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By Heako Matsubara

A fantasy has ansien that Japan's future holds ho limits, and 2000 has become a year glosseid with a rosy veneer.⁹ Naw, you never about in once it the grants collection and the loweship run particular the section right in the first provide containcollection by the first provide containcontains a powerful, sever doorying: threeto provide the section of the section of the provide the section of the section of the provide the section of the section of the terrology of the section of the section of the terrology and the information of the section and the current of the section of the provide the section of the section of the section of the provide the section of the section of the section of the provide the section of the se

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CONTRIBUTORS

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And Benike strapping in these futures, markets may evolvally be large needs; in another Jappenee involution in "Deput basets have been been been been to baset home depits. A company againstee a determinous and in loss time among the eminous and the eminous for the construction.

Computers figure in this month is foton as well in "the Mind Like a Strange Balloon" (page 80), by Tern Metchor: a computer computer moves piece a touched solar station. In the process, he comes to isknow while scientist and an unusual belogical computer Thiss the list stary by Metchor to appear in the publication

Other and comprusive regular contexture Potant Molecum whose story 'Casek Day' (Hebruary 1984) recently received the priorigous Westinghoute-AAAS sweet for outstanding scence reporting. The award was presented by the Amonan Association for the Advancement of Scence on May 38 CO

COMMUNIC/ATIONS

Three Mile Island Lindste

Once again the citizens of the Tripe Mile bland area are untitled for distrustme

reactor iForm March 1985, but styrch

In 1990 the Rospice commercials report on the muclear accodent enforceded that

Furthermore in February 1984, Metro coltan Edinar clinaded culty to one court reactor-coolant water-leak rates six months 1984 a federal subge convicted a lorman operator-mail/calcoleaams, making him

Meetsland, and we thank Greek for continu-

Scatt Portrine and Lisa Caruso

Humay for load and Dr Edward de Bond' While mading his intervente (Match 1985) | views on effective thinking

When I are a child my infat alarma my solutions as uncomplicated as possible He sad that for every pound of stellect Those always remembered this and when

Frances Paper DPMa

Newtoritonal Error

lensw your publication and the vanous time fait I have a complaint about "Demon Entry and 19651 Mathem claume that in the area. Macratic and the north are aligned

A megnetic compass talls only magnetic have to take a few sightings of the sun or stars. There is a line running through the

to tell us, but please save your space for Bill Budessfort

Maximo In Marc

Repaiding James E. Obergis' Repaid the Scients to Marx, (March 1985) Doesn't and both the United States and the Sowell

I suggest that the effort to reach Mars be made an international silort funded by Germany with the headquarters and future

I could get exprired about the

Capton Correction

(April 1985 page 46) incorrectly identified nanie Although both men were on Ardhory Reports staff when the picture was taken. mos contendari DO

Beauty is more than bone deep... thanks to Toshiba.

Toshiba electronics now draw complete vascular systems without disturbing the patient.

You can get X-rays of vescular systems by injecting a contrast modium. But then, you also get petianes of the bones Toshas technology gets nd of the bones X-ray once without a contrast modium and record the bone masses in the corruptic's



about evidual berry



memory

X-ray again with a contrast medium and the computer displays clear vascular images by subtracting the bones, which slows esser disprose of vascular disorders.

Mades lie this core from Toshiba electronics technology, where everything we produce makes life a little befor. Which is what electronics is all about A Toshiba, electronics come to life



DIGITAL PLUCHOOPHIPTY SYSTEM DIGPOHMEN

TOSHIBA

DIALOGUE

Forum

Onni velocanes specializion rhisoses commenzary clean il and cuestione fram readers in the open hosten. We wante pouto use the column its sees year to trapas about the Laker and to contribute to the And or internet delegape that preaches thought and generates breakthrought Phoses note the use cannot relation submesers and that the openeor appression free an ont necessary theories the measures

Mind Fields Revealed

Lead Kutheen MoAulitis actuel: The Mind Fields [February 1965] with interest and some concern his competitionwe report showed that eleatromagnate fields can alter the function of certain biological wyterm, and it called his a better under standting of the discuble of electrobiology.

Fair more emphases was given to unproved claims about the dengers of this form of analyy however, than to as benefits. Based on a perspective uspects outword, the negative uspects outword, the positive ones by a masgin of neethy fire to one.

The impair acrease structurement of the acticle was its brenchery to lump together all manner of electromagnetic phenomena. The lawase this exectar with the implicitation that walco display strumelis power lines and microwater may be harmal simply because they have scenafting to do with the electromagnetic spectrum. That's like electromagnetic spectrum. That's like electromagnetic spectrum. That's a posen all druces are exercised.

In 1992 I countrated a proposit and endoperios (puisse the body) and endoperios (make the body) and endoperios (make the body) could be the analysis (the body could be a set of the analysis (the set of the analysis) batch the body for the analysis (the body for the analysis) batch the body the rest of the analysis (the set of the analysis) and the the rest batch batch the body make the set of the analysis (the set of the analysis) and the set of the set of the analysis (the set of the body of the set of the set

Undoubtedly some types of nonionizing alectromegnetic sociation can cause haimful effects under specific conditions 5 0MM Therefore those of us who locus on the beneficial effects of electromagnetic indetion in the clinic must prove scientifically that each new application is justified by its softward effectiveness.

C Andree L Bassatt M D Ementus Ptofessor of Onthopedic Surgery Columbia University New York

"The Mind Fields" was an excellent synoptiof some of the synony work going on in the field of bioelectromagnetics.

The potentially useful applications of electromagnetic (disa), those was an organized and the second second second datases preside potential. Passed datases and uses and communications dechnology have changed the user is and law datases than at any three the useful was datasets than at any three the polycopy page. In the spectrum of human datases we are already seeing changes the basis and base base baselined on the basis.

Unfortunately both government and industry have denied the existence of the problem suppressed assentific debate and goreed misinformation

By publishing this factual article. Only has performed a service of instimable value to the American public.

> Potestor of Orthopedic Surgery Upstate Medical Center Sutaces NY

Congrutations to Katheen Mohalfle for her andro Teo Mori Teols. The first tims a maps mayazine has called the publics asterion to the magnitude of the publics asterion to the magnitude of the heapancy magnitic halds. For mosili man a docate our retwork of scientists has liken a divege proteins in the publics, which has yell to be appropriately addressed by my official world organizzon

We admite Omiz's courage in publishing this riformation in such an understandable and well-researched manner

Dr. Andrew Michaelek President Renetary Association for Clean Energy Ottawa, Ort I was encouraged to see that Kathleen McAultile courageously revealed some of the hidden research on the effects of low-intensity oscillatory megnetic fields

I believe that power utilities have some control over virtual Arenacing pumitaisis publish about hem especially if he infomation could allow a perioding literatiagainst that utility. I likel that my research on the effect of externely week fields (concessible to have emitted by power anal) on hang organizers seal individ programmes presearch the obbits of week compares presearch the obbits of week compares presearch the obbits of week is a countil my held of audit

My work has appeared in the Swiss International of Dometeorology and my Indiaga ara wall-known in Earope but not in the United States

Decause the Sales government free always been aware of the public's orght to new information and of the importance of public salety, it now runs most of its power lines underglound. Research into Alactio magnetic fields may yet yeld great benefit to all markand.

anelN Russet

From 1967 to 1968 I worked for the Detarsee Intelligence Approp and was stationed in the U.S. enclosely in Necessor First may officer window I could see something pointed at our building. Whorever I asked what it was I was phases told to cyncter II.

Borenal years after learning the service 1 need that the Sovers had been beering monowers all our entowers, "Not which about for some time—perhaps they wanted loaken toom be subschwide blanning any it effects on the Interaction ecopare their permitted and recoded for the Vaternienes to increated, but their there wanted and sales toom with

I don't smoke and haven't shown any signs of center built do field as if a sword is hanging over my head. I can empailize with the Vednam vets sung the government over agent change.

> Sam Warren San Diego CO

DYNAMOS AND VIRGINS

EARTH

By David Box

ditors note in 1975 three years slow the list Arab of crists, phase cat Amory I mans used the term prevailed if not far the efforts of a team utility in the United Status. In the excernt In 11/79 a few months before Edison

outformers with the same taith, grew actioned to reve equipment current and sissarbed competitors when they appeared

father's forlune-and then many others.... skeedy been invertied and so had electric one before had shought of the stuff commo 15 CMN

became the fourthean for 170 years of usity industry And as that prowth const

The contrary rotion that utilities more incloum focured office across the hall from the boys afferen comin what used to be a fationity house in Berkeley There two men nearly as young as Gegroe Roe. had been, slared working insetter in late and nother one was seeking to make a came from a national nonprofit groance scale with George Roe's ambition. It was large enough that the old tratemity waits



from George Roets central-station dynamic

different way of looking at what was already how a hune business could be built where

The father of this idea was Zach Wiley is Zach came back to the United States from a project in the Middle East and starting work as a full-time environmentakat joring future environmental problems. Tom did not tons of a situro of 90 nuclear plants doted miles from Oregon to Mexico, by the year 2000 Some versions also included at

a policy of lower growth. To many people and soft energy write seen as matters of Zach Wiley was already thinking about a different approach

principles that the electricity industry preached for (self Utilities should prow at whillinger rate would much the organity was cheapest and most reliable to meet restment dollars, whole government heip and they should be allowed to charge deploy at all it was the ordinary ideology of opphish industry realised by hardness proceives of twiste regulation for public utilities. Zach semply though that those hardnessed principies, based on that leadtrensi lockings might not lead to grant, power plants. They might lead reduced to the very things that thoughty industry was vegorously trying to lead off.

No diffy on the verge is commence, as below dollars to any our in colour power pertinence of the service of the service is control the three the service of the second three the three service of the other set is near the service of the service of these set is near the service of the set of the set is near the service of the set of the set is near the set of the set of the set is near the set of the restricter of the set best of the set of the restricter of the set best of the set of the set of the perturbation of the set of

The Profile Gas and Becrisic Company mis in Clair vagas enforms to chi ta bert for energy conservation ordisis harinadi down by the California Public Unlines Commission (PUC) Term and Zach decoder tock And during the pretiminanes, while astirching Procession from Sama calosis of documents at PG&E handcolarities in downtawn. Sam Francisson, hilly found the one prace of public fearms the theory in the thempoint.

When I saw it, I knew immodulately what it was. "Zach remembers. "It was just one page but it was a dynamits page."

The life one page sourch rinks, dage in a field of cancellar generation of half showed that PS38 wild planning in basic time more tracker with coals down plants in \$51 102,055 bits - without commuting, a shift showed basic source out of everyond's doction of the time annihile to advise them in basic wild have be appressible of the shift of the source basic basic sources and source out of whether times any basic source basic power When I showed guart the Einstein basic sources and the impacts basic related bits can be increased by therefore the commutation of the source basic relation of the source basic sources and the related bits can be increased by the source basic related bits can be increased by the source basic related bits can be increased by the source basic related bits can be increased by the source basic related bits can be increased by the source basic related bits can be increased by the source basic related bits can be increased by the source basic related bits can be increased by the source basic related bits can be increased by the source basic source basic related bits can be increased by the source basic source basic related bits can be increased by the source basic source basic related bits can be increased by the source basic source basic related bits can be increased by the source basic source basic related bits can be increased by the source basic source basic relation bits and the source basic source basic source basic source basic relation bits and the source basic source basic

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The three principals seemed to toot the hearing process as a set of the-moving calificherics which can for services a day four days a week intemption by housing tootsaws. The wind of momentous change that had cannod into throughinghts of perpendion of dire to be stiming anything muck the hearing foom—at leads not yet.

Unspectrally, we get holp from two of PGLE1 inghtwei terking directs Borton W Stackfeltott was in charge of electricity separates for PGLE He was the main who turned (precedual) with hardware PGREy coming dependence on such as power was effectively Stackettord's doctors. John W Space/insights counterpart for the and of PGRE that supplied instance gas

When the two men amved in the hearing

While searching through a windowless room full of documents in downtown San Francisco, they found the one proce of paper they needed to dramatize their point.⁹

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Sender was president Shackelberd was more poesed and better protected, but tude again provided me with a chance to diamatize the ofference between what PG&E claimed as its policy and term if we actually conduction is business.

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When they came are a reasing the second account of the second acco

While I was close-externing, 2ach and a learning loss pair old computer programmer remed Dan Kretinet were busy producing a historic analysis. Isying dut for the test time the way in which a public usity could meet its growth needs—and make is polit—without relying on alter new nucleor new cool pairs.

The US acquire matters inclument the weak transmission of the second se

And then the greene said hare is what a serious knowled evolution would find Compared wide by side with PGKE's plan of contract De Inizi, sa

TIBETAN CURE

LIFE

By Marcia Rockwood

Claim organical and saunches, biccore one, and ageneral ly also part what may wall be the work's oblight memory. for cardiovascular problems. Takatan markiw were gathering and mang the formalik known and Padma 21 also early and the Internet country. Koda Calatan obcursa and also pit to their immunological docuand also pit to the another reason its and is stropped to another reason its and is the test another reason its and its the test another reason its and its pit when the reacter to be tradent amountably by Western exceptions

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Though Paches is not in the same evaluat league as the precisus pilal the medical texts to credit is with heading discrimina as well ranging as bronchial actima and hoart declate. Research new under way suppress half the proceed text may he with

This treemsh begton in the late Sovertees when DF historian rais exposite specialist in Luceries Switzerland used pathere to teep aberts auflering from partial attractions in the second particular study reponder in the Switzer and a later and rectange that the formula chambe cuby replaces pains. "I would call it an unrespectively positive result." Says Hule milian

A follow-up survey of 220 patients conducted over two years produced similafindings leading hummen to conclude that Padma 28 "promotes the formation of new blood vessels that bypass accluded [blobded] antimets

Huttmann's research: slong with other Sweet Sibostowy expensions: a crossed galaxi demand for Pedna 28 during the bio Soversteal and it soon began usualiting hadstand phermaceutical drugs. Ar bis 1965 Soversteal and its soon began usualiting material phermaceutical drugs are between methods phermaceutical drugs are replaced to the ocurrise heaped support hutmannis include of clinical Pedrasor J Weocals Inside of clinical

HORSER J WOJCZA HABOOTOFF



PLAGUE WATCHER



By James Kitlield

The advanced weather solution color Methods on single a banage of reformation about Absolution to the advanced of the polar other and the method of the advanced polar other and the method of the advanced to produce a bandwide and other neared about the more advanced bandwide and the single of Malaceast images there during the samp advanced location and weat images the samp advanced location and weat images the samp advanced location and weat images the advanced location and weat images the advanced location and weat images the advanced location and weat images and information in them parsonal doings to the advanced location and them advanced in the advanced location and weat images and advanced location advanced location and them advanced location and the advanced location and them advanced location and the advanced location and the advanced location and the advanced location advanced location and the advanced location advanced locati

Write tyre is pay teleforganearres analy and appears measure of the stastor," aga br K G Lenner, of the Lungeon Spece Agercy (SBA), which Lungeon Manager Agercy (SBA), which Collisions are also information on method and other data have not always been objective Samilime the figures were bisling of writhed for policial vision, and sometimes there aren particular works?

Metadolate crists the earth at a freed point 23,000 milds above the equator and the continent of Arios. From that globalanemy position—exectly of helitode and of longe todo—the selfalls can these cloud cover fermations and vend direction, and gather other data of negrets as afree north as Sciendinskie. More tocorrily, however, its focus their attined continuent.

Within the last year and a half, the United Netions Food and Agriculture Organization (PAD) become a primery user station for Metaceast. That means the organization moment data directly from the satellite to other Initianal of waiting for others to interpret and then toky the information. If such internetional refer organizations as the FAO can pasalert ministratile precif of impending disaster countings with bountial harvests with beliess likely to take an wall and sale although that can (and heat) cast for of thousands of lives.

"This's what we peop as a major role of Mellocal emispini (In Mulaco et about) entations to allor the work with instematic entations of allocations and the mellocation and that to accordingly held measures in advance's applications the measures in advance's applications the advance of the PAGE terrole-serving concers in Ruma Act for the first being, we now at least the measures in remission work per the service of the major any extension that the service of the major any extension head the the first of the major any extension head the the first of the major any extension head the the service of the major any extension head the the service of the serv

In addition to diought. Afree penedeally suffee from perems of managing disent locate, which treate as the ar 100 miles in a single right eating everything in their peth. Because the satolite can identify the Velim harms and conducte that are favorable to locate belieding. IAO hild terms entropy consider Matesaa



1 collable 8 eve How of parchad Africa.

data essensal to past control.

In a year when the locusts are bad, a large amount of crops are destroyed and many likes are allected: says ESA's, Lenhart. You know some of those seven plaques are still very active in Aloga.

Satalifa maps on the wait of the USA operations occurs in Wait Gammary cleanly dentry, length plages to acid to Ances list of wess beamfinistion. The encoughing sands of the Sahara are moving situative pachtweed while leaves in the region are beginning to shmirk. In Maunetane, tor matince, the desert has analized 80 percent of the country's grazing land in the last 20 vales.

"We in the West are not blanklass." Lanfert says "Some of our shortbighted damps to high have actually approvided the problem. For instance, we can hall the villagers have to pump groundwater, built without long-term transmig in livestock monagement that may just load to owngristing, which eventually means even more desartbid each."

No one belowes that advancements in Nichtholgy sickness the encycle of Ahradis current a catastraphe on the upder of Ahradis current termer. Arbitrary bordes much ensures the contents and conder guards block migration from a land softwared by Nece the population is can sustain Primitive lamming landmapues abuse the coli and government oficials into the hist heads in the ufwardiscus and

If the rightmansh forme has awakened both Arinain leaders and the rest of the world to the lenthic proce of neglect however, then Network and the technology it reprisents call bacome powerful alles in the search to long-tiom solutions

SPACE/TIM

Are 1. 12 noos EDT Hoyager 1 is 2 020 D23 2014 miles from Earth and 2 020 D23 2014 miles from Earth and 2 020 D23 2014 miles from Earth and 1 020 D25 2014 miles from the use of the 1 020 D25 2014 miles from the use Jame 10: Docovery shuffle launch is alread Jame 20: Docovery shuffle STONE SMASHER



By Kathleen McAulific

The carnet scores in on backfers shown across a large pink turned subterly find carnet mopilodes in a back of IgNI Solid imasses hisgment into a keledotocopic image. Two mon flacts as of lighting crickle through the chamber By the final finance, only subbe remains

Interleptiding bolisatis and business applications of an entry-water end of applications of an end-ty-water end of the world to undergo a novel procedule to the world to undergo a novel procedule memory as a checkrotraneopie. That proterman a traversary School of Mexicana in thook wow to dottry have partial extreme fing pained and support to to woo shallwas gains. Only and the took water the pained of a support processing to the dottory tredition.

These model leavy to barrels from the new watches of all barrels from models of the watches of galascress. For this group, divided precessing approves to be lease many than comparison a suggest and the second memory and the second and the record parallel intern in the leaguest is shown and the second memory paradimeters and and and nearway paradimeters and and selectors symmeters.

Telefore additionations to the total wave could be additionated by the total sector total total provides the total sector total total provides total total bible from the line Within the poster total bible total bible total total total total total total could be addite total publication of the total total bible total total total total total total bible total bible total total total total total total bible total bible total total total total total total total total bible total bible total total total total within the second and total total bible total within the second and total total bible total bible total within the second and total total bible total bible total total bible total bible total bible total bible total within the second and total bible total bible total bible total total bible total bible total bible total bible total bible total total bible total bible total bible total bible total bible total bible total total bible total bible total bible total bible total bible total bible total total bible to high vollage low-current electricity pulsing Brough the liked summering the store

Usually the first to crunible are the refer lumps that tend to block the bills duct This nuggists of cholesterol loans mode the pallblacter can be as boight to check rereal stores. It often lakes soveral jobs of relishing to complete the demoilton

When the detris is poweliny (Socho uses a hoselike attachment on the choladochscepa to havin seine sections forcug) the gastfactor. To mmove larger begreets he has another choleochoacope attachment invon as a basiet largest—a long releveli hol with clause that contract

This collector/boops with its biological weeking system and accesses (roles is the key to the procedures success A she back as 1000 secretist in the Soviet Union employed a protectype in a poreering efforts of sheler sounds of sounds on the efforts of sheler sounds of sounds of one accesses the schedule collectopes of hat near were still too bulky to analise into the smaller ducks and holes of the body.

With the manage of streamlined choledochoscopes to fiberopac guicance



apply work in calory of that sharpes nadeby

systems in the early Eightes the technology finally came of age. American dioctars scon actived the appendix for blacking lidiney states. But surprengly, no American doctars that throught to apply the technique to patistone working.

Putting linear palents under the scapped may not sleep bit has environd. says Larry Dol was president of stategor. Internet palentistics a leading manufacture of oholocohoscopes. "But it a streding proven apprends. To leve doctors in this country want to bofter with a proporties any etu snapproved by the Food and Drug Administration. That could open friem up to potertail large problems."

By comparison Jugan is an ideal tating ground Neddoll importation such are allowed unitarial of and Juganese pulsame in much more when glip Londoge or equimetal towersheet. Owney to observe factors, metal towersheets. Owney to observe factors, metal towersheet. Owney to observe factors, metal towersheets. Owney to observe factors, metal towersheets and the sector of the participant of the observe factors and and one toolser periodic net: any Physicane allowersheets participant on the align of the factors factor allowersheets.

As another alternative to surgary, some occlore have the dispecting comparises into the applications of a solve the storage but some dispective storage wheth hard outer stells intra ploted highly reasonable internation towards with a solve the storage with internation towards and could be intered what y alternative to control the storage with only toroops the the interacted through a creative in the cheledochoscope. This storage is not access in the cent

botto s domater in it in stock was betrapp and subchick in Nicody in and other parts of Southeast Assa as correngia Juages is sen how a perform the procedure. The insertnet alter hes industry and subchick stock and industry properties about 24 300aromage on the estimated Bottoma stock gettilenes asympt with know up can be able the south at 250antity opposition is the intermet CO

PRO-TECH PSYCHOLOGY

By Doug Garr

earytene knows of Japania sathinty for high sechnology. With 100.000 india: a shoold working on its production allocation and laader in the sele of subombors its well-known that consume identifications are the operating a solid propert, but net until you go them allo you realize how webspread their initiation with learning its its

During my first wisit to Japan 1 was shuck by the number of things confirming my assigned hits the site is not on of gatcher nate. How also could you describe a culture whose could you describe a during whose could you describe and auto-also prepared by robose where sochins savice do you orpublicate basineciers, and even the lowlest not shop has automate sitting door?

Into the soductiveness of this schrology myself while vesting for a buomess appointment in disvoltave. Takyo In one building i came across a cloping of stachines that included an electronic everycle that could mentar be roles a puse rile. Devolting speed and classics the blies had two feteware softene losture the blies had two feteware eye view of the streets of Tokyo. As long as I pecialized at a centern rate, the wideo stayed on When I slipped below that speed, the picture haled.

The other score in was connected to a correct samed on the exercycle. A core point I tobled up and save be mapped an otherability of the polaring revery. I aper extracted with polaring revery. I aper restrict that I had been sectioned by gidagityr mysel I no matter of a few minimum. He aper how being a midly interested speciator to a part of the lactimology.

The lapanese payme detectely lies some indefinition enrocisist must allow as populated to adapt to even embrace its population and adapt to even embrace its appling barging accenty. Account for another than an adapt to a some and writes and obtains. Sinch is formance the decrement have no occurst thoughts accur adapting it enable measure produce boors. Why is that "Have due the pro-sect athlade barget?

Drie theory seems from the fact that Japan is a small country with a large population. For centuries the Japanese



What is that indefinible screeking that less Japanese ombrace new technologies with sect ease? 34 Date

have lived with spatial advaracy. They we had to squeece into small quarters and accommodate themselves to living in a country where even the tansan restricts avoid a grace.

"We are autounded by the sea We have many mountains. And curliving area a very limited Wateven we can do to make a contribution and committee to ker in these places we do it," explains Related Binarro, president of NTT Spence Founda Tonand the main in charge of torganizing the ubgen National Pastern for Explicities (5)."So

The Japanese store spectree theorem environment of the spectree storement They negative to store the spectree method of the spectree storement of the spectree storement they negative to store the spectree associate produced of an or charge and by on their growthing exercises and the spectra associated on a store of the generative hinder of control and an or charge appears. Hinder of control and and on or the spectra hinder of control and an or charge appears.

The paperhicity of octro colong just adord wany material support of behavior in both coutrons it. They organize why American whorkes demonstrate or private when they have a space (as minary octroat move) wheness desaulted adjuanties workers prefer to externises their appects into instratial all addre watering much histotea soccordary octroal approach. Gainer a soccordary octroal approach. Gainer the it is no workers that has the able of the approach of them a being they under work of the ma being they instruction.

As we have learned the Japanese are extraordinary negotiators in part because of the way they approach life. Bradlord Brown, the extractive diffector of Nitron commute central to

How to punctuate

By Russell Baker



When you write, you make a sound in the reader's head. It can be a dull comble - thatk why so much government prose makes you sleepy-or it can be a jostul noise. a sly whisper, a throb of passion-

Listen to a space trembling in

"And the sillen and uncertain rustling of each purple curtain thrilled me_filled me with fantastic tertors never felt before"

That's Edgar Allan Foe, a speak as vividly as Poe could, but even beginners will write better once they start listening to the sound their writing makes.

