

SPECIAL HOLIDAY ISSUE

THE REAL BIONIC LOVER DID DIARNERA KILLTHE DINOSAURS? EXCLUSIVE: WHY WE HAVE SEX MYSTERIOUS LIGHTS IN THE ANDES 30 BEST GAMES IN THE WORLD BEST BOOKS OF THE YEAR PLUS: A COMPLETE SF NOVELETTE



DOTOR IN CHIEF & DESIGN DIRECTOR: BOB GUCCIONE

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Allen Sohnstur, owner and diestor of Ehr Shade, in Dallas su nickerhang photographer Ollis Found in tei Minibi of Man was conversionered by Forest Car Corporation. The minibia caroheof open and we say the symbole. Diest of amazimteen



FIRST

By Paul Zwerg

 Next month 1984
will be here, and we cannot help seeing that for all George Orwell's granty prophetic fantasy, he was wrong ? Note that so years ago Castos Owell the source of the source of the source of the interface of the source of the source of the interface of the source of the source of the interface of the source of the source of the holdcourt or own to even of these but holdcourts of the source of the source of the source of the source of the holdcourts of the source of the source holdcourts of the source of the source of the holdcourts of the source of the source of the holdcourts of the source of the source of the holdcourts of the source of the source of the holdcourts of the source of the source of the holdcourts of the source of the source of the holdcourts of the source of the source of the holdcourts of the source of the source of the holdcourts of the source of the source of the holdcourts of the source of the source of the source of the holdcourts of the source of the source of the source of the holdcourts of the source of the source of the source of the holdcourts of the source of the source of the source of the holdcourts of the source of the source of the source of the source of the holdcourts of the source of the sour

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In a way Orwell deht have to invest all institution the heat only to book at Stelling political purges and the subsequent Soviet necessing of history, or at Heler's sovethoally efficient death carips. He had only to look at Europe carego by Sour you're of aerigi bomburdment, and remember the alom borndai dhuppeid on Haoshinta and Nagaaako at the end of the Second World War

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CUNNIBUS









of far from San Francisco, behind football twid it is filled with a manave-

A Hepperhemer penetrates the inter the reasons tor the secrets

became a national best ander His latest Press book, which will be published next

the point, we don't care. Schaller is ive in preserves in China. The pandas man lood source, the arrow bamboo. 6 CMN

began to flower the surrener. This phenomenon cocurs every 80 years and

passes. The subject of this month's expert on the ecostructures of many discover he s also a purvivor of modern saving neer-extrict species and to educiona us about the inspir molectore. meds all the pressure it can not because environment of any in this pantury

Writer John Stein of Nachrelle taked to Schaller in the rustic environs of the zoologist's converted tobacco farm in Comedicut . Schaller has an amazing he socialis. He is very careful, really metaulous, about the information by doornsaver, but he knows we are destroying par future. Refund his low key

month is The Ludeng Cuck in which a strange little girl, unhappy with her

mother and father meets a psychopetric

In "Track of a Legend" (page 96) scence Action writer Cysthia Felice tells on the rapped edge of lomerrow A space erormous problems of readuatment novel Colosen

In "Monoly91" (page 114) a modernized space opera, a mad scientist wants to meastomanesc's plans. Authory envire such classic plots. Carris second round nevel, 7he Treasure in the Heart of the

Scott Russell Sanders says "Thave always been bacaneted with the interface theme " In "The Circus Arienals' Desermechanical beasts begin to abandon their maker. When the master goes in historical novel. Wederman Flore has un been outosted by Wilkers Merrow DC

COMMUNICATIONS

Let Me Say The About That

In response to Nicel Ifocks's Last Word Mument 19833 131 like to say the about Prough Last Word may be the fact me like a pethetic attempt to line your four-year-old Mensan halfway through Vendentall Unconstruct MRA program

Does Monsa have a purpose? Books asks. Does a doo have Buddha rature? approximate validity, but why ran t the first

Richard Dawes

Lostianly approcisited the Last Word on the term organization called Dense

(genus I Q) and Densa (several people ebundent common serves, who refute to

article concerning the Mensa Society He moted that Mensans do nothing and requierly hold large gatherings where they jokes and have hupging contests Mary Holkfeld

The First Word by Admiral E. R. Zumwait, Jr Skily 1983 was both enimblemon

anything Euclidemore, the war he so Reagan in the 1984 electoris, where

Michael Bh

Birth Control

this We want to achieve Costs reachers.

1) The device is not 100 percent effect

to provide a safe and efficient method

approval is not expected before mid-1814

misleading when applied to get dowing since such a term could refer only to a device that has proven neversibility

Chaes' [June 1983] The theoretical assects of physics are usually quile duit to read about Ms. Honoer chills superfor

Paul Bothwol El Sobrante, CADO

FORUM

in which the markets actives and are encouraged to debate wews and

Nobel Scient Bank

Afton Blakes First Word (August 1983) The donation came dreicity from my father (Edwin McMillan, winner of the 2011 percent I am one-hall Nobel. The more I chuckled going there to get Nobel games. Iften what shiplight or plastarty. They are suit for his or her efforts. What bothers me women will believe that obtaining Nobel offepring are crowing up in my case If was not my father a Nobel price that something to say 2 was my father, not Ann McMillen Nunes

I found Aften Blake's First Word deeply regarding selective procreation is not new They believed that in order to better the genetic material. This position was

Bieke states that 'in this age, child baaring 'is no longer a right but a privi health psychological well-being? What measurement of these traits (proposed

I am especially writike to this epseonly the fillost should be allowed to



ferhouse. And I should have to go with them for in such a world I too would be hopelessly impared-by moral

Point of Rocks MD

A friend aboved me Alton Biokers First Word which described Basel's use of the

The article illustrates the primary failure parts. Nowhere in her pince doos Blake a child' instead she seems to see the child after wants a symbol. She doesn't want a

Paynelia Geapre

After Blake's endorsement of the 'Nobel the to amp on that wappr, too I heatage only because I ve heard some pretty ates 1 ve heard that Einstein actually othered his same starts ferocacusly when Freud have some fixation about his beard? probably be in bed taste

Mathemate Westw San DannO

PAWSCAM

EARTH

By Douglas Starr

Lives in Los Argelesis Little Tokyo that Warden Michael McBlade Inst propenterred the Isade Ala an inspector for the fidela infamin-resources department, it was the piblic check instancement treasers (or ringel fish. But this time he found nine pris. Isadily traan ammal keel dentify lad out on an abumman trag.

"I subjected semeting uses arms, excitis Actiona wire thim wave on to to his ear rank to choose wire thim wave on to his ear rank to necessity and hard found That a whim an official back hard provehight to own under california take Metticula natureal to the selectary who Mchaol natureal to the selectary who Mchaol of K. Woog, The nectors raid at Methy are a health block He hard back to even

Months lifer werdens field chargos against Kein He lid business in a freque five states. They found in one four-day period alone he had bucgt, 200 boar period. Kins months also lact to acress Dawis. Kins months also lact to acress Dawis High Boar human will be toget per period period. State and the lacet to the period period. Boar business period period. Boar business and the acress the lacet to the period period.

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In a series the problem began 1,000 years ago and hal a word were For certures Denthal doctare travailed injuries and downees with pohors most of such things to bein gabitatidem, correstered a blood purify and powders animes of doat or ele, thought to be general energiants. Bo poliekt were free unifere set covered in weket, muno had it that imitatian suard them as generalized

Westerners don't know how or whether these potone work, and thay may never have carried in when't for the influe of "Assers in the early Seventees. Sourced by loosened immigration leves and poor conditions in their homeslinds, hundreds of however to Kronzin, Christian Cambodams, and Veterames poulad trobe United Bases sating in San Franceso Los Angeles and other Weat Coala Otas: Sono werslow eloppens in the Knoeldem soctan of Los Angeles began seeing stronge new poulads in status. Than megan began kinding boates evolution in the ecode-mask and is drear and base, with nothing semants.

These index promptiol Courses Wayses Wen, of the Chinema Dispatisher of Final and Gama, is based that is undercome the second second



The bear sizuphread for Onectal popors

All started by the oxise, the barrers would observe to for known the calculates making oxisy pairs for the packness. After killing befores the postchess would insure this pablications and gaves until their constatist in Boardmin California were tready to buy. Were also about and the constatist in Boardmin California were tready to buy. Were also about and the constatist in Boardmin. Davids and an observation and the the mean started by the packness as a function. Davids and all Rebard Board Parks and table here that her would be it here board california.

The month at locat frauck, will wheats provide the second second second second second provide the second second second second second provide the second second second second second research second research second second research research second second research research second second research research research second second research research r

That was the signal. Move int' commanded Wein, who was picking up the conversation through a hiddam make Several officers ran to the door. On a lable were 107 bear clavity.

Based on the evidence, Kleen signed wirmshis for experit hunders in the north and two more dealers in the south Withen one year the curls had hinks as of the hundras and centerized have to prison Shawhan was interfaced to pay a \$1000 the and speed one month in jail. Built, paid \$3.400, how other deelers in Southers California recoved and these as well "Hiwant Me colosiders". Yean acade

Kien was troubled however, by the sheer volume of the poaching. Far from being is local operation, this was a multirificit-dollar business involving communication was in

WHY WE HAVE SEX



Py Kathleen McAulitte

ex is cometting of an ombar stort the state keeping it a closely fomakes---and capatrie of bearing volume consolution it would not appear to be

that and is beneficial to survival bocause whose members are vared should be

with the overwholming namorical advantage of assessal protheration. Indeed the sole of sex in evolution

The problem is so perpleting that two By this place crasterinen may be



15 CMM

starting to look like an attractive alientaevolved than the parasitio DNA theory

Berraten Firk to -- and a sizable body of evidence backs them up. A husbandthe causes of aging. But in their quest to

In the mid-dievanteas, the biologists reliced a number of research second that repared over the course of normal celular Environment repair a rack on one chain, for heiden cause of severoe and

A review of the Literature abvectment free potychoo in several startles aremais subjected to apents known to have DNA were found to suffer from other researchers have uncovered correlation with life spon in twenty-one

PSYCHONAUTICS

SPACE

By Nick Engler

est than is year after Walay, Pyutim relaring tom a servicity asked to accord Sklyut 6 he was asked to accord sklyut 6 he was marching spectra of the service and marching spectra mission. Signationary, Ryumin dd not give much thought to his scientific Rather his most invitacian concern walk's compression as plot or scientific Rather his most invitacian

This server costencial, level nonoperative that long lay in packa with resolutions of the langest owner. "would reveal inversedue apprichetigated potenzial inversedue prophosition of potenzial inversion to being cather potenzial inversion of the lange packada and warm. Net even though amounted errors "there were buried of amounted potencial the case and herroraves buil between the case and herroraves buil between the case and herroraves buil between the case and apparently himsed of all gasecosts?

The lower Glays expected down the combine to pprovide a special of a second rule become increasing of a second rule become increasing of a second rule become increasing of the second rule of a rule of environment, exited is on a studied in the combined of the combined of the combined environment, exited is an environment of the combined environment is a studied of environment of the combined envited environme

None of these observations support the notion that space travel may cause swere mersiol deturbances (though some behavioral soundate warm that the likelihood of an adverse psychological wart' inclusion as space crews become larger and the mesoars longer) Instead 20 Detu The uncorrect stress of geocetright invaluess with rews participance and peop performance may cause a meson band on island—or disaster During the likelite minime experiments a port MSM and US hway stady of lanzar betware in solation a man was load when the one mepotacity abandment disaste labed solaty procedures while carrying out work underweter

To area a small studies to space the Servit Lines Touris undersorted to the Group to Physiotic goal (Dipper) which address in the goal offset theory planning the goap instrates the goap on two to address the goap of the goap of the goap of the physiotic goal which an adjustment physiotic goal which an adjustment comments are offset on an adjustment of address the goap of the goap of the comments are offset on an adjustment to be the goap of the goap of the the comments are offset on a strategies to be the tool discorder to the goap the the beat no concernants in the tool and goal and particular graps performs of programs particular graps performs of programs particular and goal and the too goap the discorder to goap the tool goap the discorder of the goap the particular graps performs of programs particular and the goap the discorder of the goap the discorder to goap the too the goap the discorder of the goap the discorder to goap the goap the goap the discorder of the discorder of the goap the discorder of the goap the discorder of the discorder of the goap the discorder of the goap the discorder of the discorder of



Shaaz in orbit. The Russians have a plan

The group also puts ocemonauts through survival messore isolation tests, and occutes in "oal" programments" (surchysnosis) So extensive is the psychological training their commonsul Visal mir Kovatinok once paixed, "Ibu mg/t say ware trained as psychocesis."

During artission the group mostner to cave bit agains the group mostner to cave bit agains the set of ormalistic set of the set of the set of the set generative set of the se

At NASPA Arres Research Cartar in Mountain Www. California a small base of betwareal essentias — Mary Connors, an analysis at Arres. Abert Hantson of the University of California at Dava, and Farin Alexin, of the University of Sama Cara — a winding up a los/ year project that examines the Nutre role of psychology in space. A messerie report college on owner with

GROUP DREAMING

By Patrick Huyghe

Is like trying to gat a burch of choices to wake in the same baceton' is how Bit Bamen, a termer buccing at an own a trugging a baceto trober with a described in 6 fluctuations in hyring 3 burch and the same back and the same transmission of the same back and the has a fore the back 2,000 motions and same trans a transmission and the same transmission and the same transmission describe and using them when possible, to help one and using them when possible, to help one and the same transmission and describe and using them when possible, to help one ender

Solay three are cleant operatives as boots the country line / respectives a deam commercity as does claimers cloreds. Frances, Mohgan Needertheels, Manne Forde, and Nytric Roo meric assa and popularity says. These in the laters contraining concept, bit examples manager about 2000 setting more than a start and the setting. The an anony Manhaim collate large. That as nony Manhaim collate large that as nony Manhaim collate large. The set of the set minimized that the set of the set o establishing such communities of dreamons began in the early Sevenice. "Himry Reed is the pioneer he started if all 'says Strison

The true, " tags Read, a frozy-handt, bias eved dreem scanted who leves in a modeal lakefort home is Nigena Beach. Wrgins, "I was probably the singmatic of the group-treatming experiment in modern oxinue. But all field really was brong up-to-date a fisation that is long-standing, expectally emorg Amenden rise and.

Receipt alloys is that of a modern day dwarain He was alloted if the was correct He made his cure available to offers the allottain. Recet admits pointy was adoptablem. The ours came are the search of provide the search of course a solution image of a sime botta coupled with a receiver may of course a solution to potent, it became are cataviate that part here on the north to receiver and the part of the on the course of the cataviate that part here on the north or course.

His idea for a dream community also came appropriately, from a dream He and a group of associates were wandering



The problems of waking kie will correctness find their solutions in the world of the creamer on Owni In the dark, but when they started descenge in a drange, becomena way the dark desample exploited in the light Lake on their spaking of the drain in a task. Reed was tool it closely reached the starand network entropies centrony of the Place relative the abay sutting cut a publication, the Swattere Tables interesting the placement of desample to come together and varies their applications and varies

If was trying to create an alternative scientilic community that aryone could participate in by white of his being a dreamer the explains "because in offect avery dreamer is a measurble, and every cream is an experiment in consciousness."

Here offer as a shartan came into boing when his flowagil takes may be considered who as a locensed perferenced sourcestor was accensed perferenced sourcestor was accensed perferenced as percenses whereby certain individuals would spend there days medifating on a problem making a consource atfort to dream alous! it in order to atrive as come new insights.

That of the privacetry of the creativinculation processis, includes Read, "is to encourage the discerner to aftare the biometial of the cheart quark with the rest of the community. When Read concluded his clearn equilation proceduras with a member of the direarn occurs with a member of the direarn bound themselves indevertently direarning about that presents problem were inthouhaving been total what it was. This was a biocaided born of group direarning

Beed diakid ablock the preventioners with chrocol psychologier Rickert Van de Caste, a problemost in the department of Winghes Mechanis Betrinis au Lorenship of Winghes Mechanis Betrinis au Lorenship of Winghes Mechanis Betrinis au Lorenship www.withis a dawn is bootakey van de Caste Interest Tabo ablocy van de Caste Interest Tabo ablock van de Saleta and had a bring statewing interest Baste and had a bring statewing interest and beaters interest with the state and feature moustace 2014 of their effects, come

THE BIONIC LOVER

THE BODY

By Ruth Winter

The Greek poor lives they have been with the point over some with the point over some with the point over some with net backed in task. While mark men data the source is the source of every net a softward of 20 micin altheman of wordsmore in the United Blacks, in electron is the source of blacks, in themas on a with information of the source Researchers have soorty uncommon and have developed being on the other prevent backs.

New drugs hormone addives, silver wer inglants and land weiterbruck lithulaters are among the traditional solution or optione moreal task levels to the importent. Therefore was an apparatual that have the association who allow page form too inflining fibecaid optimizer traditions. First later page well who made lower find to the page. Well whose them allow First later and the second attraction respearching theorem that later and the self-and other instructurescoll outling of approximate the second attraction.

Although not luly understood an

erection is known to occur in Reported to psychological neurological and conservational. When the physiological and erectorial componentia are in sync, blood engorges the corpora dovernosit had oppongn the corpora dovernosit had oppongn tessue-liked dyinotions lying on entries soft the userthis, and the pens becoments soft

As recently as three years ago health professionals believed that at least 80 percent of all implements insuling the server psychological problems as degree server psychological problems have descent partiest. New dockets have descent makes have an underlying of modern makes have an underlying of medicate original.

Mill Bondpace of Institut diagramme bothy of the liberation of their all all all all all they have been to reach their all all all all they have been applied and they are applied and respect or assist read of where an an medicately or surgraphy contectable. Sense D rest Decigent Whiteheast I sound ney member of the Assistance for Maio Besuid Dystruction a 1 New York Espend group their diagname and Invise impostress – the advestute full TS proceed.



Some makes have had the an taken out of their balloons. Now high tech help is on the way 26. DMM

of all mon with organic related impotence can be helped.

A samely of physical problems can bring about impotence. These include vascular problems, homona' initialismon, narrous-system discretes phe Parkincors tassassi, diabetes of up and alcohol side officits, and the alternitestic of suppry on or injecty 5, the points

Cining the collarysis for the current spectrals intervent in organiz-cellular importance occurred in 1970, when Dr Richards Spectra and his collesgues at Harverd Medical School reported on a study of 103 importent man Of Medic repossiblem Spectra Mini Medic Jack (Mini Mini Medical) and Spectra Mini Medical Me

As a result of these and other friendos, constan new consider several (rations) when seeking a cause of importence A cospingues strates with the providence factured previous hindry when instudies serve paysfoldopcal testing. He had does any physical exist—concentration and instantiated factors controlling and reception—and evaluates the blood's between end withoutes the blood's between end withoutes the blood's between end withoutes the blood's

Another variable weighted in the marks ability to take errorbors during sleep (Normativ a main has four to seven another while sleeping). It electrons occur and are firm enough to active periodical to because the secole mechanem obviously works.

To assess these excitons accurately a doctor may recommend nocturnal testing in a special sleep lab. There are also two new tasts that can help speed the diagnose.

The limit, is call first a positioned on the persis with Work of bottness, concarses there exaps that break at varying degrees of pleasaw, prowthing an accurate assimpt of perfering the degree deep Called the Dacemed Stress Dacks in can be used at home It doesn't however, gue enformation about the number of nectural sectors of their reave showner as ROBOT NURSES

BREAKTHROUGHS

By Phoebe Hoban

It is a cardeteight chinner for two but only once permain a wahra, the weathing in a wheelchair. Across from him said is ported to wellad community for the ported to wellad community. It is ported to wellad community for the main direct of thought the montons to serve hem to small. Wan apple to the main direct of thought the montons to serve hem to small. Wan apple to open obuse. First these a prepared globe of toopies (many the employed open obuse). First takes a prepared globe of toopies (many the open with the bugster of control. The serve formation the bugster of control.

The future is scenario was recently excised at the Westmin Administration Mockae Conter in Palo Alo California where to team of resolutions of doveloping a new generation of mocks. Adapted from induction all scenario units. In these relative adds are non-nonservice replaces excised and an administration of mock serverity herechapped people in the carried State action.

Although the basic tochnology used to build the robot nurses is relatively simple their design principle is quite sophishcalled—a nacical departure from the robote stade of the arr. The key to their effoctiveness is a unceap partnership between man and machine rather then being delegand to work independently they are observed to work with departed.

The maximum contrast test is the work of the future size Startend University a Stefan Michaelewike. The size of the substart and/starteng is humen being have substart and/starteng is humen being have substart and/starteng is humen being have substart and/starteng a humen being and sur gase. For instant angebastion, the wright size human being a short the training works with the machine, and this residention has instalten.

The VA Aburdad Noble Ad Project (APD) at the Rehabilistics (Posserich and Deweippment Certra: in Plats Allo wer doughted by a group from Stanford University using of the held components the head of the system is a darked promoted of the system of the standard considered to be the system in the article occupied to an regit for monocomputer held postfaced processes what is no. Its motion and position. The robotic aid is equipped with a vice-recognition unit that understand a stoart? To vocal commands, and a speech synthesis system that enables it to repet the commands for ventration.

But instead of the usual robot claw ho mobile as his is ensuite grapes," is two frequest hand equipped with optical encode the robot how the is is hand is from an object. The sensors agriatia are constituty monitored and analyzed by the mosecomputer to certific hands in them is the optical work of encoder to be a object work.

Bay for insisted the user wants a glass of page the great this small stepstystep december for loading the bottle moving the cus lowest its mouth. Benefaty in obtaic calls enviropised frough the appropriate movies to take board genes benefation of the stepsty of the stepsty of a page of the stepsty of the stepsty of the approximation of the stepsty of the approximation of the stepsty of the page of the stepsty of the stepsty of the page of the stepsty of the stepsty of the page of the stepsty of the stepsty of the page of the stepsty of the stepsty of the page of the stepsty of the steps

To fer 50 parsents at the VA. Medical Center lave been mining to use the blacks at the black mining to use the with one of the patients as the next step in its elthead analysis of the conding to the designers, the current model is just the beginning, when the blackshow is a attack of the step of the step of the step atmax of the step of the step of the step of the atmax/or under way back in the blackshow

To give it some much needed ribbitly, the frum aim ma bear mounted on a three-wheeld cylindical patitions on it books exertified lies (B-202 with an artis speculing from to head. The consciences which is to special wheels with encounterworks into 4 a sense of rollies so that it can soot sets develop and rolides freely. The response machine lies has a virtual track so that he arm cen be moved from giound level up to a 30 ench weeking height.

The robot's hand is being redesigned in addition to carrying optical sensors it will be covered with distolite whakers, electrical sensing cols that will scan



A new beged of robots is designed for constant interaction with the world of humana 28 CBN

LASER CARDS

ARTIFICIAL

By Phoebe Hoban

In the popy disk of the buture may not be a disk at all but a singper of pleake resembing a credit card. And this income public in memory device, small enough to bit into your valiet will be able to ablere an entries boos of diate about you

According to its makers: Devolet Teachrotycy Corporation in Mourtain View California, the Drakos Lade Carlo et al. be videly used in portubile off-ware carlos it hai make possible a rew kind operational devolution - toom electronic paragonal teachrothen - toom electronic paragonal teachrothen - toom electronic paragonal and mourtain and electric and electri X nor maps. You dirvent a bornoclatrois - macanics and electric and electri in your podeist. Bio cosisti a James Mither en revel-in-egoriado dir a largera codi

The Dreven card is a spinot of opposilaser-chic technology its developer Jerry Drever was stamping out circular optical discs when he tooked at the labove square hare. It incught to meself I really hate to throw away that barre," Desider says. "What can i do with the metimer? And that higgered the deal not some be marketing sturts."

Proppi date and seri data ale both optical all data compares and enabled of biomy compares recognitioninstructions to the machine to camping of thesis, from well pocealing is physical opticals and pocealing is physical bold works on numbers, like the biolization bold works on numbers, like the biolization of data magnetically. Laker data held out an the from directore physical data magnetically. Laker data held out an other the toron directore physical the same to any charge out the sublinger the takes been glarcera of the sublinger the a photoetector.

