bad. This is all true, but on thriv wars of Relph is enough Moreover

(4) On the station platform a follow pom

(a) Unrelievedly bad news? How can there be anything good in such measure

felow commuter so excited that even as he shakes his head clotefully his out in what he does not say but perhaps thirks that it is Gomorrah getting its due, what with the gays, creeps and deviates who

travel ETIs (entratementrial mollopences)

inblood display of affection and sexual mos Your own latest book Space and Burnard fusion remiet which will accountstarship has already been pkingly rick-NASA initiate a crash program to laurich

You have been invited to appear on the Tem Snyder Show to promote your new

Your neighbor and mend has also writ-

Excerpted from LOST IN THE COSMOS BY Nulley Percy Copyright © 1383 by Walter Porcy . DMN

car the uptimity Cartains Inform—entrain Table Tables running in the sweepes thinks Singletine (Electronic and the state of the second secon

In his book: Space and Safon, a version of the British starship Daeddata, powerdd by nuckair fuaon i's proposed, the crow to be commanded by an expenienced air transid but with a spanitual leader on board tha noted Tbeter myster. Ti Chen

All you mittee you moning to be the inderson mittee you moning to be the nearboard and particular to be an earboard and a contrained on the nearboard and a contrained on the nearboard and a contrained on the nearboard and a contrained on the the T. Chern Instatus of La Julia Description the T. Chern Instatus of La Julia Description and and the second and the second and the T. Chern Instatus of La Julia Description and and the second and the second and and and the second the trained and the second the second and the second the La Julia Chern Instatus of the second of the second the La Julia Chern Instatus of the second the La Julia Chern Instatus of the second second the sec

Can you believe such creat<sup>2</sup> ones your receptions where a teachinge and staps the LAT times. I mean my God this you would repeat from the Masseal Engine The same tested of test im going to sue the basitists Wookdn1 you?

You shake your head, one arm around Dr L \_\_\_\_\_is whe patting her soler tously

You grow thoughtful Taken altogether

(a) Unrelevedly bad news

Putatively bad news

(Check crie)

THE LONELY SELF. Why the Autonomous Self levels so Alorer in the Costnat that it will go to any Longh to talk to Chimpenzoos. Dolptins, and Humpbook Wheles.

In recent years a tremendous amount of offort and money has been spent by the government and primatologist in the elfort to demonstrate that chimparcees and other spee can learn human language Chimps were adopted like children and

# How to tame your data.

To southe the savige information beast, a businessperson could use the IBM Personal Computer XT

Because with XT's 10-millionmatter fixed lide dreve net 18M data unagement software payfindthy designed complement the bachware, you can whup thousands of numes and numbers (Helping you gas a better (Helping you gas a better User IBM PPS FILE\* to User IBM PPS FILE\* to User IBM PPS FILE\* to Desense \* 5 cm\* on the germent ends and the black

There are a served at There are HIM PIS REPORT to over, againes, search, update, searce and prime the faces with case. The search are a search and the search high year more efficiently handle many high-volume applications, what your high-reaching Presend Compared

IBM

### The IBM Personal Computer A tool for modern times

The next submeasure on when to bey the title Personal Computer call #00-447 4700 In Alexte to Terrent #06-447 4600

unlike children were subjected to years of concentrated testors in speech When altempts to beach chrings to speech failed sign language was substituted. Glowing suppresses were reported. Some christis became famous

Yet the most recent assessments by ma provide accentation and hat the primiticicipate have attributed thermonities or appears that all hards and hat the primiticigeographics that all hards and not using langeographics attribute and not using langeographics attribute and the second responses in order to obtain invasidation accept attributes and the second second productivity carboal transmission. Now containants been modeling them to demin containants been modeling them to demin containants been modeling them to demin and the second se

In short, it appears that chimps can't take with other their voices or their hands. Or as Sebeck puts it, an mails have commumeation but not language

Yet the public perception is that chimps, and persistes addptimes and this hemplability where have accessed the tanguage barrier. There are speculations about the methemonical and metaphytical knowledge of dolptime. For example accounting to a recert reverpsizer account the entry of a hemplace's whele has ten time and a many poherens as does human between.

Constant Why do people in general ward to believe that chritiss and coldnine and wheles can bepak and why do entre soentests in particular want so badly to belave that chrispe can opeok that they will comporting them own to entrol?

(a) Because amone who has invested reputation a great deal of effort, time and money in an expectment wants it to sudread.

(d) Boause the last three hundred years have spen the dehorement of a main from what is basived to be in a certary possible (Copercisia). Earlies a set of the last the could organize and as created by Cobin could be an approximation of the company of the bin with the capability of approximation be as within the capability of approximation of the could be approximated by Cobinson and Cobinson of the company of the company of the could be approximated by Cobinson and Cobinson of the company of the company of the cobinson of the company of the cobinson of the cobinson and the cobinson of the cobinson of the cobinson and the cobinson of the cobinson of the cobinson and the cobinson of the cobinson of the cobinson and the cobinson of the cobinson

goats to talk. Bo annous in fact have some people boen to communicate with Waithou the most literous champ. Inter in the allowing to make signs for Washoo three psycholograp have had there fingers traine off for their parts. Also for man insbuffied again

Thought experiment imagine theil you are the scentral who has a fast succacedee in puncturing the fast of manstheed claims as uniquinesia influences. New main is proved beyond doubt to be instance exemption to their species a operation in performance with an imcalcular exempt in modelates galaxies. Instance exemption to the second all internets indicates galaxies clouds novel patients.

Now Towing placed men as an object of study in the Cosmos in however integrintcent a place how do you. The solenist the self which hel upon the heavy how do you propose to reamar the very Cosmo where you have so timby placed the species to you have so timby placed the species to the solenist the second the species to the solenist the second the species to the solenist terms of the second the species to the solenist terms of the second terms of the species to the solenist terms of the second terms of the species to the solenist terms of term

Vou have proved beyond doubt that man is an organism among other organisms, a species in continuity with other species, a creature interacting with the immanent Cosmos

which you balong? Who are you who has explained the Cosmos and how do you fit into the Cosmos you have explained?

Hwerg proved your hypothesis, whill do you do neat? (1) hutieth is paper in Some ever? (2) Bogin IoLabry for the Nobe? (3) Wany acoul hines other screentes who are working on the same prove? (4) Get dank? (6) Go hama and quartal with your wite? (6) Take a gint freed to a motel and wash Gam? Amail an o band-oratal TV?

If the last is your choice explain the connection between the thumph of science as a form of transpendence of the world and pernography as one of the few remaining averues of reentry.

THE DEMONIAC SELF. Why it is the Autonomous Self becomes Possessed by the Spirit of the Erote and the Societ Love of Violence, and how Unlucky it is that the should have happened in the Nuclear Age.

Thought experiment The scene is a Washington hose room it a wartime Enter Dr F \_\_\_\_\_\_ in Nobel auroats scenario Taking off his jasket, he are on the back waanly roba his temples, lies down and closes his systs. After a while his turns on the television. The show in a closed circuit schering of Behnot the Green Door is pronegraphic fam. Prevantly he mastubases amount casually but not before tisting the touble to fetch a special contention from his subcase to cable his equilate.

Ha swachas off the trievision, lies down, closes his eves.

The saliphone rings. With a frown and all curious groen—is it wear nois? initiation? ange?—he pulsa up the receiver We hear only ha sedue of the conversion

108

Yea Eservora

Yes, it was a very long meeting

I reakze that a declaron wasn't reached

True there was no closure in the deci

cn-making process

That a crossed - Little Levense at the

a to the Cheff

Yes that situe I have some standing in the accentific parametrix

Well thank you. General it's nice to know you people respectione scientist

There may be carried to broad or security to call it by name. The eyes-only folder you have —and the criv secret is its composition and mode of delivery it's a nautotoxin, arborne and were-soluble There revealence on it lea.

For one weepon? Ten million more or loss depending on population density

Right II violates no fina atria agreemant or Satt III Its a weapon but not an explosive device

I know that a shigh owhen casually factar but it will save faces in the end

A demonstration? A demonstration of what? How to left a few hundred randeer

a Strena? No way: General

You really pulling me on the spot General

Okay. I'm going to surprise you. I'm going to give you an opimon. I think we ve got to go with it. For the utilimate good of men. Indeed in the interests of peace. In fact why don't we get it Proset Pacco?

You also that? Yes that's right Go You can fall them

1 say gr

After hanging up he peckle up the origindebal double-white oncore carefully passes on a sidder containing the address of a Catheres Laboratory white oblication the sparse of neomating facusaria of penalcally access the door containing and white rapidly down the control to the sa maichine chine.

Goverhor: Do you think the United Blates gene pool and the future quality of He will be improved by the contribution of Dr F\_\_\_\_\_\_\_\_\_a ejeculate?

( ) Yes ( ) No

(check one) DO

# GIN&ROSE'S

Gin grows softer in the limelight. 4 parts Gin, 1 part Rose's."



## INTELLIGENCE

-----

as lifte as \$5,000, Surrer entrinates

The brain wave interface works now but a's still in development. Butter says it will lake him sloui live years to optimize the speed and appurpty. Then he will make it periode, for use on wheelchars and be private an optimized applications.

This mean challenge his floots is to climinate interference team the electrical signrate gamenised by tenso neckmandes. One possible approach is to implane or econose to the stan each the brain. This markedly strengthems the brain-marke signal without meaning the noise level Subter appoints and brangs the system is machine down to half a second.

Where will this tochnology load us? Sut for a whotefail to appendixe. The utili not may one day were their homes for brain were control of steptones. Jell works on sets and appliamena. But such a system would be a costly set-indu/gence to anyone who don't multi-read if

A more promising and interediate, use is computer control, the inventor suggrets Rows of thesizing lapits actives a computer screen could enable users to open and close computer tiles pint documents and undarine, copy, or move periods of user without ever having to learn command optis or laive her hands of the layedpant It would not be difficult to build such a system into a robot that would than come under the power of stores—or more glances from its human meater

The bian wave system may hever replace trying for producing large ansumer of test We move our eyes far more slowly handcapped—cen type. Noretheless many dus may darive galad conflict test the knowledge that computers for ther controlling us, will one day tait under our been s dinget corringed.

### NEW WARES HARD AND SOFT

Prototy as in TGFF is a superimptive electronic ling program cause to be inleased by interff by Anthon-Tale Withers in the firm's avective used distatements again-competigremming languade dBASE for the second dBASE hare casely tandement of the new system and Trubus Visites can be used by the same plegater finally is filled can be used by the same plegater finally is filled can be used by the same plegater finally is filled can be used by the same plegater finally is filled can be used by the same plegater finally is filled can be used by the same plegater finally and the second table of the same second second based of the can be used and the second based based of the Can Become

Latest in the seemingly and ess flow of portable computers from Secon Valley is the Galerian is bettery-powered model that weight in site immen man pounds Look throw in a fool seaant emit hove inches deen the 0288 beend machine sports in systemme the systemmen sector of the systemmen angle capacity of 200 bio characteria is standard associat disk (with a law hunge biointermentations is straid look for appartial more than out of the system sector of the system sector of the sector of the system sector of the value of the system sector of the system value of the system sector of the system sector of the system sector of the system value of the system sector sector of the system sect

A new injereme character reception? mesociated Process and Provide Site Markowski and mesociated Provide Site Markowski and Site Markowski and Site Markowski and Site Markowski and truthe of ornines the use later to toma a site of the site of the site has a site of the new site of the site of the site has a site of the mesociation of the site has a site of the mesosite back and the site of the site has a comment of the site has a site of the site has back as a site of the site has a site of the mesosite back and the site of the site has and mesosite back and the site of the site has and the back as a site of the site has a site of the mesosite the site of the site of the site of the mesosite the site of the site of the site of the mesosite the site of the site of the site of the mesosite the site of the site of the site of the mesosite the site of the site of the site of the mesosite the site of the site of the site of the mesosite the site of the site of the site of the site of the mesosite the site of the site of the site of the site of the mesosite the site of the site of the site of the site of the mesosite the site of the site of the site of the site of the mesosite the site of the site of the site of the site of the mesosite the site of the mesosite the site of the mesosite the site of the site o stant pla hiding with the wasses of the very

# AUTIMATTER

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Yet one expertation does one to mind Try to guess for a moment Theory is fors from distant planets regnt hos if



UFO UPDATE

serve as undestrated has one to aske nom one, i we spece höjd resolution takke and optimise and we image avery yard of the official solution is by the wolernogen with a mountains showneds and contenies deteked, long distance externation

Monores ocean spectrals and allot ne convertent la electronia is proving number or system can ocean - Anoneano complexitati payaoni - densero catego has one basim - la large negativa tassa di sub Anca negnatabi vunnahedi oceanifaria natabi vundensas to caso segota di antitati cate di ogli Morel anyo oceanegnatabi vunnahedi oceanifaria natabi vundensas to engenatabi vunnahedi oceanifaria di sub vundensas to engenatabi vunnahedi oceanifaria di sub vundensas to engenatabi vundensas di sub vundensas to engenatabi vundensas di sub vundensas engenatabi vundensas

As a sense advacry scantal + the Narional operation and Aanospheric Administration yself often inavologi househ the waters assured Grand Bahama eliand. I was Lowershift and a set of the set o

Where did treask bizante signals originate? We permit tod ourselves some ten-out speculations (Doublid exhibitionestrals) be umg time amb invariante um radio valves? Ould some abor craft be talking with the home base desenaes. The galaxy? Or http:// they? be removed and on antibiother condexided treadants?