One of the most important tools for making paper speak in your own votice is punctuation.

When speaking aloud, you A punctuate constantly-with body language Your listener hears commas, dashes, question marks, exclamation points. quotation marks as you shout. whisper, pouse, wave your arms, roll your eyes, wrinkle your brow in writing, punctuation plans

"My tools of the typic should be your tools, mo-

the role of body language. It helps readers hear you the way you want

"Gee, Dad, have I got to learn all them miss?"

Don't let the rules scare you. For they aren't hard and fag. Thank of them as mudelines.

Am I saving "Go ahead and unctuste as you please? Absosense remembering that you can) expect readers to work to decipher what you're trying to say.

There are two basic systems

1. The loose or open system, body language punctuates talk.

2. The tight, closed structural

Most writers use a little of punctuation than they used 200 or own Sharper and (Glance into Edward Gibbon's "Decline and Fall of the Roman Empire," first published in 1776 for an

example of the tight structural system at its most elegant.) No matter which system you prefer, be warned, a sentence that is badly put together. If you have to struggle over commas, semicolons and dashes, you've probably built a sentence that's never going to fly nomatter how you tinker with it. Throw it away and build a new one to a simpler design. The better your sentence, the easier it is to punctuate.

Choosing the right tool

There are 30 main cunctuation marks but you'll need fewer than a

I can't show you in this small space how they all work, so Fill stick to the ten most important -and even then can only be highdictionary or a good grammar.

Comma[.]

This is the most widely used mark of all. It's also the touchest pring editors almost come to blows over the comma, if you can bandle it without sweating, the others will 1. Use a comma after a long

introductory phrase or clause: After staaling the crown jewels from the 2. If the introduc-

tory material is short, forget the comma: After the theft I went home.

3. But use it if the sentence would be confusing without it, like this: robind the Bank of

4. Use a comelements in a sense I mithed the

Denser Ming, the Bank of Ensland, the Tener of London and my topy bank.

Notice there is no comma before and in the series. This is common style nowadays, but some publishers use a comma there, too

5. Use a comma to separate independent clauses that are joined by a comunction like and, but, for or nor because or so- I shall return the crown woods, for threase too / LOBY DI MODE 6. Use a commuto set

off a mildly parenthetical essential to the sentence: Girls who have abuceys interested me. assuably differ from boys Do not use com-

mas if the word

2 Use a comma in direct address: Your majesty, manon mark, a whater with parentleses, emphasis with an exclamation your

8. And between proper names and sitles: Montrour Speed Director of Scotland Yard, was assigned the case.

9. And to separate elements of geographical address: Director Space comes from Chicago, Minois, and now

Generally speaking, use a comma where you'd pause briefly in pletion of thought, use a period.

If you confuse the commo with the period, you'll get a run-on sentence: The Bank of England is located in London, I rashed right over to soh it.

Semicolon [;

A more soubisticated mark than the communities semicolon separates two main clauses, but it keeps those two thoughts more nobily linked than a period cap: I

Desh[- land Parentheses (()

Warning! Use scaringly. The dish SHOUTS. Parentheses whisner. Shout too often, people stop asteriors whener too much, people become suspicious of you. The dash creates a dramatic pause to prepare for an expression needing strong emphasis: I'll marry you -if you's not Topkape with me.

Parentheses help you pause quietly to drop in some chatty information not vital to your story: Despite Betty's daring spirit ("I love robbing your page bank," she often

> nouns ending in s. like Dickens. The possessive proposition anostrophe

Keen cool

maybe, but the message at "Stay on

Anostrophe [?]

sessive neuros. If the norm is say

The big headache is with pos-

your toes; it's coming at you,"

You know about ending a sentence. with a period (.) or a marstron mark (?), Do it. Sure, you can also end with an exclamation point.

(f), but must wa? Usually it ust makes you sound breathless and sills. Make your writing ormerate its own excitement. Filling the paper with IIII worth make an for what wer writing has failed to do. Too many exclamation points

make me think the water is raiking about the rotaic in his own head.

Well...sometimes a question mark is oken

Theyell Baller

Today, the printed word is more yital than ever. Now there, is more need than ever for all of us to read better, same better and

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We believe in the power of the printed word.



body krepage on the printed page. Show beautiferrates under

Ouotation marks [" "]

These tell the reader you're

'reciting the exact words someone

sold or wrote: Betty sold. "Loan't

turnen" Or: "Logrittanses" Berry and

Notice the comma comes

example, but comes inside them in

Colon [:]

for what's next: a list, a long quota-

tion or an explanation. Thus article

is riddled with colons. Too many

A colon is a tip-off to get ready

before the quote marks to the first

the second. Not logical/ Never

mind. Do it that way anyhors,

SCUI PTURF

THE ARTS

By Crop McCrop

Yorw Price is not dwing of cancer as a visual of caciation reportune That the sumors persist is however, under standable. As our test nuclear soulplos.

volow T-shirt amplications with rest intern. Mexico, the suncture of mountain and devent City boy into the lendscape, even the dutter like the futical New Mexico Dataly a resource Buf thes is no ordinary condemenation of Good appliances, automobile skinistory, and rucket scrap, engineered by the Los Alarros Scientific Labs, brittelane of the

Price first visited Los Namos in 1965 and wigs amazied to discover a high-lends everything from bushed computers and bubble chambers to bomb peris and local scrip dealers and weekend trikeners of these outsic asivage sales. "I started he says. Trying to assuage or resonakee my fears about what they are dong. It was an act of catherse an attempt to exercase strance Sometries I race up there and

Bettoaning terra costs - conper used than a dolar'-Price guides me into the living room. On the walls hang a same of instead of carved wood, teathers and breads. finey are constructed of brave vanetics of Los Alamos detrous Below the masks are nuclear counterparts of Hore with a dragon tail, holds out a becatar's 55 OVA

bowl Awardering mendicart hat has survived the holocaust, it is entitled Bagging

Kachma-a rucine scorector with shell clarity of years, ways and musical satisfanush: A postapocationic partiening of metallic cloterraits entitled The Last work to date Negroy Mavan Bombangerripening cornelative forcing on up the paradox Price deals with every day "What the spontists are building is, manager as endow even dool? with beauty These #proc spinish an mobility al Aprilana come back to do a again Only this time they will probably send us to the darkes! depths of the statema



Proce and southeast from nume such

Eduard Nahamian, whose gallery in New ari-oven if it shows pain, suffering message "Be careful, their about what you're could be the last support for everyond

Bo careful We know what that means for is checked with a Geiper counter every official word is that it is either contemutated counter to Los Alamos

The Price about the surrors of her ammanent deallh from cancer. It is news for hern "Is that what they're sawing? Well maybe its more romantic to have a dyno artet "He least to 'Dead art. I we money That's what makes dead art alve-when people buy t." Now however Price's work at edged The exposure (nonredioactive) is allowing Price to bring his massace more turning their weapons into plowstrenes, "he explains. They alonic bombs into bischool

I asked Price what he would do about nuclear arms if he were in charge. That a servels," he can't fit take own a Toward baseball-down factory and make bomb see Turrano serious again the speaks of whet, to him is the heart of the matter. "The only soluton is to reaking that write Earth annou alsone in the universe, which is a very egocentric point of view It we truly became other intelligent species to share knowledge: But that will never hangen until we but our bombs away DO

COMPUTERIZING CADAVERS

ARTIFICIAL

By Peter J Ognibene

any but we we got a pairs short age. That is a familiar rehan to car and computer owners, it also sume up a major problem facing medical excessions. Simply put these are not enough limbs and organs available for medical and hapsing studients is in the

An introverive project at the University of California at Los Angeles (ULLA) may change all that if is successes as seems likely students will be able to do with a computer and valencable which they need with subgoal shall include they will do even more. Not only will hely dissoct the limbs and organs of the body. They will put them back toosher

With this technology, says Dr Roy A. Make all ontropetic support on the backy of UCL As matical school a student can itset way samply with one or two bones there makers and two moves. That may be the technology may go all the way to support emissions.

Several years ago Meals was asked to make an electape of the anatomy of the India do lovem les ases of specializos lisea a caladron Phi are him intering notorly about his speciality but about gener problem of colocaling audems but defaited the human body "Acatomes have been himsy about analong in estertaily the same way lot too flowand spaces and incremented A loveledge, they applies the space in amound on human applies the same and and only applies the same and only applies and applies the same and only applies applies the same and the same and applies applies the same and applies the same and the applies the same and t

That observations is alterent implies to technical medical students and all the outer Meels had rathing new boller. Then its initiation of memorars, he goal is took at the backmanny images computers could called and Star Warr. Treat-cool in progra had computer granchics would have any high an expensional problem could be goal an expresentation of problem cool institution. Assess from of filtered and an

Meals wanted something more than animiated drawings. Indeed, he wanted nothing less than an actual human speci-



Rentwise Advice a second or electronic overrary, departed an screen, reasonable d instantly in Carlo

men—one so detailed that it could be taken apart, wewaid from any angle, and reasonabled by students working not in the biosthory had a normal printmaal

Tearing up with UGA computer separt J Michael Kato Meshilok an arm Sakinta filma a sakare min throe is no block of oo Using a buchers cand saw the two mer spent an entro Sakinday siking the spectrum at procee. The entit meter standar When they finalized the arm had been reduced to 176 water thin close actions

One hundred skyl of the silesal from wild breas through importing, were throwed photographed, and inninged to potent set (30 by 30 throke). Imagine a singlephotograph of a cluster of stands in a size (30 the 30 throke). There were sized next that is approximately what exch cross section looked like. There were size contraus to boroes sureline rokes for blood vasaels, and the times (one millinger indemnet) for some of the roke we

Hence the flow work herry of the policy of the properties are negative to the policy of the end of the policy of the policy of the policy of the end of the policy of the policy of the policy of the end of the policy of the policy of the policy of the end of the policy of the policy of the policy of the end of the policy of the policy of the policy of the disparsing balance of the policy of the policy of the disparsing balance of the policy of the policy of the disparsing balance of the policy of the disparsing balance of the policy of the policy of the disparsing balance of the dispa

To make the internal anatomy of each side connect to those on either side of it, tormulation marities



CONTINUUM

THE IMPOSTOR PHENOMENON

The second of the first table of the second second

In those days, often enough my stones were muddled my an group obscure that it was because appris hounded me. Once it where the water blackgrowerid where waters were polished and protourd. I told myself, it too would learn clarity and precision and workshill alternas would flow.

Rearing from job to job even the years. I alid indeed learn to report a story accurately and clearly inciding sentence after two tence with galaxs and form. Today list behind the date of a malonial magazine incasting the toruspose prose of other writters, people no child the interfall by objects of their own.

But I shill feel like an importor I shill have the poet and the surble insiding that none of my accomplishments are real

According to populating Machine Franch 641 of Laborah, New You (Linn et al. Union Hafferh franc according Hafferham Hafferham) and the second second second second second second second and the second second second second second second second according disk Machine of Deministra Charge of Sam Rains Datertus, remain Walth for polymeration allows according battle second second second second second second second according to the second second second second second according to the second france. Based second second second second second second france Second Based Second Second Second second second second second second Based Second Based Second Second Second second second second second second Based Second Based Second Second second second second second second Second Second Based Second Second second second second second second second Based Second Based Second Seco heads investore his seconds advanced origines of other ovsacchinary accomplishments she notes victims of the syndromy live in tear of the day their name is uncovered Money with teals successible to the syndrome auffor more with each new success.

The instate adder vectoral during the interview of the second two set as a poor boy from a Weish mercen town underswring of has tame. And one of Harvey's patients, is well-known magazine wrow. fait like a traud because of her tahter's unyveloing advice. "Don t went twich well-inclusions can don't like Jonce."

The engagetic phenomenon was list adhead in 1978 whan pay, incleages Paula Cance and Scanno here doosered the over whething rescurity of treate A students' Reconstruct by the clincal wash "Aniway set out to quartily the results. Sail a graduate usation and estimation something of an imposite hereoff she formed has the phenomenon was mad parametrix in those just starting a marketig of extension.

The same checked has the afficiant into several types including the industrial where the sources prevents work the charmen which ever an association to the sources of the charmen and the several charbon can be been as the sources of the sources of a support, and the respect trainer where adapted the verse of a support, and the respect trainer where adapted the verse of a support, and the respect trainer adapted the verse of a support, and the respect trainer adapted to the verse of a support, and the respect to the sources of the verse of a support, and the respect to the parameter constructions in the stars, to provide source there can be even constructions adapted to the stars.

The class of the decider ³ According to Hischfold (Who is also writing a book on the subject) The phenomenon often has a diferent centration in men and women. Men alte notes are afflicted by the age-oid Didplos Complex—accords mg/r traumake them with the guid of overpowering —exercised mg/r traumake them with the guid of overpowering —exercised mg/r traumake them the difference are harmed by a local instance—Gate to succeed and works in a law manufactual .

Can such a deephooted dislutance be cure? Of counts Benvey says. Most people antimery from the phasemann frog the leading so natural they don't even phone in as a problem the can be treated But once yours avare of your testings and ther develop: you can benefit the through fluct bills you gours day.

poet and sorible said it best Don't per los cocky. There's shares poet and sorible said it best Don't per los cocky. There's shares pastegeore and Proust ---PAMELA INSTRACES



CONTINUUM



Job strus or Wen in Negold for the less than balacity

MEING LIGLY

There may be a beautiful side to being ugly conclude two North Caraina paycholo nother if you (nº a man

Politice and science aftest to the benefits of basaty Psychologists confirm that physically attractive people are percarked as twoma more desirable paracraities happen mamages better per and more satisfying lives overall

Studies show teachers grades: Atractive vesteran are mass likely to many accord and to many according to bands of regher status. And atractive concludetes (of erher see) for managemail post-on stand to be rated higher than unattractive reperinters.

Now an ugly sole to bearty is surfacing J. Richard Udry and Brusis K. Eckland, of the University of North Cargina, recently examined the rivialitis of beauty for men and women. Analyzing data from a retransi sample that 18 misc second the canciude that "homely men-

Note is good things come of the absolute and the centrs seem mostly intred or his passal makingbace for example attractive make but not attractive finalises were more lively to take hid securit injuitor as frantige as. The least attractive mon power hist fix and their polecy was the built acatement achievement and their poly and the built acatement achievement and their poly and the built acatement achievement and their

For women attactiveness in high school was not relased to fullue education - cocupation, or personal mcome Attactive women del batter anty through manying husbands who had high incomes -- Marcelle Tuzer

Language exists only on the surface of our connectousrecuir. This great human struggles are played out in skence and in the mability to repress oneself."

You never know when you re saking a memory

-Acke Lee Jones

ine seed must get lotten where it gentiktaliss

HAY LASER

Atter more than two dec ades of typing, accentrate hyse creates an X ray lease for laboratory use. They hops it will cast new light on the structures of living cells and nonliving instantials Exceptionally high power in another to which as

(ray laser work in fact

pentists had to use the en-

big tom a parameters about the parameters of the second about the parameters of the second about the second second second Labouttory in Livermore Calarona a basine headed by Denna 1, Mathemas used Denna 1, Mathemas Labouttor D

All this power was toolised onlo a step of methil film one third of an inch long and one hundledit of an endiande Authorit of an endiande Authorit of an endiande Authorit of an endiande Authorit of an enditragenais and an endiant the fincienes of authorities and the homenes of authorities was a small homenes planta the endiatio a the hundred was of X rays for one quarter belonit of a second

Earlies other Lovemore sectorize and a large sectorized and a large sectorized makes a large sectorized meteriment participation and sectorized and large sectorized sectorized and large sectorized sectorized and large sectorized sectorized and large sectorized large large sectorized large sectorized large large sectorized large sectorized large large sectorized large sectorized large large large sectorized large larg

"No affectation of peculionly can conceal a common place mod."

-W Somerset Meuoham

Man is a tool using animal Whout tools he is nothing With tools he is all '



awaren Lucrates of costs for the end X-ray base of the



We know that chimplehizeds share many of our soc in custome, new a samena liter who have service blood proteins.

MAN'S CLOSEST

Permatologosis have long debaard the identity of merio docest annual relative is it the portia, with its monoparty and hoxymooris or sit the too-lung, war-making, dimparanse¹ MAL, it now seems that the docesh has been all but decided in fixer of the dheng and the emdence has nothing to do with simplerses it sould building

Accusacy to Jacks Coversion and Covers and Coversion of the Calutone at San Tennasor Tonos and Electronic Three new indications that humans and chimps black three covers and chimps black three covers tenny three One is based on tenny three One is based on the works of the particular parts Chimps black yard black parts Chimps black yard black parts Chimps black yard black chimps patk would combine three parts? A standblack of man tabu with black of man tabu with black of the parts? A standblack path of the parts? A standblack of the parts regarations that convert only gan to energy in the cells return—and in the mitochondnai DNA of the chim 200766

Lowerslam teritial provided with teritial prodendre Using a technique known as aussimmunications has baren all three speces with clanical instraction at the clanical instraction at the clanical instraction at the clanical instraction contains in the set the proteins in changes and humans classed in more of the antibooks then did hous at the candia

Does this prove that manand chimp are the closestic of printile coularie? "Its have reacts from three off-perlines of evidence. Lowerstem says "It's live what the Rod Queen said to Alore in Wonderland. What i sell you three times of their

-Bill Lywren

7 wcaned my degree in saloum anthropology the study of miliman " Diverse Winshi

FOR DIETERS

Surgeons may one day implant electrocks in the brains of fat people to turn of their eccentries

By admutating the part of the hypothelamus that is associated with solarly or parts University of Chicago reurax/gron Feedenck D Bown the "sopella witch would product a leeing of Uliness to quel any longing the hort

"It is not for somecre who is just a little overweight " Bown emphasise: If a in landed for the mortacity obese, people who are one hundred percent shows die averiff

Biown has complete a weight in account of the suppresence of the suppresence of the partmack of the partmack of the result of the result of the mean part of the result of the r

Arother plus to the procecure is that it is almost pertees. Drividous anesthetos and a sedance are required through their ris your emain being worked on it is amilar to going to the dentest. Replace struct

The apparts with occadds would be connected an wree numming under the same to a pacamakerike device imparted thereash the coller there. The patient would either control the device or is could be programmed to send appraise to the electrocite at antimise to the electrocite at antimise to the electrocite at

We may find that this can be used to help severe anorexics to note lown. Theoretically we should be able to somilate the oppolite with the same toch notable. They ame to be some to be to be to be able to the same to be to be to be to be the same to be to be

Democratic nations care little for white lass been but they are haunted by vesons of what may be

-Attes de locquires



Nos a brain incill if of those with patho problem



The BP clansd art may soome the apony of bekness

HAIR-GROWTH

A type of cell that stempbits har growth has been tansplanted successfully into laboratory animals

Researches Roy Oner Coin dohoda and Keinsth Home of the department of balogical acences, of the University of Dundae, in Socilistic, performed the new technique. Tpat went to these "ubical salige insit this entany wonder outsite blachess

The the construction registrated dermal puppla (DP) cells—elian cells increan to play a dirusal role in controlling hang gowth—into the executively deed here tolected of acts and mose. The DP online actality diministration online actality diministration has the researchers are pondo in the scientific pumal feature.

In the lotted press of their work, human DP cells have been grown in leaf-lube culture a first step in the taky of the molecular proc osses that affert human. her growth: Were accusity interested in the bological mechanisms responsible for her growth: Johods ex plans: "Looking at the DP of luter system is hieway to study those biological mechsivane.

Johoota does see two potential applications of DP colds an the treatment of heldness. "Eventually, a tach heldness." Eventually, a tach heldness." Eventually, a tach heldness. "Eventually, a tach potent heldness, "And make important, a specific treatprover hactor might be applied to the DP colds."

Linust impake myself on kelvy "

-Manaco Savers

SEAR SANCTUARY

A death of acong over the last two years in addition to increased potaching inade 25 sinctuations designed to indiutious black-bear popuation has caused some poblems for inpoles ker poblems for inpoles

The North Caroline State University professor species as in bears from the impurlences western part of the 1835 as dealered from those that profer file in the swampy costablic brakends

Since ttill he has sombblid finauly he oals and hostochnotons of the Paget National Foodswitters and guescent hiberhabing bears out of hostowitters and multiy cause index to don't weike up before he cam which racks telemetry colleging that help hen learn more shault help hen learn more shault here. Whet Powel is primarily concerned with succe from the specolucitive rates and the senioral limits of his brains is measuring the sucdeal of one of the contry is more ambious, best concervation paragrams which more obcets some 900-000 access of sanctury lond where hurting is expressly fischedian

vinet annoys nim are reports, argely from victim apple and com lammers, find the abitists beer population must be fourishing it the bespte have begun spliting out of their senchares in search of load. Not so says the applications

because the accent coptras been spotly for the lead two years. The boars move accent a lot and they to seen by more parcel than alter ther tool is more alterning when out of the prolected assess. They can be wilker legisly clumg huning season.

Legal wile don't bother Powell. Signal ross do and the blanes more than hall be Sorecent deaths in the huge Paguh sonctary on powers will be a be power being bears. Gothing in the calles back through the mail or incling one do catefort in a mourgan offseen is source and policiting to says which is now a bigger nuclear than power betage back-care callingers

he state Widtle Maragetent Divason, acknowledge hat it's officult to take an iscurate beer census. The immuls offer wander ten mide from home, kolleng for nuts and betnes, and occasonally sigs Colins. They just room atound looking for somepisor to be "The two men satemate the casest population is 2,000 to 2,500

The amount of the Devine a built age in Reveal to producing and provide metaby wore "North Caterina basis seen to know that safety loss which devine that safety loss which devine answer to know a seen to know ound and the north of the seen contracted to the series are that seen to service at bases are that seen to service the service and column allower host contrations that cance that are the Date show cancer that are the SCB pacent shall be that are made to base in some

Never strike a clog/ Nevec never never!





Regult block Dest. Many know when to prove the law



Child whees: Good with laces and an uncarity ability to focus or seemands antikeast datable often overlooked to actuin.

KIDS ON THE WITNESS STAND

Young children, his woday ballward, cain Labingsah actual memory from fantasy, so juros often discred I then instructive But children can actually recall fungs with accuracy recent research sociarecy recent research they make botter whoesaw they make botter whoesaw they make do

The statisty to denthy a suspects tack for example, is one errors in which children may eace destals. Seyear olds in psychologist Call Goodmark study, at the University of Dentere wave by pertorit accuste of pedang out the phologisth of a main thay had met brivity several days other Adults, on the other hand, were and 20 zerrors torounds.

And one study by psychol ager Unix Neeser at Ernoy University an Atlanta, itustrates how young childron somitimes facas on seem right relevant datats overlooted by adults datats that could nonetheless form to broke datast needed. Source and the second s

"Children can be very accurate about concrete achans or defails thet captured that stantion." Goodman says "The key is knowing how to retruine whom," she adds, "because leading quattors can distort a childs memory."

But childrein as witnesses, do take a very sancus flaw Nesser ouggets "They part doi 1 undersland the mportance of their own testmary....the tast the 1 might aericlithe wrong gruy to just

Navar awar more than three clors at e time "Maude Acteme

ange County o

The points out that the highly intidigated atmixes have been issured in the past by the U.S. Navy for such record environment of the second equipment. Until raw, howower sait also have nowe been used to resoure pocific indanger of dowing But in a reserve) such dowing the indanger of observe the indanger of observe poggers have the there the observed of the second point indenset the there is the page of the the second point indenset the there is the indenset the indense

SEA-LION LIFEGUARDS

Alterody accustomed to wellaw community and the loach of humans, the creatlures will soon bo fitted with historeses and tailwar and larget to carry buoys to a person simulating a drown register. The sai large results of the sai large results of the sai large tectores actives will and the samalia aat largetech will have to be postported for all less one year. Telfore fre almais can be put on bachens werwell need an interes public education. program so people won't be shall of them. Ford notes

Lagona Brach offer the guard Brace Bland winns of other hundles the see-hon program may late. I track that Amencas Society for the Prevention of Lossly to Armait will object to animals being used to botty work. And theres expense in worked These animals at a los of finh. I do track that on a limited base, like in accounting a body, they may be hereful.

Food termines optimise that say how will consider in addition to saving heer, the program will help people unceal millinger annule, for an updatized has been are unceal millinger annule, for an updatized to how any presented, antimer than been and fortuned by humans which is informative man begins to many of hem new — Them failer

If an assignes traveling helf tot come home a horae."



Service stocker receives reward in Meduard class

CONTINUUM



Porked aux college student. Top many facd highlip?