The enail cards are likely to other astrachtrary storage space. Refit now the cards, which will sell in quartify for about 51.50 eech, can store two megablytes of information—ins much as the times the capacity of scole a toppy clake and the equivalent of about 800 pages of taxit. Whin they to here years.



Fadaré alexege: Per sana limera wel sonici data rolo no underlayor al a phono: angool 37 OM/0 Densier clarms, the memory cards will be packing 7 mogabyles. And ben years from now these remarkable archival products will be able to field about 25 megabyles per side

The Chevice value on rupical associated model by locating powers is propriority where to impose hard associated in the property of the the the second second second from a paperted of the second second second from second second second second second second second second from second second second second second second second from second second second second second second second second from second second second second second second second second from second second second second second second second second from second second second second second second second second second from second second second second second second second second from second from second from second second second second second second second second s

In eithis version, the can't will held its data permanently it carnet be enseed and a carnet be renconded, on its secure ters or medical hearman is but users can update the card by authing data. For many applications, the hug memory will provide ensuits seaso to accentraciate one entrone to version.

Industry reports agree that the laser and aduld be the tacket to the next computer resolution. Desk the has already agreed up as learness some of the most lamous names in the computer industry including Fujisuu, Sohlee NCP, Wang Carton Encason, Omon Sharp, and Honoywell

"I their there is derively a later card inder future and that is anyly because I their it like the need to a dheap, nagod, high-density means the delawaring dapate information," says Mohaet Tyler presoceand thirm. I wouldn't be surprised if the laser card beaused another change in the way we design present computers converted by the test.

HLM

THE ARTS

By Jonathan Rosenbaum

Invides particle error that Namuel Da-Landra at Hryseler of Missian anvarents literinative who speciation in the aetotelos of outrigen. Intellits is motiven Manhattan apartment on hoji ana upatandro pati it could atment bolico to a dwerty student. This partic events to be hait you went to patien the contrad early at 16 foundations. If Hoji events the heist you went to patien the contrad early at 16 foundations. If Hoji events have the student you went to the material to the student with an accent that makes you sound like Table Caubil Excludes?

For a sizehold antid wich here missionsmage to est and in Highly social way of parting a factorial, if and supprinting that the parting a factorial, if and supprinting that the factor factor of the partial social superalexandred particular to partial with supermany states of the superality of the partial social supercapacity of partial social social to supprinted to all annual of partial with the supprinted to all annual of partial with the supprinted to all annual of partial with the supprint of the supersite of at each other-as if he were a mod scientist controling their stricks with the head of a knob

In his Microse Architector of Photee (1962) John Hope B and emounted as part one of his preparate Johny Favel times, Dia Landa time contractive and then phote God by determing affordance of an among bobba stabula on them A salud of shoot bootpaties is scenes as glaced by a name deserved in them, and phote the salution of the scenes as glaced by a name deserved in thempaccompanies by the phote scenes of the accompanies by the phote scenes of the phote accompanies by the phote scenes of the phote accompanies by the phote scenes of the phote scenes of the accompanies by the phote scenes of the phote scenes of the accompanies by the phote scenes of the phote scenes of the accompanies by the phote scenes of the phote scenes of the accompanies by the phote scenes of the phote scenes of the accompanies by the phote scenes of the phote scenes of the accompanies by the phote scenes of the phote scenes of the accompanies by the phote scenes of the phote scenes of the phote scenes of the accompanies by the phote scenes of the phote scenes of the phote scenes of the accompanies by the phote scenes of the phote scenes

The term is the induce to the real meater scale that will soon without the planet. De Lands offers by wey of espansion classifying his interfaces by revealing that his saddem is actually a form of advance meetings for a speciela that unkee meriding hight actually survive a nuclear holdcast

Codecaches not only invaded the tip ade of my house—the back of my letter the other ode of my wafs " De



De Lande acquired large quantities of studies, which ware interacted or linear at the audience \$2 Own

Leads continues descriting 16 mole bolomain day before the mole spoken they have size laken over contra (160) of my unconscensive. Whenever the file setof hangs approve mitty days that they all black spokes and the size of the set spokes and the size of the the size size of the size of the size the size of the size with the very cost set of the contraction of the bill the contraction of the set of the contraction.

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Mhoagi piblio cist of virtual arms between the constraint of the constraint arms between the constraint of the constraint and the constraint of the constraint between the constraint of the constraint between the constraint of the constraint of the constraint of the constraint of the net mation startices used a constraint of the net mation startices used a constraint of the constraint of the constraint of the method between the constraint of the method between the constraint of the method between the constraint of the present startices of the constraint of the the section of the constraint of the present startices and the constraint of the present startices and the constraint of the the present startices and the constraint of the present startices and the constraint of the present startices and the constraint of the test is the startices of the cold poper are the tart is the startices of the cold poper are the tart is the startices of the cold poper are the tart is the startices of the cold poper are the tart is the startices of the cold poper are the tart is the startices of the cold poper are the tart is the startices of the cold poper are the tart is the startices of the cold poper are the tart is the startices of the cold poper are the tart is the startices of the cold poper are the tartices of the cold poper are the tart is the startices of the cold poper are the tartices of the cold poper

A former film student who recalls growing up in the most Americanized Mysecp City suburb. De Landa currently makes a living working on computer computer field with

THE ARTS

By Charles Platt

a judge from their 1983 output what Omv readers have known

with and clover that the reader is barrie In a spint of fars

with small noses? Of course they are

Hepperhemerization these and other logics with a demanted gusto unicesting

Powers of Ten Clotenthy American Library) is considerably baser-kpy and then ten terres more and ten terres. NAME The book a full-page participation



35 CMM

level of our solar system, the surface of of the universe from quasans to quarks

The computer continuum. State of the Ar. Fields), sounds like a dull alle until you modern abstract pairing Clear informa

State of the Art (Stewart Tetors and This is a very athactive book, containing

Still in the picture book category but on a more human (7) lavel, is Humphrey (Addison Wesley) Elder who used to mogul kit flectory installed computer terminal and water copier plus prioral This is notbebly too cute for kids who are unfeeling technology ' In Humphrey CONTINUED ON PACE 160

PENGUIN ENCOUNTER

EXPLORATIONS

By Phyllis Wollman

Two stand there stilly in notcable services smooth while chests packeted in black. Introduction ball. With you to inscer at its debutation ball. With you to inscer at hear shall solve of them waldline over in their shalloads were and after inspecting us, bit loads downering even more weastible— a woman insiding a bucket field with name

They are a two members of the linguiscolory of Antartop parganic autilitiati frame ratio autobasts, and here years on an open in the Data and the two participants of part in the Data Para received and the employee of the theory of the model. Antartop on an estimate participant years in expressions along the data cannot be of bagits. A moving subwalk cannot of bagits. A moving subwalk cannot precessions along a 100 bagit may write receive on the own of warming in the states of the source own of the source parts of the own of warming in the source own of the own of warming in the source own.

So authentic is the space that the penguins adapted easily and don't seem the least bit bothered by the hundreds of spectators that glidle by them each week. More important, the winged though flightees, creature have statistic to breed a crucial skip in the sorvival of various pengun spoces endangered by the slow depletion of their load supply.

See Netses personnentief was per la construction personnentief was per la des services and the second service of the second per deserved and the discust too deserved per capacity issued. Second second begins personnenties to and expenditures begins personnenties to and expenditures begins personnenties to and expenditures begins personnenties and the second second begins and the second second begins and the second second begins and the second second all begins to the second second all begins and the second second begins and the second second all begins and the second second begins and the second second all begins and the second all begin



Wave blocked, well-feathered and ounces these polar pengane have a new toese in California

pengum population numbers 350

User land prought back the initial region and the second second

The hot sign played this formposimontaining and played this formposimontaining an explosion of the second of the mean players in the second of the second constraints of the second of the second compare hoteled or virtually extrained in a Univeropport hoteled or virtually extrained in a Univerdence of the second of the second of the Artistetic parameters in the second of the Artistetic parameters in the second of the Artistetic parameters in the second of the extrained of the second of the second of the sec of the pergrams backass have been as a second of the sec

The obtained is 550 Word may be assessed for the partwall of the bargulan assesses to the partwall of the bargulan make and obtained by barry school. For instance the trapical Hambodt, or Partwale, programs' fields have being threatened because and works; which are a stopped of that calls, are borg harvested for burner consensation.

Pergura from 2005 all across the United States have been gathered into the Pergure throughling tailing at Son Wards For them this Son Dego sancturery may well be the most important home away form home they't have siver home DO MEGACLOUD

STARS

By Terance Dickinson

A plot, 30 mean log-years from bent in the stretcher of the constraints object unlike anything seen before a creletal gant with the mass of a plavely bit her denny of the wegnet of clottal. Its discovery mails the first platers bit here the an adject the masses with no verbits sits, his been detended behave plates. The the could have packdown implexitors to not hereing about the optimal about the numerical back the optimal adject the optimal back the

Control addresses that the glasses of the orientian style estimate bases are mere than 1 billion glasses. Together with their possible precursors the glasses glasses are welfah af the edge of space estimates and the style of the state of the estimate of the style of the edge of space estimates and the style of the style estimates and the style of the style discovers if a style glasses the estimate of the style these. The may make the style these the style of the style of the style style of the the missing mass. The discovery of this strange cloud may lead to a cleaser understanding of the median.

Twell a Briendphosi decovery ' says Privant' Instant a obsoncer a' consel University if happened early in 1983 when Tassan and his oblegapes. Biophin Schneider George Helou and Edwar Sapteric weiu urigin the 1000 tont adotelescope in Plantin Roo Under contract bit in National Science Roundation the University uses the Intercepto Sector 10 Indiagen in Knoen galaxies

When we were calibrating our instituments we moved the issiscope of the galaxy we were observing to what we hought was blairs sky. "Recen registers "We got a signal related By sheer tasks we got a signal the edge of the cloud What here got as the last relation shearth or is cloud at the business."

Although extremely drifuse the cloud is entermote. 300 000 tight years ecrose or about three times the diameter of the Miky Way. And this thirty spread cloud of hydrogen gas toals about 1 percent of the mass in the Miky Way.



Des subergant Sales hors seine wirdens andersteine berraut, mit des hors dinnen nich such an enormough hole weich be seinig heich gehigt until ge-Knig indiuments. Anobei polisieht soudig beitigt until eich des die hole hole bereichten sind nich des hors hors bereichten sind nich des hors horsen. Bereichten sind nich des hors horsen auf all suin nicht nich sind horsen des mit allenderstein auch nicht sollt ober hörterbeiten beitigt des hors horsen Wentenden ausgestellt horsen borger bereichten sind nicht allen sollt sollt ander hörterbeiten beitigt allen beitigt horsen borger hörterbeiten sollt eine beitigt allen beitigt horsen hörterbeiten sollter beitigt horsen borger hörterbeiten sollterbeiten beitigt allen beitigt horsen hörterbeiten sollterbeiten beitigt hörterbeiten hörterbeiten beiti

Broke to such objects have give been been below and none were expected the decovery offers some introjung possibilities. Namber one is that similar dispecte easil. If here is one here is likely to be more "musee Tesser But some it has sub-in this long to find the test cloud, he predicts here possibly are red as common as wable pailables.

Number two is that this discovery will indicate where other clouds might be licent Directus is that hey would be located among a classor of plaxes delicater in small palaxes. Small palaxes delicater in small palaxes. Simil palaxes indepenting passing through a cloud such as this would have dispersed if long age. "Increase replanes "so the clouds may still lead only in regions that are delicent in small galaxes?"

Maanetie the Consel sam is mapping the structure of the cloud to define this one known example more clearly. Simultaneously, a search is under way for more intergliable rogues that will yeld maghts into the university factor DO



A galoxy covers Somewhere out there are anomous as in ble clouds that are just as large 41 CMM



CONTINUUM

ACID AIR

In had visit at of this Stepate in the code portune and memory for this postion, working in the bottom with and memory haves and experiment at the bottom with leaving frances and the bishes to accept a tower nerving porsonuction job in Jackeonnek, Towas, was diffecult on allow generating and come to diffect and how the memory physical in forth can't might be his last opportunity to start over an experiment instruction of conduction.

Unfortunitely for Part He was unawers of assisted that public National Cancer Institute officials for years. For some reason Jacksonwile officers have more lung cancer than any other occurs in the Unitari Bases.

Auti four years after the move Phil lay is a hospital bod his body raveged by lang bancer. He had been a heavy implies consuming about 1 5 picchs a day, but there was another factor that ultivarany may have contributed to his death. Invy particles of subtract bod lefe exposed as add as

And an't referensis course—act han—a produced when coal- and online power plans power safer, down of the scroophers. This safer down is contained with principiate and plans of earlier and the scroophers of safers and politicity hundreds of bases and even costributing to the destroyers of score helecost control thesis the plans (bases). In the destrophers of the scroophers and the plans (bases) is a score second control thesis the plans (bases) and the plans is a score of the score of the score of the the plans is a score of the score of the score of the the plans is a score of the destration of the score of t

That devastation was reported just recordly by almospheric devents don't winchester a provision of Result Devastation weatry. According to Winchester a good and built in mousing weatry. According to Winchester acts are as to in it mousing are an as annul, they are capable of perioditistic ad and are an as annul, they are capable of perioditistic ad the common of the control of the winchest of the thirthe the common of the low and highly hards across and such control sections of the common.

Winchesters second report inclusive that the concertration of acts are increases already from the Carolinia south intend a posit anauti-Jacksonwile and then tapering off. Much of that account he acts ongrades in the Northeast act Molwest where movem names monitore James mandates of active movement. beins in these regions are carried sourilley prevailing instatfactor in the process startic disks to otherwisely convented into instance and installing to an exceptionally reprior content of accor to an the arrow process provide the source and more table to an the arrow the source table to an exception of accord the arrow the source table to an exception of accord which the foctors along the web tables on the disk of tables which the foctors along the web tables of the accord tables and the events along the transit of the annot darged car. These entreports any tagger a long charr of teeming's Unitary events the events along the rule tark transit heads in the events along the rule tark transit heads in the events along the rule tark transit heads in the events along the rule tark transit heads in the events along the rule tark transit heads in the events along the rule tark transit heads in the events along the rule tark transit heads in the events along the rule tark transit heads in the events along the rule tark transit heads in the events along the rule tark transit heads in the events along the rule tark transit heads in the events along the rule tark transit heads in the events along the rule tark transit heads in the events along the rule tark transit heads in the events along the rule tark transit heads in the events along the rule tark transit heads in the events along the rule tark transit heads in the events along the rule tark transit heads in the events along the rule tark transit heads in the events along the rule tark transit heads in the events along the rule tark transit heads in the events along the rule tark transit heads in the events along the rule tark transit heads in the events along the rule tark transit heads in the t

Buildowith tidos events which have a double guide and a thermakers as granter a gath final title you don't an extrain to have with version available periodical and subsol the measure to have the result are realised and subsol the measure to have the result of the measure and version and the title title result of the measure and version and the title result of the subsol title and the title title the title of the subsol title title title the title the title title title title the title title

Jerrer McCorol record scenario advance of the Electric Flower Presistence Interfacts says has come under advanced in a service of the guestion is yet. "Even advanced anguage to laivels of skululars good highers have were to been found in any American of y showed no advance effects. The says "The homan body control y accesses animpean is able with one of the to estimate per anyong. The ammena is more than enough to restriction in wandings and contened income in the word of the togen."

But Whichester disagrees. "Cigarelle stroke contains allot di formalitetypic he says. "And if anthric cont on tess-sail perholis mer with formatiditypic a carcinogen innow all BCME (be (dialosmethy) other) will assue." Moreover, in the regions we have alusted he adds the concertrition of acid er generally certifiates with the incidence of death due to lang cancer

Wricheelers wurk has recently received the laut approval of the Einsterment-Nith Principian Approval (2014). Tracking this Tohngin may not be obclusive the unganization points out dray are guide disturbing. The occurrence of occurrent nations in detend geographic areas is something the National Carbon Institutes have provided out in the parts' says and approve polyderism. Who requested anonymity. And are is something we need loostudy and understand. — Mich 2004.000

CONTINUUM

ELECTRONIC HANDCUFF

District Judge Jack Love of Albuqueingue is importmenting with a new way to monitor people on probation or bail an electronic hendout!

The new handbolk is actually a pocket size than miller attacted to is weed band. Though the device weed band. Though the device weed that so large to veer on the write it is the receive sound of weeds it is the receive sound of weeds to be received we taken that acts and handbolk to respect to a sole from than their manufacts the computer two of bandbolk how women

Numercus schequards see built not he system if the bistopitit is cur of the signal ammed the computer alatta officials immeddating Backup botterics provide power in a bleckkut And duploating the coded signal says Lowe. Is theomicstay possible but practically impossible but practi-

Love wore the first prototige: devicend by NM-ODB inc., of Alburg-engue for several weeks of toxing. "They told me not to take alburger with it on. The singe And your recently several protokioners have been sentenced to wear the device in a trial program.

Ine judge beeves the cult could help monitor prepriers and mental petients "increasing their friedom to walk around and the security of the instaution." Although It would give



Juoge Jank Love models has senida control handbalf

ead start says Love welt know when they go

IMPAIRED VISION AT MOUNT PALOMAR

The years the gate locked because at Mover Pelochar Observatory in Southern Classification is have been calling at huge Cyclopean eye of the value universe. The Southern space is and to observe space and to observe spaces may be deter space and the space and the space and detectantly unced autonomer Can Segan have detained Advert Rohmar The langued productive space on the period.

But if San Dispo---the closed metropolitism area to Patomas---has no way, the scope is vision may soon be serously imprived in a recent 4-3 vote the city council of San Deepo de caded to install hephipressure sodum lights on all ds sheats. As the city grows such lights could effectively blind Palomaris grant eye with a prikt fuzzy glow that would eliminate much of per vesible spectrum.

It is a classes and Robert Brucko a Cattech autonomer and assister depoto at Plannes "When Sim Deepo proposes at a banood satiback in our diolisis op proserve the acoper. The future provide the only and interview have the amount of light the releacope can depot?

Catechis plan is to try to sell San Diego's city latters on the advantages of low prossure sodium lights which emil an easily fitared voltow color and Inne helpod solve similar problems at Northam Cakloma's Lick Observatory Bruceto mantans that he law pressure lights are not only less damaging to the operations at Palema but as more economical than the high-pressure lights lawrent for the only.

Although there are a few monangenes on the objcouncil, other members seem widing to revolve information program has been designed to ocravice the occupied of the mons of low-pressure lights fluction ways. This hopeful that well be able to turn this fing ground — will be able to turn this

What is now proved was once only integred ---Weltern (Take



Diarry plane aget The starry News Yors the Mount Palamer releases and Interval are Resistanced by San Debos sociam Norre



Postskoke physical knewpy can't revive clead research

STROKE THERAPY

Any neurology textbook will bell you that is stroke causes immediate and ineventible brain damage But now there is a treatment that seems to reverse the ineventible

Within minutes of houseaccording to the preventingintercent without the preventing intercent the second second second relation of the second second second model accessible and second second model accessible and second second bed not complications it simply allowed on complications it simply allowed on complications inserved on the complications and a complication of the and a complicatio

But the good news from Atlante's Emory University Hospital is that the neurons affected by an sichemic sector-ocured by a dealer reduction of blood flow to a portion of the brain--appraint oxide for hours or even days bettere they de "Though hey have cassed benetioning," hey all receive accugh oxygenated bloots to remain withit The means is to possible to resource the brain cells of indemoceded within white hey and the brain cells of the half-entition profession.

Buch rescue in toot has heredy successful in a harnable to cases. Emergy executivating of a more if Wood's not han a colleagues. With intrusions of a colleagues in the material and the hered backware week for the second back to backed on sugar kolution the patients back dealers and patients back and colleagues to the patients back and colleagues and patients back and the patients back and colleagues colleague

The results were impressee Eight of the mins patents registred some or all of the box motion or speech abilities within 24 hourse those unpertoined wood hard has teatment on 30 mone stroke patients and mone there has reproved dramatically. He has also halled brain-cell death in dogs that has laterinduced strokes.

Ours is one of the first theropeis arried at revening ischemic detects by improving collatest blood flow until frees vessels can drate and carry blood of inquiar responsivily incles Wood Its safe in the rives bgarwe stage but if controlled studies confirm our infail results this may well become the treament of chooce. ---Clavd Dream

ODDEN MEMORIES

Connection Rechard Physie asys he stopped drivery because of sender every mes. He shuddhend every at the henering white he recalled waking at speeding heteroleed in down the treevery Maybo 1 other shueld drivery could ever the treevery Maybo to the other drivery of about the bottle or about

New Hairmy be possible an expensional antidepresent and the second powerfs abortion memory blacked in meetin table govern hardness memory blacked hardness memory blacked hardness memory blacked hardness hardness hardness hardness hardness These drugged dinkers when drugs and hardness hardness hardness hardness and hard metaras bardness and hardness hardness and hardness and hardness hardness h

Zinetsine subserving ments caused by accordiconcludes NIM* psychologat Methoet Weingstine, who issearches the bachemae Linetgramings of the human brains acception functions Memory is a cognitive process, he replets in this subdy, we were trying to unravel face components of cognition



marrieres may kens you solver

classiplied by alochol we wanted to see whether that descation mg/t be alteruated by atteation. The acmelane he suggess counteracts alocholic memory tilachart by increasing the addivity of a brain chemcal the resublicities alocholic astronom.

But it's premature to suppersi armitidine will play a role in the treatment of alcohol abuse. Wengerover causers: A number of drugs have already been bed, and nore have been perfocularly effective."

- Eno Mishara

"It's furing the way most people love the dead. Once you're dead you're made the the "

-Jami Mandro

Nm at heaven and you will pot earth thrown in Am at earth and you will get reather."

-C 5 LEAR

CONTINUUM



Doas your philodevalori twee a newo of biller memories?

PLANT MEMORY

Plene don't hold grudges, but they apparently do remember an insuit Reexecution of the second second of Clevmont, France, found that when the but margold was wounded, it referred a "memory" of the offense, and that memory affected to later development

The box managed, an event with an event box service begins is a growth by seguring to as small, nearly and the service does The French scentrals users the French scentrals bearing the other strand bearing the appd codysiden had been porung that our mappelse had long term nocal that develop of the tably says the plant memory series of develop of the non-went of timm and palasaum one between calls. Bin comments "white plant even to possess or mechanisms whose sectors mechanisms mechanis

"Naturally, if I were absotably source on this superingrivity, if I saw no other cars speecing in either direction, then everything would be much oblater " ---the Delivers

BEYOND PLUTO

Jum 13, 1983, was a nottime day to appear acarea That montry NABAN. Ponter 30 space acminimum and appear and an appear to the second second second activity became the first internation dipace to have a largely symbols. Though Poncer was tempotaning and proble. Though Poncer was tempotaning and proble. Though Poncer was tempotaning and proble. The activity of the second problem and Plato. The second Center in Mountian View, California, Poncer wash Center in Mountian View, California, Poncer to wort acoust, coss the cular-center of the second problem and acousting representation. Voyager 1, will get these that Designed and built by the Jet Propulsion Laterratery, in Pasademia, Voyager was launched more than five years after its mail built is leater. Travering in the opposite direction. Voyager with here outser planets by early 1897.

Deen then, the roce to leave the source system may not be won. Adtronomers exepted there is a tenth planet, a massive, diark obrect beyond Phate, causing the observed per lutbatorie in the orbits of Neptune end Ultarrus. Perhaps Pronser or Vopager will disover a control to the set of course of a source source to the set of the

MEDICAL METAL

You waik through an arport metal denotor, and hough you're not wearing or carrying any matal objects, he mechine starts fo eets, the mechine starts fo beep. What to do "Accounting to a Mosaukos hemotol ogst you'd befor "hightail it o a dootor".

Or Joseph Libroch, of Measure's Medical College of Waconian Calcoverid the diagnositic postbilities of an opport metal detoctors when a patient mentioned he couldnit got hough one without setting all the alarm. The pasteri had hereofulary hemochos-



The Proneer 10 spacecraft (shown here in 7PM/s thermal-vacuum obserber) bit the known solar system in June of this year

52 CMN

melosis, a potentially deadly blood disorder in which each reaches toxic levels.