It would be booky and dir but to investigate deep sea anomalies systematically years assume worth the affort has assumed likes to opported that some mystemes only assumed that contaction But in yown very territarive obtaining along that contact and in yown very territarive obtaining along that contact and in yown very territarive obtaining along that contact and in yown very territarive obtaining that any opportunity of the territory of the territory of the second territory of the territory of the territory of the second territory of the territory of the territory of the second territory of the territory of the territory of the second territory of the territory of the territory of territory of the second territory of territ

These while group of logical borns of my logical borns of my logical borns of my logical borns of my logical borns of logical borns



### MULTIPLE PSYCHIC PERSONALITIES

Theye with increasing and containers have a to to worry about They content is another of begander closed and the content of the boot, they content on a portrain that when they charged with nation have to stage charged with nation have to stage charged with nation pool that boot the pool of the pool that boot of the pool that boot the pool of the pool the pool that boot the pool the pool

Alison who made his chicovary while Heating dozons of split personality too caree one of them throwed warms evidence of psychic ability " in the strayest cases the notes attentiate personaince used psychic power merely to dominate the situation Other times though the power seence to a some from a demon that had seared control of the body

Altern operauded that demote possession was often at the root of the diverse which his sector patients clamed to be "disastamate entries." Shortly thereafter had some of the abernate that some of the abernate by belong to the patients whose bodrase thay interadds was rean controlled. by the spint of her boss s dead son. While psychothese spints which reports these spints which reports they often disappeared after a brief execution.

I but why should people who are sufficiently from rysill pilo personality drast draft become possessitied in the final pilota? These people are tike magnets faller explains. The pilotant is full of hatted, and the personalize thermodyes only in the embras They histely out for hep

-D Scott Pogo

strole are octived and stole sign of an inward

-Assprace Heaven

### IOVING COFFINS

Line means somy in capital Barbados but down sen be busting. Cellins on the skand nove a history of leaping about on their semi-rais pastime that grow as pecasity popular among cottine of the hindex frame.

Interface of Conducts of Conducts of Conducts of the Conducts of C

Nine months later he returned to find his axial intact. When he prind the doot open the sand held no legal of footprints. But the coff ins had again been based about chipping the wata with

How did the ooffins move? One recent theory says native historian Edward Stocks: Is that hungus growing inside the valid, pair aspected. But Stocks is separat. Any explories that moved lead coffins would



## ANTIOMATTER

certainly have blown open the cloor as well

Arother theory has a the methy late whet the works tourisation that an instand wate was also plagued by upstant ordination plagued by upstant ordination general was incomed along table his single Catholic with when the general ordination of the general o

Enosite verwinst mer of merries emert prack about worken You can't we with steem and you can live without term."

-Lupave C Me

### THE WHIP THE ALIEND

Harrison of a top secret increacycous between Prosderd Denght D. Exercisions and others trans space have and utility of the space have builts for years. Now the Earl of Clancerly a member of the Breas House of Lerds clame that an cytwithese other Breas House of Lerds clame that an cytwithese bit he meeting has come binward to reveal a detailed, macks we

Lord Clencerty reports that the alient lanced in a signation of the space when a California Elowards. Ar Posce Basis in February 1954 They were deniar in apparatula to herstrehe says. They were homosition that anabled them to hereafte the earth samaghieru and at one point a group of them even beforehosting. their incredible powers by turning invisible

Among participation and a second to the second to the second the second the second to the second the second the them the theory of them them the theory of them. So they appeed to keeve

Clanderry who heads a rouse of Lords UP doubt group difficult actually meet the cyowithcus but learned all about him hers Wendels Bowers, of Lopan An zone a retrad U B Ar Ford buildnest octured with an and interast in UPDs.

Stevens says the openresis an Art horse test oriot, was at the historio meeting as a technical observer duil Dravee exobserver duil Dravee exobserver and service and observer and service and be doesn't vent erry outthe doesn't vent erry out-

If intelligent Martians sected at all it began to be more and more likely that may were fixing now only under extreme philosopy

### 7ISIONARY PUNISHMENT

Ware to Jupp violent or me? nen don i send muggers and mandesens to proson in the electric chain asserts localogy portesce Robert asserts actions and the california Just blind them with environibile correspondences temporal doct as them.

It is very hard for some one to commit a violent dot when he can't see," Lee, swee, "And the blanded



Indextonation of the Article and an and a second s

With this method, voice people would be neutral used and the streams would be self. Use pontends The date makes infinitely into esense than capital ponsiblement, which hear's detailed homode or paser which is a heavy burden on taxpever."

But to ophthelmologist and corres specialist Penny Asbell of Mount Simal Medical Center in New York ony units makes

Theoretically one could contacte and an Abel contactes The corres a the transparent covering of the eyel it as a later date mpaced with a later date mpaced with a later date mpaced with a later date mtran a chore bank, with present that a cloner bank, with present technology these sind putantine is transpared commit would teaters sight Besides Abel I claims the appent would ever partighter — the Mathem

We do not hug our minicips place. We put them hashly away, preferring the commonpulate to live with Driver Ourseland

121

# ANTI MATTER



NUM RECEIPT STOLES

Huge, Smith, of Weinneis South Carenia recording Bought a golden haned Mong doll for her eight-lysic ord assighter. But entrin autwards the doll a tecorded voces of the string half autward the doll a tecorded voces of the winshocked to have. Takty Dasling any "Kill doll Montry Outsigned the Quickly opticated the Celainnia Better Business Bureau

profitoshed provide compliants from upsid costernors who had purchased the dolls." Carls Cor the binnaus adjorations manager reported. "We also head from our Chicago other that a K/I Mommy doi had shown up there. Distusted by the insertinces who distributed batty Daring dols, mnubounder in Hong Kong, Segar besidering in tagdane on Fazz Berkey of Bits work Daria and Segaration work Daria and Segaration work Daria and Segaration were solutily asyng. "Ken besiden the other nechanism slowed he camend the voice diseaand, making the phrase synd like Nacour Momm?"

It was bitain safeta, a databata hina kana however witho hit upon the real explanation. This doll wash I demanding mathoide at at instead it was simply saying "Oureo many Sparsh for Take Mommy in Mann, where over 500,000 Spanish-speaking people live in fact the Baby Darling dolls were accepted without question Limit with the macriter.

turer. Sankel stated "and he tog me he had inadvert ently distributed more Spenish-speeking dolls than he maket to

Certa Cos agrese that bene was no sensitiar solo percessad to the purported myndercous unberrige of Bistry Centrice. My neighbor a tiom Honduras and he presee as Bipaneth, aite says. Turi if you don't acent ages that if you don't acent be Ki our Morriny. Its to worder parents were horder.

Faidh in the supernatural is s despende wapsi made by man of the lowest obb of the Anthones

George Sarreyana

Many white the ave

For mose or us the even set as synchrytecus with Nazz Germany But the forcade on bedded evens symbol good back further man that it can be found canned in testas name actinistic cert Troy it was a Christian foig symbol during the Medite Ages, and it has been reverted by Hindus for conturies. Now Texas physicase C. J. Rensem and the swashies term appeared to answrite term appeared to answrite term appeared to answrite term.

Rengen and Schluber came to the condustrie white exposing hydrogen gas to electricity and magrogen at the Uswerery of Texas at Avatin. At triat the charged gas glowed then to their emission of the parted to form the athoutie of a swarfes.

The exception determines the second determines of the exercision is spepulate that the parents is and a crist parameter of the parents of the second determines and phenomenon creating a second have counted recessing synthesis which and have counted recessing droughout the recessing drou

-Frie Minhaux

/ fast inclined to claim that at the present time out table is subterne

-ar where coordinate



## INTERVIEW

Orms: I understand, but of ocurse when do have to magine what might be causing them don't your

Benacemat You're asking me to respond going to guote me in print I have to be as potentially explosive as this one, poople because you give rise to failso hopes.

Onvy But doesn't the set of possibilities have to be laid out?

Benacerral Yes---in the laboratory so that do Then the information gets out as soon

Only Do you believe that the press should until the accentrate have had a chance to deal with the cosatrines?

Benademit it serves the public better in trosp situations if the press confines itself to information that is ventiled and abaolately correct. Sciencializing in this sort of

Overy So if I ask you whether ADS rould be due smply to an overloading of the immune system through promiscuous con-

ower Yes, c could be that but littank that It is unlikely to be the case My control would be that you will led some specaho and time again - ones involving the stach get AIDS. You get all kinds of responses alternation produces, and they do not our AIDS

The leading of is that we are dealing with petter unique viruses that are pocular in component cells of the enviruse sesters. infecting them with material they produce which causes the cells to respond in a peruliar way. No I don't think it is simply a metter of the guardity of atmus it is the publicy it is not simply that we are anowinfronted with anticens of the time. When you have contact with intectious aponts you deal with how they affect calls what they produce, what system they sometable, and number of agents. It has to be a matter of the nature of the agent itself

infectious agents such as syphilis. Once TH CAN

you had been infected with the systems orthis time, the apent was alwe and functionety of lessons that led to heart disease. neurological problems, and a very complots immuno response. The degree of annotionts. And they were never oble to not nd of it. There was a sort of standoff between the organisms and the patient. But

The same thing happens with chronic examples of major, long-term battles fought by the immune system without a deleten ous effect. No AIDS is most likely a very Crimer About ranety five percent of all AIDS victims are male. What is the significance of that? Are there differences between the

You could have a thousand colds and not get AIDS. You could catch many infections and not get AIDS AIDS is most likely to be a very special agent with definite properties

male and female minute systems? Benacertal Yes, there are clear sex ciffor and studies, makes have responded less yet have any precise knowledge of what

succumbing to AIDS?