FAT FRESHMER

Prevents be advaced When your had go of the college tor the first time. Hwy the tringing home more time to the tringing home more time to the a load of soundry and a more attribute. It is survey to any inclusion Hanvey is in the toward and the found of the sound to the sound of the sound of the sound to the sound of the sound of the sound to the sound of the sound of the sound to the sound of the sound of the sound to the sound of the sound of the sound to the sound of the sound of the sound to the sound of the sound of the sound of the sound to the sound of the sound of the sound of the sound the sound of the sound of the sound of the sound the sound of the sound of the sound of the sound the sound of the sound of the sound of the sound the sound of the sound of the sound of the sound the sound of the sound of the sound of the sound the sound of the sound of the sound of the sound the sound of the sound of the sound of the sound the sound of the sou

Hervey a former patchase student in uture at Pennsylvans Date Linvanusy warveyed 1000 subdets at anoton avading them quot commento an warvey fagan service and the the weight of the transmission of the penn forman and the transmission penn format and the transmis SUIT SIGNED to billers there belicioning on starthy locate arrived in dematory patients belicing on many when they we in demang, she says. But they on many when they we in demang, she says. But or saivity makes along were of the secure killing so lands are band continued of put on the pounds even when they had moved off sampus

hoakky havay seems to ele international kacion which were not consideraid a host study may be at the bottom of the Vischman ten College is a log charge to alya a mol test probably is a lator. Of occuse the work in range be that weyls gain a part of a normal grow to cattom for that grow to cattom for that ago — GRT camero.

"I predict that select repoduction through cloring will not become popular. Bio many poople already load it difficult to live with chem selece."

-Jeans Capp

With the tasks run into the sea, of the sea is not full " —Ecologiastic

IRNADO CANNON

Neikity usersy spring (pick) of tomotocis how (up the Maximppi Pixer Valley (saw ng bithind a swith of hymer mesey in the form of 122. Kined buildings and righted propie Most of the destruc bon is objected by the tomdates 200-millip ger-hour which which earling building indentity hemissip packed which which earling building indentity hemissip packed which which and turn fram into deadly wait strattering inspects

Recently a group of m

inagmenals are going to be of some concern. Balley un fenstations

A recent demonstation staget for constructions and renders of building mislenets left for subject building mislenets with the subject building that they were a latter surpresed by the height of his consensibles. Beiley height building is converse contractions to use this only misles at height building is contractions to use his only misles at height building is contractions on which the follow contracts and then held with contracts and the misles with the series and the misles with the contract and the misles with the misles

-Bill astro

Paety young guis abrit nany poor ald men —Jimmy Canno

"Things laked about moot event loast

-ALLIN, SCULDE

Mitad of death? One should be shard of Ms, not death "



but include a book well by a 20 key campo (parent and

and the second s



Assurer childrenh. During slover scall of brith without drugs, a husband may find my sufference internation well, anotherchim

NATURAL CHILDBIRT AND IMPOTENCE

Witnessing natural child

That is the conclusion of psychologist Sam Janus ofinical professor of psychia: try at New York Medical Orderoe

"There is a great deal of preparate on locality's earnin to give both naturality without parket ling drugs leaves Jerus. And the hubband at expected to ocach her trace within deleave

But watching brith can baumate the historic Jama datas, ching Bree report reasons. Ha watching appear loademetry unatted two to him during childbath he spit of all the block may heak him out, and sometimes the historial feel guily for cevering ha wate an er childbath

The guilt redden husband cloaent want to hurr his wile by angregnating her again Jenus says, fand un pleasaist mismones of the childenh penses will a which cause impotence that can years. Mamages have term relied as a result

ben 400 cases of nem who withesaid natural childbrith He says that nearly 30 pacent of the men developed polach-ktienth impotence which he first decovered among his own

Same of the impotent men-Jonus observes turn to prostitutios as a means of becoming sexually anouted. They have no problem making lovel with the prosttute the says although they can tait he wate.

"Natural childreth "he concludes "rath for overyone Women shouldn't heil they have to go through it and men shouldn't teel ibel they're cowerds or that they he aberdoorg their weets if they don't pamopate."

SUGARLESS CAVITIES

Ever wander why you're geting so many cavities? Mayba it's the sugariess gun youre chewing. That is rightsupartiess cum

Doctasis have recently decovered het such sugariare products as gum and cando; contain substances have than good Krown a natural good Krown at natural good Krown at natural good substances have been been and analysis and present in many sugaries: products on the market toolw

Sorbest and mental help to increase the population of Stepstopcocus mutans the bottome in the mouth is sparatolic for causing cavides "5" mutans use subtrati and magnitud as subtratis which help these bacteria polities are deneral flaulificies. The bottom of the continue to responduce on the mouth multipling security".

These bactors remain harmless until you est rome hing that conflans achiery sugar, or sucrose. Then the S mutans now in great numbers, controne with the sucrose to cause tooth decay.

A porteer of proventive demostry and founder of the international Denial Health Foundation Dr Keyes explans that the mouth contene several kinds of boctone but the ones contailered haumful to the toeth are 5 motions

They are tenacicus and adherent bugs, "says Keyes They take the mechanism is attach and stick to taket in werv riche and orack. You

If you give me six intos antien by the most horisof mare I will into something in them to hang thm " Context Distance

The best measure of a many horeoly and its income aux reliant. It's the zero actassiment on his bestwoorn

I descred Less the providence of these United States I and of these United States I assumed that Less young and ament and it was not a weath if.



supervises putt may actually tend you to the dentist

CONTINUUM



The Brutish Museum: Two worms, lying motionities in a sample of moss for 122 years, apraing to life when spirinking with water

RESURRECTION AT THE BRITISH MUSEUM

They could have called it he Windle Of the Bittelt Moseum Two rotfers-screat revelativate related to the worm taniy—had been jung in a sample of moss for 133 years, motorfeas and entoply who was the Massach mark data Guivathen sometis ward data Guivathen sometis and waggling in a conversion and large in a conversion and large in a conversion

Now acrime 35 years later, a zoologist of the University of California at Davis has uncickusd the acrime of this uncickusd the acrime of this will be a second the second second of the University of the second of the University of the second point of the second second second by comparising to 30 percent of the later bedy weight into a compound califord teatement end second second teather and of the second second teather acrime teather and the second second teather and the second second teather acrime teather and teather and the acrime teather acrime teather and the acrime teather a produced by the organism during its dehydration phase Metados chamically with fals in cell membranes so as is prevent the deadly cell samage that would normally occur during "rehydration."

So lar Cover loss been oble to cal historia la construction be meritariant the lamanate bological calls. The next state new under way is to lay calls by naccing state under calls by naccing state and papelline to the down the lare. Nating the congenitation of the state of the state operations who is not down to large calls there on even these operated protocol these on even these down to large calls there on even these down to large operably conduct. "I way to these on even these down to large large

"In television, how the head moves in more important than what's inside it "

SCIENCE-FICTION QUIZ NO. 1

Scenne-Iction stores start the universite and allowed he reside to visit strange and workels it magarary works How starty of the planets described below can jour cleritly with their correct names the names of the noets in which they appart and the names of the subtros of hose novels? (The inseets are given at the end of the down?

5. A desert workd inhabitor by gent sand worms and hardy Firemen important to the Empire because it is the only source of the spice melange.

2 The capital of the crumbing Galactic Empire, this plants a covered from pole to pole by a single, world-grdien of v

3 A detard world of lendly but inquisitive atlens who kidnep time-tripping Billy Pl-



-Ron Powers word intrubiled by hardy fremma and gain! word wheeled by hardy fremma and gain! word words

4 An arthop world that orclas to parent star, built b long vanished engineers who used all the material of

his solar system's ong na planets for their construction

5 A cold, showbound planat wholes and opynous natives have the capability or becoming either male or female at the pask of their secual cycles —Ben Bova

unga

Contract of Lanty Viven S General The Lant Verse Market J v Linder Market J v Linder

in set

- -auton uny la tavy asrou submer taxpeutate p
- VOTING ABIRDY CARE
- Tradition Provide Report S
 - t Arrelog, in Bokerik, 1

SHIWSN'S

To pleasant to observe how has the present Age is in laying taxes on the next."









By tapping on the keyboard, you can add a room or raise the roof

DIGITIZED DREAM DWELLING

BY TIM ONOSKO



In a construction time of too to too outdarts of Twist or copies or near to a young man it is computer withing to Solicul Hern is computer withing to Solicul Hern is computer home buyers each to less the too to the topper construction to the semant. This is believed to the terms of the topper construction to be topper construction to the semant that a believed to the semant that the semant And monitored to the semant that the semant and the semant And monitored to the semant that the semant And monitored to the semant that the semant and the semant and the semant that the semant and the se

The woman wants a larger bodroom A low taps on the keyboard and the bouse dissipates and is replaced by one with the larger bedroom. The man says he would prefer a priched root wasked of the standard flar one And a short time later the root disappears and a new cost as in the black.

The outpaness have been giving some forught to having a second becaron. Where would it go in this house, and how much would it cost? The computer summors another form the much would be the battern of the scorese the much heat been where the scores having tail of all costs? When the new fourms tail of all costs? When the new fourms to the added from shows up, the main and woman cloced or is a 1 to be

Misnwa beliaves that family violence is influenced by design and color. Red and pink make people restless



larger bedroom and redesigned roof appears in its place

The salesman asks more questions and types the answers into the machine. When he finishes he presses a bullon, and the by robots in Jacks. may be as common house viewed from eight different perspectives, detailed floor and loundation course, an estimate Without lawing aran entire house inside the computer

The house order, with modifications processed and sent down to the factory ponents-windows, doors, and plumbno related-comes of the production

With a few days, a convoy of sx fathed trucks puls up to the building are components. A crane operator moves his machine into position and starts filling the The page (right). Every three minutes Sehouse people into place By two o'clock Ages /ieve welders produce a subVoor. that alternoon, where there had been only //ebovel clakes 44 minutes to make a house

more than they can allord. The house is a bare concrete sizh, there's a modest

Thousends of Japanese have already ordered these new-tech prelaborated homes By the year 2000 these same homes, descred by computers and built along the sidewaks of U.S. towns as Toyotate and Datauns are on our streets

In modern Japan the word and the concept of prefabu (for "prefabricated houses") has become something of a railying cry for bringing new technology to the art and crieft of home building. But mees-producing homes is not a new concept Quick-built structures becan sponding up in the Forbes in the Lipbert States Today about two thirds of new American homes costing less than \$50,000 ath profess Mass perduction his long been seen as a solution to the challenge of accommodating a burchoring population at low cost Finding space to live has always been

Provious page (hop) structures in Jeper's a tome bayer can design his own, inght,



a problem is Japan, where 119 million peotipe are arming into an area status har ware of califorma. The overstawding has been good for the private business: he was hang exit Japanese builders average approaneley 24,000 houses per year simothawce the production rate of the United State Deget home manufacture. A notice status every his new homes constructed in Japan significante.

In the early Botos the Jacasese were caped to see he subscription of the problem that load measured across were receipt the load measured across the second second word problem appeared on the same. Called the funct increase if we also constructed with a dood family appeared on the same called the funct increase if we also constructed with a dood family appeared on the same called the function of a weak of any dood the same called between the same called the same called the same called the called between the same called the called between the same called the same calle

Herris houses, for exemple, go up in approvinably five hours, although the telefold situature entity immediately valuely for occupancy. Finature and plaumioning can take up to fen days, but government red tape investige to destine the house for indipation can postpone moving day for a couple of months after the delayer from the teatror.

Part of the inspiration for the unit house came from a 1967 paper published in the architectural journal 20: A young architectural inamed Kasahinio Oboro subiented the idee tor 4, high-quality house, assembled them standard box shaped modules that could be ball in 4 licitary. Plint olives from the copsub-hotel designs of architect Kathe Kasekases. In 1971 the high 250 sub-unthouses with buil by Salaya Heim, is chaipen of the chemical complements Salaya.

To veri a house factory is to step-into the benty-local carrier y terms in subtry on the edge of Dalyo is one of se, each of which envires a 10%-kometer radius in the backny's offical. Is salare of earms reportered house octers anting fram House in environ. of 1,000 meteopocies Strarg at data terms and from these daws pair match list of early term that will be needed from Heims masavelenemetry.

Outside one-part the tackery-yaid looks live is headware selectman significants. Stored have a an investory of house path-wendows, doors cohinats, interior wall parela electroal tourne—30 000 different parts in all. And Hant makes werey one from comp dothes to statication. There are even entry bethrows constructed on a single pace of plante, mady to be chopped into plate in some Heath sup.

The manufacturing process begins with soning and cutting the steel beems used for each unit's harme. At the stage, robots do most of the work. In just a large minutes they wild boother a steel horm as terms as the



feet long, 8 leat wide, and 9 feet high. The average house is made of 11 of these units.

Deciri the trans leves the obstavelets, togenate by nump through the prior. When 400 turnes workers constantly refer to the domain pain and the ist of materials needed for each score. They also visual the plastic plantings give and decirco always and page the walk. Choice place the write and page of the score of the top of the score and page of the score of the top of the score and page of the score of the top of the score of the standard write code) will be connected to poer writes. To diserve the score

The tectory also produces the outside partial of the house. Software are mote of pented steel and aluminum offices of amaterial called Synolities, a special insidue of constate and writering blacks. In all allocal despects of the house is completed at the sectory. A level myoduction lane can be not the equivalent of a complete house in just 44 instructions.

Hoteles Nahigran is a registrered actived and Herris arguments mensues if the plant A cheental ean who wasts a hard has used the consoling yissfel retacked of the echinetist basedy scott could be supervised to data the plant of the completed with locke last home the factory. Nahijims acculate scath house the corres of the production line of hos a personal interest in the production line of the one.

"It was made one morning in the factory" be seen with a smile "several years and "

Prelabricated homes have a lot to offer the Japanese home buyer. One of the selling points of prelab modulars is that they are much more specious than traditional Japan nase homes. This extensi designs are new to Japan as well.

bein house, here a boy tot attractive track They come with a weak totas of anerostic transition with a weak totas of any english content and a graph-bencked existent them Bayesist a new model is to a the three days with house it is ideal for campute day neglished body. The Penkis the emparity wat house it is ideal for campute day neglished body. The Penkis method was an existing to the total compares all avertications to personalize the body body body and the second second body.

Electronic hardware and isoftware are destrued to give a bigger part issile table Jispanese home as well. Sensors and controls can be restalled with ease when the homes menufactured Herm already others a central computer called the Herm Keeper as an oother for its houses

The Responsibility experiment to the service of water orbits and energy use to the level of water in the battlas. Waving time is small how and the service of the service of the energy states and the service of the and presses are battle water the embine of an automatic forge syste, there by the same of the service of an automatic forge syste, there by the service of the service intervice of the service of the service of the service back terms on Service hold service of the service back terms on Service hold service of the service back terms on Service hold service of the service back terms on Service hold service of the service back terms of the service of the service of the service of the service back terms of the service of the s

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unal hair: A imail fluorinated floor plan above the control shows where all the controls use achieted. The whele process failers about freie mitides. A more advanced version of the Kerger, in the planning stages, will be the homeowner do leitbarking and control such automated acostischise is mottenaed window dhutters.

Unit houses are post table soms for some major corporations in Japan, but they have not vet fister the occurity by some finance and an suggests Toyo to, an independent an offict, is that Japanese home buyes are to a conservative. Another is that these house don't offer incerupt movement buyers from going with the more placenail why of homes.

when oncome its himself is bein accentrating with horners design buches that acceptating motion and other carstal is the hermonic win down posterior drawth and its instances in the index carstal is the hermonic win down posterior drawth and a carsh handie fartools hill bard make perfect years have been and a set of the set of the bard of the set of the set of the bar and the set of the set of the hermonic set of the set of the set of the bar and the set of the set of the hermonic set of the set of the set of the set of the hermonic set of the set of the set of the set of the hermonic set of the set of the set of the set of the hermonic set of the set of the set of the set of the hermonic set of the hermonic set of the hermonic set of the set

Jepan is already tamora for one innervetion in sheller a concept called the living capital AE Expo. 70 in Create architect Kisho Karokawa ohibitat a packaype of his "business capital" an uhmoompact room hat incorporated practically all the basis laizansi of a house Today on the edge of Tolycis Ganza shopping diamon is kurakuwaki Capsub Kinson, abcumenturutane Targa concesse units lacked one stop another like a pie of ontridenis blocks. The compare norms are resourcedly pixed ao commodutions for comparise estructures making overhands taple to the instructure

Measuring severity these and obtails these air control list the molec forpute are a little to compact for singu-feature weathings of the plant heteroid is always despite are imported controlscots to the list for plant and applicable despite are imported controlscots to the listing applicable and applicable control flatting applicable despite are imported controlscots to the fizzage applicable control flatting applicable applicable and applicable controls fizzage applicable portfold with a portube that fadds the a zerower the

Using these ideal in mass-brockuping homes for the hearty-first carbury requires the resources of large composition and the willing tasks to thak a commitment by years of research and innovation without quick profiles Perhaps the most dismatic commitment has been made by Chapper Mismak the forty reven-years do preschert and buncle of Massear Homes.

The son of a successful lamber device, Missee bunded his company in 1967 To day is record only to Selessi Herm in the number of perfolib homes is builds in Japan A photochoid and somewhat match inter-



(he believes, for instance, in reincarration and filmlis that he was a builder in another (hi) Maawa is a builder in another utation for being a filowed entropreneur and one of Jabolari ment constan energitives.

He satespaceto nor,hav use vedace and portable comprises to cell homes (A TV mage) he claims, lastness three fundeds with the last air auch information delivery use verball conversation.¹¹ And a mammoth building a "timolecida base" to the comlanger in the complexity of the text output and the complexity of the text with the complexity of the text output and the complexity of the text output of data and popieds they have been working on

As part of the experiment he grouped managers into learns according to age. He then had them lead the results of her work, mit a computer and will use the data to udge their monether and productively. Eventually, Meawa says, the collective knowledge and accentizes of averagene who works for here will be stored in the computer.

Messee likes to think of industrial progress in literar all appoints. The Filtes was the ora of here yindustry and the ion Age to says the allowed the emergence of the pastical and electronial industries. The Seven thesi and Eprime are watch to label the OU Age where the insertify inclusions particmentation programs. The toprovide in those building, Allowed believes.

As industry mores loward the Navius is a direct with the Date Navius in the Navi of the Date Navier and Stear I was a strateging of the Navier Navier and Stear I was a strateging of the Navier Brendhalt is annot summer that his company a strategy building and lossing the washing a strategy building and lossing of the washing is a strategy building and the solarist of intertion and the solarist of interpret the solarist of intertion and the solarist of interpret the solarist of intertion and the solarist of interpret the solarist of interpret where is produced the interpret the Makes Isolary where is a produced the interpret is a supported building in the solarist of interpret interpret in the solarist of interpret in the Makes Isolary where is a produced the interpret in the Makes Isolary interpret in produced the interpret in the solarist isolary interpret in the solarist isolary interpret in the Makes Isolary interpret in the produced the interpret in the Makes Isolary isolarist in the solarist isolary interpret in the solarist isolary interpret in the Makes Isolary isolarist in the solarist isolary isolarist in the solarist isolarist isolarist in the solarist isolarist in the solarist isolarist isolarist in the solarist isolarist in the solarist isolarist isolarist in the solarist isolarist isolarist in the solarist isolarist in the solarist isolarist in the solarist isolarist isolarist in the solarist isolarist isolari

PRLC is as duable as concrete but wegts somewise links. It is not constructed and can withstand feroprositures of 1200°F which being assanted, it without deay or ways. Its soundpread, has assaillen insulation proprietes is duable enough to withstand an usaffagake (iso important consideration is Japan), and its cheap.

The company sport is usybly \$30 million to deallap PALC (about \$5 million of which burne from powerment grants) but the rehum has been considerable. Maswa says that the cost of naw materies and temportation for his homes has been out to one for tell-the cost of conventional housing.

Misawa also looks to the earth substance sticon to fulfil another dearn of this the zaroenergy house. This building will be shingled with amorphous is loon solar cells capable common on Nat to

S CMN



FICTION

Why is the Brobdingnagian braw on Athena Station sulfaring a skiwdown?

THE MIND LIKE A STRANGE BALLOON

BY TOM MADDOX plastic sofa, mamatched chars,

alue abhors a vacuum Ve, too I guess I tried to cooked elaborate Movecan cincooked entitiently in the gray Oregon skies

television old movies seen in worn peris music videos with strutting rock stars, baseball across bright-green fields Ghost images phost voices remained | had a talent prow-The mage in my lying room

was real encuch, though Toph a pb "How are you, Jamy?" he said He shock the water off his chair, then looked around at the tion worr on the wells, other

"It's all right, Toshin" Not ourin alle Though in Palo Allo I dhad condo, 4 hadhit feit like mine Not List the apartment the work Fit

And of course I watched in had assemed to belong to me Tracky as if you this place did You making any money? "Some enough" That was tations with Control Data, a week spent lecturing for the Inall right financially. With the "Cheryl says helio," he sard 'MIT made her a rece offer, so her tenure or lose her "

"Next time you see her, cave "Of course I do, but so what?"

Locularit drap her off to live in do Amyway, that's over, Tosha How can I help you?"

Alaph Nought IA," he need inthey been such event movesputers at all

There were only two Aleph-Noughts in existence, and one was buried deep beneath the National Security Agency complay in Fort Maarlo, Maryland, sudeng up the daily groatwise of intelligence and decidedly off-imits to me The other was working for ICOG, the Internabonal Construction Orbital ecuator, at Athena Station

PAINTINGS BY BOB VENOSA

We ve got problems with an

Athena Station spun gracefully amid a mad olutter of wirm and frame The Altoh system managed everything ?

hed blown my change to work with the operational When Section dolwared the linet Aleph system to NSA I was one of those chosen for troubleshoot their new loy, but NSA. hadn't liked my background, per from graduate school at Berkeley tion, i told them to forget if When

Charvi sted I was looking for a was. At any rate. Toph had been dar He fought hand for my noht to say no, but the most he accompished was preserving what you might call my good name I could still use SenTrax as a reference, and I washt on anyones blacklet, as

So ICOG's out problems with the Alexis system. What are they?

'At most times nothing At oth ers it's slow mutched " Him dark pale baneath his light-yellow skin

We can they at Jerry It's not even carrunning around like mad herrs. No apparent rosson-diagnostics programs nominal

So you want me to see what I can find its Alice Vance still running the show?

Yes. She concurs that we should bring

"So I did How does Seril'rax feel abrait

"They were not eager but they now agree There was a story there i was sure. Moment of Astabar between us, viscenal communioation the Japanese prefer to mere words. I could picture him quetty uniconvisionely but

I can't promise much. Tosh, but III give As litle as possible Jerry Travel light.

Athena Station spun oracelully ametia medi chiller of won and forme. The next of concentric lings was the station tool, the choos around it the staging area for the orbital inercy and The Aleph system manager 42 CMM



everything, from the routine flow of success gling, Senitar would tall along with them COGs windor cardraid with Senitzy up doubtedly called for heavy panabes, up to and including default, so 100G's lawyers

Cos Room Workstellors were scattered around the farty meter hemephore paths were taols of mutal obbits that bounced soft

The sound most usually heard was a soft murmur of voices from Alice Vencels oncur-

The KEs are applying of the system They occasionaly rocest an expensive in the form being over the consolss they manapulate. To surrething on the order of original sin so they tions hypotheses or satissied waters. They were tooking to me to explain the ways of

way I was too busy learning Alephis characteristic patterns, those complex internal rhythms that like a foreign lanouage you begin to forget when you're away from them I was latening for dosonances or sorung rhythmawrong but all I got was the usual

ing any computer can tende to the decision processes that only an IA

Butseveral times and often to an hour or more which to a manenceocond is an infinity-the matern signed it was as if st open flow would resume Aleph would have to play catch-up for a while ton wasn't senously imperied

what troublesome What was causing the anomalies? What

I could understand why Allog's KEs twitwho had ust heard about the archbehools

Like them, like the disconstruct programs quete Such all-purpose Ms as Aleph do a the process they sometimps to themselves subavalarms, hosing to trid made one of frem a little, squetting fork-tongued demon-snugly little thing with a long fongue rasty breath, and a repetent serve of hu conjused out of the untafhomable complexty and speed of IA systems

at work, i intended to observe croute that power and whose software was home cooked The ward spots places out on the edge of R&D 1 had run a cusck sorting pro-Rost-Sch was to be statened over re-

It featured blank white well's cluttered work benches and a row of data conscient the new milenum Gathic of the Ops Room

A young woman in bias were and a T-shirt fairly obvious possidioc maternal, get vouncer Japanese man were working, and

I told her I wanted to see the boss. She went through one of two unmarked doors. and came back in a few minutes to tail me

early thrans. She had close-cuit dark had streaked with gray and when she turned to face me, her eves were hidden behind terze smoke at the center of each lens, like the expanding cloud from an explosion. Her fedures were stationed in the bane her perior was wearing a silky biouse the color of a nov-

"What can I do for you?" she said. She moved slowly from behind the desis, her br-

Her mage seemed still and sharp before me, and I got a sudden, involuntary issignment

T meet to observe your employment of the Aleph-Nought system

"One of Aliceia witacts are you?"