Although "something like one out of sisteen people" are at nix of developing the alment, says Libnoch, the symptoms are often attrauted to diabetes or critices of the iver. One like stage symptom-- derivered, into not skin--often passes for a ten

To broat the problem, most obctors return to an ancent remody. They blood the patient "We take a pril every weak or so " Ubnoch seys "Each pril has a querter green of son. If you want to get ind of Mry grame of ison. If blees two hundrach hearthone."

Ummasist adds Libroch, the ron diposits may devel arthrisk, dipedve problems, briveted testalise, and acentemes have fieldy Rogs badd transitioner also can develop the descdat. which presents a probtom because they can't de bled. They are treated with an experience drug

Hegarding dietary Intake of von, Libroch says "Some people don't get



is that a gun in your pocket or marely non-noh blood?

whold a recommendations concerning it are at a standard because of these two schools of though? University our make export metal concetors clang a simple blood set is the selection to determine if you have a problem —Atlan Meaver

FACING KING TUT

Ever since vacing the land of the pyramids several years ago, orthopedic surgeon Pantek Barry has worldered if a reconstruction of King Taterhomenia has do might reveal method close as to the course of the phanech's death at meneen 50 he course of the phanech's death at menteen 50 he course of the phanech's death at menteen 50 he course of the bay kende 83,000

Gailft balann a national coper in the less of head and the second of head the alerthy pane-actual volume for the folderal Akater Administration But be accurated and and panel a speech panel panel a speech panel panel as a speech panel pan



The real boy-phaneoh had a sciarget cost and arraiter ayes that his gold death mask has Alexantheless As was a hardsome king

T stated the with op processing of the state of the says Certiff "Everytopy" and a suppression of the says Certiff "Everytopy" and the suppression of the certification of the state of the same state of the super state of the same state and state of the same state of the same state and state of the same state of the same state and state of the same state of the same state and state of the same state of the same state and state of the same state of the same state and state of the same state of the same state and state of the same state of the same state of the same state and state of the same state of the same state of the same state and state of the same state of

The skull nasal spine was streight indicating that he had a smaph nose," notes Gablet "But the golden burtal mask strowed a apped-up nose. I thris that was an ideolized, fattering was an ideolized, fattering was and endited, the strowes are abnormally large in the mosk. That was probably smather idealized by the Exportans."

Through likery who heads Marris Egypology Boostly believes that Tui probably persona cabolas the boost persona cabolas the boost of the transmission of the transmission can cause buy Barry is so presend with the resolution book who a tase from the presend with the resolution part that he heads of the construction and the heads of the construction and the heads of the other amount Egyptetra-Partices could be the termans of herration -Berration States

CONTINUUM

CHICKEN CANNOR

A sechargen of Arrold Air Force Base in Termoscie reaches into a lescer and pound out A feature to pound clinckien. After the feat have, is is located in a special 20-book-long cannon and frad at a speed of 700 miss per hour at be windersid of an arrout costspit. The chicken can case faitness harminesity on impact, and the bert proof campy is subsequently approved for invalation in the Air Force's newses plane.

In the past 17 years, notes a sustainer 4 George Jamison, binds have infload \$300 million worth of dammenn of Exercise association accessed the denth of ten accessed the denth of ten casting through the cashogy The chickes-cashing the cashing through the sacslast was designed to hitty altimate three tragecies Though million of the sacsments, Jameon asso for low-altitude high-speed bombing runs. Nou have the possibility of running into birds under those conditions as well.

The cricken-hing args at Antick Ar Force Base has motion-picture cumerea and electronic sensors that measure the effect of each bird a impact. The birshing provides vital information, Jamesh magnificare imposements in source that has reacted in legisticare imposements in source end canopee, " including one seed on the advanced Fold bacted britter at

UDI ALI PLAN

The present, like a note in nume, is nothing but as appartants to what is past and what is to come ----Water Savage Landor

INTH

Question What do you get if you persuade meths of two different sproves to mase? Answer Dead moths and fewer tevenous, crop-



To simulate the impact of or do on its jets, the Air Force shot loshoodd fivers out of a centron and checked out the damage

unching caterolilars

That are side between seearch on missed phenomones, or axis atmactants being conducted by the US Department of Agnocidtiss in Brownise Towards Accesses with the USDA Apricultura Research Service have dissovered their Apricultura Research Service have dissovered their attractive phenomenon and towards and a service attractive phenomenon the familie tractage have a service at the towards the familie at an inducted how content that have here menotion that an inductive how contents at the best menotion that an inductive how contents at the best menotion that the best menotion that the best menotion that the best menotion that the best menotion of the best menotion that the best menotion of the best meno-

UBDA entomologist Dar-Hendricks opponen that Hendricks opponen that instaad and share many of the series phenomenes, which the mathematic opwhich ther antennas interspoces mitigation in the mothe doein Lukakiy opour because one of the lemate budworms phenomonen encludes a opripound with a dual purpoon — at allication mate budworms and i alao stipals

Buill the air is permosited with that compand because of its potency, 10 to 20 grams per acce will do the trick—the male builworth's arithman get fazcited by phenocal overfload He then responds to the buildworth's other phenomenes and mates with her smoother genisits are memoriabled together They die in each other's "time".

Handricks thinks this actinique will be applicable o other closely telated react species as well. "If we can disrupt the natural



When the attracts unlike it a a deatily most embrace

behavior of insects," he says "Rera wort" be nearly as many eggs gothing testazed, and subsequent generations of needs will be greatly reduced." —David Dreen

The command instrue to release in a pint pot the enany that levels the stars, to MI by pure thought a mition has of rock into the sty---these are auroared of the human will that produce an studion of ithmable power?

-Freeman Dyacn

INHUMAN CONTROL ROOMS

Nucltier-power-plant

control rooms often show "an appaling disregard for human factors," a study group has told the Nuclear Regulatory Commission (NRC)

"In some cases, clatribution of clappays and controls seemed almost higher. and," says Charles Hopkins, technical dimeter of the Humen Factors Society study. "These norms often look as if someone took a box of dais and switches.



Nuclear Convict room, some look as it is designer, such a box of sints and switches, surred his back, and drive the box

lumed his back, threw the box, and attached things where they landed "

Hopkne, a psychology and engineering professor al the University of Timos, supplane Stuff, in some instances, ten to Steen Leet expansed concells from deplaye that had to be mean treat and the Steen Leet expanded Concells from the source and the Steen Steen Pero Neels on displaye to provide circle Information to operations in many instances deplaye provide instances deplaye provide instances deplaye provide instances in the steen Steen Stences deplaye provide

The NRC, which commissoned the study after the Three Mais stand (TMI) acodent, is off working to improve the situation in both desting and planned reactor control norms

Hopkins terms the TMI incrident a leatbook example of what can go wrong in a man-machene system when people in the system nave not been taken into account. The amphaseuse boewere that Takinos of automate organization had nothing to do with human organization buyed a note.

NRC officials say the

Baldys excentre calering calculates and control source dates and control source dates and control source headed where possible substantiations and the ended where possible substantiations and ended where possible bards asystem the ended where possible possible in one interaction possible interaction possibl

"As we have opportunity, let us do good to all men

ANCIENT SCALPELS

A thin, swinch scar stratches across the abdomen of archaeologist L Adrient Hamus II is a rominder of recent gastrostestinal surgery dorie with double-edge, volcanic-

glass blades—exact seph

das of incredibity sharp knives made by the Mayer Indians of Mexico some 2,500 years ago

Welleck, orkel and house of implient, has abundant vortanko glass also kinosen al obsidian rock, ocelan alshaachigy at Augustana. Collega, in Bourk Falls South Dakota, Hannus became Saconated with he Mayon knives when in an effort line consets excess indian buckhening techmiges he subfalls and other wild game.

What intropied me about actually using freese blacks says in my surgery. Harrus says is that I constantly useful knowledge can be recaptured through architeological study. Here was a channe a brow the

The surgery to repair Hannuss detective colon, was performed by Dr James Adwars at Methodist Hospital, in Omaha Adwars agreed to operate with a set of the hand-chiseled replica blades after Hannus convinced him that volcario plass is sharper than the remember of all scatned

These obsides blades have page thin edges that are only one molecule hold, Harmy says "a holdmass at which research hold blades are start," the United States are start, one-gaas scalestic which Harmas scalestic which Harmas scalestic which be ideal for infration yes surgery—Bits Mahara

"Dur present earn may have been repeated a biform ormes will be come unacted brown to be content and the taken a content agains a bus, again from the turn it becomes that the turn it becomes parts - and the same asquerce again a bus, again that the turn it becomes parts - and the same action - and the same action - and the same action and the same based another and an any same actions.

Freedor Dastaravsk



to -Columbien songery. To prove his point about Meyers obsider

CONTINUUM

UNDERWORLD SEX

Even wonder why, in this age of equal employment opportunity more women den't not, mug, and munder for a living? Sociologist Dameli J. Bottomeser of Pernsylvenia Bata Lovierstly, has sport five years assing that operation, and ha's finally come up with an answer underworld social

"Men who populate and control the world of onme prefer to work, associate and do business with other man," Betfenneser gave Softwarmeet, who bears in anound in unbreaked with make and female commas involved. They typically make who both organize and exocute the orme. The commal admittee usually available to worms he adds, are arriv-feret-file positions such as provintuing, small con games and wintig bad bears.

exclusion of women? "Surweat in the world of come.



Convex Dons Posisi shown above on death row in Maryland is an exception. Must live also an condentated to the Alaba convex

The unlikely that the career of a mails thest would be advanced by a temale thet spreaching the word that here is 'solid'. And optaborat ing with a worten would not provide the destinction or recognition that would advance a mails cirminal's career? Statismmer observes, "entails dealing with at loast two major threads the thread of arrest and imporormenia and itreads from other criminals. Therafox orminali participatis who seem most capable of force or wolence will be provided T. Boh I secon

SOOTHSAYING

Noter Lave a to according to the second strength of the second se

Dave a physologial shift in derradogiphosa science that has bried ontrain genetic diesase notably Downs synchrome (or mongetein, with die tretrive lenger- and tool onriv patterns. Novo Dave and colleegues at the Tennylvana Calegie of Pochaire Medicine report that a high sextempting of pecipite with a loop pattern on their index ingers and a treesrgue loop on the bala of their lenge schabets.

"For traty years," the reservice points out, "we've known that certain cetters are invited with different diseases, paintoularly the restorted, hierators, that it these prefares laid down in prognency, and if clabeles is a genetic disease. Then printpathors mg/t product the likelihood of the directs."

Hotekal Imperiorms and botchmis sumed out to be 85 genotest accurate un deminitiving the disabates smorp a group of 150 patents Participan in the fucus such botchune railing will forewarn the disabeterpoint batter will know to possible patient will know to avoid tucches that promote disabeter-files overesting



The whole in your pake may loveled your fallow drosses

And that such the to of the could be a such that to book up footprints of newbook to the such as the such as the capiter and as what we capiter about product ing future descrete. To avail the such as the such

"Particules no longer move softly and formally if not magesboally in preditermend parts. Native, it a Marx Bortens hypowinete pandemonium Chavie Dapin slupelock helvisbehor notwo you see it now you don't it perpins deho confusion----untr ane sees the subtle onder' — Jack Savritue

"The physicists have known an And this is a knowledge which they cannot lose "

a (60)



In the pure, bright air of the northern Andes, mystics and astronomers search for cosmic truths



BY PATRICK TIERNEY

Astronauts on some of the early And he is not alone. Already Gemin flohts puzzled over bri an odd combination of Yose, a isent flashing lights both in the flew Tibetan monks, and these Andes Some dismissed the as found pendhed high in the Chitromauts expenences as a po ean Andes, all staking some kind Padre Pamon Borrega, a conatriater-looking Catholic panel insuit that Chile is the planetary in his mid-status, believes officient for a "spinitual magnet erwise "What the astronauts ism" complete with "magnetic sew configure a prophecy we reopved in 1947 from Tibat, an Not far from these pilonms is nouncing that the spiritual toht a different breed of believers of the himiliary as shifting to They are astronomers at the cosmonauts also saw tangible ines also perched high in the northern Chile

Borregaland his organization inginearby "The neighbor called the Hermetic Society of I hood, 'some of the estimatement the Pacific, ballevo those mys-likel, "is going dowrited " Just the terious lights revealed the same arrowing parallels beworld's "New Jordan," which will haven what the method and the replace the Himalayas and the scientists say about the area of Holy Land as humanity's prime. Chile keep popping up. destination for spiritual prioring Scientists naturally acrited at

on the raligious enthusiasts liv-

PHOTOGRAPHS BY DOUGLAS KIRKLAND



When sundown comes, astronomers rush to enjoy every instant of clear seeing ?



seems like everybody in northern Chiel trinks he has some sort of direct hooksp to the heavens.

At this glance Chile is an univery candidate for a scientific Strange-is. One extrement has compared building in observatory term to putting one on the moon, except that in Chile term is a nindi water-although net much of the later.

Even ink, the information who flock has all more than some obstitutings that contribution and more accessible as an inbiditation of the contribution of more accessible as an inbiditation of the second second second second second bar. Only chemist The legal fluoribidit Current, inverse of the Ofision Contribution of the second second second of the Ofision Contribution of the second second second distributions from the Architect The Weyl Good' says Area Ander Burger and Second Second Second Second Second Data Second Second Second Second Second Second Data Second Secon

Altorations below it likely year 600 of them migrate to the Cerro Toblo Intermenia Observatory, operated by the Nattional Source Foundation. Ite 503, an egith railed weature and the Las Campenese Observatory, owned by the Camegaa Institution of Wahn rgbin Togathan the Interesticative reing alies make this Nate Choo region of Chais the main camer for studies of the 16th interest Southerm sizes.

Southern Herrisphere observationes have decided extremtages Astoromers in the Northern Herrisphere dont see a the' of the sky, bocause in twee raise shower the southern to mean like most bright tatre and galaxies as well as arrong material and 2-ky souces, as the prometry Southern Herrisphere.

Previous peget. This measure donte of Centa Rabid's loss-mean selescope slakes open in relativasis for another might a work. The Solvman telescope stands to right These pages. The bury might exp (wh) affers in weak of Learning for smaller following in the Analas (mound). objects. The center of the gailaxy hought to hold a key to underultion of the second second second second second second discontrain from Nethman and the second second second second second second second predicts and second second predicts and second second percent of the second second

Including one with a 4 meter matter, the largest in the Seufnern Hemsphate Las Campanies has 3 telescopes, and ESO has 13 he biggest of which is 3 tenders Bat thruin any he beginning Ceres Telabopters as meter telescope that would equal the 200 which more at Mount Heammer And the Europeans are going for the Genness by erecting an unprecedential to meter bisecope at a Christen with

Building a sixteen meller telescope poese zone proterne entris Anne Andrebury, notose Benedick calm seems under Lunces be the presents. "They if now the work?" largest calm and the second second second second second second telescope and the second second second second second of built meter advectory and the second second second second second. The cost text of second second second second second protect. The cost text of second second

The outver letter indi Auronomy Delecage States (RAS) is a core in point RAS aut in other the letteral States (RAS) (RAS) and the Netherlands studies stat formation in the Net point Clauds, where Skotterer Interpreter belocopes can provide indi operatibile (Solver indiante) and states tates (granted based avecage) and states and the indiante operation of the states of the states of the states and there is no indexing that the laure of graned based alwares there is no indexing mark the laure of graned based alwares.

Building in 56 mbit hisiscope is scattere on an immerree tode Right from these are only two 4-metric telescopes in its worksone at Cento Tablio and one at Toble's safer observabry at Kit Posk. Anacra. The Ametic minura at Tabla tode 2.5 years to polish and Thatis and many somethas segard it as its werks intel targo-bibliocope instructs. The entite telescope measures 45 test that worths 575 loss: and works on the same ucceta principles that a carrota entropy—in the case is earned in the probaganital depth of million writes furnish that probaganital depth of the probaganital depth of the interpretation of the probaganital depth of million depth of the probaganital depth into a white depth of the source of the anther of the source of the source of the readers previous extends from the constant from the constant previous extends from the constant previous

¹¹ In spery use not barring to look triung the fluctuation will be written the triung the fluctuation will be written to be stored for the path. Autosciences in the triung written the triung written

By combaring the four meter telescope with an ultrasenarized TV camera and some mer specificipatric techniques, Rodols distante, Phinas Commendiate de la maio al distante phinas Commendiate de la maio biblior la foryventa largendo preventa a technifica aprile en la maio assistati a la maio ante a la maio ante en la maio assistati a la maio di techni aprile en antenen o bioti file adge ante agrico ante marine a la dista di technica di technica en mantenen o bioti file adge ante ante antenen di accento di technica la dista di technica ante ante discontra di technica ante antenen di technica posteria ante spectra materia ante ante al technica ante antenen anten

The faither out in space we look the tarther task in the we see "Conter earpoint, which the alghty thread gave of tarther the space of the set of the tarther the space that anyone elses in the tarther the space tarther anyone elses in the tarther tarther the space of the set of tarther tarther the space of the set of a most of our Conte State means of the set of some detection which the university weak ago. His qualar way of the sign of outset show on the out of the state of tarther tarther of the state of the state of content weak of the state of content weak of the state of the state of the state of content weak of which the centry theory of the university outsets the centry theory of the university the state of content weak of the state of the state of the state of content weak of the state of the state of the state of content weak of the state of the state of the state of content weak of the state of state of state of the state of the state of state of the state of the state of state

Dimeramost supprising discovery is that



he louid no guasars beyond 15 billion lightyears: Astropomers had expected to tryd thom much closer to the time of the Big Bang—some 20 billion years ago—because guasars are flought to be the active nuclei of young objects.

Overtee's work power intriguing patiecloses II quasars are the most closent objects in evidence and Osme looked sevenal billion light-years beyond the most closent quasars, then what was he looking a? Is been any there?

Counter their consequences much takes how many experiments to account for the anterpart energy to figure 16 accounts for the anterpart energy to figure 16 accounts for the anterpart energy to figure 16 accounts for the bases have the account of the accounts for the bases have the account of the accounts for the bases have a constrained to account of the accounts (accounts of the accounts of the account of the acco

Now a Coloro Taxio sessento term incontra a necord contradiation much legar Tahri Gyung KJ, and the Try ton isolated and the term of the Try tone isolated and the term of the Try tone isolated and the term of the term of the term particular over all hours. Based and the term over all hours. Based and the term over all hours be reactioned to the term over all hours be reactioned and the term over all the term over all hours and the term over all hours and the term over all the term over all hours and the term over all the term over all the term over all the term contenting to the term over all the term of the term over all the term over all the term over all an associated and the term over the term of the term over the term over all the term over the term over all the terms over all the term over the term over the term over an associated and the term over term over the term over the term over term over the term over term over term over the term over term over

Licentre en entrativity in second entrativity in the entrativity in the process of the entrational entratis entational entr

But the study of soften exotices like quassitiation of the study of the exotices and the soften mandates pipelitems of working settlemest mest. The working interaction of the settlemest During one totally overtaal right all Totalo the critic send objects within weet like on Andelen condexs with 12-lock wrigspans. All the bag before ground of the settlemest settlemest agood opportunity to sub-antontiem the local Wasa. Studye sub-anton

CONTINUED ON PAGE 545





BY SCOTT RUSSELL SANDERS

Alone In his go-house after lucking the beasts in their lans for the night. Ortando Sprike was stitching a tear in

PAINTING BY MICHAEL PARKES

the iron a mangy facte when the monkey ge-

iomly rateing the shabby pelt from he iap

"You got the number on that ticket, boss" said the monkey which picked up slang from the streat local

onescent light the week in the belly sharled The spechets, computer chips encrusting its forehead the jewels. Blinking his sad eyes open, he asked, "Where did # cm?

The monkey turned its pains toward the a faint whitting of motors, a gritting of minal

"We're getarg old together" Orlando siched He was teeling more meumatic made his joints ache worse. Opening a door in the monkey's belix, he liddled with the controls When the clid no good her slapped the aremal between the furry Interhed its strong. An amneesed tog thick ened in its glass eyes

What's happening, boss?" the morkey

"You were in the process of taking me

"Yes, you were ' said Orlando wearly unraveling in the monkey's brain. Now plasse go back to the Italer and keep

There were not many others to watchthe kanceroo, the artester, the two partmusk ox These seven, plus the monkey. were all the remand of the thrity-rane ing him, sinking away in the night. Where

for help because he had already run alroat

Mooch was a sore point for Orlando. In ago, back in the glory days when he was were kicking in the air, and her top half was the predecessor of the lion whose tattered skit Orlando was now holding in his lap Imais so pristy and royal

days," she said. "so when people come

out, you'd be in two or three piezee

"If they'd been anything but windup kn chy soos you don't think id be looi enough to allok my head in one, do you?

Her name she said was Morch She lived at the orphanage in Suburb Seven How she had come to be stuck there, no one would toll her, but she had a notion d and her eyes surned up at the corners like too cheap to get her fixed. To her way of thrking the arcients had been a good deal kinder when they dumped orphans

When he found the arri, her leas were air, and her too half was stuffed inside the jaw of his principal lion. Rescued the airl begen scolding hm?

custody of her-some old man say with

"As a matter of fact," she said, gazing staving here. Ivening up this place

a woman to kee with him and had never been parentied to beend up he had no came to browse through the disney set up currents in his hear tike the motions of hish

mouth and offered to let him adopt het him filling out forms for so weaks below framed the certificate that declared him to wall of his workroom between a moderhead and a swordfait

Thrisen tack on his year with the art

as he did now while mending the fort's pell make the beautismore natural, which must impress the visitors, she urged him to make victims of this new regime, getting a leg broken in the all-patior pen. While he was in their territory. When the Overseers tried the hubbub Mooch rode an electrant out through the pates of the densy leading an nues. Every last beast was vaporized by

The Oregon City disney was tern down while he sat at prison. In its place rose feelan-Jarms eros parlots games arcades, s

Orbandio spent the three years of has servtance fixing gaogets for the warden and had a houseful of apphances and one gizmo or another was always breaking

He would need work, all noht since the authorities had confectated his measure savings and auctioned off his tools and had been saved When he clammed these house he had boucht with his prison leav-

The city gave ten a job repearing robo-

dealings with people, he hardly ever made medialons when it carrie to mach role. Will in tem ha own shop, where he could tarker in ory of Mooch. Next he built the monkey Roomo e with all the smatta he pould put shop and al right in the prattood housenocerce a gorilla, the two pandas, a Kowhich his crandiather's taodermy colleceves, some of the spectrems appeared patched together out of scraps from varsource ambourn animaba h

beests to do their tricks inside the bus "Not room enough to awrop a call in " his father enough for a gonile to beel on its cheel anough money, Orlando bought a trailer to hich on behind the bus. then a second

"Nou qualit to take that show on the road

"That's exactly what I'm going to do.

scariet letters on the sides of the bus and with grass-colored rugs and plastic trees

The population-chiefly gawking blue trailers olided to a stop in a neighsondy balding, while hared man who he could line up only one or two at a po to be Orlando Sonks, momester was not because there was so little space for the much of a showman. But once he pol cranked up, hosting and hollening about pets over the skull

was herding the beasts back into the trai-

Widness onslage/ Secrets of the woods revealed? Only when the price dropped

at the made abow than they had already part of it was the actionny ringmaster, this wavened. The more they yawned, the more that they twiched through their rouknes in up 'Welf' the tingmaster velled. 'It's not

Orlando loaded up his scorned menagwalk. 'When's the show gonna start?

somebody else might yell helfway through

Early in his second season a hecklar Drive motorcycles?" After some weeks of conscience. Orlando reprogrammed his beasts to partorm such lookshress and the monkey Waving its long shoul like a baton the anteater tossed rings at the uncorn which needly caught them on its hore.

these unbessily arbos, were larger and tis lov in his success. Mooch would hate His ears burned from just imagining what

These another back othe traders. night during that second season

"How can there be grumbing? They're

Thear what I hear boos " said the mon-

Limping back to investigate, still wear-Irollers and sute enough through the Aulike the burbling of an upset stomech "What are they savoo?" he whatened to

'Who turned them on?' The markey agits at shuffle stops. The prangutan sped the door of the first trailer a hush lef over the beests "What are you all chattering It'le inchiened, he rushed down the asse. Prowing switch after switch until every last bees! was stilled "You keep a sharp eve!