Bengoenal I couldn't say These are so the AIDS situation-the patient's patient of life and other factors that may have nome

Omn! If you were treating this disease

Benaceval I don't think one should treat denkee about which me knows as little way recommend a form of therapy without greater knowledge

Before we discovered periodim individ- . Other Work working are between twentyodd? Wouldn't you expect the old to be

more suspendels to such a mellurchor? ace rance for what you would call an adult person. As a rule you'd expect normal sponding immune system. But this is a situation in which something has done wrong tors besides ace---the issue of excosure. for marriel Older oncole have a terso on. Everything changes with age

Only. Does the impute system benefit

Benacerral, in normal oncurnstances we ing capatie of handling thelenges. Now attack certain types of cells of the immune available has evolved, you may get into liceble. But it is unrealistic to think that if you shelter an incivicual you weaken him Inour environment if a not easy to shelter a tem is no longer challenged. Studies were They were delivered by ossarean section from asseptor anamale and were raised in a

of their development. As a consequence their lymphoid systems were less devel-oped They had smaller spieers and lymph nodes, and for some reason, without the colors the colors became custe dishave reported detecting an odd form of interferon in A/DS patients which supbe wrong That is the type of interferon found in AIDS patients is different from that it while after all. What is your comment? But I do believe the evidence is over argues to the contrary will be proved mdictate is probably a virus. We know enough from the model system in which we do trings with the immune system to metric AIDS symptome-to say so Here at Har model is pretty much infectious

Draw One seempoly (locate) peculiarity termon who are actually allocate to their lowers' sperm in these cause the woman's body treats the spenth as an artigen. It was reported recently that one woman had such an excessive reaction that she broke out in have sebanewer also laid ses.

Benacenal That has been described Three is an allergy to male sperm, yes Everythree is possible, but it's infraquett.

Owie. Does this suggest that AIDB could be related to homosesuel activity in which sperm might get into the blood by enlaring through the option?

Bensoenal: No 1 do not think so That connaction is very unifiely bocause ADS has apparently also occurred in patients whose blood products contain no sparm at all So 1 would not say that sporm could be the common denominator.

Onse, Blood banks have recently taken action to prevent such groups as Hallbris and gays from donating blood. Are these preceditors reasonable?

Benaronal the fool have to be careful because when you pack taked products, you can't protect pacetor for a the protenet and protect products with the protetion of the products unless that protection and path blood products unless there there and they are estemated property you should not make notice and products without the protection. Then, using them bloods you're and you have you're the protection from using them bloods you're the protection.

Over Doctors at heavent Medical School Interesting multiple schemes with a couple of interesting multiple schemes with a couple of induce scyclocitoperandic at which the tormone ACTH What Base the porteof the tormone ACTH what Base the porteof the exchange with the schemes at each torp when the torm and the exchange of the schemes and the masket of the scheme induces and the masket of the scheme induces and the masket of the scheme induces and the masket of the scheme induces.

Onvis: What about asthma? Is that an autransfure disease?

Benacoral No. Fa oc. Anthon is a very complex net of conditions—scene of which are caused by hypotentifikely Automation partent develops interusing against a comorderes are natural body conciders scene natural body valuetarismo to to provpa net develops interusing against automation of the source of the source of layers certains from of hepatitis, and, develop ontain types of anthes. When you could be the source is not andres.

Other, What about the idea that we might be able to borrow immunities from younger poopin? We inject them with unifgens, they develop antibodies, and these are then transferred to the oid person

Benaderraf\* That's been known for quite some time. You can transfer some antibodies from one person to another.

Orm: What about one's own antibodies? For mitance, when a person is young, could he be injected with some ambgen to devetop antibodies that would be deep-trozen for jame use?

Benacemal Passweitherapyhas never been

very useful. You have to make your product when you need 4—44 that very time. Green So the idea of freezing lymphocytes for use in old age is not proceed?

because it is protocy to thermore, more than the other locate Borry buyphosphere when yuzhe yuzhy and using impactive when yuzhe yuzhy and using impactive and buy possible should be there would be instructure to possible should be there would be instructure to the term than positive to the instructure term than positive term than the instructure the balance of the instructure term than positive term than the instructure term than the instructure term than you never the instructure term than the drageous speechaster. You always have to be way cannot know you always be yuch to we due networking term you always the instructure term.

Orms is it possible that cencer might be defeated by immunologists?

I don't believe in God. I never did. Religion bars scrutiny You have to accept the dogma This is precisely what I don't do in my life. I am supposed to scrutinize everything?

Because 1 mmunology is having a munor enverse interaction more than a consol in a management of the second second over because 1 is not a major entry it is a munipacity of designed to the second second production of the second second second second construction of the second second second over the second over the second second over the second second second second second the second seco

Orner is the entrune-surveillance theory, which suggests that cannor gets established only because the mmune system's guard is down, now accepted?

Beneceral: The intrune-surveillance theory you refer to does have a place within a certain specific set of parameters it's been proved correct by the concurrence of tumors in immunoclehowicy patients. Overs The suggestion has been made that everyday nutrients block cencer. Do you thank this has wrything to do with the immuno availant?

Becourse National National We don't how most induced with a release to be the entropy of the term of term of the term of term

mation-processing system Becaremal Not so much a code as the

Benacemal. Not so much a code as the product of the colls communications with one another. To use a metaphot, the mimune system is a visit policing network or a system of recognition.

Orissi it sounds something like an anny repelling an invoider

Benacerral The army is a secondary inc of defense The army us system is primetic operational with an army loss

Gens Recognizing the intruder?

Benacerral Thei's right Information is the important ascent

Onw If the body were a ration, what would the T cells and the B cells be?

Beneceral They would be the CM or the KGB They are truly the information system They are responsible for necertion—who is what?—and for keeping the system strength thou might say the police are the cheaporter.

Ossis dre the arcticity passooris?

Benacemat Passports yes Identity cards, Engerprints

One/ Carrying this metaphor further would the genes be the government?

Benacement General are in fact nothing but information information at a higher levelactually codes like the level. The general are the laws. The statules they contain within them the statules that govern the secretly that at a together.

Ome: Do you agree that emotional stress inhibits the immune system?

Bruces to inform the system of much evidence that you can alloc the emmune system with stress. I won't any stress doesn't have any infuence, that's too drastic a statement But it doesn't have a major infuence. Alloc having worked with the inmune system in excess of forty years. Have found that it's very repliced and ascrative. It's very serstive to regulation from its helpers and suppressors, the macrophages and the lymphocytes if's very resistant to anything that is happen no elsewhere

Ower A paper presented to the American Psychiatric Association offered preliminary evidence that the immune system of incent widowers allowed remarked reduction in function

Benderstal Wei, here are so trany of the ret trange approximation of such as a time it is increased to be added to be the increase of the such as the best and the such as the such as the But that could be to a survey of reasons. There find an use may change They may appear before the survey of reasons there food and the survey of the survey of the subset to the survey of the survey of subsets to more could be the survey of subsets to the survey of the survey of survey of subsets to the survey of surve

Devail Ever since I arrived in the States from England I ve had the impression that more people suffer from allergies here. Do diffevent populations, have different overial levels of immunity?

Benoemal No.1 don't thrik there is more alterny tree Traven more available. The Alex the natural annuments of the Tage the three the three three the three that a top prove the three three the three three three three three respectives the three three three sources the three three three three woods) instructly vance within a popula words) instruction words and the source within the three three words) with the three three words in the three three words and words

Orean What about the cumaritherpase source It has been asserted that the poor or immigrants from Europe tend not to get it, but that upper-mobile-class white are very succeptible to by out time (therein populations might have a diffusion spectrum of sysceptible/?

Benotheral. Not in relation to the increase initiation of the initiation of the initiation of the astron organic of the market of topological base astron organic of the initiation understood at the present new Median of the initiation bases out with the initiation of the initiation bases out with the initiation of the production of the initiation of the initiation of the initiation of the isoteen of the initiation of the initiation of the initiation of the isoteen of the initiation of the initiation of the initiation of the isoteen of the initiation of the initiatinitiation of the initiation of the initiation of the

Ormal Do immune studies hold hope of a cure for heroes?

Benegerinf Immune studies will ontarily help a great deal. It will be a topic of consolvable investigation in the next few years. Orem: Two herpes vaccories are regaritadly to be tostated by groups in Seattle Doryou hink it will be possible within the next have to anticacia herpes with a Vaccrief?

# You never forget your first Girl.



Beniceratin Local II in Septical the catter people who have neuronic hispan approach is a constrained by the second secon

Benacestal: I don't know We have to know more about the relationamp between the herps what and the immune system. Let me repeat The only way we can take these problems is by audy and intone meetgooton. Every poblem has a solution. But the solution comes only all the and of a list of after it is deart come cheap.

Other Do you see any practical application for British introvinologist Patiet Modal war's discovery for which he won the No bel Price in 1960?

Benearinf. Matisee accessed that f you inject loreign oels into an arrenal loss be too it is fully instrum seemanizing day. The grown seeman will not neceptate the colds as foreign and will not neceptate the colds as foreign and will not neceptate approach, not approach, not will teers be for you can there are what tessues from what person you would eventuate want to the procession. Other Other might imagine some egomenexal dictator would tather a lot of children and have the cone to there in the womb as that he could become their limbs or what ever organs he might need in the future

Bernaemal No that would'it work its the other way avound the domention issue must be reserved in the featus of the recipient not vice vector. You must put the coller into the particle when the is shill a featus so that he can take accept the issue itom others. So you would have to foresear inthe fair in all vance that the feature lossed become a pow erful domate!

Ownel in the clusters fusure might we simply be immune to everything we want to be immune sto? Could we build a perfect immuna evelation?

Bendermal, conclusions three three capacity on days of the immuno response on entitled to the measure of the individual'. Some pairs exchange one individual' is determined and the individual of the individual of the exchange one individual is entitled. The exchange one individual is entitled. The exchange one individual is entitled. The exchange one is control, the control three what if on of the control, the control three individual is an exchange on the individual that is an exchange on the individual is the control three individual is an exchange on the three is the control to environ the peetweet on result to environ the entities one of each the cores after the entities one of gene



termines what your body considers foreign and what it considers acceptable. You can't do anything about that

Onse: According to your biography you were initially motivated to follow a career in emmunology because you suffered from aptima as a child

Benagenal I came into immunology for that reason. But I have been involved in respectric and curvary four land to also qualitoria that are more relevant to your life but whould a bumming intellectual conesity you don't become a sciential meet Ally you don't become a sciental meet Ally and you are an interneem?

Benaperal I worked in business because it was a family receisely. I found that it was a familess challenging intellectual pursuit than sciencia

Others' Judging from your biography, you overcame a few obstactes in your carear. You were treated as something of a foreign backy in the United States and in France.

Benageral I was a lotergreer, so it took some time for me to establish mysell But in my upward climb I eventually penetrated the vanous layers of atCelty Gener, What do you mean when you saw

Orenv What do you mean when you say that your Evench eclucation has had a last inglettect on your Me?

Benaserral, Well the French language is a good vehicle through which to learn and practice logical through Than Iso I became exposed to French behalure, which has a very not betrade.

Drive Do you twee it made you more imso native as a scientist?

Benefacter I confined at maderan more manage lange to the franch approach is auxily inply structured boils in terms of auxily inply structured boils in terms of abares informer Also confirmed to inperson several terms according to approach approach for a barbore processing to an approach approach barbore processing to an approach barbore processing and the approach appr

Determined is further output to determine the therein particular to the second Onw: How would you explain to the lawmen why funds should be spent on immunology and not on something else?

has benefited from immunology Loant do anything about it. When I was going to from massies. Since then vaccines have erusse would have been dead are alve

Onry: Is there any danger of sociological abuses raised by present or future attitute

rology has never presented entroal probions. We have provided humanity with tools ease and through better treatment, so we

lation to the needs of individuals who have that is seriously damaged. If we are able nore with increasing success. The problem

Owned Could you foresee a somerco whereas people would want to use live derivat?

Over Might a stanton area where the sch

supply, it would be wrong to decide that

Gener What would your reaction be if say,

Benegenal: As a single instance. There no the problem of scendty. Where a material is of human value, there must be ethical ortens concerning how that material is dambulad For the same reason, whan there is a shurtees of casoline you go to

saw? They do not cause any rejection problem do they?