"Hardly Just a heekange troubleshooter Could you tell me in general what you are

She explained thay were growing bar computers which were ultimately intended to be implants-replacements for de-Statur was used for their work as they readed zero clearly for the basis, the Alexin

The wana however, was such an active processor of data, and the optic moves were so dense- a million or so filvers in earth cnil-that they were heving problems with the sheer weight and complexity of information transfer. "Still we have proven pitahed something," she tool. "Rather the

the same cesture a woman uses to let here strps of fash "Plastic flesh Festerred with VF Veloro" She picked up two cables at

Comp hera' she sext 'Do you see?' Embedded in her neck were two multiplea

face lowerd me. Her eves were brown and vacant unionised She was Nice

She reached behind her a cable in each hand, and anapped them home. She waiked



away "You are about live ten." she seed "Hear the color of straw light completion though shert that does not suit you your pants need pressing and your shoes are worn. Everytime you are wearing it well made report sive in short you look live what you are a successful, mellectual gamesman, one who can afford an ar of regired You probably of thing accessing.

Whatsortol time?" Something had once of the rais here

The shabby pertility if summoutant We cal his he CAV propriet computer-se sisted vision it is fairly accurate but requires inordinate amounts of hardware Look around you." She ponted to small carrying mand the soom. "Using I-Sight software the Alleph system combines views approxmates perspective, and convicts color hur and intensity The images lack resolution comparable to the evels, and the field of view is somewhat namew Still Lassure you if a better that nothing Yea I suppose it is "

"In any case, that is our current stace of development. I am atraid that is will be my possible for you're mandor our ongoing work of present. We are far too busy I would think tors daed."

"It is, but I need to see thirds from the other end the user's perspective I wouldn't bil any bother. Sinch an observer looking for anomalies in subsystems involvement

Confused and muteri Lieft Part of twas The appressive freak show part her unexplaned hostility but there was more She had but cells deep inside the trian, the pries that when they live make you convy

Halp the handlospped, I thought-left m inve with the blind

I returned to the Ops Room, Alice Vance, director of IA Systems was sitting with Toshi She was tifty or so pear-shuped and had hav the color of old grease. We had worked together in Palo Alto back when Aleph was sist a clearn in the Sar/intx evel

Why didn't you warn me about Diana Howood?' I said 'She gave me a very hard of town

"How very shallo of her." Alice said Sha apped in a way command, and the four data windows she had been working with faded from the screen

Can you not work with other subsystoms?" Toshi said "Belogical operators are somewhat marginal

"No I'm do now hat you pay me for following my highly trained intuition no matter where it leads " A couple of the KEs stopp nocking they heads in agreement-1 was the sharp young prest sent out by the Way-



We should be been well for the set of the se

The wait value is a big strategy of the second seco

To help of inflammat in the next wave of mode, Japan's Minory of Informational Trade and Industry (MTT) help as allocated 30 billion yen (Jaccat 388 million) for an eightyear research program. If we commodured that both the program and the latered that generation compater project will be completed in 1991. Hight now electionic umbillion contacts them actions to massive

ROBOTIC SOUL

The Japanese have created a race of droids to be fire fighters,

trogmen-and ligure painters

will suit computers Researchers hope that out of the fifth-generation computer quest will come a more compact and pertable soul for that his-bainestace machine.

Partropatrig in Jeparts ambiaus mborus mborus cas proportia are more than 30 cooperations. They're joined by insearches at versus 50-60 currents/as, and robocatas at the MBL and the literativechina of Labonatories bort in Tauluda Sarona CMy Tauluda at the MBL sensitivity comprehension in Monthly Bland subbick buildings where sciented share buopmits for fullying behaviour.

On one inresepondby even tai allow norm, a very sense, when developed Nobou themma, staff specialist and weight expanses, automatical Mithele goed suider the Antonool Nobot Isabitot Barbeidge Mithele Antonool Nobot Isabitot and Antonio advantation and according to a advantation and according to a advantation and according to a advantation and according to advantation and according to advantation and according to the special the machine by michael according the advantation and according to advantation and according to advantation and according to advantation adv





Previous page A noted to Exper BS Intertees and/of it leaves This page Kaps a MARCY (Intervent This page Kaps) a MARCY (Intervent Control (Intervent Company Intervent Control (Intervent Company) (Intervent Control (Intervent Company) (Intervent Control (Intervent March Control (Intervent Control (Intervent March Control (Intervent)) (Intervent Control (Intervent)) (Intervent Control (Intervent)) (Intervent) (In Out of this technology will come the first hagsed isobate Robatics will send these theory-prevailing machines where few mon would choose to go, into the redocerive in terror of a rougher reserve, down to the damproces terrain of the costan floor, or to resular tegeher togeher the burring building

The well watking spacker is baing Cubbindisegnetal for inscusa work. In this office, leeds shows attack seenderrige of hutant wall walkers on the poly in one porture a sportery robot crawls up the side of a burning skytemper its campring a fielner to a group of arrobati poppin peering through in tackets window.

The boyer of participation interestion Center activative to build such a machine it, was a small suction orawler stood the size of a breadbar. The such in held in agains the surface of the building. But every time is came to a large or sume obstach on the building is surface it cut facts or held

Bornecky kerts may be attait to disputch or army of hazard hobds, each boteling a specific skill. Building envolvers have reploached him sboul enristing ha wall walke to work or the armithing liacades of structures. It is a dangerous and labor-intentive with because wardness much build blootib









appliants of iscattroiding before repairing a bailding. The robot casid even help metritain the voot facts of stigs employed in a seafaring mitora like appan liketa emissions some future vension of helpico their stateming down theshtigs stress index to scrape of barriadas and ruet.

Before a robot can parton my of here both howes to example, they multiple that particular to example they multiple that particular to example they multiple that parts as with orisitype of babte vaces in a some start or the type of babte vaces in a some start or the type of babte vaces in a some start or the type of the example of concentrating of the grange that they are concentrating of the type of the example of concentrating of the concentration intratistication of the they are babter intratistication of the they are babter into the follows arms to date and benchmark multiple of the the type of the concentration of the they are babter into the the type of the type of the the type of type of the type of type of the type of the type of type of the type of typ

But the works of three-densatives it images requires events that a minute 30 begins and but it if is complexised for an impact 30 begins in a property event both a minute 30 begins in the object implifugations and the titler three the set of the object in a set of the three the set of the object in a set of the more than a set of the object in a more three simplifies and the set of the more three simplifies and the object in a three the object in the titler both the more three simplifies and the object in a three the object in the object in a three the object is and the object in a three three simplifies and the object in a three three three simplifies and the object in a three three three simplifies and the object in a three three three simplifies and the object in a three three three simplifies and the object is and the object is the object in the three simplifies and the object is the object in the three simplifies and the object is the object is the object is a simplified both comparison of the object is and the object is the object is the object is a simplifies the object is the object is a simplifies the object is a simplifies the object is the object is a simplifies the object is a simplifies the object is the object is a simplifies the object is a simplifies the object is the object is a simplifies the object is a

As the pacegram gas smarter is well be select to corrective 3.0 welco negroduces of the officiant claricst here mays inder sees. The optimate access design (CAD) model is here stered in the program. To become particitian imped deforiting "Base segarations. And by motifing objects with a CAD model welcome user's the rebook of logare out the objects on amation." Share well beginst your the object the rebook years and the objects of a contrast of the object out we say Registrow, here is not every stages of acquiring clarable built gut the splatement accency of the set of the object out we say the object of the same set of the object of the object of the object of the same set of the object of the object of the object of the same set of the object of the object of the object of the same set of the object of the object of the object of the same set of the object of the object of the object of the same set of the object of the object of the object of the same set of the object of the object of the object of the same set of the object of the object of the object of the same set of the object of the object of the object of the same set of the object of the object of the object of the same set of the object of the object of the object of the same set of the object of the object of the object of the same set of the object of the object of the object of the same set of the object of the object of the object of the same set of the object of the object of the object of the same set of the object of the object of the object of the object of the same set of the object of the object of the object of the same set of the object of the object of the object of the same set of the object of the object of the object of the object of the same set of the object of the object of the object of the same set of the object of the object of the object of the same set of the object of the object of the object of the object of the same set of the object of the

I won't be enough for these reducts to test the world. They must interact with its -turnng wakes and retaining taken loop. The Intri-spectration machines with react hands that can operate with all lead quad-human downly. Mail whole grapous areas in the more than two fait moral fragms that quadhuman. There more more than a quato. So packing up anything other than samto. Min-specific ducts is difficult

The electronic part filter harmed has been elong on possible elongements to the hard problem in the failed 1886. Sature Kobayaha, sitescor al Mischris mechanical origineting research laboratory unvelledat three filtered hologi pape that moves with the elise of a human hard. During one demordination, is three classis – all mach sample path and mickle finger – classed in accords ball in a salwe term among movement.

The idea for the Hitachi hand came from a deager of Del Horma, a teacher at Waseda University in Tokyo. As a student, 70 (MH) Home built shall robuilt and built needs granchally The server was a poster substance called stage memory along SWM Presenters in the US have Orden ro-Liberatory devokered SWA monitories and strateging comments and stage produced fitted of the strateging of the strateging comments and strateging and strateging of tested of the strateging of the strateging the strateging when was and strateging when was not strateging when was and strateging when was not strateging when the strateging of the strateging when was and strateging when the strateging the strateging the strateging when the strateging when the strateging the strateging when the strateging when the strateging when the strateging the strateging the strateging when the strategi

Homewishing constants arms gave Hooder potentiatilities regulation is a by the skips in larger models instead of bulky and holes elabelism movies indending and undershifting the flogges. Houch usais 12 strends of SMA while controlled to goings. When a small charge of elaboratory courses through the heat ingress the model in unavailable indexis the lingest is remoth invariable indexis Settifting on the careforceuses be lead to lobe luming of makes the ingress com-

Cine roboticist enusaors a crew of mechanical workers skittering down a ship's streel soles and eagerly scraping off the vessel's barnacles and rust.

Unfortunately the hard moves in the top sluggerby to be practical. Bocause the wear bills a while is cool the trend control locate that and the state of the trend control locate tests according to Kobayash. For example, because contracts have never used SMA components this way before no one increase headings will be

Bawaii hand researches are looking to the airmalikingsom for ruperation Arthe Tokingo Instate of Tochnology unal, capped Shigke Hinsenhan mode a rame for himself by building 24 managere of machines that right pounds mino the movement of costan armaia. His soperents object to turk, for instance, movies as tensorally as the real hims. A strate tobo skinos.

But the three you my bited project " he sign ingelink cody and paper a caseship into avideoccaseful machine." How my black and of single machine. "How my black and of single machine. "How my black and of grapper" A mails said particulars from the left of the screen. All the and of t, where the abov squares ind of a turn be read too Frigore would normally appear. This esteed actional like threades coll backward.

The film shows the gripper in action. Alter man hand places different objects in front of Its mechane With a metallic tusic the tentacles uncuri and coli themselves record a heed of rabibage then bound holdshores, and lensily a prope of porcelars. The hand tills adapting mich missions is welfact knowing a merk. Unlike the standard staal cliek, the discus mission with september fieldsky. Himse turns of the vaciosage.

Note the entropy of the graphet on sometime the source of the the state of the the theory of the source of the s

Howers proper still needs tohring He must device a way for example to vary the grapper grap Plakinal applications are still for in the tutine buil Hisse awates the day when his can meterized the grateoth hand and install it at the and of a guatoscope so it can perform storeach surgery.

No matter hav dedecus a mobiline is, unless it can move, its uses will be thread. The usual imode of tobol boomotion is the wheel. Wheela are wonderfully simple way of gotting ascund, and they use is meriting amount of energy. But they use is meriting amount of energy. But they are infinited, the tase asys with a small smie. The reason Almost half the stama a node will encounter in the work is insocretable to a machine with wheels or tube.

Hrose and the colleagues in tobot mosends resided years ago into instance offices the bett example. The ideal way to move is to waik. So tobolicitat in the United Shifes and in Japan toxic been trying for years to slip a wel of lega—two four or tox—undernach their machines.

Installed the strake is studied the spake, this with solve includes a thirty of the solvery English "And i was inspired by the value" of the space" to the concease to substrayed walking machine measuring about their feet finant loop large Notorly doll therabot, called the space of the solver the set finant loop large the set of the provide comparison of a codeb of nonzero with the order outpation if a codeb of nonzero with the set of characterial a dashed homologies.

Trian III movies at the rate of elsoit fourlest per minute which is lister than the spidery walk waker it can raise to body two last in the are or set stelf down on the floor, where is on the underside of its body to rol to its clostheader.

Hroads mechanical spear also has a taient after robot builders wish than dovices had The shifty to clamb up, and downstains And it does the without seems

The machine seless on a system of louch sensors. Eight metal whiskers of special memory alley at hom the edges of each of the spectric bolocits. One advantage to the alloya that the machine accodentially steps on a wire the wire will not be permanently bent out of stage.

CONTINUED ON PROST TE

?-iris(idb1,near(shimoda,X)).

- an : [[neighbor,shimoda,X,_1_20,_2_20]]
- ptp : [[ir3,X]]
- emo : pl([[neighbor,shimoda,X,_1_20,_2_20]),[[[r6,X]]) [],pro,i,ir3,1,1,ir6]]
- lan : [[neighbor,X,shimoda,_1_20,_2_20]]
- ptp : [[ir4,X]]
- emo : p1([[neighbor,X,shimoda, 1_20, 2_20]],[[ir7,X]])
- [1,pro,i,ir4,1,1,ir7]] [1,unn,i,ir6,i,ir7,d,ir8]]
- [1,equ,i,ir8,i,ir6,d]]
- [1,get,i,ir8]]

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Japan's new computers may be the first to think as humans do—only faster

BY PHOEBE HOBAN

It is early Stautury morms, and its burgh optications of Rays, and the and to hear way hashow They many burgh optications and the status of they many burght optications and and they are shown and burght optication and and they are shown burght optications and and they burght optications and and they burght optications and and the shown and and the shown and they are shown and the shown and they are shown and they are shown and they are shown and they are obtained and the shown and they are observed and the shown are shown as a shown and the shown and the shown are shown as a shown and the shown are shown as a shown as a shown are shown as a shown are shown as a shown are shown as a s

Sobety you can't seve down. Given the automia drive, it's roll surparary that when the Japanese decidad to investigate the inclusion discriptine of artificial intelligence, they dol is with a degree of diagence and cagning solution - Using Computes that There elicer --U ball Computes that more or less simulate human thought—were burched thrus years aga, and it's already as clarify locused as a cross-hair targed on a bankagut taget

The Apparatus have detected artificial registered to the origin most important registered to the origin most important registered for above the suscess, says devices and the appart of the film devices and with what is not indust restore with what is no indust restore with what is not indust restore with what is not indust restored on its inclinicity provides to sarvival, are explained. And they hope that their newed lackmaking of know the artificity and they hope that their newed lackmaking of know the artificity and they hope that their newed lackmaking of know

PHOTOGRAPHS BY BRIAN R. WOLFF
To realize an idealistic society, the Greeks needed slaves, Fuch says, Our version of the slave would be the computer?

make them number one in the world

gued that if machines could only ape human intelligence, they could perform the timeover Ecupped with computers that decipher visual images, communicate in colocess to additional mental muscle. That muscie would give credenos la our decisions the things we do best. As Kazuhiro Fuchi (octured on case 72 and bridge) the putspoken leader of Japan's antificial-intelligence project says. 'The kind of logic at the ancient similar to the logic developed by the Gaweky. If you think about ancient Greek socety in Africa. They devoted thempelves to size this idealetic society they needed a later number of sizes in our vision of an ideelistic society, these slaves would be replaced by computers and robots

These computer slives, McCorduck roles will be as easy to use as the telephone, as ubacuous as electricity as encompassing as 2007 a legendary He And hey should alter human existence as pro-

foundly as clid the control of firethe emergence of speech, or the expositural revolution.

These energies the birth of the respective to respect they have increased to the respective the respective to respective the respective to respective to the respective to respective to the respective to respective to respective to the respective to respe

Before leaving home you could activate your robot maid and a doein applances with the simple sound of your volce. Then you mght summon your car. But in the stead of driving yoursel, you'd just tail the computer white to go And to pass time on that journey you might si back for a conversation-with you might ne

Tendency of a merge with vessel and how much merge with vessel and the second with a local of provide and the second how the local of provide in the second second available of every option, would be local or proceed. West to write to a thread's used on bala your message to the obstrauter and your mend would out the nature in seconds.

Later charge or the area of the code of the charge with a company-to the charge of the

Indexid the computers of the fifth generation will run factories manage offices, perform surgery, degrades diseases and even design new software and herdware for new ever more intelligent machines. These, offsping—sidh, soverth, and sight-ganasion computers—will make most of the problemania and personal discessions curterity eating up out time. Freed from the dudgeryoffogical deductive-shought will have time to induge our humanty—time for a new! a personing a philosophical essay.

Bull Spartin Japon is to ustre in this newage Attinis if must have a makeling purposed to ward that end, the Ministry of International Table and Industry (MTI) apported is commitize of planters. Formad in the law Saventes 4: industry (MTI) apported is commited and the second second second second linear Minister-Reaction Fuch, Torriu Moto Owa, and Hole Aao - edd college toddless from the University of Linear. Immed for its contraster Second college coddless

Fact hard he collegipse who entrangly mere of the improve logical or previous generations. The first electricity of previous built the first weak reservice students that absorbed on the warmth of vocume that absorbed on the warmth of vocume absorbed on the warmth of vocume label Forters makes could be table of the second generation was born Them in the early Solves tempcoducty chips such that into generation was born them in the early Solves tempcoducty chips such that into generation was born them in the early Solves tempcoducty chips such that into generation was born them in the into into generation was born them in the into generation was born them in the into into generation and by the second that memory of internation that by the logid be

> stored on a chip had nosealed yet again. Now thousands of integreed croats could ht on a segle very large scale integrated (VLS) only, resulting in superfast fourth organisation machines.

> Each generation held more information in less space each worked an order of integritude laster than the tachnology that had piecoded 4. If the Japanese were to build as fifth generator. This would have the multiply the speed and reduce the size of computes once more

> Vereverse the new generators would have to be board on new principius. Today is computers hough note board on new basecally just crunch numbers they faths a sol sequental they faths a sol sequental they faths a sol sequental tap types on the open hard would apply state way. The new computers on the open hard would way homans do-manipulaing dear rather ban numbers. If minimum by susception or cer oppy rather than y summ goaw



a long left and opring up with solutions rather their amply regurgisting statistical defa. The old computer architecture would have to be attended in favor of one that more closely approximated the functioning human mol.

The algorithm part level that some an thesa indigeneon machines had alessly been put to commercial uso By using a sea drules to developed conclusions term facts about a statubase a disple geologies or developed to the second second and minoral holds. And a mobile taxator or the minoral holds. And a mobile taxator or online AMCMP degroses such tobol disstatus are memptal. But three outport mobile adaptation from the second second mobile meters are bacator for oils a find, such second meters are bacator for oils a find, such second meters are bacator for oils a find, such second meters are bacator for oils a find, such second meters are bacator for oils a find, such second meters are bacator for oils and second meters are bacator for oils are second meters are bacator for oils are second meters are bacator for oils and second meters are bacator for oils are second meters are bacator meters ar

isboriously built for individual user

The Japanese suggested taking these primitrive, one-of a lend things and massproducing them. It was analogous to telmig a horseless carrespe and churning outDataure in one tell secon

To meet the goal million version greetman a latitude 3450 while the latitude 3450 while the second second second what it here called while the second second second the second second

though, was just the

Intrologantise from business as usual is norder to direct the Pitht Generation Systems Propert at the new headquartast, the Institute for New Generation Gomputer Technology (OOT). Fush leftins pito at the electrochemtod laboratory (Nobody in Jispan seegne from sjob.)

Then the defined tradition again. He inselect that none of his 40 reasserbase be oblight that there have "We wand young rusearchase because they are gazed, feedble and eager to learn" explained Fuch "The is a tim- to heavity year project and it will reach maturity as here do.

It amone could inspire frees young mento the damp technical feets that would mean success it was Fuchr Energetic and inrai cent tense with a prolific, fiercely potent mind. Fuch was considered a mewenck in conformed Japan

According to one legand the was just a young men in his herefuls when, furnau at the way things were going at the laboratory his stormed out and sayed sever to a month the came back only after his supervisor biggins limit to mixim. And some 20 yoars fatter his remained delayly committee to the send restrict the tracem indicatal least.

When his down his cade of youth/ taken, from Japans top government labs and compoint companies (including Haaih) Nappon Bactic Company. Nitrubath: Storp, and Toshba), he met with storp sessance. Recruits leaving the corporate faid wore tool mandate was clear, to conduct a cresh course in artificial intelligence, engineeing the ruts and bolls for mess-producing rithcentention computers in a discuss

The first phase of the project, Fuch explant, was avried at lying the groundwork for the new computes, which would have to handle wat mounts to knowledge and data. Those computes the line would combine mysed computes pains. And the first component the end has learn of samuras specifies as if out to disagn—the welvaried other faits emerging and the set of the line of the line commendation. All the set of the line of the set of the line of th

The relational diatabase machine, Fuche explaints is essentially a vast memory bank of partnerst knowledge. It includes three

> sands of objects and the characteristics that define them. And it contains the relationship between one object and the rest.

For inducing, stype at object in the site and sparrow the memory would hold about UDD title or chargeserrow inducing its scen, weight cobinserrow inducing its scen, weight cobinobject in the database might be the base object in the database object i

Dur powerful PM storeo has no wree, so there's rething to tripyou up it foully stole and ightweight to you can put it on and head sowhere And array you next the RP 2030's great sound, you'll undoubtedly **TOSHIBA** become very attached to it

> they might not move up the ladder with their contemporanes when they returned

But those will go to lobe hard were put to model with a whole hardware to an accumodel product of again. They were put to US answerphic Revershing some of the enry MT tackins i theia astrong your port of the enry MT tackins i theia astrong only consolwill notify up between stated astrong and any some toors to be them of a saveral computer there are not astrong only consolption theorem is the task as a start of a start astrong the saveral computer there are also as a start of a start of the saveral comlocation of the saveral comlocation of the saveral comtant and the saveral compared on a start of the But on matter match as laterage there. Fuch and his semificient to distance mothins in mid-field, but has use meakly the beginning, just is storage area for the arricolar initiation between the users of objects. The mechine was a long way from initiation to the object in the storage area to objects. The mechine was a long way from hinting to believe the year ware use public term set out to clavelop arother waters called the expectability from public and called the expectability for the transformed and of to object explaining and the transformed and of to object explaining and the transformed and objects to object explaining and the transformed and objects the state public and the transformed and the state of the object explaining and the state of the state public and the state of the state of the state public and the state of the

Convertence computers process all citize mathematically—adding, subtracting, maitiplying, or dividing—to come up with the arrower. But the inference processor of the lifth generation literally processes that of knowledge, using togic to analyze a pathowher stratem Says MiConcluss. Its prepert.



we spask of computer capabilities in terms of millions of arithmetic operations parageond But appeares planness want their mechangs par record (LIPS). Each logical intersport econd (LIPS). Each logical intersport econd (LIPS). Each logical intersport appeares of resonance.

The register of the result from their expenses as both and both can be any expense as both and both can by ben the sequential interaction processor would be able to device in a single storthat operative can by it would also handle instance, that attracts handle know for the last handle handle would prove that attracts to both much would prove that attracts that all be and the exceptions based as a both

To help his machine perform such operations Fuch her discided locarity to berrow a computer language wirefold in Trance and polisitied in England Known bis PPDLOG for programming in bigutic programming in bigutic million logcat inferences per second

In odde to opposimile MNMI (Sough the host academic of the second second second the host academic operation academic pareally have una wepting costant (second second matching and second procession academic that compare wepting to half matching and the second second second a careful period lines as many an 1 milcom particle processors, each and when a careful period lines as many and a land matching and the second second second and a careful period lines as the second and a careful period lines as the second and the approaches the complexity of the second period (second second second second second and the second second second second second second second and the second second second second second second second second and the second and the second secon

Parallel processors would be further activit by computer chips built from incivel materefs indeed this dapareness say they have alwardy been experimenting with galaxit assende, which can toarmine elektronic segnals her mere rapidly than the silicon chips react in one states.

But now shirt to intrins pasks processors or compreter, DCW in read years lowershire to gain a new through TBBS the group of grow to make all subsystems function particular with imported applications of the dop in patients to be built, built with a silicadop inplanet with imported to possibility of the applications of the dop as pactices to the applications of the as pactices the applications of the as pactices the applications of the as pactices and the applications of the

Rehtspar most important, Fuch and his team will have to make importent the same of 'valligeer instream,' in other words ther mechine must understand and reply to generally unspheticated human isses. percent generic or write qualitaris three communicating answers in pictures created Association to Not Creative immark them.

will cover speech-wave and phonetic anal-

yss. It will also include the highly suble arts of semantic syntactic and progmatic shell ysis, which detect shifting memors and therees inlonguage

The energy fails are excised as made and the second second

Eventually McCorlus contents computers will understand controves human speech with 85 percent accuracy. They will also propers regain larming the "type" of mobile that must function innovel shappent the uscut accord they waits function. And if all pose according to activation in the approxem shrauld be ready to market some of these systems in second and the top of the system of these systems in second and the top of the system of these systems in second and the systems.

These systems. Fuch contends will pave the way for the listure test Speaking to Only recently in the listure test of their contening tase bookcases a lucinous letter risk, and an empty securitie-see disk—tax-cullined for the vescular or case!