> messarig around with them, give a how! " Later that notil the boar slipped away

Seeaning up and down that it never saw

You know I maht sust oo and do that

He made discret inquiries in the neighlando was stumped A tiger, even a dering unterload through the streets

for a gazalle and a griffin vanished during

"Could be frey eloped hey, boss?" and the motivey, trying to cheer hen up

be a sudgment on him for having made loois abandoning him like safers jumping ship to escape a mad captain

He doubled the locks, shortened his naps, and slept al right sitting up in a La Z-Boy char in the middle trailer But still The beests stole away. While Orlando was to tworty-three basats and reduced Or-



The audicross devided Mixes writed to gradual strends on the parts is sense in sense of gradual strends of the parts in the sense of gradual strends and the sense of the sens

After his performances he would put his animals away in the other immaring buildarhis had add the other immers and two finites of the plasto-welferences furniture to pay his table—and go all on the bas wann cd. heartiset, his addrt even bother locking the beats away anymore—it has were ad absert to cue the hem os

Some rights he tried to think of new tricks. Other rechts he let ternael therk of

the future and saw only a great dark hole has entire menagene run off, the emply rented halls echoarg to his salitary value.

In the weeks tableary for looms departure, will the memory basists except the table particular and the morkey particle away more and the second and the morkey particle away the two could be a mything very fitsely with two could not do mything very fitsely with two could not do mything very fitsely with two could not do mything and the second and second the second and the second and second the second and the se

Later when he was scalarg his feet in a tub of hor water the monkey scampered in on a measure of consolation.

You were chrismes toricht, boss

"Yeah-that's why they fell asleep " said Orlando

Only at the very end, boss. You had them tagged out from clapping. You stocked them and dazzled them. You want down their buzz bugges. You tuned their eyebuilts for them.

"Buzz buggies? Eyebulte?" Orlando askod bevelared by his pet



What I'm saying bees is when you using trace lands and noosed the pandas why the count was wowed. You incread null the enriches in their token i laces.

"It's kind of you to say so

"Nily dily, boss," proclamed the monkey, which exated by awinging nimbly from the light feburas.

These two constraints of a LOS of the LOS of

Orlando gazad down al his pink toes There was water dripping steaday from his phra was the tub

He was talk atting in this mountil posture when the two pendes searchered up inor the neer of the bas. They down doa the teb and set back on their heurothe. He had never inged them to seak to they generic at him in service four dark meanshoy years. Forting a bit foolish Olando pulled his feet out of the water and searched her down down in the infolum

"What are you two after? he solved, just to break the sombar islands. The twinsgathered into their faces all the primortial soldness that pandas seem to have been designed to allow. "You can't be after juice, you rescale, i just of thereod you up?

Chando was on the point of calling the moriew, which cauld often integral these evaluations and an energy of the second gazing at time and set off washing of the the asks instand of returning to their compariment however, they showed out thistight the lend door of the buar into the also benefitias. Ortando washed over to the

the window leaving well toolprints on the Inclearn. He drew the curtain open a crack stocoing beside an open hatchway and eyes Orlando's own eyes opened wider and wider with a series of puttage. The monkey bent over to whesper some last massage in their ears, and then down the

Just as the morkey was tapping the power back into place on the heach Drcharped into the alley. "You crumely plo of scrap motal You walking sack of nuety perior You traitorous bebble box"

The monkey howard the wranch overhead and olutohed it in both fists to ward

Wrong!' Orlando velled, soutting in a for an opening where he could punch the the panciae run off? You think I'm blind just because I'm old? Thial Puster I bet that a where they ve all cone sneaking away un-

'Hoy boss, kry off Listen a remute!

"TI lay you out is where TI lay you" /II put out your lighter' But the monkey was

Just then a robocop came truncking into the alley headlamp sweeing to fix Orof how he must look-bare feet troupers rolled up to the kneed suspenders dan ging from his want, white hair stung out in a rapped surgel about his niesmin pale-sobered Orlando immediately

"Problam?" ssed the robocco

dar. 'No no Not at all Worro rust out for

"Loud everyine," the robocop remarked And late 118 0200 hours

To it inclosed? sake Oriando, forcing a laugh He probled the monkey by one paw

solows and gears and CPUs.

Oriendo pave a dismessive leuch "One of put little joknet

Kindly joke indoors." the robocop instructed Rikept the headlarre focused on them as Orlando luctered the monkey into

While Orlando pecked out from behind the puritain to make sure the roboodo was toligg away the mickey where the roboody was clambared up among the joht focures

'I can explain everything, boss Just

Orlando tutned around. The angler was

gone He left old loose in his skin. So what They were deserved him? He would hold colling against its will not even a mechanical baset. "Come on down now," ho said queefy

"You won't unplug me? You wan't unclo IT'N BETEMR?

a warit Promise '

Ortando sagged onto his bed lav back against the hissped pillows -drawing a baside him on the mediress. Its fuzzy to-

'Hay base don't blubber like that

They made me spring them loose, bees

"The pandas, the lion, the griffin-- all of them. They said if I breathed a word to you

Cone of her lunas was scrawny and her eves turned up at the corners like the eves of foxes. Whoever had batched her out into the world had been too cheap to pet her fixed?

skull. Orlando saidi "Nothing 8 gaing to hunt front but kept its seet on his belly. With p martyrod tone. Orlando asked. 'Did they ell go down mig the pipes under the dity?

We had to take the elephant and the hippenagert The optila carried them clown in pieces. Even then it was a tight ht

under the ony? Start a junkyard for wornout baasts? Who's going to use them up? freeze and their provide short out?

The old you know Shee almost as tricky

Criando lifted his head from the prilows The monkey slapped both prive over its mouth "What get?" Orlando good The monkey's eyes grew larger and larger Or-I said who's mis ov??

"They li no me apart if i tel," the monkey

"I no you apent if you don #" Sifting up

'Mooch?' said Orlando incredulous

ing the monkey ando the pillows. He impact ing for his socks lifting the suspenders into place with his thumbs, roaring. Where is she? No-don't tell me-show me? and

Fiom its throne on the prizws the monwere going to Mooch? Right now?

High the metate

"It's a long way bose, and hard "

"You're going to get your clube all fithy."

"Who cares? They to rotion arweigh

"We'l need a light and some food, and you maybe better use me up " said the stuffing crub into a satchol, hocking the charper to the monienvic electrodes

enough to drag the cover back in place above their heads. As they made they way lands thought fleetingly of the velow but on the side its doors unlocked, and he hopped somebooly would steal in Or hit the on and clady, for now he was on his way the last animal to desert his own clicust

Every now and again during that long Oily Orlando's body recollected its ape and the time of repht and sat him down uncentronicusty While on the floor Ondirection of their travels. It smelled of exdiected refrigerators. He decided the preeligenesis must be drains for sucking away to by weiking tail he pould avoid pagging



The source of modius has or instant of modius has or a social shared a social social and the social shared and modeling areas and the social social social social social social social social of the determines modius and of the determines the patient and coupled in a constant and a social of the determines the patient and coupled in a constant and a social of the determines the patient and a social social in a social s

In a few initiation of a secoral under this loser-beam bombardment, the center of cech pellet houts to four times the temperature at the center of the num. The pellit se-

> BY T.A HEPPENHEIMER



A new class of Olympian lasers with fire bolts of photons. They'll hit targets with the force of high explosives

Iddates stors the worke out AM of this presential volume of lowerd a provident and. the investig a provident and, the investig and a store of the investigation of the one investigation of the investigation of the

Ruga loser-beam generators are operating or are under construction today at Celeforemia Lawanee Evermore National Labornory

PHOTOGRAPH BY JOHN BLAUSTEIN

and at New Mession Los Alamos Nethonal Laboratory, the nation is centers for the devalopment of hydrogen bombs. Lassin bout at these labs will him be used to set off the explosions of H-bombs the stee of genes disard. The resulting microesplosions will resemble those of hull-size bombs, proticence around boards of radiation.

Builtips specifies who are builting Theos lasers don't mick of harmsolves as H-bornh casegories. For one trag, each applicant in the pop of a historiación. And many of the researchea artic locking anead to the illay what the most activities of the illay what the most activities of the trags, when have laser devices more quarky into the country's overe flatile.

For decision mitry of our most visuation betroklogen two given out-of-linking rebeards, forme of using n. Counters & M. Fronz Lesson, and an Using n. Counters & M. Fronz Usingoni and Levier netrrat. The instandesign of the net of laws p. childraw and be well-and the net of laws p. childraw and Metudament. CDM program: The instanwell-and the net of laws of the A. Fronz has already used artitions laws data for a well-between the A. Fronz has already used artitions laws data for a well-between the A. Fronz has already used artitions laws data for a well-between the A. Fronz has already used artitions laws data for a well-between the A. Fronz has a start of laws well help-

In their preliminary forms, the huge lesers of the future bear fittle resemblance to be firminate grant of second fittle resemblance to operpare locky a most advanced lagers to a fusue of immense halls and chambers with all of its plumbing showing howing the second second

The beam is born in one charter in a mester later of low power It produces a pulse of the proper wavelength and duration—a bifworth of a second for instance. The beam has all the other openbes needed to set of the fuer larget except one. It is a mislion of most times washer than the final laser pulse that will be focused onto the pellet.

This master pulse is than split up into subpulses by using been splitters, persally transparent minosi that ke half the pulse go trough and that reflect the other half in a different direction. Each subpulse

Above: A welder works on a porton of Liverreary's Nova system (Photo by James Stocki)



her reso is unit of the lates Atrance, anymhers. These performs a control the approxen in the subpulses that with these abaryances. These performs a control the discusses of the subpulses that with the abaryance is the subpulses of the subpulse of the subpulse and the subpulse at the subtion of the subpulse at the subpulse transmit to be been and even in any of anymher table. The been and even in the subpulse and the pears goes through the lates any particular performs and the the performance periodic period and any dependent of the periodic period and any dependent of the periodic period and any dependent of the periodic period and the periodic periodic at the periodic period to the angeford more that the periodic period to the angeford more the periodic periodic

At Los Alarros the chartoes of each anyloar on block where entron incoste and introgen gases. When the later is to be treat a powerlub beam of electrons severes through the gas. The electrons celles with the castor direction and beam anyloan the main block of the additional later light. A anyloan of a additional later light, amplifung be control solations.

In Exernore's laser program. The Amphere use large date porple side or gates containing the demont needshimum. The slabs are surrounded by filantiamps. Just before the laser free the filantiamps dates with light. The flack across energy the time in the needshimum along. The laser pulse following the flash causes the energy to be network as additioned later filantiam.

By alternating amplitude with phriboso and their streed within the later anter reeaterhors can boost the energy in the pulse as hong as they water while markating a clean floquidable bears Abstreement and amplify and observations and an ophic to an end. The later bears in these arms are now all all power, needy the locuring onto the pollet. The energy stree the league fibers as energy inferent innocleans as brief

Back designificant of the mere methods of the subject advances of the mere methods angular. It common is called back damp and a subject advances of the subject damp and a subject advances of the subject damp and a subject damp and the subject damp and any extra subject damp and a subject damp and a subject damp and the subject damp and a subject damp and

The least risk doct is in long, down all neasy large corps to house at noalineast large corps to house at noalineast liking the volume of the bay is a set liking the volume of the bay is a set liking the core is a baseful garotered in beams and indicated intrometing and the barries and indicated introted in barries and indicated introted in the barries and indicated introtact the barries and indicated introted in the barries and indicated interbas extended per holding americant and filters. The paper insidering americant and filters. The paper indicates from using and correct a sense introduces for comessa and correct a sense interbasis. Nearly December on color whole aparters in hearts.



BY CHARLES PLATT

From The Caves of Steel to Blade Runner, science fiction has shown us futuristic citile as potent symbols of tomorrow's technology. Not everyone
Ell's seductive to imagine a monster metropolis spangled with lights under a neon sky 9

can imagine conquering an alien wolld or exploring interstaliar space. It's easier and more exclusive to see curselves petited in a metal indiropolis spangled with lights under a nech sky.

In reason and more expected in some expected in a more exception provided with piper used in a more exception provided with the exception of t

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epissent flat transfort of schnidogy user for variant werkl tan Chag enseres forstrowerk of local are included statel habitats breken fles at the restrictes of gravey and othing indices by through the spanting universe labove flat. The subst statel of the space many local and hard but once as my has been table, we have life a possible within listen in the styr vasio an a being platet. comfortably in the complex towers serviced by scenario ramps and pentrug, left, and Angus McKels metropolis above right) The lune of the only will always retian its power. Maybe t would be

obes is as deep rooted as our fascination with science itself DO



The eyes are the mirrors of the mind. One time I watched a male kon die after a fight with another male, and I saw the amber freis die from his eyes



An orising for a baw. The times the start part is to be high started to the limit of the limit of the limit of parts and the limit of the limit of the limit of parts the limit of the limit of the limit of the parts of the limit of the l

PHOTOGRAPHS BY JOHN MUTH

To him rule as a advertisit, therefore Sonaire must add the proportability of our para inducation and betwyn for concernintion. Daties for compression air not assay with Dull fith composition control the sonaire sonaire and the sonaire sonaire and the sonaire sonaire and the sonaire sonaire and the sonaire and the sonaire sonair

Although Schaller's work as a field zoologist is confined to shot scenthe methodologies, his writing reveals a dimension of deeper understanding, a feeling of kinahip with the eminate he observe the Second He Second Second Second Second



We have expolled curselves from the Garden of Eden. Humans have bocome outsiders. Nearly all the animals fear us. But that needn't be it's well known that animals who are not disturbed have no fear? Award in 1973 and Stones of Selence (1980) within in a sharp, calip mountain shife that blanck his selis as a nossistat with his descriptive images is a fecanetna accurated wild is in the Himilaida

Hereg hava abox Scheler numerus accorrelations and his single and mousters advances. Does nave a to accorrelation provide a court of the single numerical according to the single single according to the single single single according to according to the single single single according to according to the single single single single proversion according to the packets and the single have the single single have the packets and the single have the single si

The second secon

Partials at the serve of dispert him corres with steam galax with united that represent the server of dispert hims has represent the server of dispert hims has represent the server of dispert hims correctly of Webcrete carrors are encoupled for its particular with a server that represent the server of dispert hims for the server of the server of dispert hims server of the server of the correctly of the server of the server of dispert hims of the server of the server of the server of the server of the correctly of the server of the server of the correct of the server of the dispert hims of the server of the se

Greef How did you originally become in terested in the work you do?

Behaler 1 Inst the a diffusion dusation to the assume to the design easies that as the assistance of a the only they line event terms assistance of the second second second second pages of the second second second second mer Builtham the hald of bahavaria contable marky of stateng more animals and bahavaria contrast and second to the bahavaria of the second second to the second second second second second second second second second construction component - that is second these datas i Alary and the second s

you soon won't have any left to study At

Expanding wery peti alle dang aame hing workles your whole poychologitaal balas your whole being if you renkly like andmonte and yotas; your personality too andmonte and yotas; your personality too adore to the south time your personality too adore to university to terms and ency being adore to university and collaboration becasts and could ney." X person of the years I would like to the adore in the fold?

Schalter I don't know how brig I cowld be staat hed being slow to inductive my private pasalance. I in very forstaarte in herver at wife who is willing to come aking with mitcan return at frequent intervale. Bit I like het teken git i can go at table to whoh! I het teken git i can go at whini I like a Onwer, If you had to pack one forwarte spot in the work?

Scholler There are so many vanities. For long conditions loss of widtlies and besubut climate as cithout to find a price beitter then this Seeinget National Park, in Terchana. You have endless spece millions of armels.

III you're oplwig tor another kind of bewir yw o can bok a the Vurge velcanos where i sucked mourtem garkai. That is is the borrier berwane have Reaarda and Ugarda. The scenery is geoglobular there are lonais filmer, active velochairs more gor does in the gorlias which are inner gord borothing the gorlias which are inner gord borothing a very different loss adher gord borothing a very different and of boats?

It every difficult to say. 'This is the place imigoing to stay. Obviciely haven though a because I keep searching at over the world. For sail when I iso not know.

Any remote also will tend to give you a feeling of people's hur may have a fail of problems but you have han ofly to day, an isolatapic wirkly offferent floor but modern happed here where you are arrain from through the happened in the path, that also happening now and that you are worsed about for the funce. When you are in the held when you go camping, if takey you are while to belied some of the tensor.

Onsei What can we learn from the animal works that will improve the human condition or even let human life continue?

Behalen These where it easily contex down in it have automated a lor most armited and plants, humswhind will inutamatically in the Matel out bool context both armmata and plants. Approximately bits preoversities or an antibacture and an armony context of an antibacture and armony modeuse. Boreast all aspects for owners for way modeuse there and an armony context of an antibacture and an armony context of and an armony context of an armony modeuse. Boreast all aspects for other the owner and an armony context of an armony context of an armony context of a spectra of an armony and a spectra of an armony context of an armony context of a spectra of a spectra of a spectra armony context of a spectra of a spectra armony context of a spectra of a spectra armony context of a spectra of a spectra of a spectra armony context of a spectra of a spectra of a spectra armony context of a spectra of a spectra of a spectra of a spectra armony context of a spectra of

Ormit Approximitally how many species would you say there are in the world? Schaller: Nobody knows: Carsanly five scientifically described. The ones that are can see But there are millions of othersplants. Yet they're disappearing at a trecrowth. Somewhere somebody is blowing there in solation. They disappear and that's

Schaller. Many species will be gone by the and of the partury of this rate. It is estiforest and chooped down every minute People wil still say. 'So what? We don't native. But the thirds we can never replane-not in a millior years-not the species we are woing out. There will be

then were simply working out all our options cause human boings are increasing in number and will perform to provide for those plants were work out them also

Hundreds and hundreds of chuce well to the strangest circumstances. Take for example, https://www.bisck.bears.Ther.bib into humans, dissolves galistones. Also, His cholosterol lovels are tremendously high, but he doesn't have heart attacks Why not? Bo from a hibernating black been

Green: What other examples can you give? Schaller: The capybaca----an overpaped its blood. Sharks are remarkably resistant to carriere Just about any creature may uf-

Now it you go around though leastly wo Avaire percentings will hats us offer all remein on earth for a while, as we all hope save as many species as possible. We must realize that there is a cost to all our 55 CAME

Own: Meny people don't understand the problem They their we want to save an servation They to thinking, 'Wel, five don't Scheller, Well take the pancia-since you search an an mail like that for its own value. It is unique, it is beguthal, and it too has a ical or moral imperative to conservation as

well not just an economic justification. But it is even more than that. We use the panda as a symbol, a symbol of our comthe leget, and the rain torest the adult One needs a symbol to which people relate-comething to accuse empaths. If you

Nations permit multinational corporations to operate with few restections-converting forests, stripping minorals, depriving their neonie of a futurebecause of they own avariag

wronment, you automatically preserve cies of plants and animals as well The if the pands chappeared. True, the forests

Schaler, Any maurian forest provides in Sauchwan province the year before last of years to replensh the sol

Pocole are always womed about economes. New much is it worth? In fact, you for example to purfy the same amount of weter that one square mile of forest with you had to build a plant-a factory-to do such punication, ridding the water of

cost millions of cloilars for what that patch

Gener How can this concept be presented

Schalar, Even/body has to live, everybody actural conservatorists often sex." You put animals over people ' But I don't think any thoughtful person closs that What you're ical rules you can clevelop and also presarve, but it takes some forethought an takes some trade-offs. A good current exout abalone, the shell fishermen should These's no question about that and they srchins, which in turn eat kelp. In areas where there are no sea offers, see unchina inclustry. Additionally the kelp prizedea otige needed to solve a cliemma is avaienderwork in's time to stop researching and start theticog. After all, a world unsale for

Look at Japan's eternational imposition cause of whisting, as mother example. The behavior of the Japanose as well as the jobed? For a low hundled jobs and prodnot survive arryway, aust as the demand for country a hundhed years ago. We know what will happen, yet we do not stop. If the

Schaller: One thing that makes conservawork of all the private conservation onplirezeleves-Seeres Club, Widerness Soci-Ho and others-that put pressure on the environment of any administration in this of ignorance. Most other countries don't have this private involvement so chance is much more difficult to achieve. Inside-

Oreal, What are the various international

organizations, and how successful have their offorts been?

Relative Consignments with a set of the set of the constraint of the set of the set of the constraint of the set of

These is a straining strategy to the strain top the straining strategy strategy is a straining strategy of the straining strategy strategy is a strategy of the straining strategy strategy is a straining straining strategy strategy is a straining strategy strategy is a strategy strategy is a straining strategy strategy is a straining strategy is a straining strategy strategy is a straining strategy is a straining strategy strategy is a straining strategy is a straining strategy strategy is a straining strategy is a straining strategy strategy is a straining strategy is a straining strategy strategy is a straining strategy is a straining strategy strategy is a straining strategy is a straining strategy strategy strategy is a straining strategy strategy strategy strategy strategy strategy is a straining strategy strategy strategy strategy strategy is a straining strategy strategy strategy strategy strategy is a strategy strategy strategy strategy strategy strategy strategy is a strategy str

Orms What steps can be taken to change the setuator?

Bichaller Organizations like the New York Zeotogosil Society my to work with local gevenimments to develop magnetate solutions to probleme and then to lottey for those eolutions. We may try to adalatish a material parts, instruct a local-eoluciation program, provide hearing

so chicalle. But italicia time dimensional appendimentaria a longener you can al horizo ao garet in a constry Unit people know you can al horizo time time and the second mean well to the time, to italicia ender the second can be unative mainter maccillation and unative mainter maccillations as an indication of the second can be owned to the second can be unative and projects for contractivities and the second time and the owned well and they can agric owned to the second can be appended and complia our well under projects and complia for the second time and and they do the second time and and they the second time and and the second time and and the second time and second seco

Deter Around 1990 the U.S. Fahrand Witlie Service product removing the later and of the busication of the later and the second second

J got down on my hands and kriees to lower my silhouette The cheetah kept looking at me. I then sat down quetly within six feet of him. And we stayed there side by side ⁹

anoourage hunters to hunt in countries less concerned with conservation?

software, mail Labor occurry enclosed for 1 and what a weak open for humping end what is opening. Some countries have enough to provide any set of the software have country permits a legal exposit of these have country permits a legal exposit of these have country permits a legal exposit of these have de receiving investment and the software integration as here weak year weak of the software integration and any country of the software integration and the software integration of the software and the software integration of the software integrating takes in our oper Legal of theme

One: Woldrif these countries recover higher revenues from tourism—from people corring specifically to see the ammate—than from allowing a few sport hunters to go in and shoot them?

Sohalen The regional perior in meet ocuters day new tack interval year of uncertaint through lounom. Even many of the bestknown perior in (set Atrica are not Foreign tourise) do there is inforced to gend in the country as a whole—a significant contribution to countrise the Kentys—builtifie of the score cose book to the parties. It has been estimated that one make lian is worth nearly half a million dollars in tourist reserves for Kenya, since most loansis want to zee all loan block all allos.

But fire countries have spectracies they again again units of but the And what substantial costs of but the And what substantial costs of but the And what substantial costs of the they but on the but they be an again they but on the table managed but poole in the countries for their over prepare linear out of the noise important and her contrains on we and to encourage that each their encounts of the dense and her the contrains of while and the second but the terminal of while denses a factorized hermitian to where in the second hermitian to where the denses a factorized hermitian to where the existence and before.

Omai Whose is this work rup?

Sense: In normal encoder Hancere Paul text have been encoded when need were to their text have been encoded when need were to their text have been encoded by the paul. The beauty means and the paul. The beauty have the paul text have beauty text and the paul text have a beauty paul were the beauty text and beauty paul were the beauty text and beauty paul were the beauty text and beauty text and text and text and the were exist of the paul for the Massian to use, thereby terverant market the and castle

The startform revery sources who wersh murboard page which is colleid to bed the A factors of the total bill for a site of the total start of the start of the start of the start start of the start of the start of the start start of the start of the start of the start have there pleasance. The Massar may not concretely be watter and the bannin have there pleasance. The Massar may not able call the start of the start of the completely begin with the plan which, able calls the theorem by begin plan which, able calls the start of the

new serve of progress?