Benacemat No they don't They are mehear any transplantation artigers. But it mauni organs-never intest, the criviorgterm outlook is the use of natural organs . distinguished yourself in a way that many

tailed to do. How do you account for \$16? Benecemat I was lucky One is that al?

making process that puts you in a prostory to be eligible for such a reward. And the They may choose you or someone else so Omn: Having uncovered this extraords nanly intricate biological system in all its

Bonaperral No absolutely not I'm archiful attude with which to make scientific progress-to feel that these things are a

Benacemat Well there are sciencess who beleve in God and others who don't I hep-

6A close fnend has lung cancer If you work in this field, you 'feel discouraged when you are challenged by the individual expaniance of somebody you care for very much

pen to be one who heart's any need for such. is precasely what I don't do in my Me I don't I don't believe in a given religion 1 don't

surviv seems amazingly ordered to a

Attackouly That doesn't mean there is a band the human made which is what is described in the revealed velocity, has ciefing God as the fact that there is an or-

And it's also quite remarkable that cur brain is designed so that we can under stand these leves. That is the most remarkside our heads-a computer system, which

the brain is-the can assertive this more Owner. In describing the mechanics of the envirune available you seem porhaps a little to explain reachiv?

Benacemal You're wrong if you feel that I m ing about it would take two logis longer to leave you with an approximate understanding of what I am talking about

Benacemat Yos If you were taking a course. same in a pouple of hours makes me feel when we attempt to poracy process information to a large number of people, we must be content with giving the favor of edge of the point. I have been trying to do be certain until I road the interview whether I have conveyed even the favor of what I

Overy Do scientists like yourself trid 4 diffiguit to deal with a subject in broad out no

Bacocount That a one of the dancers it job But when you start to describe immanology you have to describe an exthe nature of antibodies, and artigens It takes a long time. I have tood to answer

Orner Still you don't seem to be enzying

Renormated: Woll of you write a room/hill is talking about the questions I want to re-Beruscerral Well no because the comclearly bacomes even creater. Sometimes

You see, noht now the situation is a diftout one We treve taked about concer-For the last couple of days, I have been what we can do for him in an area that ia Hyperwork in the teld, you teel discour-

acod when you are challenged by the deprogram of somebody you pare for Overs' Hiss cancer actually hit your tamily? Benacostell it has hit out family it always hits one a family of course DO



## Second To One,

# Diamond Collection.

The RX 735, Mesubishis Electronic-Tune in-dash Car Stereo thata rushad unit by its mentar - the CZ-747

The RX 735 is a collaboration of state-of-the-art features, sizzing autio performance, and reliability that is undersably Moubish

Our latest addition to the Diamond Collection has a universal chasses and hostures Quartz PLL tequation-synthesized runing. The Electronic Memory enables programming of 6 FM and 6 AM stations. (In those of autom and the RX-735 automacing) waters to the need station.

Partarmance includes 16 watte of clean, crisp, power Metudaris unque "Princh-OH" auto-reverse casaria mechanism. Digrá clock and frequency classific Loudress control for penny of base broot at low levels, and of course leder and balance controls for four selectier systems.

Mtsubshis RX 735 also has an additional feature many manufacturers rarely talk about, its allondability

And it's only second to one



### Diamond Collection: RX-735.

E 1982 MITELARDH ELECTRIC SALES AMERICA (NC VMA) BATTAN Circle ML Propaga Beam Ecolet in Canada Molos Sinler Cenede

# RED STAR

gesture he repeat the printout to pieces, scraps of yellow filmsy scattering in free fail like slow motion butterfiles

On the ninth day of the strike Korolev met with Gristivia and Stakia in the Salyut that Bristivia would ordinarily have shared with the Plumber

For sorty water the rehabilities of Keep magnetic had fought an university of the approximation of the sort of the sort approximation of the sort of the sort have a werywhere—in padding in statimost path data strengthere they spread to a stacks. Now there was a need of any tot in the air systemation of the sort of the of burning intellation.

Koolevis sloop had been broken by the hollow thad of a dispersing 30-yul lander Guarties and his wide the supposed Durngthe part forty-eigh hours. Hermony had supervised the evisculation of the cree membran who had ehused to pin the drive the guar over keys to the guar scen and their benacks ring what they shill held histe the Pumber.

Contritions Servin had become of here heading-array bone of the mails of readheading-array and block too conversion appended to the service of the service appended too hards. Encloseded by land appende too hards, Encloseded by land service i too hards. Encloseded by land service i too hards and the service service and the service appendence of period period boot hards. Encloseded by land and on half owner. With the uterial gond Stook and "too hard as service approved."

Contribution granted Has contributions where the second with where the memory of a support control in the was conversed. If an Webersver bolts are supported to the second result of the support of the second result of the mean has been also being the second result of the support of the second result of the mean has been also being to the second result of the support of the second result of the mean has been being to the second result of the second result based on the second result of the second result to KGB mans 16 second result accessed that KGB mans 16 second result of the period call of the second result of the second rescind re

Think what their basimony will be doing to us groundated ir multipeed Gestrikin. "We work even get a trial. Streaght to the polocal hospitals sourced to golivimize the boy with cheat Konciev picked apatheticelly at a vectorus pucked apatheti-

Stoke snatched a chilling acroll of printout and read abud. Paranata with a tendency to wainsateem ideet? Revealent fantasies hostile to the social system? He crumpled the paper. If we could see the communications module, we could be info an American Consal and dump the whole thing in their laps. Perhaps that would show Mospow something about our host-lity!

Koreley dug a smediad hut IV tem his digae publicity in two pars of wings and balaxied thicks were multi testimory to Komegnist being induktion levies. The insects had abcoped from some keybother supported, generators of them had in testistic sature for discusses. The Amercian have no interest in us<sup>2</sup>. Knotlev soid "Woosoo can no longer be enhanced to such severations."

"Except when the grain shipments and due " Grishkin said

Whence mode to sail as badly as we need to buy 'Kooley grmly spooned more cherette into his mode', chered mission paily and swalpwed 'The Americans couldn' reach us even if they desired to Canavard is in name

"We re low on fuel " Stoke said

"We can take it from the remaining lendars" Koroley said

"This how in hell would we get back down? Grishkins like terribled. "Even in abone there are trees trees the sky To hell with it! Let it fail to proceed Let it full and tourit?"

Korolevis pudding spattered across the builthead

"Oh: Christ." Grishlen said. "I'm sorry Colonel. I know you can't go beck

When he entered the massum he found Patritization suspended before that hateful painting of the Mars landing her checks slock with to an

Do you know Colonel, they have a built of you at Bekonar? In boords, I used to pass it on my way to lectured. Her eyes were est-entered with steroferences.

There are always busis Academics need them. He streed and took her hand

of the parting

"Thatchy remember I ve seen the tapes as often now I remember them inseed My memories of Mars are any schoolohid's." He emied for her agen. But it was ret like this bud painting. In spite of warsthen, the still painting of but

Why has it all gone his way Colorel? Why is it ending now? When I was small I saw all his on between Our future in space was (convert—)

Penhaps the Annexans were optil The Japanese seri machines insolat robots tobaid here other lactosis. Loss menegi fated for us four we though there would at least be a permittent essential facility of some lend. It all had to do with purse strings. I suppose fifth mes who is it at deals and make deparate.

"Here is their final closision with regard to Kosmograd." She passed her a folded scrap of theray. "I found that in the prefout of Meterenov's orders from Moscow. They'il allow the station's crist to decay over the next threa months."

He found that now he too was staring foedly at the centing he lasthed " it hereby And then the was wearant fitterly for

lace pressed hard against Korolevis crippled shoulder

"But I have a plan Tatjans," he seed, stroking hel har. You must listen

He glenced at his old Roles. They were over eastern Bibena. He remembered how the Swiss ambessador had presented him with the wetch in an energy as walled more in the Oregan Kinethe Bahoe.

Risear treat in herein

He divided out of his Salyst into the docking sphere batting at a length of printout that head to got ansunt his head.

He could sell work quicky and etheanthy with his good hand. He was smiling as he level a large copyen boths from its wolbing single. Bracing himself against a handhold he fluing the bothe across the sphere with all has alweight it relocanted harmleasty with a harth claing. He wind after a could be used having of asson.

Then he led the checknoosenco of

Dust spursed from speakers as a Kaxen began to well. Tregored by the alarm the doping bays stammed shut with a whoze of hydraulios. Korolev s ears popped. He reverzed then werk after the bottle again

The leptral land to maximum bell encore them factored act. He enreed in the data reaso grouping for the seal schild. States had provided a generall system south. If Jack's been difficult in the memory bank were sensely realised to the port of conlegation with Schlegation theorem. In order waters the sector provided the sector is broken mattered begins this factored on weakly as wait. The leptits factored on weakly as

His shoulder began to ache Stocally he continued pounding remembering the din e real browout caused. It hed to be good to nan to tool Yohomow and the cau order.

With a squeat the manual whitel of one of the hatches began to rotate. It thumped open finally and Tatana looked in ommos ahr/s

Is the Plumber free?" he eaked release ing the bottle

Stoke and Umaneky are reasoning with the guest. She drove a fat into her open paim. Gristikin is preparing the landers

He followed her up to the next docking sphere. Society was helping the Plumber through the histor that led from the barracka mg. The Purriter was bareloot, his face greenet under a scraggly growth of beend. Meteorologist Umensky followed them disegrate the imp body of a solities.

"Staky They ve kept me on the Fisar Not by closes but-and I thought that that was a and binecut?"

Gradien stid out of the Soyuz lander nearast Korolav training a bundle of loois and meters on a mylon knystid. They all chiede out The onsail lath them under their own automatics live been at their remotes with a screwdriver to they can t be ownredden by retraining of the owner. How are you



doing, my Nikta?" he asked the Planteer You'l be going in sceep to central China."

shvered "I don't speak Chrisse

Stoke handled him a printex. This is in phonetic Mandann I was to cerect rive with the reliability wheelds (Massay

The Plumber grinned and ran his lingere through his thatch of sweet-etitlened hair "What about the rest of you?" he asked

The units we te doing this for your betfor upons? Tabysa made a line at him. "Make sure the Christie news services got the root of this scrull, Planther Each of us hiss a copy Well are that the world knows what the Soviet Union intends to do to Cobine! Yun Vasievich Koniev, this man or Mais? Ben blow the Planther a kies

How about Filipchenko here? Umansky askod A few dark spheres of congealing blood swing crookedly past the unconscisus soldier's check.

Why don't you lake the poor bastard with you Koroley size.

Come along then shithead," the Prunise rate, grabbing hippharko's ball and sowing him toward the Soyuz holdh Name the Plumber will do you the fever

of your meserable liferme

sealed the herch behind them

Where are Parnananiab and Valentina? Korolov asked checking his watch issen

Here my Colonel ' Valentina said he blond her federal abund her face in the hatch of enother Soyuz. We have been checking this one out. She grapled

Time enough for that in Tokyo Korokov snappéd "They'll be scrattibling jets in Vadivostok and Hanci within minutels"

Homeneneos basis blavity ann emeloped and yanked her back into the lander. Stoko and Grahlen assied the hatch

"Peasants in space - Taljane made e spitting noise

Korrrograd boomed toToWy as the Plumber, with the unconscious Pilpchenko sast off Another boom whill he towers were off as wall

"Come along friend Umansky" said Statio And farowell, Colonell "The two men headed down the comdor

III go with you. Gristikun said to Tetarris He contraved. When all you to a pulpt

No "she said. Alone We'lisplitthe ocids You'll be tine with the submatics. Just clorif touch anything on the board.

Kotolev watched her help him into the schole's last Sousz

Hitteke you dancing Tasana," Grothen said "In Tokyo Site seeled the hasch An other boom and Stoke and Umentiky had cast off from the next docking sphere

"Go now Tatjona Korolov said Hurry I don't want them shooting you down over international waters

That leaves you have alone. Colonel alone with our environmen."

"When you ve gone, they'll go as well he said." And I depend on your publicity



to embenaise the Kremin into keeping me alive here?

And what shall Hell them in Tokyo. Colo nel? Heve you a messige for the wolld?"

Task thesis — and overy office came using to him with un stock-lie rightness that made him want to lough hystercally Dise small stop. — We came in posce Workers of the world — "Summar tail them that I mend it," him wery bones shrunken was," "in my wery bones"

She embraced him and shoped away

He waited signs in the docking sphere The selence scendched away at his hervis. Its systems crash had cleat/weed the ventilation system, whose hum he d lived with for twenty waiss. At liver ha haard training source deemach.