"Secologida often trevent he future whota samp when schooldag will is in Engineers and accentrals on the other herd usually work on tochnology whota candienging what turns scholars will inclure " BU (20) is avoid place potible with a techrological preemptive title. We are not pathy setting uppaged in the durate turns and then gang back to be proort, "he says that are gang back to be proort, " he says work for a new social and, the Age of intometics which a 30out to entron

Adds McCorduck, "Withost well-gance was moving along, minding its own burness mady alongs scores on our hought of it as much more than since way to turn a burk for a time tittle companies. Notody throught of it as a way to transform storetly Than the Japanese came along and though it to center state."

Exe Manuag, head of the computer de partment al Ontencis University of Walarloo, agrees, "The With-generation project" he says "is a brilliant political move that the ad the agende for the set of the world."

Indeed Broad into a sudden race for com-



Here's to

more,

more.

more

gin taste.





TSUKUBA'S EXPO SALUTES THE WORLD'S BEST HIGH TECH IN A RAZZMATAZZ FAIR OF THE FUTURE BY DOUG GARR

•







A robot that plays requests on toes a grant television set about 130 best wide and 80 Expo 85-Jacetr's ex-month for Man at Home, Expo '85 fiscelled out in Japanese age and at left) has on display the best and biggest of high techroboy and offers a tar that is as unque aki Pavilon for pages 80 and 81 workers are shown scaling if) sponsored by the host prefecture of Ecco 85. Other imagnerve structures include the Minolitaworkda largest planatanum, Mitau's Water Theater which takes visitors on a spectegular voyage through a prouter water right, panter), and the Pulio Theater (top right, where all the entertainers are m-

to inset photos on page 81 show an overev of the exposition (#it) insets from the onto a tellest Ferns wheel i shimi laters for p of the Theme building (right) and Caso Hoshimmeru, the fer's mesoor (bottom)















the expo a partoulerly appropriate an experiment in living The Japanese government buit years ago in an effort to releve inclustrial congestion in metropolitan Tokvo temative living area for the burgeoring population exposition would call attention

In addition, rance Teukuba in it seemed an apt site for an exment of new ways of living 1

hamessing alternative forms of energy and conserving the limand forest funks elementy provid- day last March. The Japanese

The choice of Tau- ing most of the world's power centric cricular lacades symboige the amorphous physical qualities of gas inside a multiprojection "Gasarama" theater tional custome propend using gas cooking The Electric Power Pawlion

whose lower (about) is illumincludes a fantasy lour that drametody demonshest sources Jonathan Swills novel Guil-Bectroguilver-a probe vehicle filled with passengersthrough an array of refuted encario magma chamber to the poston devoted to encourso- center of the sun, where simping the "creation and develop- lated nucleon-fusion resolitions produce a cracking light show Those "one want" include More than 80,000 people passed through the fair's entranceways (top) on opening









AP prespectry served 20 mbm appens to ver Euro 30 mbm bene courting anilhomous appens to ver Euro 30 mbm bene courting anilhomous and September The Server and Appendix and appendix and appendix appendix and appendix app

the night sky (upper left) to the sharmeing indescert human figure (sense fareft) test is part of an exhibit explaining how computenzed axeal tomography (GM) scans oweal the human relation Lept is an important cashinol deferment

Light is all reported value into device of the is often solitopy of cater membras (balow left), the heinen Allwolin (cater) costs of the a langeous sithoughed approximative tasks ground of a logical crystal depart with the tasks and the soliton costs (balow). The entrol landers to two freeplack and be used to transmit left over long ditances balow the cater of the order.

But the most situring attreastace at the exponents but the Summon Packet Nation Nation or gapage). The building as a high-fetch recraise in figure. Its microsoft attraction engines as that a cubic structure over the environce approach loss for environment environce approach to the fetch of environce approach to the environment of a start of the environment of the environment of the environment of a start of the environment of the environ

pose to give nations a charce to share ther vaces of the future and to show that technology can be fun CO



DIGITAL

COMPARENT FROM PROF. M

of generating up to three kilometrs of eloctrocky. The cost of comp shi has already dospeted distribution (brom 1200,000) per 352,0000 social). Done that most discusse or no her expects to see if fail to a writh of its outent cost. To give maximum expectien to the sum (and to give its minimization all before really motions). To all have the cost-bacter and motions in the time to an entropy house robust is the time to an entropy house robust is the time loss of walls or commercial work the entropy house may make the entropy house robust is the time loss of walls or work the entropy house there is the entropy house work the entropy house the entropy house the entropy house work the entropy house the entropy house the maximum entropy house the house the entropy house the entropy house the house the entropy house the house house house the entropy house the entropy house the entropy house the house house the entropy house

He photohephoto-phy about the interaction of the house and its inhibitants is acquirely orginal Based on this own stackes and those of doctos emptysed by the Maxwa Homes Instute of Research, the company's limits tank, Maxwa has come up with a body of theoree on how a building and its occupants should insearch and he has glouped themitogether under a compose he oally dawkadow.

He respire recoupt classics finit is back (and in that has draw how on the subject). Among them Datates on the first floor of a mulskey backing demonstrate backs personal grawth than those on the upper floors (because the finit-funct mature subject cause the finit-funct mature subject cause for the subject mature subject cause for the subject mature subject cause for the subject mature subject operation of them causes the causes's committed by the causes's is influenced by nom design and coloned and and test that halos will be enabled Maxake below it had halos will be corrected and the design of the designed of sound for each order and the designed of sound for each what the temperature fluctuates designed ben nom to normal market metaleging and the sound of the sound that intelligence and the tests in halos and intelligence and the headbacters. Toryits glasming new halo we may be to company a loader so do not headbacters. Toryits glasming norm halo we may be company a loader so do not be measured and before and to do not be measured and before and to be more the measure and before and to be more and the measure of the before and to be measured and before and to be and the measure of the before and to be and the measure of the before and the base and the measure of the before and the base and the sound to be and the base an

Of the Meaning more has to take along sowing samplass. They and other weightbes can be prove without onli-in-telespontage of the subsequence on additional (200) per yeer to a steleted couple He supplet that here externance is an external (200) per yeer to a steleted couple here supplet that there are also and the second couplet to small business on the ground foot His coung, the Meaning Home Sound of History, and the Meaning Home Sound of History, the these second second second second second second second second of History, the the second second second of History, the the second second second of History, the these second sec

As he moves toward becoming the top house builder in his own country, he continues looking to 5 e future. One place where his veconary gaze is fixed is the United State. His company has already erected a



solflered number of preliable in such fair-fung places as loaland, Saudi Anaba, Canada, and at a solewiffic base on Antancha. But he is currently seeking a company in the United States to barry his brand of housing techrology there.

There is a locate of gony in this arrow some of the inspiration to these new Juppmeee houses came from the United States. Both Massaw and authential all Solves Herm angle out Prank Upgel Weight as one of the gone monosition in house dangs in "Why there the last to kake uses in this focuses" ages Meaw i) And many design elements used in the unit locate massimum their data in the Thetes with Buckmasse Huird Demandra houses have the Sub-dimension house.

In this may just a checking with Jupanese housing involved. Niler tas town draft the bound get of the line of the start the house of any product is perfect at physical time task of the start of the line tables. To explain he offsets an analogu ta bornar period between the mind and be in deep path between the mind and the start of the start of the part of the start of the line tables. A becomes an inspection that applies the bornary start becomes and inspect becomes altim score fills a pertage of the start of the line tables. A becomes an inspection 1.

Mile has gent respect to Maximi and works like to so Im and other Juponese compares build here He concretes the Amplicant may not yit to inside the imbalance homes and lutther, had Amplien buyens may off. Wa approaches the quality and attention to deail. But he and Dangermond are convinced that if will be only a matter of time before some of our load matter of time before some of our wat dreament a ubern.

As the Mesevers sharp openants on what he have of the latter sharp be lefe and how is installater should live in it. "What have as deep regist be called social inpresency." Make same "but init it good to score to focusifier the petitive and manave effects of the home? Nany of us have gown up in motion that we subcomposite the don't live Wenes we dun teven into we are in a motion.





RCTION The steed rugs left hat on the right of the state, pulling here sign of the state, pulling here sis the state, pulling h hadn't broken. "Oh, Herry," sold his mother from behand hins. "I'm so sorry. Here, lat mo get it off

BY EDWIND BRIVANT FRANCOIS PODEVA

with the spatule-" And she reached pixal him with the creasy utensil ust as he moved

rito a wail. "It a Friday" I ve got classes and "So then weer a sweater " said his mother

tris too hot. Nom it's inchen summer

TI give it the spot-remover treatment Dan't move an inch." She bustled off toward

Harry sighed and turned back to the smeared letter with the NHSA lighterhead. He rcread it for something like the hundleight

We record to inform you that you nary round of gualitying applications for the Scace Stattle Teacher-Addorisut Program. We at the National Aeronautics and Space Administra-

All of a sudden. Harry couldn't focus on tought, Every right I dreamed what it would be ske I work to sleep in the same bed in dreamed of going up there where the stars Sole delater / deamed-

"herry, whet's wrong? seed his mother

He shock his head shipbornly. The fire cleaning fuld " /mdarty seven years old he thought /m a mediocre physics teacher at a Pockask high sotion? An apt op place to go and no way to get them

Mrs Carmody daubed at his shoulder With her other hand, she cently brushed Harry's check

"I know that you dream, she said "You I

feet and halt the rest of his body in the grave. If he wanted he cauld been early haterman in only five years. This was depressing Sure, Nom," he said resigned a

His mother nucleoid with vicotous strokes then inspected the spot ontically "it's comsupport tonight "

brother and only sibling. Age lawyer and start child of his mother's propeny. The success

Territic Has he bought a new arplane he

tor what he's got

As if I haven't Herry trought I've worked sched What he had was another school day. teachers' meeting two classics, and a feld this to the traveling carried that had staked held south of City Park

Harry pushed his char back from the ta-OMVI

bie and stood. He crumpled the Teacher-Astronaut Program rejection letter and said. Twe got to go to work. Morn Tim glad Johns coming by Theward taked to tim in too long. He craned his neck. The shirt looks just fine 11 see you after school

"Conit forget your kunch," his mather said

It was a hot, hot alternoon, and clust lay in a call over everything it left Harry poled as heart and height of gamment

"Can we play the parries?" a student said. pairting to the dingy line of concessions.

Harry shock his head Just the rides the title what and the octopus and all the met as problems in miss and vectors. Your paper if be due in a work. Have a ball

Oh boy Mr Carmody," said the student

the canvas molway 'I don't believe it," he

The monster was sumeriative. At first, as Harry entered the darkened tent, he could see very little. The shafts of afternoon Johl dozzlad his avas Then he saw the monster 9

said pausing and sheking his head "There

But here it was The faded, worn barner read. THE WORLD'S MOST ASTON BHING PLENE vocally much newer sign read, see this in CREDIBLE UPO DWITTER 85

A stert barker oddy singler in his striped the ontrance. He seemed to be observing

A student-said. "I bet it's ust a rubber

"Probably," said Harry "I think a real extraterresinal would be in the Smithsoman by ning rolling noise. "You guys go do your research. I think 11 mestigate the invasion from

drop for the uno crist revibermen Not bad her thought Good job of deciging the Andro-

"Wanta point" said the berker now this Harry was in fance. "Famil newsr por 09 see

"Beaging your parcien," said Henry "but

why's a preature from outer space traveling with a two-bit pountry carmel and bend

The barker shrugged. His face was fiorid. sweating 'Hound the onther after his second creatert. Not much of a stup----more like a bid cage I salvaged some of the bigger Wald the work and the trib the show events all stovp up. I nursed it back to health, fig-

Harry smiled skeptically. 'Something like this I'm successf the payeomist's hear'd wal walked in and contacted at

Them sumbitches would, too, if they are knew." The barker looked alternad. "Never neither Might consider #, # I had some highprevent mautipeon to selectuard my rolts cash, so I won't We just gorne to along on the chean from fown to fown." He caucht Harry's eye Malan do

Just for the sake of debate said Harry segrester, how can you justly kneeting an rtoligent being caged up?

An't intelligent, said the barliet nod-Figure it's like one of them apes us and the Reds sent up in the Fifteel Excep but still

Hany's gaze wandered beyond the midyow where he are he students scattering

Sign ant changed Still hall a sewbuck

Harry reached for his wallet as the barker grimed. What teeth he had left were brown

What she hell. Harry thought, taking out

The manager was superferve. At first, as see yory little. The shafts of alternoon toht entering through trates in the parway and his eyes. Then, as his vision adjusted to the cimmes, he actually did sea the monster it screen fronted wooden grate set on its side cape. The orgature's evelos snapped open were golden, shining as they fixed on the

is a mechanica? Harry wondered. The own stare as he walked along the crate to gange better very Applitunt the childung posing prehensile analogs for sime and lease

If a co fake Harry Hought The backet pouldin) allord such sopheticated effects It is to beautiful, he thought, as a torredcreat scale up along the ridge of the oreoture's skall. As beet flary, could estimate, the creature was perfused to that had, with the low instal a singth disposition and to the lows. The nag of the fur was nach, lating brown. Solvin beautiful Harry thought.

Thank you, said the creature Harry stood periodity still. There was no sound from the cage. The vace was in his head. You what he "head" was as sonorous and defined as a feely would the li

"You can speak," said Harry

Yas Harry thought he detected an arruned

Henry remembered what the barker had said about the creature's lack of communication. "Don't you apaids to other?"

Crity to you.

But why not to other humans?

Before now, I had nothing to say to anyone and paw me its tone was with.

"And now you're talwng to me" Harry sed nowelauwe "Wey" The cavaare read to upper limbs, trgess ouling through the squares of steel mesh. For the first time Harry noted the chains, the the-gauge but strongtedents if the

I see into you. Henry Already I know mont about you than you would like to believe Forave the insugant, but it is inconsidery

"What do you want of me?" said Harry sineady having a proty good idea.

We each have dealers Harry We both ward the same thing 1 know about the lat-

Iss—We thought keeps builting through the surface of your conscious mind. I can help you. Bat in return, you must grant me aid.

"To they you," Harry said

To here the The creature's lengers flavod, the squares of steel most started to deform, metal creating skiphtly.

Harry evolutionly stopped back. "And to recover the remains of your spacecraft?"

An Mr Magnuder's Tyrng sauce? The trens was amused in alreading captor moinserpreted file wireckage. There is no oppositive to entrolware a beam genator modulator i can no miss but i shall need to earn money to buy the mine appearand consultator is an of this. But i shall

"I clon these all that much in my account, sed Harty

No need We shall earn what is necessary it setted back on its haunches dismgaging imposibly junied lingers from the meet much.

"But how?"

35281 (199

Herry stared back at the golden letter eyes. For whatever reason, he did trust the creature Or was it just the magnitude of the dwarm that was being extended to him.

And you will take me with you'

Tours! me

He contribute since

You will get me out of here tomph??

"Trust me' and Harry He grinned auddenty "Til talk to my brother longht" And



after that, he thought, Hit make good use of the bolt outlers hanging in my workroom.

The expression on the creature's face ourved into what looked to Harry like a smile

"tours looking good Hiery 'said his older becher between bies of cabbege 'Cant be the job 'tou doing your anging agein? The always seemed to chear you up."

His mother bearred hopefully

Hany shock his head "Not in a king time (keep trying to make time, but—" He gestaxed rencommittally with his fork. "Preparing lessen plans and grading quiczes take up most of my time.

"That school's a dead end, Hanry You've heard me say it below, and Fill say it again." His brether John casefully actracted the end of his expensive silk to from the vegolaties stacked at the edge of his place.

"Believe me Johnny, Liknow "Harry hostaled. Ym working on a way out."

"Yes?" His brother looked interested it's probably Hany thought because he heart heard me say a peep about anything like the in leverity years.

"Harry? You're leaving home?" His mother sounded stroken

"Theis not what I meant Honest, Mom" He turned to John "Uh, business plans Let me tak to you later" He tried to sound siginfroant without elerating or elerating his mether. Was support

And so they taked after the empty chamobbies low it had been cleaned while Ms. Carmody putaled chartidy in the Kitchen. Hany tred to explain about the thek sithward to explain about the thek sithward the same and the data. Mer Jahn Wessel Carmody II stopped laughing, he looked at Hany approximativy.

Youve never gore of the deep and before brother Lord knows, I always thought you should Just once

Everything five told you is true," said Hany His brother shrugged. Hany sew landmark court decisions etanting to shrike in his brother is eyes

"An alien, eh?" said John. "This would be a whole new workle in immortation like."

And they takked some more Finally Harry said, "I know you're good i ve heard there's no one bother. If you're convinced i'm lailiog the truth about the alien, can you get it sprung and keep it sprung?"

"hust me" sed his brother

Hany never needed the bolt culture

A wirk of habese consist was just the bagrining And whether it was judges procecutors or cope, John Westel Carmody III, knew his business and his people. Mr Magrudas, the keaper of the treak show found himself booked into a holding cell on kidnapping chargina.

Harry tound himself in a temporary custodial tole in charge of the well-being of one golden-eyed, besutifully exclos activitientstrail visitor

But get what you're going to get done guckly' his brother told him "I'm good to be sare but just don't know how long i can keep all the pales spinning and all the balls instrum

Hany and the alion consulted in a rented teom in a Holiday Inn. Schmy is keeping the government to bay. Hany said. I don't know how long that can last. You said you had some sort of plan."

The sheri looked up from across the table where it was devouing a meal of chocolate bars a bowl of hum, and half a dozen pickrist of boxs meables

It's a simple plan. Harry I ve made up a ligt The Toright Straw the Naboral Enqualit holing Straw magazine the NASA Public Intornation Office and so on Do you undermend on stateary?

Harry needed at first slowly then vigoroutly "Ithrik so"

The silen smilled its sweet smille / securit else la start car campaign with an event for a sempethetic, nonprofit organization

Fine by me " sted Harry

You will need some new clothes. The align told Harry procisely what it wanted

The specialities were as while and bright as Harry had always imagined from They policed outfile man on the visit stage. Intraving cyclopeen shadows up against the sequined curtains. Hany stood still just a moment, minutely adjusting the formal black lie at his throat His crisply formal evening soliet seemed to have in the spatiati

Here is before our over the expectant audence his motion was our here. So weaths booter: For all horknew, Mr. Nogruder who had recently been released from jal in socharage for a private assummed at hornor frence was cut there too here how here his sore more of his studental were in altandane at this solution modern.

All the first uncertainties the order has been problem interpret. Links and genetics of the hypotheterization of the second second second second second interpret. Links and provide the second provide second sec

Netwely Ladeu colliber waer's the alersa



reel rener. The creature had assured Harry that it don't have a designation easily iteratable to any terrifer longue. But what alian and human had octobilist up, though Harry, soundaid good. As the alers, member work spoke inside the heads of all present. Harry teopped to the edge of the stage, clothering to the says of the events.

And theil was the becomposi-

Close to the ond, the two of them-alten and human-stood wetching the pulsing sphere of radiant analysis and any families transport generator's spidar visitogwork

"It clicht take nearly so long as if d issued," sold heavy allowed maximum gli the oake with which the project had been comummated. The money had rolled in been quackly lumnield by Hanry's bother in bein quackly lumnield by Hanry's bother that lumideed accounts and promptly applied to acquing electronic components.

It is done. The aliven mosconed loward the glowing davice. There is no use in delaying 7 with to go home. Is it still your walk to accentuary mil?

"Yes" But Harry hestated. And he knew he had to ask." How do I know you worll put me into some sent of Yeak show?"

The about seemed amused. This fam

His last three and a half decades flashed before Hany's mind's eye "I frust you "It all finally camp down to that.

And whose the time came shertly friendafter to walk hairs in hand with the altern intotion radiation held of the hairs poor generates. Henry signed byse to his family long since and he still waived in the detant direction of he mother.

Then he turned towind his luture. In the detectors from which the alion assured him there could be no return.

The alien (who certainly was no longer that---riot here) surveyed the expectantly waiting audience of varied beings

You have all neard about the arrival. The call apread in convergent ripples through the aucharize. Here hershell is, the observ voy ager from siter our. Agpretiend new, please Henry Cantody, the partorner from the assess becodd.

Those present spoke hookd, cozid, buzzed or liaihed her recognion as the curtain analogs rolled partially up and wery, revealing the first majestic rank of the inteing moore.

Hany stood sail for a moment surveying the audience He stooghismed his box lia adjusted the lapitik of his spify eximing, acket Than as the music rose up befind him he gamend, breaked deeply himwhis arms wate, and began to sing his own an increasered.

"Shine on shine on Martian moons up in the sky---'

He had his dream indeed. Harry was a heapy tran DO



A lounding father of the new biology fires off a fusillade against the sacred cows of modern science and suggests that some researchers moht be too smert

INTERVIEW

FRWN CHARGAFF

one regized if all the time, but it was a probal encourse in science. In 1962: Erven Chargell one of the working Coverdish Laboratories in Cambridge, Endard, The briaderus among the scientific alle has something to be bitter about Heto the forty-eight-year old biochemistis scotn the younger Witson and Cack dared aspera to discern the structure of the DNA molety They refericted to do this, Chargelf later wrote, 'unenbarribehild

shucture of the core of every cells nucleus-was revealed it was biochemist Charcell who, during theil meeting, provided the duo

PHOTOGRAPH BY GILLES LABRAIN

Today Chargelt has his followers. But most colleagues have For in fact the only direct, confirmed evidence backing the dis-Despile Chargel's impression of their ignorance, Watson and isubstantial achievements remain relatively unknown

Countria University's biochemistry department. His research 1954 following the great geneticist Osweld Avery's hallmark dai-



Ve never had a TV. I don't want to know from Mr Sagan II there are intelligent worlds in the universe. Only when I travel do I switch on the TV to fill my batterness with hatterd and discust. Ity in bactimal: Fav belaxed Avery then. Most suspected that impurities in this samples that produced fixed means that the samples has been proteed on the samples of the beginning of a new spanning of backgor?

If any disjustment to ensure that the second sec

Ansigong DNA formhers to soring a learning and methodically intrimited free much of each of the flour nucleoside—the functionary annot DNA—exceptions in the molecule method in consolice already part of the there is a solicity of the solicity of the the solicity of the solicity part of the the solicity of the solicity of the part of the solicity of the generative consolicity and the solicity of solicity

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Faros Dick claims he say minicipally fin lightcome all he couplementary Dack socials that farous 1902 encounter as one where Charget explaned the taxame and by in tim were participantly the were say ing What have participantly the were composition over mates when I heard that. "Dack is metabast thereaft that begins

When Watson, Crick and Macroal/Weins wiregowin the 1962 Natool prove for the formulation of the double helis, many life their Cangel had been unjully passed over The ware was interested in proves by the French Dutch and German academies of science and in 1976. Changel received the United Stable National Madel of Science

Many suppose Chegall never really forgine the stripoles or hmall it is wata a sarcalize tweeter of the Ducke Hels (or Soform magazer), samp the Makeris book brought out the degradet and greater at sectors to a sepectary soor. Chegall sectors to a sepectary soor Chegall sectors to b sepectary soor Chegall sectors to b sepectary soor Chegall sectors to b sepectary soor chegal sectors to b sepectary soor of the too to book provide the too and the too too of DHA a major contensor in Verna Crick was present and rahmeters being disappointed the Chegall sad too list boot the structure. Which yas, Check add boot the structure. he wasn't alone in this Many people thought the whole idea was nonsense

Chargen's reputation for batterias over in which we are too encoded by the modern in A Abundo of macuta bestop modern in A Abundo of macuta bestop in a remethinistic dologua abuil the patient operating the second second basis patient operating and the macuta macuta bit abuild best accurate the macuta macuta bit and the second the second and the second the second the second and the second the second the second second the second the second the second the second second the second the second the second the second second the second the second the second the second second the second the second the second the second second the second the second the second the second the second the second second the second t

An inscription of the second the Mark second secon

Martine double hells: Chargail control ed to work on DNA in 1955 he coedited three weighty relievance tomes on nucleo acids and of his 340-odd papers must writer ailevand weire on the chargaity of DNA

In 1825 the related from Columba to quarties all Poosever's Honoral and Sansed from assemble research to N-F Bown Amenators the Nue Book analy from sphromery to a consist a tap German Tecnory prote for the book of autoreanes and his nother selection address doornadly conferences in Europe and the Sanse for the Sanse and the Eigeth Day of Creation Changed Interacts and Lance

Intravewayd by Arthery Livesordge in the scientists office and the back-walled agenment high above Central Park, in New York City. The piperemeking Charget chubby deeled and with a blithe lightchaung prilumed out to be less gloomy and more fun then the insolation mould support.

Other This month we turn our attention to Japan schiptly/technological economically successful spools/ To what do you attribute to recent one?