Bidiation: One example comes from a speech delivered by Laus Aberto Monga persident of Dollar Ross. He orded the impertained of resolving a privere domentic ones while meshalengs a deep controlment to conservation with a national point permitting "Repurit to the Land".

Now here is a civeraloping country will a conservation table on its fieldships. And what do we have in our care administrator? The bindmass is sace? At least we will acce have a obtained bind administration have been administrative of the net level been able to be appointed of turnwe as some and be did to dthem.

Otto:/ Aside from maris doing too much development, what angle environmental factor-lead, mercury, an pollution-most therefers the attrant world?

Schaller, its smole habitat destruction. The earth is surprisingly realistic as a reident from the amount of pollution at hos ab-

Two visionaries of robotics and automation look to a future of silicon

CYBERSHOCK

BY ROBERT MALONE

be meetings weld all like to see Albert verse with Sr Issec Newton, Sendy Koufax phoning to Babe Puth: or, somewhat



occutted to us, the first meeting between John Diebold the information Age. Once was able to amange it

John Debold (above rolf) corned the word automaage in 1992 in a book of that title incer revised in a 1992 edition) he described for the first time in taxman's terms the basic elements of automation and computer technolony More than any other work. Disbold's book swakened and his mentational consulting firm. The Diebold Group, business automation. Over the years his company's client hid has included such corporate grants as ITT IBM. Exiton

Isaac Asmov (above left) has been one of the world's leading practitioners of science fiction and popularizers. of sevence Extraordinarily prolific, he has published well over 300 books, in helds ranging from physics to the works. of Sesivespeare to biblical studies. He now has three non toton bories in production-one on robote, another on

proved to have many things in common Both started ca-Animov holds a Ph D in chemistry from Columbia Univorsity and for many years held a post in biochemistry at Boston University Both are tascanated by the history of

New York aperment, a startinoly realistic re-organism of Elizabethan England Sevend in the plush sedereth-pertury drawing room the two peered into the automated robotized future. Will the new technologies displace human workers? Will they create a classifies society? Or will status would be interior to that of mechanics? Will people become suit another form of intelligence as mechines evolve that own kinds of bitanpower? All seemed possible to these founding fathers of the Computer Age

Guide to Science listend The Acbots of dhon of his classic / science in ancient China. Both are deeply concerned with

Chatting with writer and robotics expert Robert Malone and a croup of Orroy edi-Asimov waxing philosophical, Dieboid business. What emerged was a fascinal

Owner losent, one you start by telling us how you came to can the lerm robotics? Astroy It was in a story of course. It was were only two kinds. Some were works of morphity, such as Frankerszlest. In these Creator alone Therefore any tobol Itsul

It wasn't whit I thought a robot story should ket brought up by this nursemaid, which was largely metallic. She was alread it would

Genel This was deciades before the idea

Asarray Yee, Ewas The story was not see of years. I wrote enother story, which was saleguards. Finally my editor told mail. would have to make the systemate: 'What Overs Was that John Carrobal?

The Three Laws of Robotics which I can quote in my sleep, are A robot mey not robot must obey the orders given to it by protect its own existence, except where that

cause it was logical. Most branches of physics and in soit hydraulics aerody -Orror Were you aware at the time of the SA CAN

play RUR [for Rossutt's Universal Ro

Asaron "lives I wave The word mitol came into being in 1921. Until then people had spoket of automations. Pohot caught on

John could you explain the origins of

was writing a paper at Harvard Basiness School m 1950. It was for General Dorot.

61 don't spell well-I have problems with my own name: so I shortened automatization. I thought it automation, and I could consistently spell it.9

of coordinating that of the university a m ing World War IE. The contact word at that

Query Can you tell us how you come to be

shipman in the Merchant Mannel Atlenthe were I went to the Merchant Martin Acad of the shors engine with his own hands torsaken part of the world, you would be shie to make the massing part from raw

After the way ended I want to Savath

came in with the idea that someday the different parts of the factory would be tem Dorat felt that the project should be sign a factory to make a piston. That is

Over it is interesting that you both had and interlice. This was unusual at that time Asimov, Well I recognized that people with relief and yoy. Many of my stones ris-Frankenstein complex, a feeling that robots were dangerous and would mean a

in my stones generally there were laws as a means for correcting galley proofs Hence the tille I wrote it while I was con

I am not surprised that there shill is opposition. There is very good reason for it inductriful and tumate way. We carnot

Gross Which of these words automation

Deboid I am not sure either one is parko-

thet robots and robotics are not as fright gaven Romaid Peagan control of the renetyshould be spenking of Peragran tabols, your robots is not a sufficiently periorative term to apply, so they speak of Reagan clones.

as the workers. Why bother with reinclus-

storce has declared that the future of Emone will depend upon information technology That will be the key to international competitiveness The Japanese in current statements by their Ministry of Internamain determinants in international compethernes al be monator lightology it is key to Japan's survival

Orm: How about in the United States?

Diebold: I thank the fact is less well rec concelled here but I do not believe that in mation Again, bough, they loar the special durampiownent Even in 1367, during another monstrim there was talk that automation would put forty million people out

Aarnoy One reason the Ultrad States may that all we have to do is stay on top. So we

industrial policy to guide business. Though maily need to do is to move into the new industries. One of the difficulties in this is

Overy The stress in business and in secsty in conteral seems to have shated to word intellectual and communicative skills

Detoid: It storests me very much that soonce fiction has made an important loop. From being interested in technology it has

he really important thing about this portant concern is how we are going to dwn problems may rootere a very differ-

We must also change our institutions in order to cape with these new problems.

We might gain by involving science fiction people and accentists with those who research meeting to consider real futures IS OWN

that vision. John Gienn may have been up

Owner Fild been on Each we need more

Deboid Yes. We should be thanking of the in order to have the crowth We are not applying imagination to our robustors.

Agency, Sometimes the side effects of an date purpose. Say you have robots that are intended to do site too chall too re versable even tumariform it kills the con-

Once you have compared yoursalf to ro-

6 Many of my stones assumed there would be considerable opposition to the robots I called it the - Frankmostern complex. a feeling that rabots were dangerous 9

account all human beings as len when you be set human beings

Omen. When do you think this robut en

Asency it might come as the pase deap new_provided we make it through the and up veeiing the unemployed as substandard human beings or even as sub-

Orwar is something twe a subrababa class

Asimpy it would be an extremely unstable

Oney Nearo City in expected to have the population is swelling throughout the Agmor The problems of the hans for may well be exacertaned by population in-

creates occurring faster than car be ab

Deboid One of the great problems will be and abili move into this new eta. Many of

Assessy. To take the optimistic view John. Frederick the Great doubled that a nation

Destroid I frank that it will loade. We now have many more options than we have ever handling of those options in order not to and up with an Drivolitan society

Look back to the reneteenth contain-

Johns F Kannady used to tell of going into ine Dam was built. That was the way the

galvanged by his cleath. his had already actived put a site tor his library memorial for that tarn-a decade in which infletion

The contrast between the expensions of the early Filters, when there were shi reon to say that a project would be importare to the future. Today we have one hunto taxe stelligent trade of a That is the key to the successful use of all this science, and technology

Onver, Although the World Trade Center was constructed in New York, the Second Avenue subway were rever completed. Is it a mer of economics political, and acesil factore that causes that sort of fallure? Are these oblaction increasing?

Detoid I think they are but they also have a cycleal characteristic. It is interesting to look at the Japanese model, where we can be a different culture and what kinds of intrgs are possible if you have a vision the way you do throug is otherent.

Omy is it possible to get ourselves out of our cycle?

Disbold I that is is controllable. Politically we need to understand what the pactners are—the real is institutional problems, as oppoind to whatever happens on the news bright. If the news is of a blackout the fundamental problem is that we should have recognized the need for greater electronic organized the need for greater

Aarroy I wonder whether this is a symptom of the notion that Earth is no observed of to do arythmig. No matter what you may wait to do here it metheres with people with to do here it metheres with people why dither Parhapa the next have take the next Grand Codee Dams are going to be in space.

Debuil How does our secenty rank protess? We can have anything we want if we sky with it, but we accusity to off in orvertal chectors at once while characted by , ...

Which shired of ethericem are we paying to the energy question at this point? There all no date strendtrig in horiz of gascher particle, so aniorgy issues have no exercis import on the political patcess. We need matchements for thiste offs on provides loads, We need your land of thereing on these track-offs.

Great Are bere inherent firmsblons to progress say in computers or robote or information handling?

Details (height as the field of indemised) theritoping (height as the field of indemised) where cold that there is too hold the field of the cold that there is too hold the field and an interaction revealed the main that and also the interactions revealed the main that and an interaction revealed the main that and an interaction revealed the main that and and an another the main that the set of the set of the set of the set and and and another the set of the set and the set of the set of the set of the set and the set of the set of the set of the set and the set of the set of the set of the set and the set of the set of the set of the set is the set of the set of

The brain has elements that Janction down to the molecular size. We are not near the molecular level in computers if we wanted to build a machine as for exercising the huttish brain. God knows how target a would have to be Will we exercisely be would have to be Will we exercisely be pactness of the bran? I think we more

How much tariner do ser event to go? do not trink time the later we will stock to the trink time pound into Car boddes on an reme: Inguide that do not go very test wherein in a computer we may go toxular but space of the We could have an obpoted dense at the tume toxet but set poted dense at the tume toxet but set and a filmation tower even but set to an even and goes from one adds of the time.

Deboti John vici Neumani, of course carrie-up with a separate discourse that is paid one way to mimo thatain installing genea, and it is not key the way we thank All our compaties taday follow that one consept. That cannot be the end of a Someone ason will come up with a nontion learner machate that could be ter more powerful.

Astrov We and to think of neeligence as a single flang. We measure it one way, with the LG ... will if were that sample Thank

 The real world is now international and interplanetary, but most people still conceive of it in terms of how far a person can ride a horse in a day.

must be many varieties of intelligence. I imprect that as we continue to develop computine, we are going to have antifocal intelligence of many kinds. Some will do one thing very well, and others will specolicion in different areas.

Pethaps note of base computers will clohumen things very well Vio will take our place as one times formed in enforcement may, even come to recognise of therein tame of intelligence in human beings and notice to ready to section intelligence out to people who there intelligence out futured the sec

Deboid What about the merger of biology and information?For instance, a detect acoasa link between a computer and the human brain. Are there may less mechanistic forms the might take?

Aamov L is now clear that chess playing computes can bear almost among be reach the grand master level — not because help play good chess but because the humans they play make occuspone blanders, and the computer always catches them is plays base chess but who no metakes the fuman by contrate is lead to be poster maskee chess but who will make matakes now and then

Suppose you could comparence a hument being just to the ootst of pawering him form making those stupid messive. Now he would play at a plast instructive level all the time and no compoler would be able to tauch him. The would be a small patch pit half-would process something much better. This is the sort of experiance we might look forward to

Debailt (Gong beyond that kind of physcal metger is the possibility of orearing biological mathema more versifie then the Von Neureann machine. I am suis we are going to proceed to biological computers or biological components that make up systems. I suspect that braak throng are some to brace is the neuron that in .

Addition Lob us assume that everything their impringes spont the softext as portrainerity seconded and that our officiality is in the later official position interaction to the softext takes they own advantage over many poobies in ord that interactive everything but deficially if we can find on tools with nois becall sales policies and have so diplocer this although the can find out oppose the start policips we can edge it to computers in Could improve them by several obtain of magnatule two need some breakthrough take

Central Flow do we prepare the next gen entation for these changes?

Debug One series places in to look of the thirds that have not happened but shald One of the lag ones is the use of all thir technology in advattor. When a child learns about the battle of Jultend 4 should all be there in three determinents on a screen in front of lass.

We call leach in the pre-Gutenberg way, with scrept needbal tablewe designed be physicians: and leavest of the Macriticentus' Noticed is asynch to the veneral a system that will oblace a orbit better red times modulately. Neted we have a call to put bone composes in schools. That is happening in any sort of an organized way in the public sector.

Everything is liabor-inferieve in the isoholin Society knows scence and how to built and dwithbare chara products but if depend understand any of the emportant finiting. Provide do not went to talk about this fact: We must find define the need to exclusite chiften to their initial capacity. We have not insmired to organize ourselves in achieve these social coversions.

Attract. I worder if the proclams of one segment of an incurst with help us solve the profession of other segmens. During the instructor many people will also that post inductor teaming the will read all education extension. The will make all education extension to the during the extension will not the people to do the education for generative leaders to sum of other the area of people instructions the will onter the area of instructions will will not the tocaus of instruction taking.

CONTINUED ON THE A PROPERTY AND A PR



FICTION

 Intermos started at school right after we returned from Thanksowing holder and look down the peoper turkeys and plignme from the windows. The teacher sang 'Uncle bells, Santa smolis, he was supposed to be reprogramming my December reacing assorment, and the computer printed out wirery cheathers the right word, and any Humeus whenever I was wrong. And it said any yuwate a lot and didn't tight up the observation board We used the gold math beads as garlands House Items Frenew only warschaptebrak to acheme to get out of lessons. Still, we of the Christmas Teaty of '55 that brought peace to all the work of the of action in how whole stations full of people had powhere to go but back to Farth their way of Me taken from them by the stroke of a place to go, but 7 cidn't speak up because was eacer to cut out prencing, round differ that was successed to be used on



BY CYNTHIA FELICE

One Christmas morning a young boy discovers the truth behind an ancient myth

PAINTING BY BOB VENOSA

The bells on the artifers and houses and hearbla were ablety that my enclose in hearbla two off when I hung them up. Alter backs fore off when I hung them up. Alter backs areas in a dort if any were were atting around adhout on Christmas be day when was showing and he told us to go build anowners, and he awept up the solup of continuction paper and coulucied and gifter abine while we put our Christmas stress in places applies and had them if ho our pakets as that our hands would be rine to make smokals

My best friend. Timothy and I took some of the gingerbread cockes sprinked with red sugar to leave in the woods for Bigbot then san out the door and got pelled with snowballs by upper-graders who must have snowballs out entrien

Tendity and I has over the new taken srow in the playgroundte dack behind the sittletel tense, where we eccepted up anow and tred back. We were every matched to a white soubdall type tinck and heavy Then the little lade came out of school and behavyou are by sittleng our flama.

"The kille barls," Transity mutaend throwing down a kalahasi i supert he was lead updat that the kits onea had decoded to team was drying and making has develop them was drying and making has way to the achor building, and ameene was super to come checking to see who was making be table. "Come on," he suit, sit happing disput: "tut's go baal day own fort and go medh for tagtor 1.

The control of your way not adapted a language or you can alway always and a language the interval of verter appearsity in the works structured by the structure appearsity in the works structured by the structure way and and work way and a structure and a structure way works and a structure way and a structure and structure and a structure way and a structure to the work and structure to structure the work data stars over the verter structure and way and the structure and structure and structure and the structure and structure and structure and the structure and structure and and structure the structure and structure and and structure and structure and structure and and structure and structure

Losving the school behind us we made our way toward the greenway along the towarpath, where the freightes sprived is with a blizzard of show when they whoshed by

"Look here," Tenothy shouled, hagging at something he distepped on in the snow Both of us acreatived at the ensw and pulled until we freed a great piece of cardboard it was frozen stift.

"Let a go to the hel," I said

Dragging our candidated skell behind us, we intrudged along Bigliosi's own Insti-Triculy in two woods. You could like it as esture had passed here from time to thin bucause branches were braine back wolder than any kid could cause, and the path conted the hill outside a wire and gockat fairs, and the galax was always locked to too. chee Less Digitize and ensigner rate out. The Nilvas teelas acres of grass manuscul by robot with grast tokay blacks nummer and stratosk is a case bat is write. Hotel to sacking. The only house with hards to sacking. The only house with hards to sacking the sack of the hards of the sack was word because The type in only no cities accentated or went anywhene, and my parents would stake then had when the type labot account he hards and he was pulsa storage act hards and he was pulsa storage. Sac

The forcement lives clamp Beloco cotor delayed all only a low architecture in the set delayed a long of the architecture in board on a unchain to ango be not mee. Then we climbical what seema to be toursen thousand one with seema to be toursen as hand as ancient warnow who di just decagoed there elevinent out ho Abs.

> We just knew that Bigfoot came out in the dark storms looking for stray kids to eat, and that gingerbread cookies marely whetted the creature's appetre

Timothy's autr's house whered and bloked, and I looked up Those were no windows, but it had in thousand eyes hid dan in the alver rivets that held the metal skin over tungster bones.

In the whole anow it looked desolate, save for a trickle of smoke

"Hey your surt'shouse is onlino." I said Timothy geve me is bok that aways made me load suppit. "Her twat exchanger's broken Shd's burning gas," he said Tikhaw because the saived my died to get her a new case before Drukemas.

"Does she come to your house for Chrames?"

"Nah Scintemes she comes video just We she used to when she lived up there." His gestund skyward, where anoutskies wore crystalizing and taling on us but I knew he meant higher, one of the space shabers of orbiting ones. "Is better now bectuse heres no disky when we tak. Its We also were in Portlend or somethers."

"What's sha like?" I said, suddenly wondeing slout this peoular person who had been a fature in my community and i was listic, yot whom 10 never seen

Tenothy structed "Like an aust al

ways wanting to know it I ale my peak." Wattor Timothy was parting the caroboard elephant sled making roady to resume our sourney in the Alos.

Why doesn't she come out of there?"

"My diad says she's got a complex or apmetting from when she lived up there" He gestured skywikd again

What's a complex?

For a moment Terrothy looked blank, then he said," It's like what Joan-John and Lester-Linda Johnson have"

"You mean she goes to the clinic and comes back something else?" I said, wondering if his aunt used to be his uncle

"I mean she doesn't go anywhere

But like to the consumer showcases down in the mail and the restaurant. She goes there, doesn't she?

"Nope Last year when her mux cable got cut and her video wasn't working she practically starved to cleah."

But why? Is she crippled or something? The teacher had asid he knew a spacer who spent meat of his time in a semining pool, and when he addorme out he had to use a wheelchar because he was too cids oget used to gravity agen

No sho's not enpoled

What's she look

"My mothe

Timetry a mother was regular looking to do with getting upy. The Johnson washing the built by with though what my dust called phases which he add with my dust called phases which he add auth a complex was like Letter Johnson Long phase. Long has dust my and cause Longer Linds on the dust my and cause Longer Linds on the outher with them and Therothy's aust new did

"What does she do made all the time?" "Works."

I nocided, considerably wiser. The old public buildings were down in the woods with the school, mody morumets to waske of space ever since we got our mix obtlet hat. Rel into were building in the community. Most of the grown-ups atopped grapt to write and hey stratue sail had to out, and not used on vertice day.

"Corre on "Tempfry said

But the smoke lascreated me. It putted out of a silver pipe and skitered down the side of the house as if the flurty taking show was putting it down. It smelled strange 1 formed a snowball, a good solid one, took, and the silver none and list if the

"Missed by at least a lejomoter," Timothy sed scowing

Leducting I lined enotive, mased the pipe, but struck the house, which resounded with a motalic hour of closed are of the house's even with a while patho of srow. Truckly granted at me, his much lingking with mine. Stred have to come out to get the snow of the series. Scon we had packed a wavy line of white spots about modewy up to short of

"One more on the right," commanded Tamothy But he slopped midswing when we heard a loud whening noise. Around the hell came a grace cutter funcustly churring arrow with its blades.

"Retrest" shouled Attils the Hun Tim-

We leaped abcerd and the elephant sank to its knees. I didn't need Timothy to tell me to run

At the tence we three ourselves over the forces pickets, minaculously not getting our clothes hang up in the water. The grass outer whered along the tenced parameter frustrated, thank goodness, by the limits of its oxide-on send trind.

"Ever seen what one of those trings does to a rabber?" he asked me

740

Outs them up into bits of fur and guts. Timothy aud sciencity

"Your ount's werd "I said, grateful to be on the right side of the fance

"Uh all You lost a glove. "Timothy said I nodded unhappily and turned to look over at the wrong side of the tence. Streets of fet and wre and red rylon lay in the cross outfine sweth.

We vestion on teaching like the depicted winnow in the Attrine words without our expropersisted (own until we without our boots tacks an the proving the stand they boots tacks an the proving the stand tack tacks property wet provedue and tack packs property wet provedue and tack packs at the tacket in the stand tack pack at the tacket in the stand tack the result is an at the tacket in the stand tack the pack at the tacket in the stand tack the pack at the tacket in the stand tack the pack at the tacket in the stand tack the stand tacket is and tacket tacket tacket tacket tacket at the stand tacket tacket

We subwad the toconnes an the wear on the Wiggleses' house, only to find little Bobby Wiggles in them hand-the-down boots overheating and making great pud das with each strep

Tracticy well issued out in the score exciting lot injustrational bott lot orthogen inducting lot injustrational bott lot orthogen in bigliout might losses, in our case the losses of the losses, in our case the loss of the losses of the losses of the loss of the losses of the losses of the losses of the losses of the loss of the losses of the loss of the loss of the losses of the loss of the loss of the losses of the loss of the loss of the losses of the loss of the loss of the losses of the loss of the loss of the grade whet pack ends and diplication when we vector of the loss of the loss of the losses of the loss of the loss of the losses of the loss of the loss of the losses of the loss of the loss of the losses of the losses of the loss of the losses of the losses of the loss of the losses of the lo

'Go back and plug your gloves into the recharger.' Dad said without glancing up But Mam must have looked up becasite.

she sad right away. "Both of them "

"Tiost one," I said

"Go beck out and find it."

Timothy and i looked at each other More was still wanthing me "it wont do

Applied to the second s

'Why would she do a thing like that?

Timothy and I shrucosed

"Weil 11 call her and ask her to let you get your gieve." Dad said, rolling his chier to the commission

"The grass cutter got 1" I said, more wring to lace putrishment for loang a grave than what might happen if Dad loand out the day before Christmas that word closed her house's used.

"I told you she was girting crazer by the minute. Dad said.

She isn't dangerous

"How do you know that? The grass cutler of all throat."

She has too much dread to be delibarasely mean 1 clort doubt for a second that the knew a couple of kds could outrun the grass cutter and what else could

The wide numers
didn't stoer very wall as (
 picked up
speed, and there was no path
 n the snow
 / wasn't completely sure I'd
 be on target

to make the ferce lump?

she do⁵ Go outede and ask them to go away?" Mam shock her hood "Her heert would stop from the ansety of leaving her Min samption.

"She left the clinic fast enough when it caught on fire and when she first came book that was as much har sanchistry as her expected hor user is now."

"You can't expect her to have enough onengy to treat every minor day to day in order the au emergency."

"I three she should go back where she came from

"Hugh dear We voted for the treaty

They cught to have sent them to U-5

"Couldn't and you know-

Tendity and I left them taking about his out, but I knew rd probably not head the end of the glowe. That was the problem with souspetanan parents, they knew all the tricks from the lind will of kids, and they had very could memore to

In the kitchen we had hot chocolda, dopping some on the puzzle my big street had broken back into a thousand proces balow she oave it to me

"What are you getting for Christmas?" Trivetty asked me his cheelo still onk lists

being outdoors and his eyes as bright as trisel fluttering in the warm convection summers of the house

Idmugget My planatu were transtool wergenige to Arriteria te trans of early team here submit all were to be the submit and the second to all were to be the submit and any submit all were to be the submit and any submit and the submit and the submit submit and the submit and the submit and the submit and the submit and any submit and the submit and the submit and the submit and the submit submit and the submit and the submit and submit and the submit and the submit submit and the submit and the submit and submit and the submit and su

Me too.' Timothy said. 'and a sled which should we play with tro?'