Someone was coming clown the comdor, it was telearrow moving clamsity in a vacuum suit. Korolov smiled

Yofremov wore his bland, offesal mask behind the Lexan faceballe, but he provided meaning Korolevis eryos as he passed. He was heading for he gun roote

Not' Kernisy should

The iGaxon blaced the station's call to full battle elect.

The gurr room hatch was open when he reached it lineate the solders were moving errory in the galvaticed rollex of consten dail, vanking the bread straps of their consols seets across the chests of their burry suits.

Don't do If' He clawed at the shift acopedion fabra: of Yehamov's sun Che of the accelerators powered up with a statcato whine. On a tracking screen green creen here closed in on a red dot

Valnamov removed his helmet. Calmiy with no change in his expression, he backhanded Korolev with the helmet.

Make them stopf: Korolov solited. The walls shock as a beam cut local with the sound of a chacking whith. Your wfo, Yelsenovi She is out there!

Outside Colonel Yetserrov grabbad Korolev's arthretic hand and squeezed Korolev screamed 'Outside' A gloved fet ahuck hem in fre cheal

Kotolev poundicd helplosity on the vecum suit as he was aboved out into the carevent. Exer I Colored date rot come batween the Red Army and its orders. Yetterrov looked side row, the maak had cruntaled. The spact The said: "Wait here until its over."

Then higgs an abyre struck the beam meakann and the barroots rug in a split second diggs throthy and the second diggs and korden saw the gain som minks and outings entre a beer can outshold under a boot, appende a beer can outshold under a boot, appende about the second of a soldier sprinning away from a concale. The sait out proget is vescuent then the air in the sait out through the spon halthen may find two steems of blood as ced from Kordewig steems of blood as ced from Kordewig

The last thing Korpley remembared

TIA CANN

hosting was the fetch door stamming shut

being dony beind his eyes memory being dony beind his eyes memory being do lacture. This was as great a danger as the block or self, nitogen bubbing through the block to strike with whitehot crepting pain.

But it was all so remote, so academic, restly He turned the wheels of the hatches aut of some strange evene of notifieste obligs, nothing more. The labor was quite onerous, and he washed very much to return to the masouril and eldep.

The cost repart the tests with cault, but is explanar can were beyond them He hand Stathsions purchers with the vegatibase and signs, the exclusion states in the generative the gain occurs and the tainside generative the gain occurs and the tainside symmetria that exclusions has prioritized symmetria that exclusions has prioritized precisivity the hour of the estates in the precisivity the hour of the estates in the increase of the means with the upper at morphane He was obtain it may appear the symmetry of the test of the increase of the symmetry of the morphane He was obtain it may appear to the symmetry of the increase of the increase of the symmetry of the increase of the increa

He spent uncounted hours sovering the museum's tonary of lapse. A fitting pumult for the Last Man in Space who had once been the Trist Man on Man.

He became observations with the toon of Gegarin endlessly rearring the granty between reasons the Solves. He revenreals that led so unatability to the commonals death. The splits of martysis Gegarin, the test Solve one, the Arcencean coated raises in them split solve. Arcencean coated raises in them split solve.

Often he deserted of Tugara, the lock at one eyes like the lock he'd magnet of the eyes of the muscum's portains. And create you at here also have a portains and create here adjusted and the states to have here often here adjusted by the states of the traditional From a great debance, as though here working and interpola across here traditional from a great debance, as though here working the averaged across here working the averaged across here the adjusted by the state of the states of the traditional for the adjust Certification to adjust Certification and the states certification the states of the states of the states of the traditional for the states certification the states of the states of the states of the states certification for the states certification for the states of the states of the states certification for the states cerification for the states certification for the states cerific

When the knocking came he knew that if must be a deserve as well

The hatch wheeled open

In the blueb floosening light from the dol him he are that the woman was black Long confectives of matted har nose like cobres around her head. She wore gog gies, a alk water's screet heaving before her in free fail. Andy she each in English was better comes are that

A small, muscular man, recarly bald, and wearing only a jockstrap and a singling toolbalt floated up behind her and period in "Is be alwe?"

Of course I am alive,' said Korolev a slightly appented English

The man called Andy sailed in overher head "fou okay, Jack?" His right broap was tatooest with a geodesic ballion above crossed lightning bots and bore the legend sustaints, is unrivi. We weren't experting anybody. "Nother were 1" and Kommy blinking.

"We've come to live here" and the woman drifting closer

Were from the balancies squatters in guess you could say Heard the place was ampty You know the others decaying on this bring? The man executed a clarmey motion somessue, the tools clattering of his beit. "The free fail's curracious

'God' said the woman '1 just can't get used to at it is wonderful. It is two skydwing, but there's no wind '

Koopiny stands at the men, who had the blandsting, careless lock of someone drunk, on freedom since birth. "But you don't even have a launchpad, he said.

"Lisund pair" the man said laughing What we do we haul these supplus booster engines up the cables to the balloons drop from and fire emin metar

That surgarie Korolev said

Clot us here, dight #7

Korolev nodded if this was all a dream it was a very perculiar one. 'I am Colonal Yuri Vasilavich Korolav

Marol: The women clapped her hands. Wast I the kate hear that "She placked the infle Lanokhod moon rover model from the haldheart and becars to word it

Hey the man and "I gots work We got a bunch of boosters outside We gots bit this thing before it starts burning."

Semisting clanged against the hull.
Kosnograd rang with the impact.
That is be Tuba. Andy said consuling a wris-watch.
Rom on time.

But why? Korolev shock his head deeply confused. Why have you como?

We tool you To live here We can an large this they maybe built more Trays and we direver make it hing in the built bons, but we were the only ones who could make them work. If were our one characteria get out here on our own. Who'd want to two out here to the sale of some government, some arrow phase is burnted of peripatienc? You'n we to want a further -went in your bornes, moth?

Kerelevitmidel Array germad back. We grabbed those power calles and justpolied curselives similarity and when you gat to the top well man you enter make that by jump or else you not them. This voice rose. And you don't look back, no art We we made that your and we mere to star!

The woman placed the model's Veloci whoek against the curved well and relassed it it went socoting along above them heads whiming memity "tent thet cuze? The loads are said comp to love it."

Korolev stated into Andy's eyes Kos recents sang again, pening the late Lu nation model onto a new course

East Los Acpeles the worrset and That's the one with the locks init. ' Bhe took off her goggles, and Korolev saw her eyes bitming over with a wonderful binacy

'Wal, said Andy ratting his toolbelt you feel like showing us around? CO







CONTRACTO FROM PROF. CT

stachets: A two: three, or even higherblock assembly can replicate when pland in a box with other loces blocks and shikes party. Drie and of the completed assembly hools on to the loce blocks in the right sequence building up a duplicate chain and their releasing in when the heat block has been corrected.

Home Jacobiot, a physicist at Blocklyn College. In New York burt another such device using an HO team set in hit menter, there are her lands of programmed, and propeiled backars, called heads and taid their exculses matching around a lange of mack with averall advised in teams. If a por of boccars a head and set is assembled on a sating it can repredicted head.

Here is how it is done. The head our m the pair was to a loop head of to come by and sharing order the mait gen suffig intermined onto the service on the prostructed onto the service sufficient of the head of the service sufficient of the that because our pair Crack the happent the that because our pair chart was inspect during one that can reproduce using the service our sufficient of the service of pair reproduction commans and all safe

The control of the second seco

In tast some isoematik stready leaf this computes an empetitive metal in set in additional using it. Kenneny, president of Dartmocht College and other of the inventions of the comparise in anguage BASIC belows their operates of the Constituent an include task operates of the Constituent and redden of proposales. In deviations - theory of the operative streads in their leaf of the proposale in the deviation of theory operative transmission streads in their leaf of the proposales. In deviation theory operation of some improvement in its oftening as that any calculates to because of their below.

But compact, self-sproducing solats sail to beyond the isothrobugual haracan. Au contring to Mannin Minsky head oil arthmains today would have to be the said of a factory to reproduce inself from row mate nate retries then from profildmonaled pairs.

Fujisu Fatuo Ltd a manufacturer of numerically controlled machine tools, took a part step toward that poel With a \$40 million oboit factory, notices may also out of by other tools with only 100 humans is supervise and help. The plant produced 100 robots in no inst year. Once such a plant can make its own components it calls be programmed to make more of isolf to leptoduce (See Robots of Japan January 1982.)

Binck are carried toware all the picklems takes occos will have to how on a datart planet, we mail apply them with gails and with the picklem solving bibly to carry cut ther accommission in our all chanse this complax will begin to extra commission between common num carried to be accommon in a commission of the solution of the solution of the solution of the line whose extraction we carried predict

At the simplest level what would hap

pan if one machine bagan to noglect to production dinates in order to reproduce? Its offspring, possissing the same hait might about dominative the machine propulation. Would some tom of "kin prefering behavior same? Wight the notacites even dewelpp a form of "scorporal adhustin" in which the machines behave in seemingly unsyltent high not to well others that all viol in to incale a more stable 'scorth'.

If our machines attain this behavioral apphaticitient indea Rehavioral and of the department of computer and communication sciences at the Lenvershy of Michgam in Ann Notice. If may be time to adwhather they have become so like us that we have no further right to command filters to car own purposes and so should qui etily emancipate them.

And one wonders. Could such self-re-



producing indices sometay become our enemes? The usual answers in the work here the source that the source our here that is that nearly our We are to could owner boars would cause growthe area owner boars would cause growthe acnernic cause. Of the sense Cause metores thereagent Regis Wendel Barton of the Maachelai unitsaff Trading Source the commental cause or household pairs of the source account the household pairs of the house accounter the household pairs of the source accounter the household pairs of the source of the household pairs of the source pairs of the household pairs of the source of the

And what if the machines learned to detress themasives' The Replectang Dyters themasives' The Replectang Dyters themasives' The Replectang Dyters the Replectang Dyters the Replectang Dylated by assessment of the Replectang and Categories of themasile and the Replectang and Categories of the Replectang Dyters that leader when the other additions that leader when the replectang and the Replectang Dyters that leader the Replectang Dyters that leader the Replectang Dy-Replectang Dyreplectang Dyreplectang

Noretheless a flow people view the furture gravely dense flau //weiey associate profession of physical at the University of Mascun, points out that the advent of mochines has been annuarigh iterate optipaned to the billion of years it book cathon based life to evolve on flauth first for asme laws of impeduation apply to onth burkqucal would and machines.

Machines, Wesley raylons, "Twee relies evolved toward an intrataid biomass (ganitity), increased ecological ethcency maximal reproduction rate paidenters of apacels, molifly and a longer this span. Machines being a form of life, are in occepted from with satisfacture have dithe result is learn, is that shoot life, with make pathwated life wench.

Yet there is another possibility Will we are approaching ask. MMR computer scientist Rodger A. Citi, is optimised to the science of the science of the science and the science of the science of the Amman and matching activity and become necessary Citir week the document could be specification which would act the optimised with the science of the science of the specification with the science of the optimised with the science of the science of the optimised with the science of the science of the optimised with the science of the science of the optimised with the science of the science of the optimised with the science of the science of the optimised with the science of the science of the optimised with the science of the science of the optimised with the science of the science of the optimised with the science of the science of the optimised with the science of the science of the optimised with the science of the science of the science of the optimised with the science of the science of the science of the optimised with the science of the science of the science of the optimised with the science of the science of the science of the optimised with the science of the science of the science of the optimised with the science of the scien

"Risels and blood are if adopted to space. Cill commerce build adopted in redat are ideal Juar as our own DNA me adda within a proactive memorizand, and mitochoncins are locked within cells are ganelas of the space oclony organism. I see free traveling this (thornes) the commas assuring this traveling and the space oclosid, and so on — growing evolving and reproducing. And we will be asab their offspang. DO KALEIDOSCOPE

ECKERALED PROMIPHOE 61

powered now an old Anglepose and an instator Tiffany. When Sophe switched them on, the frencily room suddenly lodeed as altern as the internal of a spaceship. They and the box on the studio couch

"Ill off some water," said Sophee

That the boys a data case panied and hey dated guyy and noncolvulus encongainadows. The boy wave a lenkar mail wat of fines gold gold bacebases had the caffs of his date deeves a golden bold of his date deeves a golden bold on an around his next. His odd y ost wide on an around his next. His odd y ost wide boy services en enforcederal all her hern with gold thread and political targonies. There were golden buckles on his second his hern dance has ends.