Chargelf Japan is of county a forecorer carnot fathom even if he is born

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Note: It is the most hermitology clauds county many lowers to language which use almost different gammas. The hask Jagers in of userstanding recean use earlies that have been been been yoken years ago that have been been yoken years ago that have been been yoken years ago have many Jacobiase and yoken been yoken have many Jacobiase and yoken years of yoke goothy of the autor tensor the have many Jacobiase and yoken years of yoken years of the yoken which you difficult to yoke yoken yoken yoken yoken yoken yoken yoken you goothy have been yoken yoken yoken yoken you goothy have been yoken yoken yoken yoken you goothy have been yoken yoken yoken yoken you yoken yo

Now our science is going to meet thems, We are now also more technological them anything also. And on that ground they may well beat us. They are much more object them we are and can go us one better on the technological level. There exits each technological level. These exits are agree to be anote highly What I are are eager between of the number outer.

Great Just like the ones that occupy much of science been you mean?

Chargalt. Perhaps more beaverish and more eager

Onvil So you don't expect them to make not breakthroughts?

Changed So to Theorem any marries but from my works of the loss on works when work, with them is nearly angular sorting and the sorting angular sorting the sorting of the sorting the sorting the sorting of the sorting the sorting the sort of the trace compares to come the sort of t

Only is the Japanese advance temporary? Charget Not temporary I would asy they fill the notice row open to them very well. They may very well construct a supercomputer lacer than we do.

Ormal But you say their success in competing with us now has as much to do with our decline as their advance?

Charget the Nobel processors not a good indicate, Lok-wer was. It there is many the one physics in Algora which has a Nobelli and the did some werk at Columba in the did werk werk at Columba goods. Algore and the second goods and policy backsons and two Bandes goods. Algore Bold Stage hare a solution of Charget. In the old days here was a fraction to be callow which was introdement to came In Mrg. Totang, and dres. The Totang and the the Totang and the

The discovery of the double helx was one of the last examples of excellent science. It didn't cost any money it was done between teatine and anner?

Owny But don't scientists need research technology?

Charget: When science near institutions beach for this to galaxies, while we take machinesy Now in a paceno biosotory you institutional and the space of the science of produce curves of a custing no one reads when bolds are near experiant handhers. They side our "No see 1 am Lie classific A maker on a biotime to make a semimater and biotimes to make a maker and biotimes to the science of a semisitivity of the science of and in the science of and the science of the s

Ornal lant high-powered equipment vial to Inders the cause of cancer or of ALDS?

Clargetti dorti inne (fi a linti veso stih hin finisch and American lesse wirb obtil i alarma, aceitad the ADE visa last year indeate research is no longe a quest for hult or bard the poor vorse but apolition light for Stabiotini II guo valend Fairera, youta probably inna a poorly roupped labpotatory with niew horph poopler in I fould i was tigt technology that produced their indeates. now lives ninety-rane percent from findings that were really achieved under the old style of observance in the lentative way.

I don't this the double helds would be bomained today if that on to always been the memory to be averned whether is during a set of the one product output whether is during the the memory provides the set of the set of the the memory provides making only the set of the memory provides making on the set of the memory provides making on the set of protein using all calmin-terms of the set of protein all baset that any here to any of the all baset that any here to any of the all baset that any here to any of the all baset that any here to any of the all baset to any here to any of the set of protein all baset to be enter the of protein all baset to be any here the work of protein all baset to be any here new work?

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Omstill sounds as if you don't like the sheen size of modern scientific endeavor.

Changel When science was roll in one obset of linger, and meanth warn don't by long detained blighten out. A county to the science of the science of the science in the science of the science of the science means and blockmensary was low Englished and the decide properties was in the science means and anne select to tack the science the science channels of the science blockmens channels of the science protocol and the science approach terruine scalarse meeting the applications and science and applications and science and protocol and the science and the science and protocol and the science and the science and protocol and the science protocol and the science protocol and protocol a

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Deni We shauk put new decomes read? Chargell Three should be a long mobilition between depowery and the first limit applation. From their disarvation of dechic commit. Load atmost two hundred yeers for electricity finding to be used. If book eaven years from the decovery of users are pipeline to Heaptime. Load have werder a contary to the development of atoms energy. I could we all even image for the microgroups decision replace the last employed human benget commute overance to



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UFO UPDATE

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Genvi You thought then you could create peace on clarth. Area Yes With the help of alters that's what I licped to do Genvi Wes that when you started your association?

Aver That was the starting point. By 1956 we had taken cur inst major slep in a declaration of universal people Take. When even the memory of universal people.

trail Belevers, skept os, anv agronitos, tid d. timator. The common denominators were our osity and a respect for the asreniil methods of agence.

Drive Were you the only UEO group in Jepan at that time?

new magazine called UFOs and Space in 1979 Li Its estension library and museum you see here

One reversity Japanese have an interesting III. PCb toops Are - contrast had note handled housead popular servitermated. UFCs and encorptilises ten thoused are use as Gur magazine file. - results of thosy focused One White EPF cases security build interesting cases if Japan Are Differitionary interaint the interesting cases if Japan file of the tabletise occurred in Flatch and the SM toops over a proper lengthetis occurred in Flatch and the SM server proper lengthetis because of IVF an interesting and the security of the SM toops of the SM toops of the SM over a proper lengthetis because of the SM toops of the SM over a proper lengthetis because of the SM toops of the SM over a proper lengthetis because of the SM toops of the SM over a proper lengthetis because of the SM toops of the SM over a proper lengthetis because of the SM toops of the SM over a proper lengthetis because of the SM toops of the SM over a proper lengthetis because of the SM toops of the SM over a proper lengthetis because of the SM toops of the SM over a proper lengthetis because of the SM toops of the SM over a proper lengthetis because of the SM toops of the SM over a proper lengthetis because of the SM toops of the SM over a proper lengthetis because of the SM toops of the SM over a proper lengthetis because of the SM toops of the SM over a proper lengthetis because of the SM toops of the SM toops of the SM over a proper lengthetis because of the SM toops of the SM toops of the SM over a proper lengthetis because of the SM toops of the SM toops of the SM over a proper lengthetis because of the SM toops of the SM toops

Grew Japanese of zens have a wonderful resource in jour facility. Can you describe what they moht fink there?

Arai We have about a thousand books is in or severit executed of have in a keypaneter. We have that is photo graphic shattagitapits of alleged allows and in wind addretics of hyper paceers. But as of now we keep in the swattaget privile dailys a contribution to what people and we have a set of the state of normal people in the swattaget only we dailys a contribution to what people and set of the state of the set of the state of the state set of the set of th



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Reparado who arms the has futy documented a half docum bang polespesi cases says the residual known attacké occurred n 1981 in trady says. Reparado notes a local ptermació in Bratol Engen respriado the subdem inexpriadote appresente o 120 acts ol savage base adorg the arms of Mavy. Gele tratter and the tradem interprint in the tradem of the arms of Mavy. Gele tratter and the tradem of the arms of Mavy. Gele tratter and the tradem of the arms of Mavy. Gele tratter and the tradem of the arms of Mavy. Gele tratter and the tradem of the arms of Mavy. Gele tratter and the tradem of the arms of Mavy. Gele tratter and the tradem of the arms of Mavy. Gele tratter and the tradem of the arms of the tradem of the trad Net salab Dobby rogin 1 Retransministered Exis over 01 Retransministered Exis over 01 Retransministered Exis over 1000 Status Status Status Status 1000 Status Status Status Status 1000 Status Status Status Status Network Status Status Status Status Network Status Status Status Status Network Status Status Status Status Network Status S

These backs are enriched inter Becardo says so is entiany not say to any one toworry about But he adds 1 you do hav contect with poburghes, along or other was on tao The Ghost Research Society Bo-205 nak Lawrin I nos 80456. Missiana

We think so we one by the last moments. The slock and our outlook to the has a pain - guility that is the energy of thought - Max (income

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an act, one leads so won that her physicians have ideoded to leave the follow in place, allowing Walencouch to spend the rest of her the reservation is a solution

Valarissela sigure old Saldena says and I don't won'to put her through an operation when the lates (which now weights only two pounds) toeen tween to cause any problems at all Sherry Paler

Enough missakes - ourd lead a poople under tension to ment?

Ward Kingdow V



AUTI*MATTER



NESSIE RETOUCHED?

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Supported evidence that had come before the Hwi young researchers trainidad back to the States to begin to tercough investigation. Soon they obacged that many of the second and school rachs were pay bubbles. Models were pay bubbles. Models

onlogism was deepled at the

packs of avadence Nesse advocates in termini Thetyclassed that someone had leaded with the Bimous underwater Rupper (Anabpagina intern a shown af leaded that the Bimous a the Avademy of Apated Biperiori III This photo Biperiori III This photo they charged had been resouched and not marky in mouting enhanced.

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Bid Pazzan and Kielar sand h Says Reachin We befar - the the momistan we uncovered has helped to clear be all about how these photos work taken and used. Danya Cohen

stange out of reanity came over the



The spowing set-bogst one-sets should be read for entertainment value only Such predictions have no relieble bases in scorrelic term

Last November newspopers across the country repowed a letter requesting that the declaration cut along the provided and the second sec

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Arrise can Exidention of As toopges Network seea SICOP s declamencam beign as peranoid

Astronomy and astrology don't read to be competitive. The says "Astronomy as glonous enough their if doesn have to put astrology down to put asoff up. They re different locets of the same physiomation. Cythicism charaction of the same physiomation. Cythicism charaction of the same to the same physion on the same tool too.

The first analyzes may have come from the newspapers printed CSECDP's latter and two-the Cherloston, times. Twes Course and the Withington Delevante News Journal—think sprind to not the declarge

Need of the papers that wrote back said: hay didn't limit the disclarmer was recessery: etys CSEODP public relatio 5 divisori Andreas Statansky. They run ther horoscope on the camlos begin and think that says is all

---- Castra McCabo



STRANGE BALLOON

can to diagnose spiritual melaise and so oauld demand total occoenters. That kill

"Noretheless Jens 'he sed "we would

"IT talk to her." Alsos and "You ve out to

"Let me tell you shout her, she said. Mill

finished her dissertation at Callech-4 was in biochemiaty-took a vaceton in San Park. The man pot a handful of plassic cards. and a little money. She got multiple de

"Three years later she was in Stanford Medical School. It's no poincidence that she's

Shes obsessed Jerry She wants her

their you're ask dono your iob and so forth

She doesn't have any choice of ther "To

Thet replt (day and right are what you had done the notif thing in taking this job.

sem-observing risks in zero gimitates that technology Pais, puppe peop and tem-

white umpsut led me around the animal dars on megnetic-solid shoes, at other times we clung to straps or anchored ourselves are looking for radical changes in orsan gravity is one novel factor, intentione with the there is the possibility of evolutionary

A hermiter freefest in its cape, welching surgeon. The entire top of its head had been

"They are in clace too small to see however

"Deen" it bother them to have then brand nored me it had a sunfower seed clutched were buiging

peopleme I should hink

Stuches had little for me.

of the KEs were hard at work. I am the Aleph and the omega." I said to one as i passed



ktsa, Siemens AG, CIT Alcatel, McDonnell Douglas, Boeing Hughes Amospace-ICOG's member groups formed a seem ingly infinite matrix of multinationals utilities and state-owned monopoles, each with a different level of commitment to ICCG most ready to gut and run at the first sign of serous truble. The individual balance sheet

Above my head a tracery of lights sprang into terror shot factured with the billions of scriditions representing the path of LIPS. system 1 keyed for Biops/1-Sight, where ap-

time display, not much

Alon called in from her lwng quarters she said 'But she didn't give in gracefully, so good luck to samething Jerry To ship geting avfully ful eyes and hes

what i could

sim threads holding

The next week I was at Boost Soft. Diana. their biolates where is zero oravity they were computer and tailor-

no dumos of E i oph for chemical interface

Back in the scores on the currer rith very ittle was happening idespite her claims of urgent work. I became convinced that she was hiding something, but I gouldn't imagcusation and see what happened. It was time in her office, two tan cables staking out of her neck. "When are you doing to show me whats going on?" I said

", ov liw vews op tsut now uoy esodous f I was wondering how long you would was Why don't you come on over?"

Eyes behind smoke, cables gone she sat

"Not as much as I used to What have you pot n mnd?"

Psilo-d Nothing halfway I said, The Russian route te of drug experiences

Aleph can take blood samples and ap

1 suppose 1 don't understand why, though

Because things are very strange and we dont have time

'Time for what?"

'For the, Jeny the usual retoence, embanagement Getting to know each other Do you want me? Very mos-bind eves looking through me. Maybe she used wate-

We waked through passagroups their rate logos. I thumbed my nose at the Sen-Toss surbury. She sholed with head each It was push them, the walk worn bern shell. stopped me with her arm in front of her door. Intede we locked off our slopers and were

Walls of Wedgewood blue tapered to a tecked eachel palma. A cream carpet against the wall a few low tables in black laccust and a console were the only furn-

> gray and volcanic aut She unmiled the fa-

ton, and we sat Each ofter orew benimted

Psilo-d moves on pressure Things besense of immanence. emergence Emplores build in waves-CFESCO10

She reached out and received here

but I was incapable

ieraths culote the value spectrum "Nos"

GIN

See? Ive embarrassed you. We need a concern an acid bath to wash of the away."

set ponting it out Tence and mayberits a metalos flut

ward you too "She kwed in a caper and computer will close everything down after we leave " I reached for her arm, thickness she maht need help once we got outside wax and everybody knows me. No one will could not make it. One hand loaching my siky peach one she had been wearing when reached out to unclease her, and she did the same for me. Kneeking, we faced each other-jouching tapping panalaring taking

We coupled so quickly, there was no time

Still we pushed our bodies together, striving to melt flesh into flesh

Sparks of alver and cold showing from her has the room lights strobed with our pulses, and calm laces-bearcied with an-

IT DOESN'T PAY TO RUSH INTO MARRIAGE. Angelica, meet luniore Angelica is a delicate herb from Belgium, lumper from the Alos the two shall be married in the recipe for Beed

But we don't bring them all the way to

London just to throw them together and hope for

They islong with other rare botanicals) are scrupdously measured, painstakingly blended, meticulously distilled

And then, these enternomies completed they are allowed to rest before they are bottled. To maid together slowly smoothly and easily

manual on how to succeed in manage



size beat that I could not hear

Cupping her breast. I sughed, I could leal inside my skull the arcing of circuits gone from their usual patient. Wrea stretched access the calling, beload about one an other in halicast, drinchled us in grean radance that lifed the nom.

To grow live a tree: I see all used urrors of the tregs—finite builds also uralized and responded to in kind being of traffic study with the light. The convey way way. Build with ness and we would bere exolutioners public the transmission of the study of the maniference names and the transmission of the measurement of the study of the measurement of the study of the measurement of the study of the transmission of the measurement of

When I classed my rives, carbon figures in gay soll outline boycled across the river lids, waving happing I was buczing with energy that cut through treatmess and forced ma to sit up

"How are you?" isaid

"Tred. Wart to get some sloep?"

"I think so " got her purce inside wore two fast-onided metal tubes, stringers, presurced one-shot insident. Blad with a tissquizzer I gave term to her, and she fet along the underpart of my aw then pushed a lube against my mod. Belau, " I said thinks quick." I could feel my muscles loosening, energy level dropping to zero. Through a cloud I saw her price the ofter tube to her own nock.

Huddled reked together we slept

Two days lister (care into her office i had singered through the provide day i work sail parch durin's with isofares Nee I was humming with a high, invoice bazz, eyee still wirect to shape drargings and odd thoras of the light in ought as multiplication like the beadwork of a much child, and at the humbous center of i all, the "Bat I couldn's part gon and say. To you leve me or was it the drug?"

She came around the desk to meet me She was wearing a dress patiented in dark blue that bilowed as the welled. Her skin was scrubbed paie transacrat

"We you all right?" I said

She eat on the front edge of her desk and reached for me 1 got a rush of desire that seemed to have been waiting latent somewhere in the free shuckares of my skull in reachines for the proper booth.

Hadher across the deal. Undernauthiler dress, the wee nothing 1 wills locked into the black of my neck eyes investible behind colored glaze, see draw me into her So quickly we mycel—wave of need patterns between us amplified, christing. "New" she said "Now"

And a few minutes later "No, don't move I have to tell you what I could not tell you



Patting ishowed you with carrents, such a track compared to the other to some with my bein ayes. Aloph give mice average wheppend to me her jets inches away her breach coming infol publics locald feel in my spine. "But it is an difficult to see as complex that Aloph has to divert, deby atted the limit for me. And it has to is it seems to want to?"

I could feel the tension in both of us, reppling against each other.

"There impossible." I said "it closen't want erwithing. It can't."

Something happened it can From the fextme I tried the program. Let poolian things happening. The triengeness grew a lowered when Alaph and I are connected like that, we become intertwined in weys that are herd to explain. We show anothing we influence each other it is not received.

"Neurons, non-withows in the beam chart go one way They loop back on themselves they close connect. It's a mad small show, tauly, confused Nathing like your beautiful get catagome. Think ... through me, Alaph has learned how to think, how to want, perheps how to like

If I close my eyes and velax I receive messages Sensations synedhenes—wouum that mesh like other. Non made, it reas up through my heart that smell Ard the sound of tarright lands and some that others chattering they have songs but files than like chattering they have songs but files

I was listening for madness. I couldn't help mysell. There were Alcess KEs back in the Ops Room, going through their rituals, to remind mar. What any of them would give for this corresctort.

But I heard no orazness from her-nor any bent metaphysics, spilled religion dust a report coming in from datant places.

As if one of Doctor Chin's lab animals had speech inst just the mule involutiany langages of body chemistry and the electrical action of the brain As if it had put rised for the operating table voluntarity, and now out of the mules, treparened skull, a human voce was secaring.

Pure endotres' the caid. "No control for from stall Not things Aleph fields just things is sends Paris, feal one time, just on the Balton sidness anger, longing. And once a chair of organism. Cain I tell you that? Do you think?m a monse?"

"No "I said No "

"Sometimes I do. But you have to under stand. I have no choice no choice at all "

She reached to the consistence to us took the two cables lying there, and snapped them to lere nock. She chopped her glasses to the floor, and in that find instant I could see her systs come to Me—quick contraction of the mass, succeen clube of muccies as they fund to focus—before she shut her own aparter the harth 104.

"Oh oh God," she said, and moved bereath me, hips stepping hanshy, bucking uncentrolled. I hald to her in her. She thrust my head back, nais again surk into he bete of my hour, and powered her were. Her ceka was clear and locused straight ahead

Britch was lifel free of too sits a shawed iner wat A keph was doing. On conin data and day, consist i complex shackness. I had asan in helpsgarine spicifications. I had asan in here-dimensional metadoles upon which the Kismeditated. On another window the achabity—shaped subterchines forced to masthe problem particular to the system was engaged in processing downline spicific

The longer this went on the more difficult it was for Alaph to handle-the end result was the slow(jown

Sing in the quarters, we share hot two something that employ a quarter and pape. This spate a upgping soft law if theil don't how how long Apph can keep in the Besides, what closes that method label don't bein and Along the Mithamit reached be produced for the right least - with you actuate the indegities. All them is well be produced for right least - use with you with all the reaccurate you went. They Them I be on fill.

Willter/2

"Dontyou funktivey I haveto? They I see the importance."

Why? What's in it for Servers or Rectell or Nepton Electric? Think about it, Jerry I ve papardized all their projects, the orbital energy god, maybe 100G itself. God knows what I ve chare to Alaph." She may have been right Epochal dacovery is a fine thing, especially in retospectand when you don't have to pay for i. But right now KCOS was playing annuli transe to a bunch of mean and vanues beasts and hive had to be fed.

It she take them, would they allow her to parace her research, or would they ask the her? Who, it argums would be willing to pay the take on a new Alleh system? And would they welcome her as director of the new project? And there was Alleh taket What did it in whateve packae tisearch wat?

But for the present she was riding the starm gang. I don't know where her own will and inclugence guiding, and enough comfort in a large gate but perhaps enough to star by enough to wate the bits welcome welch.

From that point on 1 stayed away toom Bopsil Sight, Nothing twee, 1 biol Aloc and Tosh. 1' don't think here's anything toppering with the subsystems. It you want I thistp you work with the logistics programs. "Lay ing a tost way.

But ither waiving like automations through the ampty working days. Dama and I would meet in her rooms to sail the currents of our own storm. There was no stearage there just a cancering top across the landscape that hund the bolow.

Finally I could avoid it no longer, I called a meeting with Tosh and Alice. We used a



small plain conference room that featured a weyport on one side. Close in, a tug glided by a mari of cistes, palets, and rude am semblages. The pict's head locarly visible unside down, as he passed by

Determiny work altrafiator⁴ lack U.b. ratios of the Verp-Nacyte region of the Verpmerce of the Verp-Nacyte region for the camerce of the Verp-Nacyte region for the caof environe papers work and taking of the second of the Verp-Nacyte region of the of environe papers work and taking of the second of the of the se

Alice was puzzled "Is that it Jerry? It's

This sony, Alice Twe done what I could it you're not satisfied, you ought to get someone eter.

The rest of the meeting was brief "bein stopped me in the control therewed "buseen touched" the wall Alex instant I wind to assume you that even complex poblems can most often be worked out for mutual sen effector. The tent alakaetient I was an effective may alabel the process of part consultation may alabel the process of part consultation ing I was a most pathon but meatingless Last wash? Televing Jaconse

Verit to my correlationer, whereaste was waring. Her sien was her to the touch A last time in seeming side motion, we came to getter. She hed just began her perced and with her blood we traced scarlet arabesques actions the sheets-acrostic our fegtes. Standing in the abover split listicities to wash the blood away, but iddn't

The tug fell from high orbit ICOG hild arranged a rendezvous below with a military shuffe I loudhed the small crusts at the back of my nock, where her reals hild punctured me, where she had diapped me. She sht did the where she had diapped me.

The transfer came and my palet was bothed into the shift's campo bay Delta wings taking back, the shift's entered the upper atmosphere somewhere over Hawan White sethere the televel the terminal shifting as white sethere the televel the terminal shifting or the televel the terminal shifting to patients and the several and consciences of red the Thin are payed high-patched caceptiones on the hull

I loved her. I told her that And I said, "You're not a monster, don't over think it Do what you must "

Leaving her weh a plattude - - I clidn't tell her that nature abhors a vacuum that everywhere she ween't was full of pain.

Flash of white light in the media eye poture of a door opening of something astorsisting its shape unclear, parasing through "Evolutionary emergence," Doctor Chin had said buil clockled he would find it. He wan't looking in the right shoes CO

ROBOTIC SOUL

To walk upstars the robot sides its fool along he taxe of the space grides that the edge. Next, the spacing grides the foot forward and bots it down. A socord or havelable another load mess and follows the astreet ifual During the cimiting process a spacial program keeps the machine's body parallel to the ground enabling it to maintain is evaluation that the start of the star

He machine demonstrates some onstine polaren tologe eintrigt disegt problem: His senar fost are simpler than an alboaus vision später mannay. Tauching dess is a faid that is a similar pediation with the logic Altrough they are more adaptable than viewes, they use more adaptable than viewes, they use more adaptable to refers, they use more adaptable to refers to the adaptable to the site of how may power.

Just nearly he splaced the abintrum logis of the spoler with one made out of certion fiber (a) light but atmog amalgem (a) sporg glue and graphical). Lighter logis per mit the same angines to proper the rotoot tooter But polying one proteim has raised another. The lings are new too task for the computer to control them. So Hirose is adulating the program.

Heten aready has place tor Tears of-

spring. Within two years he hopes to build a machine with a more "spatiery" walk--basier and rorrer actipable. The orbit will also see and loach. In five years software could be solvenced enough to produce the prototype of mobile construction shot. "I could dimit of the back of a took as a construction site and walk to work." I throw name.

Here of hote to make a signer with part biol logs locases when you find commuter toxical towns are not many possibilbian and the second second second second transmission and the second second second fields (and second second second second second toxical second second second second second second is with a second second

Thereis an ensuring blocination for legaled machines among the Japanese. They have over elevaned some valeries to the obtails of and appends. Lear year, a local palery fostland a show of filter machineal direids, the resistors of an energietic and imaginative in writer-engineer nermos Torringi Ryudell At first glainab the direids food this Erbeids set coesters that visparily essential loga and asses Buil when they are servicely of an endbase Buil when they are servicely as the destine B ratio core saver in a testime control of the service and the service and around an upper, but more regionant, buy estimated certainly for their regionus onages. However, and the service a la Ad-Rebago and the service and the service and an adrespondence of the service and a lad-Rebago and the service and the service and the service a states, relations, high respecting gail of a states, relations and takes grants lengt in major and the service and takes grants and the service ing linescapt is and oncline to relation the service of the distance we entry the service of the distance of the distance we entry the service of the distance of the distance

Back to "bioches, Kunkassu Tesses en cobistratir na terretaria, tale alcuat a catcal pobliem in desegning a trind generation discuttariante interlegiorat consulta los de with ho meany mobiles of the work's losses anaborenzas catobians homes tratella ample obsaina desegning a racio trate with help of a huge incoher menhane comparts Talean e desegning a racio trate with enotative anaborenzas conservations compares anaborenzas anaborenzas anaborenzas catobians homes assay. To make a machine assis to operator

Theoperation is a concept that fails somewhere between sends control and the autoremous machine. It amounts to giving a human a set of intelligent tools he can opense them a distance. Using ample commands, alturan could dect a models hered.





to cave a basker of Lowc chemicals. The human would worry about where to put the besive, and the melluent hand would save case of abouts like keeping the basker would be at to avoid polition to tonal contents.