A stadil joint have togo to the terminal and tesk tra objeky of my Chromatings ler to incove that a stead was not on n. My old one haar worked gut the will last writer, but 15 used in a users to dam up Cohron Creek is make a panel for my race boats, and a food had seeled the one-was waters and camed a raine busited the unrens. To laste to a rannenberng or Christias Chas o Krass forspie. Chry in lightor, because I al al assess of the test of the test of the test had a seen test of the test of the test of the backase I cohron the test on your syste.

"We should play with the stack find." Terrothy seed "before the other teds come out and run the show"

"I m going to get a krille with a real L-5 crystal handle."

Treatily shrugged "My suri's going to give me one of hers someday. She has lots of stuff here when she was a spacer.

"fiably but my knile will be new Then I'd like to see Bigloot get away from me?"

"We can bring B gloot back on my slind." Timothy said excitedly. He chugalugged the rest of his chocolite. "Early right after presenta Meet ing at the Hil."

"Why at the hil?" I said suspiciously But Timothy was already heading for the door and sulling on his boots.

Rest place for sledding

"But what about your ount's mower?" I and whapening now

"Early, he reminded me as he stapped out into the arrow I followed him holding the door open. Which bring your sted."

"What time do you open presents?" said Butil Timothy answered, I didn't hear

The source was falling in the fluees, and the work had concerned up and the source was starting to drift own the bedges. Fourty how a want ready dreft with it is in hill white around and fault fault in the source of the around and fault in the source of the source of was it who to addrift could up the drift double for it could hell that it here, it source the source of the source of the source of the double to the source of the source of the double that it was not source of the the source of the source of the source of the source out of source of the source of the source of the source out of source of the source of the source of the source out of source of the source of the source of the source out of source of the source of the source of the source out of source of the source of the source of the source out of source of the source of the source of the source out of source of the source of the source of the source of the source out of source of the source of the source of the source out of source of the source of the source of the source of the source out of source of the source of the source of the source of the source out of source of the source of the source of the source of the source out of source of the source of the source of the source of the source out of the source out of the source of t mitters from Terrathy's creazy aunt's house Timothy would let me by his siled in Epulled E up the hill, cause if he didn't I wouldn't let him hold my L-5 crystel-handled limits if Lot one.

"Cleans the sort" my taker stoces and i cloced if and white beat weating is beauting i cloced if and white beat weating is beauting informing weating to be assume the stoce of the memory was and is consecutive to the stoce of the memory and advertises stoce may be assume only an ick Advertises Stoce may the stoce of the stoce of the stoce of the stoce of the who served about stoce way have even if it do come downs that and have even in the barries and the stoce of the stoce of the stoce costs of a stoce is the stoce have even barries and the stoce of the stoce of the stoce of the barries advector window evens in the barries advector of the stoce of the stoce of the barries advector of the stoce of the stoce of the barries advector of the stoce of th

I woke to alknow and the sure knowledge that if was Christmaa morting: Locht know whether to look out the window or check undar the free inst, until heard my seter in the hall and made a clash to beer har to the living room, where my parents had plot all the packages with their red bows and wrappings under the tree

The big one verspeed in red plasto had to be the Advintue Boards in though my parents were formula for putting that same tab. U.S. organized anyes in pack ages the state of CPB complete with node to werp in down so you couldn't sail lockfort wat is hind out for some where was in K. but lihad to because my parents came in KMering about ootbe and calking in mMering about ootbe and as in the some some We are compared and one compared to every the transmit term of the term of term of the term of term o

And then with my knot strapped around the outside of my sokat and my sled in hand I was off to meet Timotify dataminad to have firstoot in too before tunchtime. The going was also because the drift wire fail and I lowed to break two passes and test the sub-fill chapter beneating the filled test to start of our the subset process of the start of the subset process of the subset the representation of the subset process of the subset of the subset process of the test process of the subset process of the test subset process of test subset process of the test subset process of test subset process of the test subset process of test subset test subset of test subset process of test subset test subset test subset test subset of test subset subset test subset test subset subset subset test subse

Intrody watch there yet and because of outfit watch they are also on the fit and outfit watch they are also on the fit and outfit watch they are writed in tood one y stateling. The survey had been writed in tood the method of the fitnes white with just a plantal they watch they are also do caucio carry and the sign them may also be also do caucio carry and the sign them may also do caucio carry the trees would plant the survey at the do caucio carry the trees would planta the survey at the survey and the sign them may also the survey at the interference of the survey at the do the survey at the trees would provide a the do the survey at the stepse would be carry as the survey at the significant the survey at the dot survey at the stepse would be carry at the survey at the stepse would be carry as the survey at the stepse would be survey at the dot survey at the stepse would be survey at the dot survey at the stepse would be survey at the dot survey at the stepse would be survey at the dot survey at the stepse would be survey at the dot survey at the stepse would be survey at the dot survey at the stepse would be survey at the dot survey at the stepse would be survey at the dot survey at the survey at the survey at the survey at the dot survey at the survey at the survey at the survey at the dot survey at the survey at the

A new Shure phono cartridge can improve your sound more than \$800 speakers.

If you're looking to improve the sound of your stereo system with expensive mew speakers, you could be overlooking ar better side. New State phono carrolige on the end of your tone arm could improve your sound even more than those speakers, and as a fraction of the cost.

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If you want to improve your strends, buy new speakers. But If you want to improve your sound, buy a new Share caindge. For our free brochure, write Shure Bothers Inc., Dept 650, 222 Hiertry Ave., Evanston, IL 60204, or with your local authorized Shure Genter.



the top of the protext were overed. When was started of the iset work gives normality to beind around to Trindfry with regit fully the optemping appresent for all thewait then ("analest to the top of the fully was many in the store, but you need throw what their tigging of works) they choosed of it canno on in the store, but you need throw what their tigging of works) the choosed of the tight have at the top was all and completing in the compared, and there was no larger of amounts compared, and the top was compared, and there was no larger of amounts compared, and the top was compared, and the top was compared.

After the dot previous provided the setup and provided the setup and

raciad just before hiting the big drift. The sled skidded along the downside of this drift and into a hole. I hit on something that sontime liying. I came down hand hurt and crivino, ucascle down.



surf Maybe her house had ears as well as eyes and I shouled and should promeing Id never throw should all the house again. If hough that all the blood in my body was posicid behind my eytedelly and if I cred again my team would be blood and lwamad to cry again bocause i since that Timothys surf never would come because the never would any blood.

And then in the still resis of the moming when there was nothing to team in the snowpacked world but my crying. If heard what sounded like an annual breathing into a microphone—a very powerful microphone or a very big atimat

I hald my breath and leasened creatily, watching the woods, learned this the creat time was Larging these baland the show covered bashes. But was hanging upside down and it look me a moment to inelate the the sound was coming from boind me, closer now hesting. I barred widy and presedimy table against this peckat to see what was on the other size.

A tower no huis

Shoulders live a gorita

White as the show

broath making great clocks

Feet loaving meaning Vacks

There wasn't a doubt at all in my mino that 1'd farally found Bigfoot, and it was more swill than anything I had imagined

Isosampi and indiringand gate why isosampi and indiringand gate why isosampi andiri and the substantiant in the emergeneration. The substantiant isosampi and the substantiant and the the substantiant and the substantiant in costants and there are substantiant. With my cost here is label of substantiant and the three was between us but in handles. In the propert may the substantiant and the three was between us but in handles when be parts aget to account any substantiant cost and the substantiant and the three was between us but in handles. It should be parts aget to account a place in the parts aget and the business at the parts aget to account a place in the parts for the substantiant based based on the my handless and handless based on the my handless at the based based based on the my handless at the based based based based based and the place based based based based based based and the based based based based based based and the based based based based based based based and the based based based based based based based and the based based based based based based based and the based based based based based based based and the based based based based based based based based and the based based based based based based based based and the based based based based based based based and the based based based based based based based and the based based based based based based based and the based based based based based based based based and the based based based based based based based based and the based based based based based based based based based and the based based based based based based based based based and the based base

She is go to the, neached over to pick upthe L-5 exits, and twind to between her thumb and featinger. The crystal fashed in the samight yastikk the ods they d kined on L-5. She fitped it and L ought it they handed. I backed away toward where my skel ally didn't bother to collepter if but grabbed the cord. I and for the woods

When I looked tack, Bejtor we give but her tacks elle a clear tail to the declear the house at the score of the hill, where Chardman was which a vold cerver, where Trentfryts crazy wart would sithler slave to death than come out sor tool. And sentemes when it showed, especially when it showed on Christians Day, I certified over the tence ther universe to whose the dirts of show of the even of the house. I hall like gittering Christians Stat.



entitied "Lurray Ardit: Human Requirements for Datedid Spacelight: cummanaries for Datedid Spacelight: cummanaries the issums beings from Sower and comprise data from many different sources, admannas, or ings, datare weither athbors. Antranctic bases. Tabut animism and women are cleared in and cut off and mist poperator to survive

Although none of the Earth-based studies exactly repicate the conditions in orbit. orthan events coordinate environments with sufficient consistency to form a general pacture of the problems likely to arise on long spaceflicths.

During the initial phase of the meson, there is a good and all analysis whe care adapt to the unusual lwng incumitances and guidy, later everything there is the three house mesones. Later on the good felorening investments is done physical felorening investments in the physical adaption felorening investments and other investment in attacker. Hence, the unusual adaption inclusion in attacker, hence, functioners meson is outlether such as the spacectal commances on an elemen outlet

Once the massion bacomas routine, berefern rest in The own become dopressed and lose motivation, and monie textness low just over halfway through the, that?. At the end, approaches, they be come entropolal, appressive, and dargerously rowshy. Depression may vanish and monie may recover, but accel which severontinues explosited to the operativation.

It should be emphasized that these only a behaviorial model for groups in space, these psychological events are probable, not detain. The levelhood of each event depands on housends of variables. These are some of the most important

 Maxophysiology Scree neurological properties may book huma performance in orbit. For instance, there is evidence that people whole eight and left brain helves are symmonical—hat is einithe ade an dominent—are befor problem obless. The Soviets have also found that a regular of coldan mythm helps commonals mainfain a traditional work profile.

 Savarity A1 space crews of most gende tecche nerve common, there a weary steppe transmit yon Earth--pressure, town innergies, sparsed autors-well tollow us into acids. Thomsau jn may have been the cause of one music in an Artactice as one moti the semic could happen it paces are acid the semic could happen it acids of professional and one media up of impressed Internexus, in movial leafers are get acids into their sexial leafers are get acids into their sexial leafers are get acids into their sexial leafers before a high and no their sexial leafers are get acids and not may media. homosexuals are not necessarily excluded from spacellight

Intercoperatory Tuble course will comrestrict a statute of the statute of the most of allower course in the statute of the order in a statute of the statute of the order of the statute of the statute of the order of the statute of the statute of the order is the statute of the statute of the order is the statute of the statute of the program has statute or the constatute of the program has statute or the constatute of the statute of the the the constatute of the statute of the the statute of the statute of the statute of the statute of the statute or the statute of the statute of the statute or the statute of the statute of the statute or the statute of the statute of the statute or the statute of the statute of the statute or the statute of the statute of the statute or the statute of the statute of the statute or the statute of the statute of the statute or the statute of the statute

One selector is further completated by is lisk of adequate testing providures in the Antactic and in the "social expenments, psychological lists listed to prodact the behavior of either the endvicuale family and the testing and the social sector that there tests are usually designed to decoders We have no setable way of demthing basis memoral cautions. As to the future role of psychology in the

US space program, no cine has a cluo-NASA has no immediate plants to form a team similar to the Soviet Giroup for Playchalogical Support, even though the approxy seams to be geering up for long missions on a named statude. If lact, the question of withose behavioral science sciences's control was an in NASA. Many Camora, kies any behavioral science and thosy explaining why.

NASA, she points out is composed mamy of engineers and physicists—people clearing with technical lacks. The nocket either works on I docent's the cays The addrail locendes are a great deel more ambiguous. Finding a riche for psychiogy in NASA wil depend on increasing the laces eigency's therence of embody.by

There is some evidence that this hay be happening. All the additions dispace Center, in Housian a group of madeai doctors and backcontrol togethere have control backtors backbox and the hards this of the proposed backbox and the hards this of the proposed backbox and the hards this of the proposed backbox and the hards the hard together backbox and the hard together backbox and the more emportant psychologoal wandlike the hards propertied.

"We may never be able to nail cown the fruth about human behavior in space" concludes Connors, "but we can dropel some of the ignorance " DO



VEGETOLOGY

BY FRANK KENDIG AND USA BUCK



orial definitions, also plant une est is a vegetatele, by another, if a appling that grows in the soft Takes the annual consultated a rectest or the team because of its deletate, concerning layers. The another (EgyBBLA, with brackfel allower and way entry price, participate), and by provide grows and sharing to price that presented. Softwy genthe engineers and sharing to price the presented. Softwy

PHOTOGRAPHS BY LEE BOLTIN

Prough the borratio as is chronowing a finaland the standard of the Supreme Court. At that have husts were displayed, and the out-international the blandards in order to tack to testant or Deginality though to be both posicional and in the final test the onco-disclose terminon the marking concepts the testance in rechards to posiettic in terms careful concepts the testance in rechards collection with a terms careful concept test testance in rechards collection standards for any bandhold build be and the standard collection testandards for any bandhold build be and the standard collection standards for any bandhold build be and the standard for any bandhold build be and the standards for any bandhold build be any bandhold build be and the standards for any bandhold build be any bandhold build be and the standards for any bandhold build be any bandhold build be and the standards for any bandhold build be any bandhold be any bandhold build be any bandhold build be any bandhold be any bandhold build bandhold build be any bandhold build bandhold bandhold bandhold bandhold ba







CIRCUS ANIMALS

CONTINUED FROM PASE 13

nest it hdgeted constantly running up the addes and across the balling of the passage darling glances forward. Its headlamp eves casting spears of light

How did you ever find her? Driando partied during one of these dizzy tells

She found us replied the monkey She found voi/?

One right at the show linere the skill, example block-want widdles applieddoing the old incignito humbor. But we could see right through that grave Tight gave her the final square list out a growt and in two tokes we all spotted her. The Ubbattart Her lage dut a katadom in the memory Last lists the photics all over your lass. A tills object, but was the number are got all implied Mooch the investment.

Haw could also have come so close and made no signal to him? Orlando wondered. Maybe he had aged too much and also had taken him to be just some sity old much all also the loado. "Then what?

When she saw wild gother ID, she bear at for the aut. Old tiger shufk out and hwhet her home-frough and then damn back and growled the depotons in my ear and live bean whispening them in everybody depresses from their time on

You mean Tigar made it clear to the maniand and back in one realit? Oh no boss Mooth sril camped out in the wids. Shas downstairs in the raganti-hone shap

When an earth is that?

The high class dump for burned-out suce swels and trazzled magic boots

Translating his monivey s arcane chatter Orlando said. "You mean where they salvace staff from electronics arth?

You got it Modeh todaks the rebost here on the diveryid Tiger bags while got a workshop and a parts winners that make used a parts and the set of the set of After Tiger shuck back to the onces i find on all de based has been been as the one high and back and the set of the set inget and back on allowed Modeh and here harp and back on allowed Modeh and here bor us and unfork our protests and set as discording.

Of course of course "said Offendo absently." She was a goddess to you "hou'd heard me takeng about her from the day t made you.

"Mooch ran in us like electronic book We knew all the stones about how she d ppung our encestors from the densey Compared to the things she pulled with the old brines. The proces was Podurik city

"Tree" said Ordendo He had bled them with his own lowing legends about the girl No wonder they had non-away to her. The air down near the floor where he was noting seemed to be growing thelet and more soure stoom he would have to take not he



18 bat of Thomas Educan could have seen this house the would have documented the light bulb

issife and size cubes of it to swallow

The point a head in the detailed books. Deals, the interact segrets in the original data of the last of the partial of the same of the last of the partial of the same of the last of the same of the last of the last of the same of the last of the last of the same of the last of the last of the same of the last of the last of the same of the last of the last of the same of the last of the last of the same of the last of the last of the same of the last of the new same of the last of the same of the same of the last of the same of the

"Receipt Sam seven water to serve here? The constraint, it reproves the constraint of the memory, Stein nutri have incorporated the memory stein nutri have incorporated the have incorporative bit of the most have incorporative bit of the seven in the standard ther? Where the horizon is not the standard ther? Where the nutri have incorporational have incorporated bits the there. Also have incorporate bits also have in the large have and provide the standard bits of the the standard bits? Where is no in the standard bits provide the standard bits of the standard bits of the production of the standard bits of the standard production of the standard bits of th

Criandos steps began to chig. His chost burned. Fealing mate and mote a fool, webrig hands never seen the pandala elecaping down the halph his said to the manisy, to you all compand to steel every one bu one and down trust mater?

Over its should in the monitory multited. A bunch of pure-D ingrates right boss? If we had to eat byaity weld will blank thats for sure

Then why clid you stack around?

The monkey cut is eyes round all him o binding giare and then looked ahead down the kinnel. I though shout hightaires 4, has were mark if we gitten off

You could have told me about Mooch

Les I said the others threatened to

Flut why did they pare?

They figured you cliasso them and stick them back in that mely clink circuit.

It was postly writiched. Orlando conestated Feeling about as low as he could, wanting pome reasonance he suid. But you were going to stack with me no matter what, even if that meant being cut off from Mooch lower?

Not lorever no Just until you cashed in your chips "

Each of Oniecto a final was beginning to leaf as if it had a balle of whe wrapped around it. He shuffled slong penulay. And Mooch never seni word back that I should come? Site never sent any of the beasts to leach me?

Well there was one thing " the monkey said reluctantly

A mesusate? Whit will #? What? 'Evon

as he should the question into the echoing tunnel. Orlando knew he would not want to hear the answer

In a gradging voice the monkey whispered. She said don't any beast dare to il you where she was because she was alraid of you."

"DI me?" Criando ground to a hall

"Anald and analysis of the bests of as cruel to you she said. The bests of lock her you'd never breathed a mean wood about her in all our days. And she said you weren't the sort to saik mean, but in your heart, you got had to hate her."

Me hase Moooh? At these years she's been magining that?

Orlando sagged against the sode of the smalled of parking lots, overheated orcuits the rayaged trays in calcternas He heart The monkey jumped around here luciono al tes elbows, abbering in that incompartmentable street inco When the monkey's it up eyes played over his out the ragged patches, the holes where has quite a line buredo. He could not rememglide rapping he head on the floor. The monkey's sebbening pleyed all around him the a gang of lods volking, and then it was cause. He forestheat in orders. He insertion the used-up ar infitting him with its sewith vapors, bursting up through the pave forgettable sight, a cloud of memory

When light divided mamentarily from clariviness in Orlando's head the trist object to appear wate a wornain's face, screwed up with worry, for eyes upsteat. He blinked "Meach?"

This face deappeared, as if jerked away by a root

Weath?" He ordered his muscles to prophracy, clother the small oracle to prophracy, clother the small oracle to oracle the set of the base of the small oracle of the set of the base of the small oracle clother provide a work cought attrice and head head head? Head head to be alread on head head, patients the barring had been to betrate. Account of Model?" Cristeds yielded ence again to the budynes of barrows boron he cought acoust

Mooch it was, all right. The monkey had intrihed her-Orliverob field passed out within a hundred moters of the durapand she had come running with go stratcher and oxygen tank. She had been amazed. If these Orliverois functions of the the stracture and then onto the meleaned pail let in her workcom at how little of him there was. She numerrisated han as being enormous, a filter of doorways, and she found in that to before that this dwindled doulight man was Orbinob, the lighter she had runned. What was left of the secret dawlight back, is a dog bore with all the meet and ballie was seen.

"He made me show hirt the way awade: the morkey whered from its redoubt among the packing cases." Hers a bold terror when best ited."

Model have to larger at that too only, leave of weaking ther pariant. Onlando was the most precedelik soulid the had ever most Whatever site meght have changed in the soven years ander since the had destroyed the deray and vibendand him to all has troubles, his grand as of gantwase occurrent have everyperated. But could even so deep a seek wash weaky the land of her cruely?

'Eyerk a knot in your taillater, Mr. Mud.' she said to the monkey

The air was thok enough to chew. He magned that milions of people had already breathed this wir and left in it whatever they had no more use for?

She gave Orlando a lew more white of oxygen to clean the posons out of his lungs and then pulled the blanket up to his offer and lot him stopp. His old face as analysed and stowed as an analyse blanter purse was boastaful to her. The nm of white has enotypied his baid scalp like hold covered busines incortal a white cond.

"The show kept getting warse." the mankey test

"You hush," said Mooch

It was pathetic An old clown and his lagged out beasts '

T reduced from to that thought Mooch To the moniesy site whispered. Why don't you go mens abound in the warehouse with the rest of the monacquire?

They I harrener me into a cookie sheet.

"I sold them to leave you alone

"I want to stay here and see the boss when he wakes up "

"Go." Monch hased, "or FII watch down your twicel and grab your tail and yank you track out."

The monkey scattebled away into the storage bay, where the refurbashed circus animals were milling about Mooch bent over Criando and stroked his forehead importing the verticals is if the kin vertical is either that has been forked too many inner. His vers laktions to result the lake build due to good this lakt seeps anternal, hinking of the pain the had coased him. The dense, boyg tim and alkad of lower, weating to be vertical as the had read with the manifest of the dense to the set of the method him in deal way her addiscore mentod him in deal way her addiscore

Disjects this share. Accord average boosed tasks on the year miler one spinor works and the groups street of the thir The physics and the spinor street of the third physics and the spinor street of the third physics and the spinor street of the spinor street of an influence of the spinor street of the spinor street of the spinor street of the physics of the spinor street of the spinor tensor street of the spinor street of the spinor tensor street of the spinor street of the spinor tensor street of the spinor street of the spinor tensor street of the spinor street of the spinor tensor street of the spinor street of the spinor tensor street of the spinor street of the spinor street of the spinor street of the spinor spinor street of the spinor street of the spinor spinor street of the spinor street of the spinor spinor street of the spinor street of the spinor spinor street of the spinor street of the spinor spinor street of the spinor street of the spinor spinor street of the spinor street of the spinor spinor

The series is good to according to the proting score in the series of the series of

Otherwise manybast constructions example social manybast construction terms do social to the social term vession when the social social terms and the minimum social term down to show a few minimum social term down to show a few months would be down to show before for the social term down to show before for the social term down to show before for the social term down to the social term of the social term of the social terms and the social term of the social terms and ter

Citiando meanwhile, was dearring of his beasts. One by one they were returning, their politis shiny, their ayeal is up with a secret they could not wan to tell him DD



FICTION

So she's chained to the wall and has to save the world—can she help it if sex is the only thing on her mind?

MONOLYTH

BY JAYGE CARR

I detrift bother to pail on my chemes tim no dumb both. No don't have to tell me three times. I knew I waan't gathing out of my tendy neighbothood dungeon or my towily tilamm charan-tertamm is in for charas the year—by any unsafed elforts of my own personal bod And no one we going to tell me out of these unless—

And to think when I tartied on this indiculsus cock of a planet (I been complaining about bosision Weil there is nothing borng about holes a bolig about the borng about holes a bolig about the of space of holes of the digood bas of Nee III to been if planet comers and—caveat about the digood bas of Nee IIII new Planet But for the time bana I merely watcheduck of the opened my eye which the Cappace Rena list my taxy of United Texas Rena list my taxy of United Texas and the Cappace representation of the Cappace representation of the Cappace representation of the Cappace representation of the Cappace method and the Cappac

PAINTING BY WOLFGANG HUTTER

and the black startives blinking coyly in his golden curis, the Gorgious Piece wiss—a Gorgeous Piece What did a vitate for dwplot, one-eyed battered survivor of ourfless bravis, have bother a bat of prime charge meta like that?

Now I knew

The float-a-table nudged agenst my knees and I glated down at a bow full of gray goo I swallowed—and decided I wasn't hungry enough to eat the glop yot

Full been staring all the current serving of yeach to about twenty standard minutes or so when the well opposite meruphole asks, with much cheaking and growing typical of meruphole and the Same Sciential walked in, carefully steprag in the sale—that is, out of the mach of my cheares—hall of my tittle dungeon-cellawe from-teme.