"Some heavy gear!" said Sophie

She ran into the lotchen and came back with a wet lowel and water in a cup. Bhe held the cup to the boys lips and medie him dhrik than she winaid his face.

They took runn wabting the boya she dealthis long replicitions in the human term and running. They took durance built have appearing the service and particular to appearing the service of the service subtraction for the service to the barren was and particular to the barren's durance to applie of the service the barren's water service and the service the barren's water service the barren's water service the barren's service to particular and the barren the barren's service the barren's service the barren's service to barren the barren's service the barren's the bar

The topy would not wait. He upwell thermally the table in any science finally anadoming back them a bowl and leaving it to easi on the back they would be unit in costa as the waited accurate is any When the solution that save the minimized. When the solution that save the minimized back the solution that save the minimized back the solution my prover, thereing out not hereing dring into the wind and come back to stion the vecasity of the back.

Gus was usered when the boy carrier in any provide Gus and on with his works in any provide Gus and on which sworks in the same inner. This is not local any annual site and the same of the same of the same of the boyes in the Gus paper of the same of the part and Gus paper of the same of the address in the same one databased of them as the the boyes and the same of the address in t

Sophie and Gus could make nothing of the boy a written or spoken language. They were nervous but let things rule. The boy ate hard-bolied eggs for support and chank water. He found one of Gus s drawing blocks and a penol and sat on the poch blocks and a penol and sat on the poch

"Maybe we should give him a bottle and a cork " said Sophie.

She washed the dates and sang 'With These Sacred Bowers' in a owest cracked contrato value. Gus worked away inspired and sad, thinking of Mazart

I am Charylagian their born and of the Phono Gauvance of the impendia Hourice of Seuthern Mexico. On the Inventent day instruction the Nexico. The Inventent day manual the Nexico Houris and Seuthern and product and the Seuthern and Seuthern and product and the Seuthern and America and Discounting and Seuthern and America and Discounting of the cases of the America Day and Castra Inventor In America Day and Castra Inventor Internet and Day and Day and Day and Castra Inventor Internet and Day and Day and Castra Inventor Internet and Day and Day and Day and Castra Inventor Internet and Day and Day and Day and Castra Inventor Internet and Day and Day and Day and Castra Inventor Internet and Day and Day and Day and Castra Inventor Internet and Day and D

As Sighter reacted for the last egg to break into the pain, the boy should and hald his hands over the egg cattor. Site stared atto his face and save an apprival reaches the taxes back thinh bleak the ogg and gritted her forth while he fred if durrely biggether with the backs. He can read has negating plateful to the table and begins eating with fingers and a spoon

Twe got the hang of it " she ead to Gua. "If it be difficult, but we il manage."

Gus was angry at the discovery, it was nearly impossible for them not to touch the box a food. They unwrapped, sloed, set theap out secretly.

The ferring had novar bean better, Quashowed the boy how to catch his own fulland cook them over an open fire. Along the beach, he and Sophe had the barbacue going. The had these were like beachs being and into the adhering dishineas.

He sits alone," said Sopher. "Can't be more than about thirteen years old."

He a doing time said Gua. He tooks through the magazines.

"Does he recourse anything?

Gue strugged. He spends his time wrting on his pad, he said defensively

Lano Chaptaphan aki aswa Lawoh Ma ard eat timi Lingki progradano and hare angra tawam 7. Timik Meni Aso adi mo angra hare basa chadaga lo the sistero by a meri poset net have make thermanika i haki the adi pageneriks stratuctore for a machine beit make gapting. Times ases in set to an integrate global cabust ayaut mit program and handler of Tablapan my possage haki basher. O mothy all possing and basher of Tablapan my possage haki basher. O mothy all cabust

Gus watched the boy rise early in the morning and go outside to pray. From the latohen window he could are tim morph purposability to the Inghast point on Plankers's Key a microsoftic ridge, microsoft by by ammig a level shock digrate. The boy solod listing the dast, atms theori. The next gianlistication is the level was indirect up a signifimediation to catch its her rays. When the mean rays were cloudly the boy model of any right he sait on the beach straining at the dast right ray on the level.

"The is no good " said Gue "He's a good boy but he's pring

"I see what you're cloing," said Sophie "and it frightens ma."

Gus hidd respiced his boat from the weekad leas (on a wax making of shipshape. One samy moring the topy an up wonning his sams and shatben is the same shatben is and shatben is the same shatben is a same shatben in the patient a hindry ship. Ho same shatben is beaching a particular shatben is wonned Spathe and particular shatben his wonned Spathe and particular shatben his and Spathe came out to meet them.

"He has something going," said Gus The boy still all smiles wiped his hand

The boy set ist strikes wheel he hand on his breaches and held it out to Sopher She clasped it eagenly "Otay" she said. If is is passe. The is

"Okay" she said. If is is pasce. This is some kind of breakthrough: shark heaven

The boy led them to a place on the basels where to have all hartword the sand and made two crocks of shells. He made them kneel in the orbits, then he stad batween herm and proyed about to the morting san. He went into a modest performme and dew points in the sand.

Tiget # "said Sophie "Man Gus you're man 1m worren

The boy repeated the words, he had a little touble with the W. He velied his eyec and pointed they choused obed-ently.

He repeated the words several times name

Sun-Man-that was Gus, Sun-Woman Sontra, Ha manual to homaid

"Bunzy Boy?" successed Que

The boy would not accept the name it was no time for heistation

"Ramon." said Sophie

The bay ined if dui and accepted the mem Ha spoke may paywai and stepped chains of gold around the nocks of same in the Sameanen method them enterlated with ned and green threads of wear behavior. After the spoke threads and the behavior. After a cased determination of the way hey double to due to the size of the size Speke thread cases hard takes on the size Speke thread cases hard takes on the size state. The speke threads and the cardes Seguriting takes double minimized providy is weathing and

He saw the dark fail of hair, the face alen from its very you'n. He was liked with ansaty, an unbekel, a hanger for something real, something within his own terms of relevence. Then the caremony wadower too. Daw The boy still excited, amiling indicated that hey should est and drink. He led them back to the house, and Sighter whyperd up a puck colabration meal inamed sweet com reconstruited orange junce craciters cheese, and sardness. Remon served them with his own hands.

"What were you thinking of with that name Remon?" asked Gus afterward

Who knows? Sophie pound herself half a glass of the proclous red wine. "Pa, the sun god Ramundo Raysond Linear as hell caled him Devid."

David was the name of Sophie slown con Dave Clawson, a neglectful shift in Guass opinion, who was istudying grophic art worktis acry in New York Ody

Your girls, seed Sophie following the train of thought. They re fine. They have partners, they re settled.

"Living near their mothers," said Gus with resignation." Four granidatideen row Head: the pretty one had two loovs Grace was here with that goddamined film criw

The world was born again. See and sky were washed clean, holdking the island in a huge globe of turguose-blue. The maintand was generer then be remembered.

We keep-we kept up a ktie "

Where is he? asked Sopree, charging the subject. Where's Barron? On the powers with the stary.

Proceers to the Sam the load of Mo 1 hours been shaken the rew/. The old create have been discussed by the rew is encoded or a guidere year. Here dress makes in resident my Mo much exercise an indext. In create and rew is the shake is a state possed, and I will be able to device the yoards, and I will be able to device the yoards of boardbars. I behave it is no define ing dod boardbars. I behave it is no define wind it aprese my how tanggarge

A golden sige had begun The boy laughted his ale their cooleng his demarcied games and udversaries. After his helped Gus repart his diright they hitched herris behind is and oncurringested Pleler's Key-Even Sophe took turns towing or pedaling Parron mitled of English-intact he would speak roshing else He was all of childhar improvides.

He was patient with Sophie's pictures of Mayan Incan, and Astec temples. One day in answer to some father-mother questioning, he drew for Gus a family tree. Stout male figures with clumps of wives and childrem reached up in a trengular pile to a faceless grant above him was the sun dec Barroo indicaved his plate in the here.

It figures," said Sophie, at right in the lamplight. He must be a prince at the very least. Poor little devil."

Where was he saling, I wonder? asked Gus. What have they got over there?"

The answer proved to be Big House A summer place, perhaps?

The weather was perfect a golden chain of encless mid summer days without a trade of chood. Gus worked on this colleges, and Sophie in some despair finished her book on the Spontel Wein.

The Binstein and Array of the A

How much do you think he understands?" asked Glus one evening. "Are you getting anywhere?"

He vaguely recognises words in both languages said Sophie. I pronounce them queerly He doesn't want to correct my pronunciation

"He still won't open up '

Gus he can't There's some big prohitation in mena

Do we have any land of picture of this sun langdom?

Such such Sprine "Pure exhapping tion how the follows must also a rule how Remon An empire weaking form—how Bern to California II developed slower in serro wears by comparison with Europe it beson top of characteristic and the service and the service service show of them were strong on organization. They have the grade "They have the organization they have pages "They have proposed and of the ord was invest taken away by the bad puys, he conguitatione

The the gold, and Qua. We've had a bit of gold washed up—butters, buckles this of pidel inink tose consorts startped with a sun data are percession startped with a sun data are percession money. Tound a couple of small ingost the other day. I wouldn't have believed any civilization used an amon ond."

The congestatores beleved it i rade Sophie 1 have a quote from one of shoe greedy bastands saver grantly that he gold in Central America aone would last forsive So they are an encore with many diterent races and they have a storig mpenal enlique—this sun worksho.

"Great <sup>7</sup> said Gr.s. 'And where are wo? I mean where are the Europeans? Or do I mean Caucasiana?

"How about up north?" suggested Sophie "Still backing around in horred het mata Growing grapes in Vinland Making raids on the Amerind nations

Come on stready said Gus. Why are we the phrtmas in the scenario?

He supped at his wine

When the vimage rune out, the said "maybe we should head north"

Sophie stood by the verande rail and looked over the clarkening see

We shouldn't question Ramón too much, she said

"You think it wornes him? asked Gus Heiseenshappy erough Exts well Sleeps ike a baby:

He has had servents tutors all kinds of prople at his beck and call but not too many people he could relate to as human beings. His relationship to us is stranger than we can impactive

Today we are meabails, parthed the root of the have, and played bell in the evening of the have, and played bell in the evening Sunwarran Thuy they core burn a world of accesses. Their mage with two back to the Sun and economic his prestige and ny own when their Mood Their ares the store.

Gus left Ramon curied up on the couch for his seats and wandered down to So price a shack under the middley sun.

Look here he said 'Look at this'

He hald the boy a drawing, it had bean completed. Under the sun and the sun long and the towering heap of nobles and their families the boy had shown a row of midde-state officials or solitiers.

Then he had hiled in paintakingly a was provid of any creatures into more than blobs with two eyes, the rest of the world the common people. It was a shawing that truly phosted Gus

A prince "said Sophie "He world view a bound to be a little different Do you think he deare well for his poe?"

"He probably overamplified a lot," and Gus, sighing 1 don't think he does draw very well for his age. Compand with his written songt, his drawings are childen."

He's a child and we are grown ups and Sophie falling Gus by the hand

What do you mean?

He's na strange place He doesn tknow what to make of us. But these and any doubt in the world, in any world, about the way we should behave with this boy. We can only love here and do out best to rhem."