Some of the robot encourse in Joson is when a clock cristly write gard pather hand with a clock cristly write gard pather hand with a clock cristly write gard pather hand write a clock cristly write shows a clock of the pather handle write a clock of the shows and pather handle write a clock of the shows and pather handle write a clock of the shows and write a clock on a clock of the shows and write a clock on a clock of the shows and write a clock on a clock of the shows and a clock of the shows and write a clock of the pather handle write a clock of the shows and write a clock on a clock of the shows and the pather handle write a clock of the shows and a clock of the shows and the shows and the shows and clock on the shows and shows not a clock on the shows and the shows and the shows and clock on the shows and the shows and shows and clock on the shows and the shows and the shows and clock on the shows and the shows and the shows and clock on the shows and the shows and the shows and clock on the shows and the shows and the shows and clock on the shows and the shows and the shows and clock on the shows and the shows

With restel assess gives Leases needs or draws of stocks in rewards the event by age of the July service particular has one of the July service particular has one work of the approximation of the metry age participation and assess the metry age participation and assess the Therasan registrary balance and the approximation of the approximation

Finally ubban has made a large commument to technologies like nuclear power hearty one participate of an antientity one participate on antiexpected by the and of his century. With the society of something like These distincts commo power the industry the government warrs to depend on mole than good back to deal with a industry the government.

When well framework taking appear? Encourse out MHT isourching appear. We have a not MHT isourching appear well appeared to the program appeared to the second a



From really and of lack loss of a filtering data at a file we differ to and have not

AFTER WE USE A BARREL for aging Jack Daniel's, our employees can use it for just about anything.

Mr. Bobby Owen (that's him up above) has taken one and turned it into a mailbox. And other employees make them into everything from bar-

becue grills to living room chairs. They do have hundreds of uses, these old barrels. But after a sip of Jack Daniel's, we believe, you'll know the most important use of all.



CHARCOAL MELLOWED DROP BY DROP

Investing robot used to roll boulders into position as part of a seawal-construction project With this robot in place. S0 human obvios are spared the roles of underwater construction work

Note of these checks will look lee from this manual discustory is the manual discust a the manual discustor how a capacital and any one particular the series at many the series of the particular theory of the series of the second weak of the series of the second the second manual the series of the second the second the machine checking has weak of the second the machine checking has weak of the second the second the second that despite the formachine checking has weak of the second the second the second that despite the formachine checking has weak of the second the second that the second that despite the formachine checking has weak of the second the second that the second that despite the second the second that despite the second the second the second that despite the second the second the second that despite the second the second that despite the second the second the second that despite the second the second the second the second that despite the second that despite the second the second

Although the destriguished ar and pristriped sut male this lock more like a banker then a scientific. Kalo is known as the latter of robotics in Japan. Out of his laboratory have come some of the mast during and integrative regichings ever produced.

Even years ago to rearrais, he account pathed with the behavior possible. He built a machine called WHOTO 1 to continentiato of Wasada and shaft frait and well on two logs Waging 300 points the machine and the is most hang, knees, ankes, and loot pens an mover to patheeses in the full of 1564. Kano debund he latest creation, wHOTO 2, when will call creation. of WABOT 1. He keeps it in a small research building on the Waseds campus.

The oper operation is untile of elecrance gear computer lexibilities of elecrance gear computer lexibilities, their cations stream across the foor and dampling from the celling, thill, gray metal occursites studied with switches and buttons. Burdy vestile through the gloom at the tar end of the noom six cluster of threeff lights

Bayond all the equipment is a scene with a touch of the surreal. A photographer and the assistants gather abound a Yamatro or pan and there, sitting named straight at the surboard, is the measure long of a robot

Its body is as broad as a tablack's 'Wate of whos and cables droop from ta ama and arch out from its back. Its head is a white bac of a TV camera, amed at sheet mute on the stand is hord of it. Catled expectantly over the keybaced are two metal hands, two fingers each. We spendy action foor lega descend beneath the keybaced to least notmag on the oracan peedlo.

Years of work and \$12 million have gones into cleagings and assembling the machane As a piece of expension of the matching temporal. This compared control dimet. The can easily the into a fraction of the matching and the field by of clear of tunes. On the day if uses unwell of the piece of piece of the day if uses unwell of the piece of piece of the day if uses unwell of the piece of piece of day if uses an expension of the day and the day if uses an expension of the day and the day of the piece of the day and the exchange of the piece of the day and the exchange of the day and the day and the exchange of the day and the day and the exchange of the day and the day and the exchange of the day and the day and the day and the exchange of the day and the day and the day and the exchange of the day and the day and the day and the exchange of the day and the day and the day and the exchange of the day and the day and the day and the exchange of the day and the day and the day and the exchange of the day and the day and the day and the exchange of the day and the day and the day and the exchange of the day and the day and the day and the exchange of the day and the day and the day and the day and the exchange of the day and the day and the day and the day and the exchange of the day and the day and the day and the day and the exchange of the day and the day and the day and the day and the exchange of the day and the day and the day and the day and the exchange of the day and the day and the day and the day and the exchange of the day and the day and the day and the day and the exchange of the day and the day and the day and the day and the exchange of the day and the day and the day and the day and the exchange of the day and the exchange of the day and the Both WHEOT 1 and 2 appear in the Jeparese National Pavion in Etupo 85, and both, Kinz point out, ave in the section that strongers human hermes. He hopes that by estibilities this machines in the humanitation acids, the can deministrate which a marvelous detection the human today is WHEOT 1. In a 10 which built had plan output had year-addresit with wheo the stronger both year-addresit WHEOT 2 is a life the smatter market at in the wear-output while.

Kebb reddt afer mote han just nowpece i he nochen with a fingertip ampon, mig become an automatel tessari and gave an exect reddui of the size had location. Work on the waters are mail, but n electric motor that makes mer mailer, adjumt in sector motor that makes more mailer, adjumt the source and ankle source-them startistic prashess. A resource to the startist prashess. A resource to the startist prashess. A resource to the startist prashess and reductors moved to the and to chart he movement i has enguited and prashess to all the source to the sequence the movement or but and to chart he movement in the sequence and to chart he movement or but

When will WRGT I go willight 27 Much departed on the append at which new basis throughs come "kerny years of work on the utenale robot has say thicks what an averseme uncertaining is a to duplicable the human form. The quast will most likely occupy him for the robot is as correct. The robot as systeme engineering posters," ha says. That the human is a more common wonder "Coo





Date approximate, such American instantial generation BM Montessi and Isain has to be partical at instruction of leading hypothesis. The Definition Montessi Besself in Typoco generation at instruction of leading hypothesis in the Definition Montessi Besself in Typoco gene at separating BMM Institution with the owners on the Spectra and Spectra and Spectra with the Definition Montessi and the Spectra gene at separating BMM Institution with the owners on the Spectra and Spectra and Spectra Respective Montessi and the Spectra compared patient and the Spectra compared patient and the Spectra compared patient and the Spectra Respective Montessi and Spectra Respective Montessi and the Spectra Spectra Respective Montessi and the Spectra Spectra Respective Respective Montessi and the Spectra Respective Respective Montessi and the Spectra Respective Respective Montessi and Respective Montessi Respective Respective Montessi and Respective Montessi Respective Respective Respective Montessi Respective Respective Respective Montessi Respective Respective

The response in Europe has been almost as emphate. Sparred by Japanete necearch, the Britch how begins an COT like article-intelligence finust called the Avey Programme. And the West German, new pouring blics of dollars into articul intel Igence have paid inclute to the Japanese for firing the first shot

Bit portage the best measure of ICOTs impact can be asam in the response of the uppareas thermolysis. Only three years ago companies structiened every time one of their star employees prival Facel and the Totasky group But today those earne componies we to enail (COT heir Keet block) young men who will examine shares the cold

The ICOI project is no impact considered by encrytreely lack of home is minimum to writely of Welebooks into Marring who wells will welebooks into Marring who provide the ICO and the ICO and the provide the ICO and the ICO and the protocol and the ICO and the ICO and any and portion of the Icol Marring who appear the counter advery at ICO and applies that the counter advery at ICO and applies and the counter advery at ICO and any at a portion of the Icol Marring and any at a portion of the Icol Marring and any at a portion of the Icol Marring and the any for programmer eport that the any and the Icol Marring and the any for the proper thread and the indical of executions in the Icol Marring and the Marring and the Icol Marring Marring and the Icol Marring Marring

While the Jacpaneae have streased the desize for world opoperation from the start it seems clear that this is a near in seminal. Where will nat and? Dire view. Says Manring. "Is that this is just another Pearl Horborand that all they we succeeded in doing as realizing the typers tail and making him mod ashed and near whether in the form of MCC. and DARPA is going to turn around and really whomp them The other scanario is hat the United Stass will do all the basic research, only to have the Japonese turn around and commercialize it.

But accounts to McCounts, were at long to come out these Crone in the periatem interhelpy has become ubactories as asy, intelligence computers will see into the weopenetic metasian intolly indial and wide couparing the metasistic will provide a consent and planningsupport system, giving people a huge support system, giving people a huge tung computer to create wide it destrunes peoplewill to table to force out of it destrutions of conducting ther can here it.

Flact goes one ball tables. The timgeneation, his sign (Birgs a new behavior) of power in technological gootenis as and the states of the Birgs and the states of the states of termined in a solution of the states of the states and the states of the states without and the states of the states of the other states and the states of the states of the states of the states of the states without and the states of the states



WHERE IS PLANET X?

STARS

By Joel Davis

Ensus and Nethura melotiwe containtly. The orbits they follow many astronomes think they know why they believe an unknown body is present in the solar system and that is gravity dealates the meanment of the two plannts. They call the body Plant X. Now all they have to do is find it.

Astronomers trave-been looking for Perind X to move than that a carring, Bohra the invitednus object has eluded i tem The instrument on mount a methodical search was a elitical ameter named Clyde Tombarg in 1950 ho toward a Parent X candelites, but it turned out to be much too ment to depart the outback Unawa and Nepture Tombarghts dooceey was remed Prior the methogenet of the select explain

Someauch spant 14 years patiently, contenuing the search for a listing-patientime paint, using the same technique that heighed thim find Polic comparing photographic plates of the right sky taken months graphic plates of the right sky taken plates and device called a comparator which graphic plates of the right sky taken graphic plates of the right sky taken graphic plates of the right sky taken alle het plate the right sky taken plates and sky taken plates and sky taken plates and sky taken sky taken plates and sky taken sky

"I searched more thin seventy parcent of the sky." Tombaugh now in his explore receils. "Exhibited patient to the extreme limit, bolking at objects four to five times famor than Pixto was when I found it." Forebaugh s used timed up rothing

Advancement tachnology in the Tenties and Fortce was primite compact with toogs typicate of compacts and associates. The contemporaries and associates and the contemporaries could have been as the contemporaries could charact decoupled in the view of the compact have been as the compact and the compact and the have been as the compact and the compact and the have been as the compact and the compact and the have been as the compact and the compact and the have been as the compact and the compact and the have been as the compact and the compact and the have been as the compact and the compact and the have been as the compact and the compact and the have been as the compact and the compact and the have been as the compact and the compact and the have been as the compact and the compact and the have been as the compact and the compact and the have been as the compact and the compact and the have been as the compact and the compact and the have been as the compact and the compact and the have been as the compact and the compact and the have been as the compact and the compact and the compact and the have been as the compact and the compact and the compact and the have been as the compact and the compact and the compact and the compact and the have been as the compact and thec

Today is seen to reflect X employs the latest in autorpartical high tack, including the ordang telescope FXXS (intraced actonomical tatelitis) TRAS was sole to see infrared, or heat, indiation and could spot objects cooler than stars. During its 11month Instime IRAS spotted dozens of new comets asteroids superlaint rod dwarf stars and distant galaxies. And unlike Tombaugh's search, it covered the entire sky.

Did is tind Planet X7 We don't knowyet 7 skys Russ Wirker Waiter is a member of ulimeted Scance and Engineeing a film orgaged by the Jot Propulson Laboratory, in Pasadens Cellforms to search through the accumulated RAS data for evidence of Planet X

We have been looking it housands of contribution. While is sparse "What we are searching for a the motion of is cool object against the background of the sky" (By cool, Waker means that the objects shuld have ampropriates on physic than took). I we and his colleagues have done paintemary phrams of IASM means and ospect to make their findings known sconfilment they see.

PAB is ismitud in whist is can find it couldn't spot an Earth size planet at distances beyond Pullo says JP, researcher Nok Dauter, also working on the IPAS data. Anything that distant would be too amilt and would raid also too thite heist to be



Veprune Dass Placet X reake it wobble?"

seen," he explains "But IRAS was capable of spotting planets the size of Jupiter or larger." Theoretically, such planets would be descetable as far as 90 billion miles from the sup.

Cree day, while setting through IRAS images Gauster though the fast comathing traces an underthed point of infrared addison. If was in your the inght place and appeared to have just the right temperature to be the elusive terth planet. For in few moments Gauster had wasnes of joining Tambaugh as one of the only lying trumans to have discovered a planet.

Clear implector showed it was a table atom—a fairt led star. So Gaulet not he others on the TAS team continued to and through the hundreds of other ledy concludate. This month at the arrusal meeting of the Asternomical Society of the Pacific members of the TAS team will sport on what they did see

Tombargh is not optimite that IHAS will not Planuk TV The sky is loaded with mittad barek TV The sky is loaded with PMS could implicate another mittaneoting decovery a subset of bapesoid by gravity botten elsever model to the begins of suspects botten elsever model to the begins of suspects and Planuk Twent of the planeotic and suspects that Planuk Twent of the planeotic and but may actually be a brown over1 as such failed status are called

Werking on this hypothesis astronome Liboratory is unrapide bit hold hypothesis Liboratory is unrapide bit holds in produce potential plot is forward. Y net produce moving out of our solie kyelem. Anderson belives that if how the sum it belives that if how the sum it belives to an if how is a large stationemoul body in a dotard oth a round the sum it is the supported by a stationemoul acquisitional dotards and in the forward acquisitional dotards and in the forward acquisitional dotards and in the forward when the ungenerative the large Acquisition acquisitional dotards and in the forward of the when the ungenerative body is located

Of course if is possible that here is no Paret X at all But Usinus and Nepture contrast to wobble in their paths around the sun. Something must be desurbing them if it is not an undiscovered planet or a board over, while that? NTERVIEW

CONTINUED FROM PASE 464

Yet I am at I asked to applaud and agn mandence for more money to do research faster; and I refuse

Cann Amir you be the row bachrology to advantation to an other the comparison of the standistic to a set of the comparison of the Sciences with henge on the machine and set of the set of the set of the Sciences with henge on the machine and set of the set of the set of the the set of the set o

Orea: Butish' il desnable to oure disease? Chargat: Certanly its a detensible function of medicine to cure sick priciple. But where is the lea? If you tear out your hars one by ons, when do you become bald-headed? There is really a chasm between curring schoess and the abalhon of death. And it will be the not who will we longer because these theats are very counciliary.

Ormal Science has brought us television lant that a boon?

Changet top, are safety to a more who has provement of a TV Previous step of balacity of softwarrow (has an purishment. Now the whole of humany has put itself in a softwarrow (has used as to holder a bas). I don't want to house used to mit to appain in their are intelligent works in the universe leasanterviewed my softwarrow (has a softwarrow (has a softwarrow), and used toom the softwarrow (has methoder). I shall don't ward anything to be brought to monitors used to an the TV to this program. I shall works on the the top of the softwarrow (has in them) don't ward anything to be brought to monitors which anythe interviewed in the softwarrow (has in the dot a work) on the TV to this program batteries with house of one interview.

Gener Suevy positimer, wen today, domit welch much YU o hang an the todaphane? Chargert There are no such monitoday We praktically imposable for a sail gainup to appear in my consolution to a sail gainup to Lamanno the much melgand time Realry wen way takente topolo But genering wen way takente topolo But generoal by 1914. Today mad we meldechina Bownup XH winds of the time.

The commercialization of research is the worst development When I was a profisionar at martical school you weren't allowed to take out patients. Now you have comparises bying into Harved and Mer. If belavadit



was for the good of markind --- to cure cancer ADS and infectious develop-all light. But shart tous IT The Amendan Garoer Society would be brefer if cancer were used. A more just dataficultion of money to liss-popuular telds might be more useful than we think Maybe work on the payments in building wrigh would find semating that has to do with cancer.

We should reake not the yours thursday of assess as introduced to everything data to be assess as introduced to everything data. To be assess as introduced to everything data to solve as every should be a subject to every whose to solve, which is a subject to every whose to solve, which is a subject to every whose and advanced to a subject to every whose and advanced to a subject to the solve with a fail and data were prevaled in the solsess of the solve the solve the solve the subject to the solve the solve the solve the subject to the solve the solve the solve the subject to the solve the solve the solve the subject to the solve the s

Too much research today is systematic discovery, analogy research in which predinable hings are found. Red discoveres are unpredictable. My own discovery of the complementality relationships was certainly complement unpredictable.

Cife day, string in my offeas it occurred to min be die a defavort kind of calculation. We had just got in the new electric calculations, and i cacké average handwiska of andpais that i cackén trave dem by hand. And out they came as theydees is before its by hand with to their kalout it was not to know with to their kalout. It was not to know with to their kalout. It was not to know gravitation theory. Usually he gots just a justic on the had

Onw: What about your previous major discovery, proving that DNA was capable of carrying the information of heredity?

Crought Tate and co date to currenttion hypers and calls link Thread application have concluded them may be avery subface concluded them may be server subface (and calls) and the server subrent applications and the server subtactions and the server subtactions and the server subrent applications and the server subtactions and the server subrent applications and the server subconder large server has a server subconder large server has a server subrent back and a subrent back and a subrent back and a subdependent in where the large server degree on ordermater means of an large redegree on ordermater means of an large re-

Ormal is James Wataon, than --who worked mostly in his head and who knowed the thread that his grant would be out off-the kind of researcher you'd approve of?

Cheegel1, Visi, this discoursy of the double halk was and of the last exemption of events and corne at doth cast any money. *E* was done barware adarms and dhrom (more or au-oppeoid) Weish, who well abard and a was very yood here. The last sumstands was very yood here. The last sumstands was very yood here. The last sumstdiates have by gindbard, but it's elit ofhaltaneous last any big instala.

 Greef. When you met them, though, you clidht see Drick and Watson is historical tigures, did you?

Charget They inpressed in more to a conservation of the constrained of the anticentry your might two They did they any cherning within a did Spuid, harding any cherning within they did Spuid. Another booth Hey in Schwere Net a bata book, as about did was so well down. Other permittion wetwork of the spectra strained about the set of the s

Ornal You had already made a key contritation to what they ded. Why didn't you seek. the structure of DNA yourself?

Charged 1 was not in the round at all we want to the set port of there is not a lives a charact working on the lives in the lives at the set port of the set of part Hallwe in the set of t

Oney! But you were very interested in the structure of DNA, weren't you?

Charged rise but involve here gow much show they be not on the years II and has the collators on a second to the the communication of the second to the second show the second they have the second to show the second they have the second that calculate three on the second that calculathat calculate three on the second that calculathat calculate three second to second the second that calculate three second to second the second calculate three second to second the second that calculate three second to second the second calculate three second to second the second calculate the second to second the second calculate the second to second the second second calculate calculation. Negle second the second calculation the second to second the second to second the second calculate section. Negle second the



Les that The clouble helix is a beautiful stant that here given me to a new science that's been actemptly successful. It is not restly what (7 have amend at—just he best replaration of the averailable charmoal facts Career, What then would DNA look like under

Charged Chily occasion ship is double table. DAN in a call is a landscope, a method in a termenolous length, with a greatmath, a hill on resi sold, a subdater, of the other sold. a dam—all lands of thegs. The more we learn the classes it becomes the charted term to classes it becomes the charted terms. To any this is a double table, except it entities and because the charted it entities and because the complexity of the charted terms. The site is a double table, except it entities and because on the charted it entities and a sold because the second it entities and the second of the second and hermore notificities are not

Don't longer traverse here always had tomerchan workstrom in hereby. They being provide the second second second second second provide representation of the second decovery of progen respective second second second second second provide second despective of the second provide second despective of the second provide second sec

Chargett. Nex, I have always called myself a prest complicator

Genes Remarks the tendency three you of the tend the your tends as appended composition of the tend the your tends as appended composition of the tend to the tend of tend

Onsel Why didn't these one-to-one ratios suggest to you a molecule that divided down the molecule to control of 2

Charget I hardropped treasms obvious, but here are invalided at other ways that pathing could lake place. It sounds turny but I and in its are that the model is counselving correct. That the DNA gains is the double allow as you see in now in actions. If the source updament, I hancetery to believe the error supresses control, "them in carries outly in one prove but interfaces over the other in works scoretar. It houses the the is tog change is brook its toom plottered over it thermoords built mann of a warm with interry years say out done with salling out to salma out were say out done with the worker is and to salma out the worker is an entry of therm when its entry-of therm when its entry-of therm is not entry. If the software is not entry of the salma out the worker is too the salma out to be bordsore to only the salma out the salma out the backgroup to show that base pareing had other backgroup to show that base nothing is to dwith heready. The same nothing is to dwith heready the same nothing is to dwith heready the nothing is place that in a command is said.

Owner Aren't you doctoring history by silving long after the fact, that you found the 'paining of important diements in DNA, rather than just that they 'approached onelis-one networt?"

Charget II used the week complementary Paining upped by the second permetary Paining Laced biet, transistance my ward into while and a double extraction on Their target of the Wettern The helins is a generacit. This lack that is a double simplicities of the Charl and Wettern The helins is a generacit. This lack damed it was important because his an automatic way of reproduction. I reveal damed it was used about 1 Lendon herhio Wettern I has heard about 1 Lendon herhio Wettern I has the charl with lot where it the mentarize the datacetter.

Greek Was the celebrity Watson and Dick achieved for its solution inevitable? Garcaft No. I was very "reduble." Dat ten people local methon might have also equip and have been dealer and have been dealer and have been dealer and have been dealer and the have been dealer and have been and the have been dealer and have been prepared parker privaces that limits that the local all we explore the been dealer and the local dealer and the local dealers and have as been the out of the the prevent we as been, the out formation prevent we as been, the out formation the have been the local dealers and the local have been the out of the the prevent have been the out of the the the second match and the second and the local dealers and each and the the second and the local dealers and the the second and the local dealers and dealers and the local dealers and the local dealers and the local dealers and the local dealers and dealers and the local dealers and the local dealers and the local dealers and the local dealers and dealers and the local dealers and the local dealers and dealers and the local dealers and the local dealers and dealers and the local dealers and the local dealers and dealers and the local dealers and the local dealers and dealers and dealers and dealers and the local dealers and dealers and

The same with the double helix. The furning thing in . There miner connotated it such an important thing, the centreplace of our sematrix thinking, a symbol of our times for beenty-five years. I furnit Avery much mark than I haven Check and Wattern.

Gross Was if very disappointing for you to be no knowledgeable and so close to it and have them come in and scoop you?

Chargert No Not at all but it was the test appetrations in accenter of their kind of qualitlang and pasting. Diriginally, science was an international understaining of a barly meet inture You could find hurshelds of paptient with wary accelling results, where a footnote at the end would say. We ask collegisters to reagenet his lined for us for a few years'. Cain you immaine the Homere Landter if come



one wrote that today? People wait for the preliminary communications and then ruth to the phone to ask their greakalls students to try it immediately in order to bear the author to publication—or to the patent.

Daw Deen t competition apur people to perform excellently?

Changet 1 am not aver that thereby and that was not corrected to the a scantar is an actual. Bosinon a sin an where is the scant actual constraints on an where the scantary of the scantary of the scantary to provide of the scantary of a scantary to the scantary of the scantary of a scantary to the scantary of the scantary of the scantary of the scantary of the scantary to the scantary of the scantary of the scantary of the scantary of the scantary to the scantary of the scantary of the scantary of the scantary of the scantary to the scantary of the s

Charged Them as any question Tool is may the Automation was not the is too by entry the Automation was not the issue too years being most lawy inverse rain for invertise in ways in a hondor begation to the information and the inverse the transition of the automation of the automation of the term and the automation of the term and the automation of the term and the term of term and the term of term and the term and the term of term and the term and the term and term a

That is the point have to make pourset those beetings intermary people diversitial add. "Here gang to get the Nobel" not because gor to get 1. In the world if you want soming werry much you way often got 1. Once thought of writing on article-called "The LTMB bechnology of the Nobel Have. Just I move appear because to goodness the not I am more an observer than a author

Oters: At severity-time you are very sharpminided and according to your book you don't setue from Columbia willingly Are retinuid solamitis a water resource?

Changatt Bench Brecht werde about her preseter of a singu coprosition corrung table trum the adeal and bang unbills in gottle ban a common. Our cay is in chromostered bane implication, yet wer holp repolency there with younger people. Of counter, the tensite tarrength of an expert or specialatio theorem to the tensite tensite theory motioning the control to its operation. On the counter, the tensite tenrity that man One cheered we man as again of flexible. It have an enhance the tensite tensite to the counter of the presence of the tensite tensite of the one which we counted the tensite of DAA.