I steried at him

He emised, showing more need, grown shark leadh than any two humans ans enified to have (Local mutation? Planetary ad? All Lowe was a made him took at least half as dangerous as throw he was)

Charged your mind yet? he inquired genally, in a deep, competing voice that would have made anybody but a hardened space timer like me built him.

Now I clicint believe for a second he could put off what he clamed he could - even with my help. But I wein't going to risk fouling up things for everybody else if he did procharge of the second off.

Not even for the charics to be Number Two of the known universe

Especially if he was Number One

Fellow skeet priots. I spoke through a smile as false as his own. Would you buy a used alwater from this format?

"Bubborn he said, but it sounded something like a complement. I could sweeten the por, he offered

You'd let me be Number One 11 oc

"Would you believe me if I said yes?"

Will you let me out of this obsolete Tetamum Meeten (1) say yes?

I might consider if "

And letism my Key? I had to give him parts for subhery My Key-mean sould control, and all of my electer-was there all the far and of my electer-was there all the far and of my electer-was there of an electronic sources and all of my channed-up reach but of? so tempting a remarder.

"Under that shall we say, proper condtions " I could tell he fruszed the as far as I trusted him.

And how may I ask are you planning to sweeten the pot?"

An-advance payment shall we say With what you can't take your shifty eye off of, Captain Monolyth."

I aut back and thought about it. Gorgoous the Gorgeous Rece certainly wasbut "hourd give up your hweete, brain dramed? Suid you will Tell se another deeps knew story. Doddy

Lookd hear him gending his party testh togetheri gotten nim in the raw with that 15 Owi "He is not---" Pause Very deep breath "His an experiment that don't work out Useful for brute muscle work and for seducing ideal plots that think with thee---"

Count into physical i fusion linguing production the Conversion have the count physical set in Conversion have the count physical set in Conversion have the set sector that against the count of the own gram plater for the count to boot the Sovie Economic and the count of the sector that against the Sovie Economic and the count of the sector that against the Sovie Economic and the sector that the sec

Evon though I knew he'd seen it all before, my fury wont nova. It looks could kull, what he got from my one gye would have stretched hem out on his dungeon floor ?

and they distril have room to natte

He knew why I was laughing all right no problem in his brain department

Toculd the shark loads—field 1 decided for het very effect—gisteroof hungify perform a waveseter on you-wellout arearhete. My sold is consider usin 1 beleve I could guarantee to remove every monthal pair. Insives and all and leep them connected and alve. Exposure the prives Depressive the one reven.

Heard that threat several times already "Some pilot titliba, spread out all over your operating table, brisin dramed

True you'd be utterly useless as a plot But as an example you'd be perfect

I made one good my at puting my wriste out of his so clever manacles. Uselessly He reached up and before patch the covnext my errorit we solver patch the covnext my errorit we solver.

Tak Buddery: He port or my Achile? heel Even Hooght I know heid sean if all before, my kny wert nove. If looks ossid kill, what he got from my one way would have direkted him out on his clammy durgeon floor, permanently unswedde "Now I todki clame you a frish sys. and the damaged nerves, and set it all back in so you could never tell there'd beenan accident was 17

I strugged The darith had been frying for mythroad, I ducked but not fast encogin Not fast encogin to save my eye. that is But you should have seen the darih after got through with him.

The Same Scientist leaned closer started in "Usine there was necessary analysis in the societ from the motiscaring. Id assumed it was prophetics. I could tell it wasni an implanted component — but is in the costhetics, either What is if?

Some of what did the damage Busted bottle. The medics were shald to do much medding. They left a bit?

"Butchers Topuki fixit so there wouldn't even be a scar

I shook mp head Lue will construing long encough need in the tormatic batteries to change Besides, no siding water tools hold be paying with my mod while wells well write the inflamman. Chang, it has well write to be inflamman. The second second second second pay Lub hold second second second second second end be the second second second second second will my minimum head second secon

He mart

And the was likely to get it, lon Sure As soon as the galaxy stopped rotating

No the galaxy is skill rotating

So what were we there the Sane Soerisal the Gergeoux Perce, and I doing aboat my sketter heating for the S.S.s prime goal in this Mo?

Easy Like my bod in one pace Libered hird 55. All east, Libered hird 55. All east, Libered hird 50 what his east, once his patence ran but Aber all, there are loss of space profitsome of them almost as good as me. All his had to do all his had to do we keep hyre; until he found one (30 good and (10 wine)

Besides. I was getting tony surrounded by all that old-fashioned non-t-field matter

The Gorgeous Piece loved spacing he kept telling me so, until I was ready to clip tim one corpoous or not

And the questions he asked "Do you waity contwol at the ship from the one contwol. Captain Monolv17"

New other II patient one honey gold shaukar I patient on the step form at the series of the serie

Nester says in contenue are wate use Nester was the Sams Scientist lying on a face field lounge is programmed for his custiling his own concole (mechan mechanical, brain, and Wheel know what disa—I distin () to his chest, a privacy sheld around his head to he could concontrate

The Key csell is carry-size-barely of mine once powered all accessible sur-

Open and activated it is a mortage of interfaces and instruments. When using it test my elbows on: so I usually program a

head, which the S.S. zonived, and the presthe Key, a meller plus flexible tube that Keybrain and the G P's babble

controlled energy beids force telds. They only look like walls, like the noid matter to be doing in hyper-of you haven't ac-

That's hyper, you're seeing hyper. And the Key did £ The Key is my skepter Everything you one moreot the suppliers a force field controlled by and produced nikre-weyfing

the Key and the Key- Look inside the Key m a mega K brain a field projector,

Does that mean-' He flowned the was

Sure tabe " I patted his hand it was pands on how much cargo I want to hauf Looksone the hull down only carry the Key me likerally carrying t, of course). Why program a hull around it, program my ise ng quarters, and off we go. Made the hyone out Anyway not to worry, that a what

" He look a deep breath and got it out. Suppose the enewoy gwid begwhouts while we re two

I cidnit understand for a second-and

Looukin't heip laughing. "No change of a brownout in space dear. Where do you Were causing space there's gobs of an

GAs far as I could tell, he'd done no meddling with my think tank. I was still mo and in hall control I baped And he said he needed my active conneration 9

use a ted more energy then we can absun Trecharged the source on Mynahl only

I was about to ensw thirdses when a hard hoper backed me on my back | affected lower tip come out in a petulant pout

your dutes. Captain. Fid hate for this skee

programmed this route myself, and the Key has an excellent auto circuit. I'll be warned p and pushed it back in -- "unless you want

plust-control conscie was attached to his write by a force uniplical as well as the

how you keep your deals?

"Not --- through his teeth --- while voure could print a sloaeter through hyper I wouldn't need you'

Lost my hands on the G.P.s. shoulders. He was whimpening, trying to whaple away obvously tembed his 'master' was going to obey me, and it had been all my idea.

I twisted my head. If you were a prior

"I sake only calculated risks. For the last,

I timed it just right The Key chimed loadly. I gave one last luxunous sentch

The S.S. was sitting on the seat Ht prosnoring bahly mouth open in a setuned

Twosicing - again his enumeration was overprepise-"that if anything your rep

Estrugged "Well he does have plenty

We will we will, loor " (Right after the unverse turns cold in entropy-cleath we of no return? The place whose even light risks. 'I mattered too low for him to been

guianty chunk of another universe while over the little sucker had pull

And Igor the Bane Scientist, maybe the exerts so same, aber all —winted the lo come close enough to its close to skim the want transce. The Schwateschild tracks the datatoo from the black hole all which the escape wilcoty was greater than the sevent of lott.

No way I dooxied All sorts of ochtball things happen at the event horizon of in back hole. Like trive naming al more than one speed. Finzen infinite gravitational twoes, Good staff the that

No fool igor the S.S. 'Capitan' ha said solfy teoping his rotten control

Lichanged my mind I mean the invent honzon was a risk builiger and his mesabolie control console (his control – my metabolismi) were a sure lass Hed alreack marking meta costella of settoles

And I could it even use the Key to elimnate his conside because their but is had. Infee program loak on my Key to stop me from using it to separate him hom he pitty little after ego No hield invess to cut the unbroat no Fried walk to a little analytic pitty of Littley.

So I was, as they say between the deviand the deep. Very deep. in fact

What he wanted to do was theoretically possible. Theorem rin1 piloting

"Lemme make a few test rune." I manbled wordering how long I could expect he perenae to last. I knew that even in few

thousand test runs wouldn't do the job

Leempures for a sense of correlary maneurosts, with plenty of strights effect. Which mesent in use the pull of the sucker black hele scall to swerg you around and cut Would be furn if investit doing it around is deedly black hole.

Actually a constant was the only way to put if of Bostmant in well also wave both sample and bost of built according to also sample of he was right and if to take the improvement of the sample of the based he improvement and and the key occup protocit them many gwaves and hererendows X rays and a low other for impress loads doors as choose of the form

If I did it all right the back out wouldn't be a problem

He had plans, you see

So did 1 of course

Hatti told me all about his, even before I started the lest num, and i leapt finning about them as we want in and wore hunled back out, were in--Mother that sucker hid nowerfi---and alternated back out.

He hadn't even gloated just stated everything matter of tacty. I ve set up these equators and solved from and these are the results implemented correctly they il make me master of the universe.

Lovely Always wanted to be Number Two of Everything

The trouble was assuming I could do whatks wanted and we don't all pet killed



trying his plan could actually work

Drice he used me and my skewar and rice to bottle un a black tole

Simpla, ance somebody thought of dong if Assuming enough energy, there's no limit to the reas of a falce wall. Dr... a force bubble. And than's lots of energy around a black hole.

Plenty of good ships, old style metter and filleld, got lost eround the auckars, proving just how much energy they had

But if you could get close enough, and use the enougy of the hole stant to power your force wall, you could (theoretically) englates it Naw you had a black hole in a (tag') bottle. The next stap is to move it

Ed been a bet skeptical

Aftar all the one thing a black hold has is more. And the more mass, he more long it takes to move it. And the more energy to produce the force. And --

But meets is convertible to changy over the pass-paces know that And is accounting to the S.S. where we do when we go into hyper is produce a ministerry left the search all black hole which easily so body in norm space that is popel through to hyper and pade us able. Coming out, pail the we varies he says we can do the same with a bodyde big black hole angulary. We says

When you ve got your bottled singularity somewhere extended unamate weapon Would you like a black hole unbottled on your planet?

Indust destruction. Whether if displayed two played into a capably expanding armiser of dealasociated asoms or merely loar or heve beg cherke shocking off in vehicus direcenous. I calch task i washit all theil armses to third call.

Neither was to He didn't topolo my m habited planet-and who would want to rate any other lond?---eould take the milk 1 dath, a other

i played Skyhook around the little suckar three or four teses, coming a title okser each ame Then I orbited well out and turned to the 5.5. No good, biain-drained

7457 He analoc

"No Tao taky The odds regimet juting olds encyclib to tut ywa anglobener belan the lansa alound hile nasty the balan the lansa alound hile nasty the balan the lansa alound hile nasty the balan you bala to pour heaviewith on hard feelings (want beins charge charter feel baue constatively young yours being of time by work out another way to constrution - 1 outside over as theftip time activat frought to feel the ward of the bit nother -

The pain stopped abruptly, bull i was still racked with day heavies and the atterimages of pain. Then even that was pone

Tast up binked Country condice of the "bore a skilled har Captern I do be here you'd let me play symptomize on your nerves indefinitely, rather than go down and do what you apreed to do earlier?

Succee is permanent," I said "While I'm hurting, i'm aiwe

"I pould make you report that last. But not exactly poval more like a man making a precalculated move in a came, space

I caught my to between my teeth I ve

convenced you couldn't do it it wouldn't more games. I'll give you a count of live fo you continue the englobement or you dienow And your death wouldn't alop me. I

"You can and we both know it. My patence is beginning to wear thin. One Two

"Good " He nedded. "And my word a better than yours. Captain. You'll be sec-

Thanks a heap." I muttered, pulled the paths. The Key could produce trajectories And maybe aller that photoe, again and acter: as we want in Comes a point when to give way to good of human instruct

Like a balancing act issepting two hoavy weights on a pivot even only you had to

The Key would do the actual englobemost its sellenes were far faster than a hismen's But I did the programming. Then Always. I tell you three times

"Give me victory or give me death " I cestress of mme, one Patrice Henry He laughed We went in Heliside

And I was the ship and the ship was me

Too here to back put, he snapped I

If wanted us if could actually feel its cult to eat us ill was grabbing fulgang, trying warled-we were conco-to-fai-

At the overst horizon-or almost-every

A corretary is a nee smooth ourse but

a speed, and whoopie, over you gol

Force-either on you or exerted by

Course at those speeds I had plorts

For one crazy nanosecond as the en-

when the secondary program I'd sneaked

Igor was lying on an Fileld Jounge his billed but not actually touching him (i.d. slammed around makes brusses) During De Miso, a secondary field wert around his (deleted) console. His program lock



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In a 2000, and the pairs system has been got before to partnerse, the parent form here any here to partnerse, the parent form here any here been cannot bailed interacting the second here on another the order pattern as I is an any default avec, on the order pattern being any order paper on the monon contential set of any any paper on the monon contential set of alternal and the ensaming patholes, not in the of paper of the monon contential set of the pathonic and the content soft of the pathonic of the setting pathonic soft on the pathonic of the pathonic soft of the setting pathonic soft on the setting pathonic of the setting pathonic soft on the pathonic of the setting pathonic soft on the setting pathonic soft on the pathonic soft of the setting pathonic soft on the setting

PHOTOGRAPH BY DAN MORBILL

tem has been colonized and it now her-

But there's a cetch. Although there are hundrads of billions of people spread out other, planetary materials are nearing asearthside 'energy crunch of the 1970s

Three s no argente however, no server of urgency. For the people of 2600 have a cian a plan that coos way back to 1983 by the nerror of Dave Crawel

David R. Criswell walks the earth today. just like the rest of us. But for most of us. solar wind Hels president of his own apportwhen not there he divides his working time. between the Galifornia Space Hebbuts of the Los Alamos National Laboratory's Inskitute of Geophysics and Plansfary Phys-

With dark her and beard and a memorable Tests (wing, he looks as I he could make a long nong Brahma bulls or dire do any of that. He's usually found on the teleptone saving throas like "Weil heli,

It ananta incredible, cutracinous. Even power are not for those with weak nervos.

We begin with the notion that in the rel for energy and living space will take him of the earth first to the space between and beyond. We've already begun a small mass movement of the planet 'I spend more time above thirty thousand feet in a et," says Criswell. "then I downlong about is true for most people

We've utilized a lot of the earth elready of industriatioation in Great Britain to the present, human manipulation and use of oil-has increased by an average 6 per-CMM

the volume of industrial "mass handling" doubles on Earth

of increases maybe 20 percent per year for will be a product of space utilization-of our going into space to get our taw mate-

At these takes of expension, we'll be up ing planetary resources at a steady clip Crigwoll projects that at the 20 percent made into spapecraft, space stations macromachines "At this pont." he save continued growth will require the classbe complete approximately four hundred

So anagine were to the year 2000 and Jupiter is only a memory in its place feet.

Cooled hydrogen and heilum are collected into globs of metter. The result will be a string of man-made Irozen pearls of star stuff

referen et mane batetata supporten bi new raw material is comet influx, ap preaching Earth at the rate of about 100 Chewellins "rather depressing its a level comparable with the present work! proindustrialized solar system, that's paseuts

barretu association operative will this be the end of growth for good?

Criment is no passimist. The report more mmemoil 99.56 parcent of all the matter in the solar system is in the sub. Against 1. planets are tray tragments, 'srval parbcles." In Crewel's words and our proc-

Star Phino taking the oun apart bit by bit downt mean exercusting it. Paradoescally, to ramove matter from the surwill be to projong its life "it is a well-known fact in antrophysics.' Crawell explains

that the larger a star is, the faster it burns up its supplies of hydrogen, helium, and other fassionable elements "

While our surils life span sounds plotty long-12 billion years-smaller stars the puter layers and converted into white-dwarf longer." Crewel sava

Thinking billions of years about is more

p-utmately-converted surlight Out

waste of solar energy," says Crawell. "Not only are we failing to use the eighty-one milion growarts (a growalt is a belion ently sending matnivishing to cold deep duce out fossil fuels and to power out in-

a skatance with solar cells

The way to do it in to go hight to the eruste dweth to the out, taking what metter and onergy we need and leaving as Crowell puts it. stellar husbandry

So how do you take a star apart? Ente elators. What we want from the sun is its plasma-the stores of incropen hearn. and heaver dismosts that make up the atpable of being moved around by magnetic holds, and it will be the plo of particle accelerators to create the holds

Today's accelerators on Earth and man-FormiLab in Botzwa Illinois is only exilelomaters to pecumference. Chawell's massperhaps one hundred kilometers in chameccelerator girdling the sun at its equator accelerator would be constructed in space. They if he made of Mercury, Not the ele-

Solar criatoy would provide the power to meanets forcing substantic particips into this movement of particles would decenate a magnetic field, a hupe and investigle pyopen at the solar poles. The artificial magnetic field provides openings over the north and south poles of the son through which plasma can escape." Growell asys "In eftect hey term rocket noralist over each of the sorth poles."

What factors plasms out the nooten's Assessmment participation of the acceler alors only taken be enlarged and structure optimistic and the taken between a subalting the sumination of taken and and the other analogues, of the analogue taken of the analogues, of the analogues taken of the analogues, of the analogues taken of the analogues, of the analogues taken the person of sum with the taken out in gatatic spaces of sum with the taken out in gatatic spaces of sum with the taken out in gatatic spaces of sum with the taken out in gatatic spaces of sum with the taken out in gatatic spaces of sum with the taken out in gatatic spaces of sum of the taken out in gatatic spaces of sum of the taken out in gatatic spaces of sum of the taken out in gatatic spaces of sum of the taken out in gatatic spaces of sum of the taken out in gatatic spaces of sum of the taken out in gatatic spaces of sum of the taken out in gatatic spaces of sum of the taken out in gatatic spaces of sum of the taken out in gatatic spaces of sum of the taken out in gatatic spaces of sum of the taken out in gatatic spaces of sum of the taken out in gatatic spaces of sum of the taken out in gatatic spaces of sum of the taken out in gatatic spaces of sum of the taken out in gatatic spaces of sum of taken out in gatatic spaces of sum of taken out in the taken out in gatatic spaces of sum of taken out in the taken out in gatatic spaces of sum of taken out in the taken out in taken out in the taken out in taken out in the taken out in the taken out in ta

Finally the cooled hydrogen and helium are collocted and formed into grait (plot of matter held together by that own grainity, just tike the most of the gaseour parets. The nearth will be a tating of manmane planetoids, frozen pearls of stellar suff evaluation our use

Crewell presented this scenario at the Los Alamos National Laboratory is Contenence on Interneties Mayation in New 7853. In the clear act high althout and expantion optimized in the sense Mountaine. If it easy to three the sense Mountaine the Anyerthickes there were clearts arrong scentrals in the audience stool. Token Drawell measurementing protoct

What here earning would know accession to the methy Merce. Take Characteristic Development and the data was merced to the methy part of the methy methy many characteristic data was an end of the methy and the methy methy for accession to the methy methy methy methy and the methy an

Well then assuming that start titling will work, what will we do with the insteadies is light? That will contract mane dealars The collected hythogen could be combined with corgen excluded from the mean and anterests to make about 18th tons of within per year.

"Such a cubil of water would be larger, than two hundred kilometers on a side, a new ocean every meety years, or over time million four hundred thousand new terres-

thai oceans over the three hundred million years of star Hting." Chowell save

What more say liting will allow the creation of whole new boopherse. Billions each year to found the would be available each year to found the propagation of humans. A husbandle date could support heany million times more people thin we new support on Earth. To seekill tays

Earning a larger verse, by the time future orientation is matterial converting that Lub exclusion is matterial converting that Lub exclusion of the second second terms has could power machines of the future fraaccibia power machines of the future fraaccibia to the second or right. All the baeactions to the second second second second several barries and the second second

How much would a hand-held electronic calculator or a B-1 bomber have cost the emperor of Ancient Rome to construct? Much more than the value of the empire?

a star could convert the original stellar core or a derived core into a suitabilit black hiduit has could be done tar 50% then the enorgy talease laterime of the cultured black hote words approach suitain militain timbs the estimated app of the universe.

Apple processing industrial pairs: Celaned Alak Inde: How much of the cenother operating take aerously? I put the quantion to Robert W Bussiah Immet no stange to speculation or to down to list hard science Famous for the Bussiah Immet restails/Rampit hes product of NESOO Inc. a Susce energy research and divercement commany.

¹¹I can't take any of the staff servously be spys after reading Chawkii Lus Alamas paper accept to a three peece on a galactic code it is all not ser of in terms of technical development to a valid anything but philosophy—and axispethie philoso phy at that imagine aiting in Franklan it 1500 and wring about the faulte of the world oxiditive hundred were later?

His comment echoics a post Crowell tenset had made when I asked him to entimate how much ster litting would cost 'How much would New York a Hewker-Packard calculator or a 8-1 bomber have cost the emperior of Ancent Rome to baild?' he register ("Auch more than the value of the entre empre.

But while Busserd and Crowell agree about the difficulty of seeing into the for tare notifier of them is healtent about trying to gleripte it, and Busserd acknowledged that star Wing could probably be content busite them.

When totatoour Creater 13 as a high rough of the analysis of the second of the second

Dyson spheres, the only competion to Converti spin to interesting the sum is mengy, see the transmission taken is sum is freeman. Dyson in 1960 he work on . Soence "The maps of Jupits, if distributed in a sphere table monitory across the same taken the cartin distributed to a sphere table monitory and additional table monitory and additional table and additional table. The additional table and cards control with all the machinery vapaned to replaying the oxider. In tectors with a line musicial table tables and in the tables of the machinery regions and the tables of the musicitian and tables and the tables of the musicitian and the statement of the tables of the tables of the tables of the tables of the musicities of the tables of the musicities of the tables of tables of the musicities of the tables of the musicities of the tables of tables of the tables of the tables of the tables of tables of the tables of the tables of the tables of tables of the tables of the tables of tables of the tables of tables of the tables of tables of tables of tables of the tables of table

Dyeas one of the workle most ferrougtionstratic physicals, has long desarred homes, and the second second second second hereing other second lists of a work-advert being the granitational field of a work-advert being most being the second second second results and being the second second second work and the second second second second manufactures and second sec

At the citize at Pencetaru Linkershifk in water to Advance Budy Dyson budied Celevale 5 paper. The antimetic as to so a up you water and the patient of the source Of occurs anybody can make up he over estimate an heat we might do in the next million years. In some ways Chevell is table anyone the source and the way it is less the everything company the way it has heat everything company.

But how does Chowell's star titling starts up against: Dyon ophene? "On it's rot wry ditient" his says. "My proposal is open to just the same objections: that it's ne possibility among a huge visitivity linke mo perscular teasion to say that one or the other is more likely."

Other acenteis hope we world do any star iting Solar astronomer John Eddy of Colorado s High Athyle Otherwiting and suffer of The New Suri The Solar Results from Savab LNASA. URSP. cmm. 'Loop below will be able to start husbanding the sun wall have to know a heat of a lot mass about it han we do now The thought of motifying the outer envelope of the sun space rise. It sounds like somaone telling me he's percent to take mu is not

The problem, "Eddy continues, "Is that we don't understand even though Crowell style we do the basic physics of the emergence gamentars process within the surperiorming ontexal surgery on a beaut the we don't fully understand trafferers are

Works still, in Eddy's view, see the charges to the earth is climate that belowing with the sun would people. If you after the suffic relations by tan percent youre done a catastropher turing. We have only one sun, after all and if our weikenlanted medding loads things up, we won't got another clamace.

In Critikelia eyes howover working about chmsto charges to Earth will eventualyba midwirt (byth ame serbe road) to work on the sair most of manand will be living elevanes that can be moved classifier to or torther from our new and in a scoordance with its rodunce. Due our of and conservative sentity parspactive with have waterbed

If it possible to go beyond even a solar system perspective in triad in the Russian interconter Nakati Randomina possibilitat the triad of the Russian energy and the subsider of the Russian energy and the subsider of the Russian energy and the sublusits of the plant. Type is culture on the Carl Hend, have at the usakes the power of their sam, here exemption in the power of the subtor control intercontent in a Dyson Successful control of a Dyson.