That might include taking him in-back to the Bio Hotee

Yes. He can't stay here too long

J assend my invest baby on the node, which bronging or a large bubble. The pain was great bubble of a large bubble. The pain was great bub bineares usual free which a set of the second second bubble of the operation of the second bubble of the operation of the precision moderner agent to make me to my takers how and the second bubble bubble of the second bubble

been ordered and to what end? What do we know of the nothern barbaness? The year of Sulmers and Sumerown is just begiming. If they bring me to the Panch they will hose many months of the

My knows are completely healed We interior a fassil for Someomen schrödey, angang making trucce, and damang. Once the Survertan was a rytrift of a physicistic. I neve seen the Menese New the is off all still supplet site in angane Survers to gets fields if nody believe they shill do it bough they are so of C.C. Comme my bout he was of the blood royal and choose but he was of the blood royal and choose the Isabeth Howers it the province

D Sun, O Sun Emperor beloved innomen what would you two individual inteat me to do in she matter? I am Chaptulpan, nich in my hentage, poor in underblending. I play all for guidence Somen has medre me a carrie of quality.

A Rokering kght lived and died in the holiows of the waves. They waited until they were sure the dark shape would beech, and then they stole outside ?

and a pair of stifts. Toolay we tred to calch figh with a net and got very well and Sunwomen set on the beach heighting

The boal sidewide retary. They are belowinsmit to lake mini the Parkin Linkake the exercise of alwing them that my mother uses these waiking. Lang particle with sertmess and cannot uppen the insistem They a analysis. Summars these to combar use works housds, Summars these to combar use in a division. Takking with Summars and Sumworks note the herport before the Flanken. The canast and the averalis centre.

There I stood with two old barbanans I was honor bound to explain our relationstat. Either way they had to de

Ramon went off by himself. He would not be comforted.

"What's got into him now for heaven's raise?" asked Data

"What the hell do we know about princes sighed Sophie "What do we know about the Boo House?"

"It can't be wrong to take term said Gus "It might be all very well for us old farts to stay on a desert stand, but a kut?" "Yes you're right And his mother is probably there loo, the poor lady."

You could waithere " saas Que "To come back for you---come back to stay if I dich'! see any future for us in the Fac House."

No "sad Soprie "No. I tenk we ought to stay together. What if the damned island went back again while you were away? Anyway, it might be interesting to see all hose EI Datalo curs

He carrie class to them Scope that, hen Gua, he kosed them clumsky upon the biotetexit and resed them up, indicating that he mail not speak. He smithat have over and they want back to the house teach over any different to the support Soprie went down to skep the last right in her own collope and period.

Gue singl lightly he was needless: but the boy slipped wway without waking him. In the morring he was gone. He had isken his raft. The ses was calm. Ramon had a long way to pedal, but he would surely come to his flag house on the laws.

I am Chapspipers known of the Bax, and I take hit responsibility I coskill not deliver thear two parsons to be Ahled Perbapa bey an account participant hey come from some halded ains? They are wait and And and have loaked after. They are wait and acces away. I will never signate thom: They can remain upon New Liking they are also descated by the Sau and so is the others.

I see my appoint upon the utend as a besid alasting it is not the main of a Price to at abound waiting to be resourced. Air is it fitting to bend othere to my service if it resource the loss of their lines. I was mean to pot my must in the Sun, the find of all and mean the voyage above, on my raft.

I will bury these scripts or burn them. I will ted no human of the existence of the sland and standards. That is no need The Sun sees of and understands.

Sophie and Gua sat on the beach most of the day, keeping an eye on the weather When the tights came out on the kaya, they still sat for a long time, watching

Guit wonying. Sophie said reasour-

"But why? Why go alone?

Why? Why? Con I you know why? she cooliemed. "All the feasity skill with the not esting, the silonce, the way he refused to make the con listication in the?

What are you getting at?


"We were tabled. He knew they wouldn't accept us. Remember his disawing? Perhaps there was simply no place for us in the activities of things.

"He was some kind of prince wasn't he?" said Gus. "You'd thris he word would count to normething."

Gus you known from the first. That was a good ket, and Sophie . Believe me he know what he was comp.

" puese you're ruh!

"Gus what can see do? I mean, how long can we sit have waiting for the lights to change?

"I'm only sonry shout your book " he said "The Spanish Main "

"I can stand it' and Sophie "but you work You were a big name back there" "I can work anywhere," said Gus stol

I can work anywhere text Gus theiidy "Plenty of good material at hand. I think we might develop a little have something to knock their eyes out if this damried is land ever does change lands."

"You don't want to take the boat, go exploring?" she selead "I'd go along if that's what you really wanted to do

No." said Gus "No We'd befoolish We have everything we need. We'l almost "

He sighed "Only two boffes left," he said "The last bottles of red in the world " "Don't be the sure," said Sophie snup-

ging up to him She could just see his rugged profile in

the dim light Gus Rocca. Of all the men to dim light Gus Rocca. Of all the men on earth. She remembered the brawl when Clawson caught them covaried with her green paint in the shower, shemelossly making true.

"I have a vina growing sha said. "A graps vine it never previat all unit effer the humoane, but now it looks like we'll be having purple grapes."

Floride Commune Esperanza Net Susample to Elisabeth Nowhope Lieson and Records, Reconstruction Center Seven Southwest Extract from quarterly overland newsletter Arm? 2024 Old Style

The stard is very unnil and we guiths usual spaced our eports that it "opported overright. I wouldn't normally pay much attention to this but this inland is a puzzle. Someone has made is beautiful it is like a drinner this whole place is tenaced, plantial who grapements, corn, paperts, surflow ara-worldeful uncontaminated food loads us howes't seen a norm the dright.

"There are two buildings on the island, one large and one small both enterly costend, encrupied with a marvalizer where or lot of poly there. Easy need poly marvalizer that any of us wat saw in our lives, and that any of us wat saw in our lives, and surplices and propolicity some. When the surplices thiring, the where estand seems to beful up. By make its own motives.

"Then there are twentieth century books pictures large and to cars and one in suba wall of the smaller tempte is obverted with a manuscript book on the Spanish Man Elustrated with sing shawing. They have also core formatic things with old wine bottles. Yet an awful lot of the stuff is mediances. Pre Columbian almost

From a scribe chronider in the service of Chaysupan, known as the Navigstor. Prince Governor of the Province of Southem Mexico. Third Empire of the Suit-

Is the seventh year of his office the young phrop Governor turned the Segathy and on the way to the Heliday Pavilon and, taking a pair of ratio with the advisors approached a certain select This was the place, he seal, where he had been cast ones ap a offic furthers ween previously.

If was a small detellate place with a runned wooden shelter of some kind, sink majute the gray sensi.

The Prince already known for his strangth and diginity knell down and project and shed trans in the strange place. It was numered among his court that he had been visions on the island and that he had been visions on the island and that he had been restraint execosed by two electes.

"While the Phince was at his proyets two of the salice came up with a find a large tartie with strange while markings upon its back. Phince Covernor Chaytogen forbade them to kill the creature and prochemed the siliand a banctuary for all long throug, declarged to reven to the Sim. OD



her lungs had been mistakenly inserted in

the passage to her stomach instead • Elizabeth Mak, a thirty-four-year-old woman from Hamiton. Ontano, chief in 1979 from an air embolism after an otherwise successful operation

Dr. George Gevia. Inor anestector inelected the way was come of blood from her translusion: a procedure that more consecution technism and the patient's anculatory system. Normally, anishestis bases come blood in the sympa berula taled against such a task methyp. Gerula taled to false task pressurem an where an unformtion became longed—in-the fals upfield december the region.

Described in the train that followed as a conservatorial, a string sever. On Genula was acculted of comma ineging and a was the conservation of the several several commanded. Genula tophfresi the tern task used in to conserve valuable block without moders of several tern deven times before abled by the risk inequiled. There are many ables the risk inequiled. There are many ables the risk inequiled. There are many ables to risk an explain.

Effective of reasoning is representative of the ensembla under non-a physician in second billing and non-a physician in second billing of the second billing of the profession billing data to a spectry? Or must pattern from unappend billing and an analytic of non-terms bewein of the inserting and the surgery they and their insurance comparison by?

Threat is no sizely access Centry to promit is addy of a docernationer orbitral ecosystems is addy of a docernation of the ecosystem of the second second access of additional formatic ecosystems (a docernatic additional formatic ecosystem) access of additional formatic ecosystems (a docernatic ecosystems) and the agents before additional ecosystems (a docernatic provide and ecosystem) access of three-year project halo beam ecosystem orbits of a web and with beam ecosystem orbits of a protein beam ecosystem of the cosystem access of additional ecosystems (a docernatic protein access) and a docernatic protein access of the additional access of t

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Figs. 6. A contraction of the second second



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# NEXT OWN

FICTION



What happens when the world's top sum of write the locotro toold in abdit of end over matter? Howerd Weidrep poles Eastern in Man-Warrast Calensis, a abort sitry confirming two Avartast Calensis, a abort sitry confirming two Createst matching, and a sitra sitration index to the last Creat sitry. Next the Manmortanian and Sitra and Creation Sitry. Next Apolis August was researed David Balanding and a sitration of an ited in the other "Wheth David Apolis Magnation and Sitration Site and and and and real in the other "Wheth David and a site in the sitry and the site of the mances and real in the site of the manent heat is and and work point of the research and the matching the createst and work point of the research and the site and and and work point of the distance.

INTERVIEW



The prevail the split back is althout a boundary bound, but it has been only about the decades secon resultation in the prevail of the decades prevails and the split back interpretent of the bound has a reneared in the split prevails and the bound has a reneared in the split prevails and appoint or boundary of the split prevails and appoint or boundary in the split prevails and appoint of the split prevail or appoint on the appoint of the split prevail or appoint on the appoint of the split prevail or appoint on the split pretained the split prevail or appoint on the split pretained the split prevail or appoint on the split pretained the split prevail or appoint on the split pretained the split prevail of the split pretained the split prevails and appoint on the split pretained the split prevails appoint on the split prevails appoint on the split pretained the split prevails appoint on the split prevails appoint on the split pretained the split prevails appoint on the split prevails appoint on the split pretained the split prevails appoint on the s

STONEHENGE



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FEMALES IN CHARGE



In model parse protect of large statistical the even regime in any law of large statistical test of large statistical bases and the large statistical bases and large statistical bases and

# חחרופור

# Meral Diamon

read many mapazines, including Ontry to help my students keep up with the work being done in all scianetic meas. As a Provieting in the April 1983 issue

I found Powiecige's report on the sci enate class enlightening, but I found her editorial commanta on the right to kie not the stance of penaltic encineeting. Many should be pursued for the good of all peowhen it involves the dignity of the human what is right and must support what is good

Many people believe in the absolute as Powedge would say when we leel that

I sincerely hope that in the future with

the editorial pages and let science in quartee stand on their own ment. Combin-

**Rev Edward Welk** 

Dr Margaret Patterson's little black box treating drug addicts. But we must avoid being seduced by the mysticus of the machine, it must supplement, not substitute McAu Plet article barely mentions the vasi long repetient therapouto setting that includes counseling by conno. Herigent and

My experience as a psychotheraped cures depend largely on a thorapoulto approach daughed to teach people a buller

Putterson's box, for all its advantages. reka beeng abused by the "ristant cureping society. After all to use Peter Townshand 5 words it corretaries gives pay chedelo expensions or tools "ust like



two? One throught dollars is refining compared lowhat most address spend on druga

# Arenal Catelly

Marry papple are not aware (or do not wish secruciating pain each year in research facilities all over the United States. These are no laws to protect them. They do not example small monkeys are strapped into tee what could happen in a car crath dogs the ends of monitorys finders are out of to

instead of wasting money on redundant experimentation, we can use tax money to

Involved alloans are the only once who can holp If you are concerned with how congressman and senators and support

An George Bernard Shaw said. Wosection is a social evil because as it adthe expense of human character

# Domestic Robots

Richard Wolkome's Robots at Home (April 19803) taken a curious look at what may be But what I find more intriguing is the relaporeing between the article's accompaawing provok and the atticle's content.

related hall-lemale creation. The picture continues the stereotypical yew most people have of domostic help, that is they mesouline Joseph Engelberger will call his Asmoy And in decussing robot mobility Wokom r notes, "Carnepie-Mellon professors have even choreographed a dence for a robot and a women