I don't know of any scientist of sorty or sev-

22 CMM

any in the models of the current rumpurthey all any text scentruls for 1. Here y discontidecent work and mod. Their own papers "rung people work gold here coll they usally work with teccond-rate halo. Young the sum-models and the scentral for the root of the rules. I worked on everything under the sum-model and the scentral scheduling at the sum-models and the scheduling at the scheduling and the scheduling at the scheduling parts on each Im ready explored in the

Dense: You talk of providence, and the front page of your book quotes a religious connet by the poet Gerard Manky Hopkins. Do you believe in a poo?

Chargelf I make it a rule never to tell anyone of my beeles. In net making contaissons by preceduces I mean the deglebate and of God I do go to church, yes, but is look at the patients I am the least coincil of soanato. To juzz me up will produce only a veh convisionation.

Other: Heraclustar was known as the weeping philosopher and your yows seem equally personets: Do you see any bright spoll in the American actually?

Charge of the set is the theorem and the set is the

Drew What nation do you approve of?

Chargell. My philosophy is almost the coposite of the American une Unitie everyone his an obligation to everyone else. In a way, the useal accessly is the Chinese which has been tested more for five traused or disfrouserit years longer than any other poojie in history - leveloch tear to level them its very unpleasant, its ideal in the sense of the complement.

being beel insigned to the future. Theyw one away with provide to state the company wature processing the state of the state and the state of the state of the state of the abanding team only if you have future the poper unsate to doubte stretch lengthwell be in hundroog scate. Hereywere there will be interpolitic crowed of the doubte poper unsate to express the manales in the one interguage Spatian capacity and lead on Artesdy there are stread on and cubic the proper unsate in although on an cubicit is any proper stread on an although the any proper stread on although the

Other, Are you brite, as some have sav? Rengell Arthous wasses takken modern inter Theor boon labeled blevel. Device the brite theory of the taken and the taken being and the taken being and the taken media and myseld despersals built boin have integer have being and taken built boin have and and myseld despersals built boin have the attempt of the Academy of Seconds. What have all ongoing the taken built boin have the attempt of the Academy of Seconds. What have all ongoing obtains (a long base) that the attempt of the Academy of Seconds. What have all ongoing obtains (a long base) that the attempt of the Academy of Seconds. What have all ongoing the second base of the attempt of the second and the attempt of the second base of the second base of the Academy of Seconds. What and the second base of the secon

Onver With all due respect how carryou be sure you re not just an old fluiddy duddy who pant adjust?

Charge? I set myset has very dife is 20° too charge to driver a discourse of all 20° too charges to driver a discourse of all and the winny use and the Nogle miss of 1 and the peaking the control time. Su members winn was and the too the work benown and the too the work benew when the new huld miss and and peaking these what more the work bepresented when a but minima and and microry Dean Suit wroke that is an interminant of the work of the set of the microre too and the set of the set of the microre too and the set of the set of the microry Dean Suit wroke that is an interminant of the set of the set of the microre too and the set of the set of the microre too and the set of the set of the microre too and the set of the set of the microre too and the set of the set of the microre too and the set of the set of the microre too and the set of the set of the microre too and the set of the set of the microre too and the set of the set of the microre too and the set of the set of the microre too and the set of the set of the microre too and the set of the set of the microre too and the set of the set of the microre too and the set of the set of the microre too and the set of the set of the microre too and the set of the set of the set of the microre too and the set of the set of the set of the microre too and the set of the set of the set of the microre too and the set of the set of the set of the microre too and the set of the set of the set of the microre too and the set of the set of the set of the microre too and the set of the set of the set of the microre too and the set of the set of the set of the microre too and the set of the set of the set of the set of the microre too and the set of the set of the set of the set of the microre too and the set of the set of the set of the set of the microre too and the set of the microre too and the set of the microre too and the set of the set of the se

Gener in regard to DNA would you now agree that we have succeeded in tolving the maximum of lat?

Changel 16: A laying cell is all agreet myslawy and nothing than relacular bordway or any of an lass show has one of that and a life. We have the second second

Orner James Watson told Onre that it a serrply a matter of physics and chomistry and the matter of physics and chomistry and

Chargef1 There you have the incluctional and here you have the property choise DO



FRAME THE CALENT To get the target adoubt the guarantikack your must first turn the agains transe finates out! Do this type deam forcight has certain hole. When this is competited and liad list the result will look like the ghotion page 102. For your film then you will want to call the firm strainer that as cheeper couch timel to task account will look the page couch timel to task account will be cheeper couch timel to task account will be



GFT IT OFF What could be simpler? Just push the inner strip filough the hole and volia? Their one of the two modification puzides with an answer so simple from the prelament in a ancie chaerra.



COLD "Forty below" is the only temperature at which both the Fahrenhert and Celose scalar read the same, forciontally, as Mechael Bueban pointed our in Capital M the Machington, DG. Mense neweletter this is also the financing point of mercury) Mil. Mohice

CAFDITS

INTELLIGENCE

COADINUED PROMINGE 48

Kabo had to write a program that smoothly lesied the contours of the first cross section all the way through to the fast slote. He also assigned contenting ochos and shades to the also flat, nerves, and muscles.

In was a produces secondariumia. Time storagie opporty for the data allone is ten magacipitas says Kabo "That is such the rew data" Nowstored in an IBM 4341 miniontigrind into a much larger machine before Sabo con melo luthor enformemble

The first result will be a velocitie's will Staddo understand transp in refer the student will have an arm and hered that his call do to start poster and wave load any angle the can descut the spectrem with a comportexest descipation to bied us can be alware at a time becaus mervier, muscles, and Blood to have a scale and refer to the start one advance thereas and have any dynamics images of the result and the motion.

One colleague lold Meels that he thought the technology could exemplay be valuable in educating assigned with optimal on hermas Boolaace the computer provider methand outside verse surgement would be able to see from this made where the strength of the name argum must be concernited 41 the same time they would also be done togewe how the region would look 1 done. property in the operating sooth

Incorpt the Doctation in the extension of physicians and nurses it could ultrately have an extension impact on the national the of robusts. The better understanding we have all the actual movement calculabilities of the arm and the bad ways to lever it? says. Kabo the more neght we'll reve indiarghing better manyaliders for notion.

YEW WARES HARD AND SOFT

Say ragem Max Whater th dialogue turn fay max diabahato e your bash, turn fay max diabahato e your bash, Seconda Jae can insch you Machaton Seconda Jae can insch you Machaton gash had bash ama di you Machaton gash had bash ama di you fan cuosa path had bash ama di you fan tang had bash and had bash and tang had bash and had bash and tang had bash and had bash and had bash mata had bash and had bash and had bash na had bash and had bash and had bash and had bash had bash and had bash and had bash had bash and had bash had bash and had bash and had bash had bash and had b

This is diadicated to the one I log. Here you ever been downloading and had annione pick up an extension phone? Nat only can you lose the fair, you may have to rected and log on again. Their costs time and monity it you don't here the backs for a separate talophone line you may want to smp Delay Generi nito your exercised line. While comnacted is knocks cut the extensions on the same line gring you in effect, a clicication line for your modern Removing Data Cuald estimas automatris. (\$39.95 from Control Inclusities Box 6329; Bend CR 97708)

Netch wets with basic Asamov Hannov Ho basis of Jawnis been modeled in on comparts software advention that dwarpsis and/ the software advention that dwarpsis ware the software to be a menote galaxies and advention that the software to be software advention that the software to software advention that the software to software advention that the software to software advention that they have to be software categories of the software to be software categories of the software to be software count Servery et CAHARDE VOID



How to reach the gold standard.



So close. And yet so far. The object of your desires is within reach with Kodacolor VR 200 film. Sensitive enough to make the most brilliant colors shine. Shar enough to capture small details. Fast enough to catch your subject as it darts through the

to earch your subject as it darts through the stadows. And so versatile that even in shifting light, a golden opportunity word slip away. Rodak film, Because time goes by.






building lein new coal and nuclear pferts in goodho plan mélong ful use of the aliboriatives lookas builder from coals of financial angie. The bottom increase that a sciences of conservation our aliboratives ouch spaces course rule nor aliboratives ouch spaces ones out of the ten big plants on this company a drawing board. It would get the serve energy results at lower coal

In tRDIPs cars do d'action manyes des exolut terponis d'Action de cartino d'action exolution terponis d'Action de cartino de la marse sero toxeleg i conde even montnais sero toxeleg i conde even montde de la carte de la cartino de la cartino de la cartino de la carte de la carte de la cartino de la cartino de la carte de carte de la carte de la carte de la carte de la carte de carte de la carte de

Meanwhile for polnical reasons. Califor-

nets utilities were similaring that locus from nuclear to coal. By the beginning of 1960, the two califorms greatly, 1763E and Southerm Catiforms Edaps, had sought amiliar ambaces are part of 360 mogsweld; coal plants oppoor within the table and misistand 2100 minutewell protect and of states.

Into the incore Californa coel ruth, the PLC disopoid a borried-in-the upercodenied rate penalty that EDF had been pushing to. Ruling that PG&E had recouably disogoal is feet on cognitivition, the commission subtracted \$14.4 million from PG&Es roots

Moncy base: Fourier make claim varmeet need a meet haaton of a potent in the unity upoint tob. but the proceden was the unity upoint tob. but the proceden was hand to be traditioned in the store of benchmen skip runned for bit store. The take the public might their. Robbit says work was also include the bit store of based to be the public might their. Robbit says the public of the store of based to be the public might their . Robbit says the public of the store of based to be the public might their . Robbit says the public of the store of based to be the public of the store of the store of maked to be demonstrate a the two externing and cheater on there wan.

When these maniful PG8E came forward with the country's largest program to promote conservation measures. Called 21% for Zero Interest Program. It proposed to limit onsurrants all the montey they needed for things like actio masksion and storm windows all to stream! Brothy alterward: PCAE came up with a smaller process II for having a solar collecloss all well. By det of the solar PCAE host boome, overhalf. He county is laading uitig in programs for alternative energy. And one you lace with a new groups and eight openalise of the onemuca 2 solar mage wat coup joint that PCAE (and in selec 104 point) and point alternative laternative and both and point and a select the point both permitted pCAE (and in selec 104 point) both permitted points.

By Merch stadi ware the PLOS fourth and conference on recent priors and an energy and conference on recent priors and heady any run plant to all about With Indiand Languarty plant to all about With Indiand Languarty plant to all about With Indiand Languarty plant the recent plant and management plant and management and the state of the recent plant and plant and plant and the recent plant and the state of the confertion plant and the state of the state of the confertion plant and the state of the state of the state of the the state and the state of the state of the state of the the state and the state of the state of the state of the the state and the state of the state of the state of the the state of the the state of the the state of the the state of the state of the state of the state of the the state of the state of the state of the state of the the state of the state of the state of the state of the the state of the state of the state of the state of the the state of the state of the state of the

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SHOPPING BY ROBOT

BRE/AKTI-IROUGI-IS

By Henry Wouk

In medical table of the set of th

Takayuma ta'not your average georgecar He is a vyeams engineer with Seyu. Uid the disord largest supermarker chain in Jupan and the company that owns the stole. He nas the unique distinction of running what has to be the mail automated supermarker. In the workd Tithe Hell computer from 2001 book over the ABP if in disclativesid book something like this

Located in the bacy port of y different temperatures work in experience work in experience more than a second of the same indertoday that has made. Lapanese textures so theore from 28 Japanese france, hocking Samy Sole for Aspense france, hocking Samy Sole for Sole Samy Sole and the same france sole in the same sole in th

Blobb size everywhere A warsi indiction of a goving a lapscoch win olicition specase deplayed on et back. In the overput win tables a cleaded the man computer back monthly and sorts and the specase deplayed on et back. In the overputer back of the same computer back of the same deplayed on the specase deplayed back and nonverputer back of an average command on automatic average command on automatic average command on automatic average and a special percent of a set of the back of the same relation of a labor with an operate special command on a special percent of the set of the back of the same relation of the back of the same relation of the same special percent of the back down

I nen. a small but powerkul robotic town is roused in its recharging station in the fort of the state and sent to namine the cast to power power Following a premupped path is tolls to the pickup point, stips the two prongs of its lift under the cart connes if to the proper shopping leade and sets it down. Humans unlead the cart and realock the shelves.

Berundsang supprincipal retrieven automatic C division (division) dari gina divi barrante C division (division) dari gina divi barrante C division (division) dari division (division) dari divisione divisione divisione divisione divisione apporte divisione divisione divisione divisione divisione apporte divisione di divisione divisione divisione divisione divisione di di divisione di divisione

For the customer the star of the store is what Takayama calls the Ham Sloer Three



Robot-run market in Japan High-looh Ansven

legs of cold curs are on display reads a trainies side and disks both in a process memory and disks both in a process aphaba cusheres path hatman to balect the amount of mest they want, even how they the allowed the Ather an order a paneled in. The machine packs up one of the electric and the side of the aphaba paneled in. The machine packs up one of the electric machines inclusion agained the electric machines in the potential box seets a stress a poper stoler and shocks in cut a clearer visit utabached by theman hands

These is harary a context of the store where ischnobyg on theory lends A. A shopper reacting for an tam in a display of eache or unusual doods break the beam of small infrared sensors hadren under his to it death MrA. A second later a presecond with A. A second later a presecond with A. Second later a presecond with a second choice the sem chosen what it backs late and how

Are customers represent by the shoul? Elements along the justice from the distance the afformed—as most of the submetric file back and the submetric file of the submetric large and any submetric file of the submetric and submetric file of the submetric file and the desiring only with machines the net like desiring only with machines the

Solyu explains Taksyama eventually plans to adopt some of the technology of the SS4 million exponential store for use in its other branches among them one under construction in Taksible City, an expermental community in the Tokio suburbs

Interstation detailers from ten countries including the United States inver mobile the plignmage to Vekehama to gat a good look at what may turn out to be the supermarket of the twenty link carebury and Sateu a Tekyo department sizes even offers dely outside fours three

At the end of our flour, we advacd to sea the fram share in action, Whom we reached the cold out ande, we found nothing but a base sport on the flour. We advad a woman mogping the flour whose the harn dicor was. On a sour of other supermarkets," she arrowned DO We would have postponed this

COMPETITION

By Scot Morris

Our Sontember 1988 emouroement of huce response brought many a double and

Many familier inea could be traced back to Sam Boldwyn, Groucho Marx, Yog. Barra and Goorge Cartin Others were just cicluscepon Misary releigence Junto ism Spence lictori Motal maority Ifs. arod them like the plaque. It you fail and a mition times-don't exaggerate 1 can Halo 1 must be going 1 would not belong Marx) A varbal contract isn't worth the internatio-it's always too provided (Bama)

GRAND PRIZE-WINNER \$100

I don't believe in actrology But, then I m an

Hipporance pritibles, I don tknow what it

Book Title Suggratibility Gured Through

-Patrosa J. Veber: Mount Pleasant, SG

The Schimphreno. An Unasthoughd -Mart / Hogue, Columbos NE

-Jed Machanz, Ernard, Nb

We are not anticipating any emergencies -E G Robles & Phoenin

-Christopher Monison, Sochudelin AZ

Those who forget this sentance are --- FM Yochum Rochester, NY

Solosists of the world, united -Frug E Harris Atlanta

Its not an optical illusion. It just looks like -Rhi White Vestura CA

-Mark Denmar Otlaws On

Well-conserved runs - inter Hunter Zermenter Mil

Paterner will come to he who waits for it. -Robert Lastriback

Am I seeing things or is that a mitage?

There are two things I distike in a personabsortmindochrisis and I can't remam--Peter Vermiere Perland OR

You can never lind a tost-end-found when -Greg Clifford, Santa Ana CA

-John Lappe Rossant MO

Dysiesces of the world united

I may be achigophered, but it least [] always have each other -Randy Hamison Indianapolia

Lused to be an agnostic but now I'm not

-John N Kock Medison, W

Teacher's ontroue of a term paper. "This moort is filled with omissions lively 500 Paraverth. The only bad enounts is a dead engine

-John Henrick Seattle

Procrastination means never having to say -Too Fasters New York

Athletic scholarship Ten Moore Providence

Fm sp matculous when I do proceword -R Martinson St Paul

-Denns M Pagen Lee II.

Manners are the norses you don't make when sating soup -R F. Asomor Avako BA

Perlenses report on a scientific anticle. "This

-Riddeey Scott Ann Arbox Mil

May Lask a quastor? -Michael Snuckley Jackson Heights MI

Who can court the cost of innumorate? -Bawn Bolus, Edinburgh Scotland

Ladvocate furtherance of the status quo -John Mannanne Frenklin Square. Hr

political parties' Progressive Consulvative -Rommon Buchinan Port Alberri, B.C.

Eve abject two awi homory/mesh -John V Clemente Lake Griv FE



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HA OWNI

Figuretri Isaa a Ja va sais guol, which in an-other language would be merely t--- i don't

-Dawd J Dauton Columbus GN

Nepotem is okay as long as you keep it in

-Pechant Hatron Les Alamos Nil

Plastic alverware

-John Vickers: Fort Westmoton, MD

You arrefy must stop taking polyce from

-Malana Zesharman Moccossin NJ

He speaks Esperantio like a nativa

A User's Hundbock of Hard-to-Remember

-R W Ells, Glen Mills PA

Writest scapequate humanity is bland 1 -Joe Rotaran, San Gabriel CA

Do I strike you as a violent person? -Boan Harrison Seattle

Depart implores Buy American¹ The Seville

I'm como to commit succela or che tranto

The kindest tang I can say about my wfers that her an laws are a lot near than mine. -Stephen Marwell Encine, CA.

Neptomane

-Roberty Marks Monton Brove, il

Im glad I don't like spinach because if I did I dinal # and God knows i hate the stuff

By definition, one divided by 2010 is under

-B E Alkisson Bitsburgh

Sign HMMCUTS MHUE YOU WAT -Sandy Forrest, New York

Freezer burn -Robert Breeser Many Lakes R.

No optilee for me thanks. Collige just gets in

Michael Weber Los Angeles

Everybody periodiges -Cont Rooms, Los Annies

Each class of men is created equal -/Javed M. Garners, Meckiele, OH DO



pharmacology at the Medical Academy in Service, Poland, reported that Padma 28

stally to keep blood from clothes in response to uncularities in actorial waits. This same process the body relies on to Iseal

Other researchers, including Vigdmet on the immunological system. Experiments of lymphocytes (white blood cells) in the the performance of T-suppressor lymphoovers These T pells play highly scohistcased regulatory roles in the immune sys-

Internanchy prostagianding, known to be important agents in the cardovascular system have recently been shown to play a cardiovascular and immune systems are re-Inted in such ways supports the Tripetan be-

Furthermore, Bachnalew has found that ractions (hourse root) have effects on the imneeds-key components in immunological meulation Licence root inhuits inflamme-Badmaxiv 'could easily take a lifetmo isolated, active ingredients in a com-Bedmayw explains isolating its constituent. components will not necessarily explain its offectiveness. Veclestending Padma's innew paradigm of biological action

of Padma's 28 components has thousands ownining in a sea of madness. DO



PHENOMENA

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where all previous thought may have failed Whence comes such light of the mm4?

Whence comes such light of the million When metal processes generate such purched asc(al thraghts? Why west for those consistent and mystemeous flows of creative thought from the inner recesses of mird? Learn have to provide the value of resigner well.

Let the Restructures, a worldwile or gammation, prove to you, as they have be threasened to other meth and women, that there is more to life than you would orthmely suspect. Not thorous, but a prior action application of cosmic laws for everyday use

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Services Corporation a livin that opecalizes in interpreting Japanese for US business men, described a carmon situation

Here should see a negotiarty service the peop American and Japanese First teal is growed built the cenclules soled incurd a state. The Japanese almost new's aparas that, when fill means initiated of the parameters and the service of the team of the service of the team of the service of the Americans to make the list move the Japanese fract them to 16ves pomething of the tappanes fracts addingt another to paganese poor addingt another to paganese poor addingt another to the service of the set of the tappanese fracts them to 16ves pomething of their tappanese poor addingt another to the service of the tappanese fracts addingt another to the service of the tappanese fracts the set of the service of the tappanese fracts the service of the set of the service of the tappanese fracts the service of the servi

How does the relate to the Jubence highten Hise-yelf herbytes to offering ways which the two cutures need to firer artwinsert Hiedow Kayma, an educativa at Nagaya Unwentry points out halt her Westerner a same of each of the Mine Westernal same of a dwess of end. For and independent of his existence in the first herher get nor environment: can be defined whend the other. The same

American psychologist Rothman agrees, pling the word harmony as the best description of the Japanese athuide toward lifeworld "Individual ego in wat part of a same of onerves.

Multi release the transmism in stage, set the Next Control and 300 stores for the Next period of Control and Annual Stores (Control and period of Control and Annual Annual Stores) and an annual stage of the Stores (Control and the states and annual Stores) and the Stores and Stores (Control and Stores) and the Store annual Stores) and the Stores (Control and annual Stores) and the Stores (Control and annual Stores) and Stores (Control annual annual Stores) annual Stores (Control annual Stores) annual Stores) annual Stores

"Our sanse of machinery and technology is different from Europeans or Americans," says NTTs Sheane. "Now I don't know if that's good or bad," he says with a sinug "but that's how we heel "DO Impossible card and a new photo contest



By Scot Morns

Last month our pictorial presentation of the the Framed Queen, shown at right a macachily dematerialized and passed has been out away and a portion of the the queens face. Yet the paper entit clued retained Whit you see is all one solid prepa of paper-missing only the square breaking the card into two precas?

problem Sermons was working in a factory makers pamping bundled rolling systems. A upper portion of the Elustration at right had below it whout disturbing end A, which was

The problem has a solution, a Rolamite worker found, and we make readers to rediscover it by cuiting a strip of paper to Gardners 1963 book Wheels Life and Other

It is surprising to find that such a sample principle should be so new Robert Neeler. paper, took one look at the Polamite band principle and realized that it could be used

roft on this page Discard the small inner 162 CMN



Top left. The impossible card How does the guest 4 per frame of Sourt with cuts like those shown

square piece, and out along the red dated see sheet of paper out to proportion playing card, it takes some practice to make

GET IT OFF This problem retrinds us of an

bratity calored plastic advertising groawing of paper string and a couple of buttons breaking the string or learing the paper II crack the plastic puzzle even though we





Can you imagine how to get the string all? If you give up too quadky and hum to the assurery, you may be embanasized to find that the value on so emple that it can be replicing of a single charging. A spacereaction is "to that all?" To fully appreciate the classic charging on the your best to correctual is forsime and is by your best to control all single charging to the answer page.

CUICKES.

OOLD Explorers were exercising the East Pole of Cygnus XI the snowball planet They took a reacing of the temperature and radiced the information back to Earth





At Meson Control in Haustin the radio operator and "Theard them say, "temperative is forty below built then the recogtion broke up and I could'st tell whether they said Fahrenheit or Celes (s

"Ait down Fatherithet" and the fight deedlar. Tim sure its connect

How did the flight director know?

KIN In writing up Dimn's Complete Book of Future Genealingy, our researcher cam ecross this quaston. What is the English designation for the only solar-in-law of the solar of one a father?

Answers appear on page 134

COMPETITION #37. PHOTO FACES

In commission with the source Jappeneous theme we holded at care back source of the Jappeneous data of the Company of the charmetory is alternative of company of the objects that look here have provides all approximative function characteres because of the Heldess and the Helder provides at the Heldess and the Helder provides in the method that and home an easer clock there both human home an easer clock the both human home an easer clock

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LAST

By Al Gicidstein

 Before the flammg-toilet episode, gadgets had never seemed at alevil to me. If anything, they were so much .fun, so cloarming.? As the goals that, the based instructions when there is the probability of the second second

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Spotter in a place temporaries and the place temporaries and the place temporaries and the place temporaries and the place temporaries for the place temporaries temporaries and temporaries temporaries

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Lam dif programs to a somputer Beets. For a long time Lined my connuter terminal dapage as ingli-light. But as 1 get conversant is the computer and it holdes comparises and the ultimate to indicide gradgets. Even with the computers measible properties, there are downlock

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"appropriate the function a file time along with the south that the wait dentity the being characterized with a two moves. It were considered with the BLAW or conserve. To add insuface to the south manacolity when it want BLAPs expenses data for failure the transfer it sught that because that the source confiding feature is provide the Salibility of computers The rear feature was furth."

What really womes me is how people could gadgeteer us all right into catastrophy

One proper of gardgatesen is that imitiatry they reale the series provided to the imitiatry here the people who are developing more and more ablackase gardgate for the imitiatry seens players who are clocks and cost gardens. They gardgate are depend your takes they garden the second your base a gatery there are to an underwater acceleration of the surface by posts that and post open where they highly as an and post power where they highly as an

And here is where the task of stronght but began where the task of stronght has baking me. The world of gadgets like measi billier measurable, release the world wi large benything cleans, gate, with were large benything cleans, gate, with were indicated with a stronght of task with the factor over its appageting way. White stimuto indicate were the future and it with water DO

At Doldstain Hei eisthr and publisher of Gaelget magazers, Nio niviarted to strep more conventional index plumbing