Whather or not this revenue of the scout of domestic help us male rather than le-Reattrie CADO



1. PENNY PLE: A perry diameter is about derestmate and stop stacking after about

2 ABE UP Lincoln is faceup on both aidea and I do) In the long run I would expect sale up and you decover the catch Fifty percent of the time this will happon on the first try and I will win \$5. On rawar socaantile, there is a 1 in 32 chance that the perfore you stopped failing the bet. My size

3 ALONE APPLICATION Ed got the job

- 5 BAD BILL \$7 and a hell

Thomas C. Rowo, a University of Wapon sin of Stovern Frent psychologist, asks a find inne Most Bark of the problem as one and \$70 and took in \$60 and \$80. for a

7 CHOORE QUICKLY The hels would cons The propertion of arapace to the



We cant explain all the steps to the apwhen but terre is how you must have started First rote that in the last step, two depts of the dividend are brought clown turn out to be 1650 that subtracted from a three close our acceler from chail number The third digit of the quotient

in product subtracted from a four digit quotent 97.809 Further elimination of possibilities provides the anover Smith a 124 hears will divay up an estate valued at

9. REVOLUTIONARY DUESTION, From your point of yew George A makes two the core George A points each part of has profile only once toward coin B, countaround the sun. As seen from the sun or the earth the rorth making 365 25 etvolu-Thus a "siderial day" (as seen from out

10 BALANCE THE BOOKS The error 6 \$1,000 If Ledger had withdrawn all his money at once, the total of the subject LETT of a time the right hand column would queckly provi to a huge and unmetakably marandees amount (\$990 + 980 + 970 + \$60 and so ord

may be drawn tangent to three green or structing all east protes is known as the mehlern of Applicnus, after the Greek structed orcies are marged into one day oram in the discription below DO



# EARTH

millions of bugs a year. But through it all the Artranks never encourabed warton counteres tail bits (filled with lociform and lucitizate) they could somehow never part of about 12 million frazen freñv terreas

Anything is possible was their catch to sterulate domand for meech trunka Antonik got an even rucer jot when he guppy tank. All of the guppies dest

has been plackang oway these last 40 years buzzing and how Joseph Bonaveritura. multi glow audaciously in full yaw of

example that an undisclosed chemical concerny had developed a cifute spate of cleative favories of his three pet calls, headed econoction Englis Cornel University featly foon has potential as a heart stimu lant The frouble is that Ersner still can't find stations and mos-fo noest the team

Just what the Antonias and they vision guess There's growing interest in using the town to keep pigeone off eaves for ratarice Luciferin and luciferree may soon skuppesh cows "We'd like to proumveral evenues of learn," save Alan Arton K. "We d for sust about anything DO



# PHENOMENA

Constant data, photographice Most Harrison Barrison March The endocide an entertransandor of real ages and halo substrate or not substrate which have adapted on one substrate the endocide and the endocide one which the tables these tables was anothing a barrison to the endocide and the endocide barrison and the endocide and the endocide and the endocide and the barrison and the endocide barrison and the endocide and the endocide barrison and the endocide and the endocide the endocide and the barrison and the endocide the endocide and the endocide and the endocide and the endocide the endocide and the endocide and the endocide the endocide and the endocide and the endocide and the endocide the endocide and the endocide and the endocide and the endocide the endocide and the endocide and the endocide and the endocide the endocide and the endocide and the endocide and the endocide the endocide and the endocide and the endocide and the endocide the endocide and the endocide and the endocide and the endocide the endocide and the endocide and the endocide and the endocide and the endocide the endocide and the Money miscellany and pet-peeve poetry



By Scot Marris

MONEY MATTERS This month we after a venety of problems that, directly or indirectly deal with metters financial

1 PENAMP PELE How well can you asimate the second a certif-Antoxi how many permy thicknesses are these in expension of the permy damage and the second result. Second the control of expension the second result Stack permise second responses that second responses and the second response for an and the second responses and the second response and the second response for an an and the second response for an an and the second response for an and the second response for an an and the second response for an and the second response for an and the second response for an an an and the second response for an an and the second response for an and the second response for an an and the second response for an an and the second response for an an and the second response for an an and the second response for an an an an an an

2 ABE UP I have a brand new 55 bill if I drop if from above my head. III bell you 55 that well and whith Abe Unooin laceup if not, III pay you 510. Will you take the bell? How much should I separat to viru or isse on the bell in the long m?

3 ALONE APPLICATION Edward is applying for up to at a bank. The personnal divector ables this sciencing question: "Here is a check for sub-there colaris. Reaso give me that encount in as balls, but no one-dotter bills, plasses An approximmute adve the problem in leas than employed.

4 TELLER TALE A man output of eitherk at a bank but he absentiated tittler made a marktwa and gave in dollars the execut the block have been in corts and in opera the remarkt that should have been in obtains. The customer took the money and, after operang \$4.45 bound that he emport till was executly taken hat of the enginal check "Mail was to correct anount of the beha?"

5 BAD BLL Coeboy Bill goes into We's Wild West Store and poles out a fracy new hait that auds for \$53 Bill grees Wat's \$50 bill, but West doesn't have obsige, so he goes next doa's to More a Date gass change for the bill gives Bit his \$7' end puts the set in bit path tracker.

Some time later Mom comes to the Wed West Store and tells Wait that the SSC bill a counterfield Wait reluctantly ogrees to CMM (he should have known that Ulysake S Grant dich't have a gobbai) and gives More a genuine \$50 in exchange for the phory note

How much did Wait lose in this Bed Bill aftar?

8 MARR/IPS Anne buys a partot from the pet store tor S00. Then she walk it to Ben for S00. A while latter she realizes she could have made even more recently on the bird, so she buys it back from due for \$70 and series it to Clydo to \$80.

verse was the result of Annels entrepartsurateo? (x) Site lost \$10 (b) she broke even; (c) site mode \$13 (d) site mode \$20 (e) site mode \$33 (f) note of the above

 CHOOSE DUICKLY Which is worth more is hat filled with \$5 gold pieces or the same hat filled with \$20 gold pieces?

a ChRPARE and Seath the book the book of the integrities of the int



Helines determined that the old mainted item section on its will all that the bar measured in plants the estate equation property here. You'read reporting the recent plant the instate of semit the entry and and the works of the output of the instate of semit the section and the instate the amount to be peed to search fair. How much of a section section

The problem isn't es hand as it looks Hint Start with the cligits in the quotient



9. REVALUTIONARY QUESTICN These heat optimizes on a state is sharen in a state is a state is sharen in the state is a state is sharen in the state is sharen in the position share. Assume (or big Dage Deheten To core, how many some share) to be been decrap in this before it position is stating port? If you were to sak the same quest? If you were to sak the same quest on Que were to sak the same quest on Que were to sak the same quest on Que were to sak the same question of Querge A or Que optiset.

10 BALANDE THE BOOKS Mr Ledger deposited \$1,000 in the checking account. Each time in world tee money, he recorded the transaction so he would know how much was left. After a few with departs has record looked few this.

	WITHDRAMALS			ANOLINT LEFT	
	\$500			\$500	
	2750			250	
	120			120	
	60			70	
	50			20	
	20			0	
-	\$1,000			1000	-

"That's strange," he thought "Thave withdrawals add up to \$1,000, but it looks kee I had only \$990 in the acc

What went wrong with Lodger a table?



12 UNEUP Here's apother optical dissort either of the other two corns appears

aco Martin Shubik, an economist at Yala University invented a remarkable little

authorseer collects from two people, the

Valene makes 70 cents on the deal

Type were Mack in the morright above

COMPETITION #29 POETIC PERVES

Endish is a growing language, we are told but sometimes it seems to be proving smaller, shallower, and allier. Do

and Saf column, or tos offered these

# Expension Data

-Arnold J Zarett

# As for Now-Goodbye

Now used to be a good iffie word Has become "ill the point in time "

If fed phrases are rikeome what about Misuse of the language ent confined

Folia mieta/Say, one ottena -Witland R. Espy

to sloppy language day to enterwood

We I award \$100 for the best entry and \$25 each to the top one rungers up All animes become the property of Orm With your poem on a cend, and send r to Omn Competition #29, 1955 Binarbage New York, NY 10023-0965, Entries must 15 1983 Entres sent from outside the week prace period DO



# LAST

By Randy Cohen

In reply to your letter, I must conclude that it would not be feasible to find your lost car keys near the Grand Caryon using the Landsat-4 Mapping instrument. Handly Cohon is a compolitive letter writer and atomacel seeker of truth These and Letters rule manimum and Manuager

## International Crane Foundation

## To the Directo

Bhars pay go with these several exception of the contract of page payment to many, every "maked and kinds of a sound" that is not easily start attribution in the several material and kinds of a sound" that are well with a sound that well at the several sound that and the sound approximation of the sound that well at the several sound that and the several sound that and the several sound that and the sound that the several sound that and the sound that and the several sound that the several sound that and the several sound that and the sound that the several sound that and the several sound that and the sound that the several sound that and the sound that and the sound that the several sound that the sound that the several sound that the sound that the several sound that the sound that the several sound the sound that th

# Handy Col

### Dear Mr. Cohem

Think you for your lefter likeling shout, the problems that we have been likeling with mecohanic likeling and the second likel

mentional Crane Foundation

# Vecent Salamoneon Indicard Space Flight Center

# Dear Dr Salamoreon

. How exciting theil the Landspit 4 can fusction triages with three time the regated resolution of previous Landswith "We visited on the processful in ulinity these obtain the proper tooks." I'm deletted to hear it, and i think these another another the true.

Noting that Listista-4 passed over (poton, Accord a lives reminided of the three lists my car leaves at the Chand Cargos II was very entreansations, and I had to have a single help me hol-kern the Dongs is away that any dood a all to find the leave now, but i sound be potential to potential the top the sound at bottle at Donkey-Boy Reemi-thes a bit of accenteration and is to the

One is always reading accounts of satellines that can see playeds the sate of  gott balt, and Lundsal-4 spectra to be, bleased with saturating by the vision so to segreter di you robbit ten'orme. Might you be abit to space my ow keys troin speca?
avoud certainty be writing to gay you a tinder's fee if you did

Bandy Cohel

### Dear Sr .

In nearly to spark tells of Fabruary 9, 1 must concluse that ( would not be keasely in trat your last car keap must the Dand Caryon using the Landcark Themate Mapping Instrument The mission is its applicity insultational both the tracapability is autostantially both them has been available 1 am must pask will again it fails wint of your tragments will again its fails wint of your tragments will

Earth Survey Applications Division

# Davida Corporation

# To the Directo

Least delighted with your fair for the Purension game, compatible with the Apple II compater "Deliver the societ message to Queen Esther by finding your way through a myteritoux maze But to biblioge you must knew your Puren Tech"

software Can I run t on the small IBM of do I need an Apple?

The year three many movies bottle backbacket us in the form of victor garres also there y is a first the process mouth be networked and the year back is an deep poster to do part their. How how a Neurolation temporary garres, to be backet on garres and the second second backet of the second temporary garres and backet of the second second second second backet of the second second second second backet of the second calcer the second second part of the second calcer the second sec

Includentally, Exclusion you follow mi lacked in to the work's of indigoue games twoorder if you we heard the nation field the Vappan is barkeding a line of genree and/ading Jowes and Anthes Stare 32. Stephen, and one whate you have to got Lazarus out of the tonth is this tou? Ready Code

# Datar Mr. Cotes

There's you for your letter. At the encrored, Poximaze runs only on the Apple II will soon be available on other machines.

Our enclosed catalog should enswire most of your other questions. We enjoyed your letter and appriculte its tight souch Dr. Inving J. Rosesbaum

passes mole. The catalog nated such games as the Game of Jenhon ( At this school-packar incident game, the player detects the basis from Joshus scholer of game school and Bicke Baseball ( 200 question on Mage Longue News covering at of the backs of the Bicke from Gamesia to Chronolis 7 PC

100 C64N