Criswell has suggested an alternate means to becoming a type II evidence. And effect as an electrought he has suggested a way to detect possible Type II cultures. In fact he speculiars that we may almostly have detected some

The key in this is the "meeting material problem Advocremes have allowed toge share not righter more set if under the providence appell of a help of meeting meeting prost bildly, suggests Chaved. The thether help of the problem is therein nothing opnotify observable out them it is institunely commission meeting meeting of our own galaxy and dhran is composed in fluctandod takes the allowed instantial facilities, shores and states of hy origin halk an and other allowers.

Whitever the falls of this or Chowell's other ideals, even his onlice adverse/organiths in thoughts are inspired. This really all impressive much leave Eddy. "His ideals are wonderful, excerne, heady with

Will any of what he forecase over tappen? I sek Dyson whether Chrowell's sair fifting scanario in absund. No on the conhety, the replies. This not absund enough impain while will reply happen will be much more suppliance.

CONCERNING WORL OF TERS-GRANN

ALLEN

White or call for a firer catching. "Alka-Bilmands Shot Corp. Belgarn, Wacemein 53(04 1-800-558-8623, Tales 36-002 Wacemein, (d)10, 284, 346.

tometang called the cheam helper roper ment A group of people are assisted to contate their desaming on an individual and his problem, which is never statist The day before the desamininghi, some of the desamas may medicate with the person or use bond take with him.

The following meeting while the pools meetings pairs to exclusit the creations, encoder a pairs to exclusit they demand and the pairs of the creation freed with a close call there individual pace of a packar. Yan'd be Create says in the spaced trees. This is this like the pace of a packar, Yan'd be Create says in pace of a packar, Yan'd be Create says in pace of a packar, Yan'd be Create says in pace of a packar, Yan'd be create says in pace of a packar, Yan'd be create says in packar of the same of the packar and packar. After same of main fields and packar of the same of main fields and decision for magnetic and the create to decision for magnetic and the create of the company of the same of the decision for a same of the same of the decision for a same of the same of the decision for the same of the same of the decision for the same of the same of the decision for the same of the same of the decision for the same of the same of the decision for the same of the same of the decision for the same of the same of the decision for the same of the same of the decision for the same of the decision for the same of the same of the decision for the same of the same of the decision for the same of the same of the decision for the same of the same of the decision for the same of the same of the decision for the same of the same of the decision for the same of the same of the decision for the same of the same of the decision for the same of the same of the decision for decision for the decision for the dec

Whan detaining about one working pottern, for eservice the group thand is recurring intege of water. It turned out the worken had a photes of water Decusion the various detern integes with the group heged har tools on how that photes came about not gave her the outsige to conader learning how to serm again

In software memory and weightback builds preserve and an exploration of a software prependition on the software of a software prependition on the software of a software preserved and the software of the software of the height on the software of the software of the software provide the software of the software and the software of the software

Because if seemed to income unpolian thoughts the distant-height stoppinment eventicated of ultipathy and seemed is continne. Soop heid interes minore lakes is board when the lake pathy was intole lakes to potor when the lake pathy was intole lakes to potor when the lake pathy was intoleing a bib agement. Even more capitors in the dearn holper altopathy was refletable vapo coded always at in to hotor

Initially Read was isolated about this repect of his discovery He throught he flad a way of resting per Buthie specific workly realized had the wat was a loss-than perfect tool



the per research. To begin with the bright periodils problem is other indiffaction, not easy to summarize an a single intrapy of drawn. And the dream hotpers seam to peck up on yout part of the problem. In addition the process of indiang the helpes desires to the target partice chail only with the help of the target hinteel, a subjective process that is most air then occerne

As an isotropic of the layers a problem inport takes, these lasks the aboys of one young to channel with the aboys of one young to channel with the aboys of the problem of the above the above the takes the groups aren't to channel above the when the groups aren't to channel above the above the area were to channel above the above the above the solution of the above the takes the above the solution of the above the above the solution of the above above the above the solution of the above the above the solution of the above above the above the solution of the above the takes that of the solution of the above the solution of the solution of the above the solution of the solution o

E however, the drawn holpor photomtrion down dockin motivatly and undoraccular in everyday life if drawns do indeed peek outside the world of the drewmer and provide valuable information slocal tha world is seems such knowledge could be out to most use in Other 47693.

Beakerbars at the University of Close tions in Spark Anal. Here, to Tray Terre band and responsing a collection of a laway's charge can be stread as informative as the lend of diagonalis informaers along through the strength of the stratewest. In one experiment live lambes we noted to aver, dhere dates and elso to get to a tamity intercent. Each tamity we noted to aver, dhere dates and elso the stream of the stream of the stream response and the stream of the stream elso a tamity intercent. If the stream elso a tamity intercent of the stream elso.

The experimenters found that in 70 percent of the cases, the dwalm interpreter agreed with the interviewing therapetity assessments of the termines provided additional information that had been undenced dear the termine therapetity.

But the value of the group-theremap concept set only in thereasy. There may be political reminations to the process of a group of people focusing their divates on a control proper larger fixed. We know that the unconscious steppes society if we can become eavier of this process we can number it and basies this glowith info some which was prophed comprehension.

These tream communities are just the start of an explosion ' notes network orgenuer Samson 'When two or more people get together to talk about diverse thats when the magic happens' DO

Asypce intervented in more inflamation about participating is dream continuities can write to Desam Natiwark Bulletin 333 thost Twrstyfast Stores New Hold NY 19071 FICTION

An angry little girl becomes the unwiting accomplice in a criminal's vengeance



ALLIE: 1981 It was Tureday manuto and being dark a law weeks after my birthday I was four waars old Mother and Daddy had namiverd, but Mother was still a control and knocked him around a and that's what happened that tma but even after she oot him to shut up they were still both really mad, so she took me down to the lake to benches and got out the piece of aming she always kept in her notive when she was with the then made a circle around the bonch with it. The storig was about terr was a lot amplier, and I had to stay inside if all the time. Than she want off to do her logg ro an old creen car with no one in white movies on TV, parked a little ways away from me on the gravel, up under a tree where it was

PAINTING BY CHARLES BELL

pretty close to the water. The sun was alteady gone and it was almost dark but I car and waddle up to it and stick its head of sources down and push uself the rost what happened to the ducks underneath but none of them ever came out actain heads-mailards-and one brown duck on under the car before Mother came back

When I lold her about the ducks she pola man hedrig in the car under a blanket rapped and skinny, and he smalled bad His hands wate big and red. Mother said the ducks would came under, where he Mother sed Daddy'd arrosted hen for the found two mellants seven brown ducks.

From the Sand City Tottler, May 9, 1981

by Tatlier stall writer Thom Homart The Tabler learned yeshooley that (worky-Chapterier colleges was arested Tuesday evening by Police Officer Mrs Misana Matton on charges alonning from the all

Ottow Matson who was recently proof chicks mere going upder an old car

She told her mother and Officer Mattern investigated, only to And James Patrick Dubic histing under a blanket in the back and duck peliets were scattered on the

pharass stemming from the elleged sale of new public and cars to four advice restau casts on the Perumate. The mateutietti-

Pagoda and Hil's Terrace Cale-have been charged with serving the sea guilt and Duck & Forange while the cals are

Dubic has not only been convicted on has been responsible for the deams of thousands of linsh settions sold for theu boautiful "polits" to the Messcart fur stolut

JAMES PATRICK DUBIC, The Trail 'Obto get the sury frinking about the dognap

Mother was yelling at Father, and he was whining back Pretty soon he'd start yeiling, and then she'd start htting hm. They'd been drinking a lot, like always, I couldn't stand either of them.

prog charges again, with that bit about Mixing thrown in to appeal to their rooten it was all builshe, I'd never had anothing against dogs. Or gats either, and he was twing to get them to believe I was killing cats, sop and that wasn't true 1d always a white and he knew #, but # shch I make to try to get me for the cats arryway

a tubber cluck. Withome was say him I hadn't been mesang anothing 1d cet me out of anything this time no matter

late Robert Tyrone Dubic had the habit of tilling with hall bearings before he used it unconsciousness. The same rubber duck

cal barred of birds in general and of ducks

at that sade about the detendant's feel been repeatedly beaton by a satisfic older been so badly mauled by your aunts flock of geose that you were horestakeed for

Putrick Dubic is just like everybody else He isn't But what he is is a man of intellgence and principle, a research scientist our national defense and a teacher who It wasn't going to work. Not this time.

We'l appeal. We some told me when ing that there was no way they write doing prepubliced the pury and kept you from get

Websome," I need, 'you know I didn't the cats officer You know I always liked dogs and cals-

Of course Jenny He didn't believe me even though he was supposed to be on my rate "Not the dogs and cats Just those

Bobery used to before they shipped him off to Vietnam and killed tem Bul I swore Witneme sat like I was going to get all the her hull-chain methar and her parahized lather who'd led about me at the dograph case ingli The benfund whitid written those owners who'd tred to put each other out. of buraness by accurang one another of from when they difficed me to get sea guils

All of them But especially the ducks

From the Sand City Tabler, July 3, 1983

(wonty years in the state pendentiary Since down by knowns have made sponoted of most recently by changing that the Tattion's crussiding echanisk unfarty provideed the jury against him and so precluded a fun their Disbics lawyers accompanied the latest appear with a multimilion dollar suit against the Tatler for kind and defension of character

We are very happy indeed to report that Duties a speak has been derived and that all charges against us have been uncondingnally dismissed.

JOLAE: April 1998 This was a ready for right and the air conditionar was bloken open Mohar was yoling all Fahrer on the was wramppack. Pretry soon hild bartyoling and then shaki wath filling him. They't been dimking a lot like slowys I was eleven and heryd been dong the same teng bar as long as I could remember I nov drift stand either of ten.

To see wanted the second secon

I didn't like the park much, but I oldn't have my menda that lived close, and I up Carmel Hill to Bath's house But I oouldn't stand staying home any longer other, not with them abilitighting. It would had some more to dress. After a while he just got gureter and quictor until he work drack at the time even though he got prefs. morning. That was okay any way because he had a right to get angry even if not at mo the way Mother treated ten She treated him like shit and he never did any held gotten nort of hit and droopy teopol and pasty looking not like he looked in typeo pictures Mother had from balors the accudent, when he still looked a lot like that kept bring me he was going to fix the air conditioner but never did. Only Father di

The sun was going away but it wen't guite dark yet Everytbody was coming in to share and surring in their diguacyclos. I had to be careful i could still immember watching Moher anreal that man who was lating ducks under his car 1 off had the cligpings, including the cere in this Califade where they seed I was the one who neely each time.

I didn't want to try anything with the

ducing contractions, where papels round letter what happened so where it involutions of couple and papers of a software it involutions of the software of the software of the couple and pawers out on the where on the outline of the software outlines of the wey they waited in calculate the docution of the software outlines of the software wey they waited in calculate the they may also be also be also the first the result of the software outlines of the they may also be also be also the first the result of the software outlines of the height one of the the software outlines of the height one of the the software outlines of the height one of the the software outlines of the letter of the software outlines of the the result outlines outlines outlines of the the result outlines outlines outlines outlines of the result outlines outli

groups and quacking at packing atoms in of the male maliands were doing that hing they do together when here all swith allow one of the Tartwin females without ever

I didn't diske the ducks—though I didn't much like them either, with their mean kitle eyes and the way they waiked around like they ware the most important things on land ?

catching her and then hey lake of the optime and near her through the an but will don't auch her, and a few of here wear law of the first system is the world here wear in a standard or the system is the world here wear the system is the system of the world in a standard or in places and beeing here paid exertised the first world here in the back down index with the world here in the back down index world here in a standard down law here is standard or in the first down law here is standard or in the first down law here is standard or in the first of the line is standard or in the first of the line is standard or in the first of the line is standard or in the first of the line is standard or in the first of the line is the standard or in the first of the standard of the line is standard or in the first of the standard or the line is standard or in the first of the standard or the line is standard or in the first of the standard or in the first of the standard or in the line is the line of the standard or in the line is the line of the standard or in the line is the line of the standard or in the line is the line of the standard or in the line is the line of the standard or in the line is the line of the standard or in the line is the standard or in the standard

Down at the other and of the lake there was an old lady throwing bread bruilities to the sware, but I dight think shed notice what I was doing it I wated until it was suit a title defer

Dee at two malands, a really pretry molewith a bright green head and a beg patch of shrry these in the side wate of a host patch of shrry these in the side wate of a host of with the other docks, per sort of feating like he wate half askep. Shoch he doch has been half askep. Shoch he doch has been half askep. Shoch he doch have pretry the make bet i hough the?

could be ten with a good enough shot

Bucketty ine starting door jime thing outdoor ow when hines are all and all outdoor ow when hines are all and all outdoor ow when hines a thread or the thin outdoor outdoor ow and all outdoor outdoor when all outdoor outdoor outdoor outdoor watch and hine words that had not all all outdoor outdoor outdoor outdoor all and all he words the not outdoor the watch outdoor outdoor outdoor outdoor all and all he words the not outdoor all all all and the starts of the door words outdoor outdoor outdoor outdoor one owned had all one outdoor one owned had all one outdoor outdoo

The deart lack like bey stackly do when the way close encupt to swin them oft, either A at once to wait a with them and they were all spanning and besting them emption and tyring bit way. Intracht I daw someting and byrin that, at which taked fault only it was not dark for a period of the the star and them and them at the period to test the star and them at the bas were running across the water peopion and firms to encode.

But one lonato-meteo the mothet, I couldn't tel-was footing with text both up and her canned logs teleform and the test lead tert and logs that the test of the lead test text of the test of the test and test of the test of the test of the meter and watch anywhere I could not so it mat the weed down to the footing and tabyed there. Maybe it was taking down there like as support butte

It was getting too dark to ase anything, so I beight a Big Mac with some money. I took from Mothol's purse the test time she left it around the house, then work home

When I want to the lake with broculars the next moming the dead duck was going located that the other area then. But it was there extend to area back after echod. It always categorial following and the model, away from the shallow water their duck and the cluck allow to end and in only moved just encught to keep inway from people on ther application.

That's how I noticed it, because when an equecycle carrs within mapbe (free feat of it. It would move sway to it stayed pat the carrie distance rawly, then come back as such as the cycle was gone. And it do the same theo poser with it bold

Besides, it rever divid or propried itself or seamed to be looking for food and all the other ducks ignored it.

They district seem scared, they just didn't pay any attention to it

But that was when the sun was shining As soon as things clouded over, it would start swimmers toward the other ducks, but when the sun came out again the duck always abopted and went back to flowing on its own sway from everything rise.

All escept one time, when a lot of reely dark clouds covered the sun for fifteen minutes. The duck started awrinning to
ward another duck—a male mallerit this time—but it didn't stop like before when the ser read score set form betwild the clouds again I was watching it through the bimocularit to see what if would do if it attacked the male

It swam closer and closer until the two ducts were mightely a yead away from each other then it put its head down like it was looking for food on the bottom and dwed

A second or two later the other mailable gave a sort of shocked squarek and go pulled under, just ko a garf arepping tufe had reached up from undernaafh end grabbed if in its give and pulled it under Only I briev it waam to anapping turtle, it was the other dude.

I watched where it wort under for a while, but there wasn't any blood or faithers, nothing to show a duck was gotting ideal or eaties under the vater except that it rever came up again.

But the minutes later the killer duck came bobbing up again 11 was all muddy and 1 rought it had been lying down these on the boltom esting the other duck and then had burned what was latt his a dog with a bone it is instead with

It preened itself for a while looking pretty and sity like any other mailard then were back to suntwithing

I want back to the take after deriver and just as the last light was going away, I saw, I make its other kind of attack. Only this time I had the binoculars ready, so I got to see from It worked.

It charged patilies are duck, only it doct stop when the other duck thosis got away and the another misie mailatd — there was both of them out on the when, just as ways—and the keller duck legat right on going tasks and bears with a both wood open unit suit before it was going to minter mailatil, when it part of all with a digital strateging tasks and to be a mouth duck a going tasks and to be a mouth duck a part of the strateging the strateging the strateging tasks and to be a the strateging tasks and the strateging the strateging tasks and the strateging tasks and strateging tasks and the strateging tasks and strateging tasks and the strateging tasks and strateging tasks and

The scissors want back in the later clucks mouth, and it grabbed the dead ducks head in its bill. Then dead. Only this tense it left the headless cluck is body floating in the water, and it didn't corne up again be lose dark.

I was there with the banoculars the next, day at summe. There was a cluster of bag water files I hadn't noticed before where the duck hed wanished.

About an hour later the water here deappeared like tehning like bolders yanked down by a big fait, and the duck bolderd of the surface is was all muddy, but it presend table until was clean, then swam back to the medite

Event home Moher hadn't come back at all kist right but Father was streamy welfor. I helped him got up and direased, that made us examited eggs and toat. He yelled are for spilling prune uce on his strict or i just loft him three and welf to school any' without helping prune lunch.

It rained all afternoon and when I want to the take after school. I couldn't lind the



Jack Duniel Disfillery, Law Motion, Prop., Boute 1, Lunchburg (Prop. 361), Tennessee 37352

duck, though all the others were still out, and il looked a long time. I want to some sporting-goods stores and checkels out that isking nets. They all cost too much, and anyway the duck could/ve out the way out with the scissors in its mouth. Basilde, I clicht seree wheel's duch attain it pulled the ducks under

The spacers meant it was some kind of machine or mighte a seal duck that had been changed so it was put duck and part mochine. Ike the berric man. So maybe it had a load of ways to beek out of the net. Like claves or a hocked award or something else holdien under its teath net it could use to chag down the ducks had a con the device.

I were home and checked Mothers purse built all her had was been therefuelding balls, and I was sure sheld robots of any wear making Built hah ald all systems and a fary ours pace, so loos three purchas and put her refusion in there places of Mould teel like she all had boot the teams amount of smore/whet the right one of her therefue called its akie if look 200% her to her she aller to our 200% of the wash Saurulay betteroor.

Mother had already decided to stay home with Father, so she said go alread, and Londed up meking twelve dollars

It rened the whole noist wold, so i stayed away from the lake and didn't get to see the duck. But I was glad I stayed away because them was a move on TV Sunday attendor that i wakched at Bedia incode ince issuabili Boy. with Robbe the Robot, where an net computer taken own Pabba to The management of the state of the state is the management of the state and the state of the state of the state and the state of the state of the state and the state of the state of the state and the state of the state of the state and the state of the state of the state and the state of the state and the state of the state of the state and the state of the state of the state and the state of the state of the state and the state of the state of the state of the state and the state of the state of the state of the state and the state of the state of the state of the state of the state and the state of t

By their loss increases means your Meanery process and baylow they to bey an entities of the the only way in it spaced out in cach the address and many and the spaced out in a state of the address and many and the space of the space of the address of the space of the space of the space address of the space of the space of the space address of the space of the space of the space address of the space of the space of the space address of the space of the space of the space address of the space of the space of the space address of the space of the space of the space address of the space of the the space of the space of the space of the space of the the space of duck back on, and then it would get me but I duch twant to give up. I really needed that duck a lot

A few expectation of pottion of pottion of the expectation of the expectation of the expectation of the pottion of the expectation of the expectation of the pottion of the expectation of the expectati

This has to already seen it do has has hyper thing where it came particularly out of the water to shake the other docks, so have it dogged the other docks under or when it do is them there. Pertops it had beginness had been in the writing at much the hooks or even seens from other them appearing in cased to instrome them them appearing in cased to the top of being appearing in cased to the second them.

But the real thing wrong with living to catch it at right was that I wouldn't be able to see it without a light, so I wouldn't know



while If was clarge, And servebody might over a light and context birl do what was dong. So I limitly decided to pail in our some neurong when it was not shore, put what he mun came up but, bofore the duck what neuro came up but, bofore the duck and ready to achieve on a non-That way, maybe river, birl the and the way turned our and wan if it was, maybe it would just own back our to the method and start surbatima is little early.

Then one in ght I saw it was down in the most close to shore I had my tan-galao can, some faster type and a heavy khale sack from the army naxy surplus tote in somebody is hindge I had a little water in the doil in close the duck needed &

I went to the lake early next monting and wated for things to get bright out. Not many cars drove by, and hobody paid any stren ton to me.

When the sam came up word abor the dock. Thus caugh a large that it possis whidock it also a large that it possis whidock it also they gut interfaced back to the unstand a memory being to be not caugh a out of the bottless that is come are of backtop and more. They do not not all back to address that and the the source of backdock and the back to be address to the back to be ready of a source to the back to be merging and source that the back to the merging and and it source that the merging and the source the source merging and the source the source merging and the source the source merging and the s

A real helpsche cene by, going a lot lauter hear in was suppreved to i neal rood walls protenting all was doing was looking at the water. The Percebe weet by without even allowing down, but new i could near another can over on the other sale of the label, the Linver the other sale of the label, the Linver the other weet prefet up and latering of lowand work and the I hait in drag the clack in a bit latter

Pretty scon i doutd use if and it wen't s outs datif, mere like a big pisce of wood a binneh flowid is vant leng and a outpied inches (Inck, with Jour or like breakmolt like branches doking out of it. At lest i hought it was pair a branch fiel emogene bit them i see that the lity pad dama campa out of the entities of the breakmolth.

We note as I had the later to do it the more than the second sec I put the blac in the caru, but the large variant like too cargin and i put the start was so bits now to open muticans that was so bits now to open mutations and the start was so bits now to open mutations and the start between the start but the data the start and the start but the transsergent completes made things but on washing to the start but the transwashing to the start but the start but the washing to the start but the start but the washing the start but the start but of cabeen with park and the start but of cabeen with park and be start but of the start park and be start but the start weather the start and be start but the start weather the start and be start but the start weather the start and be started to at

When I went inside and closed the door. I could turn on the lights and notody could see the from the house.

I put the ten gallon can uncler the workbanch, behind a broken television on an inbody could sain it and se even when the door was open the light how cuties wouldn't cut the can to been planning what to do for a long time, and i had it at foured out or most of it anyway.

I thought I saw something real bright like a knite-blade liash Then all the females were flying off and the bables wire running across the water, and trying to escape?

I even linew whose cluck it was James Patratic Dulks's the one it herped Mether arrest There outkin's the way papels who haved ducks that much, and some of the clippings taking aloud how errent the way and how good he way with computies the figurate it out for ear that three I saw The investee Boy.

Alterward I got my dippings out and studied from so I could be sure what he looked like and loop in sigs on the people at the like but he want over these, at least not unless he'd phaneed a lot

Hocked the shed and left the cluck in the dark unal Saturday right That way if it had solar batteries maybe dray if run down enough so it couldn't hurt me even if it waned to

Solurday right before Mother want to work I saled her what'd hoppened to Dubo. She said she disht levow hei thet she could find out if wanted. I said yes it was only an thirty when she clove away, so it wasn't day yet

I want blick to the shed around mine When I unlocked the door and pushed is open I shore a fashlight inside balani I want in and suried the real lapte on but the dock was will in the can i closed the door and chagged the can out, then pulsed the big can of it i etyped by the door so i could run away if the dack came after me then i furned the lights off and used the hashight while I dumped the duck out of the tack.

It were set at big longs to trave too the must and taxes at big longs, the trave too the must medit at been at big longs and thursed on the big big long works, but is at at dath to with the provide the travel of the big big with the travel when it poked to be an with the difference of our travels, but is big to be handle is alway at regits with the initiate on, where was could

Egol II black in the sack, then pushed it behind the TV again

Motive weight from all ling to one can be obtained on the set of the set of the set of the constant of the set of the set of the set of the constant of the set of the set of the set of the constant of the set of the set

It was admost direk when I got home but Mother and Faither were still out logic with lever threads. Forber was making nastly commercial about Mether every new and then I clicht understand everything, but could fell when cometing was mean by the look or Mother's lace.

Lasked her about Dubio, but she said she hadn't had a chance to chock yet and she'd limit out for me Monday. Lasad I had homework and went to my room to read about ducks.

Monday she chirfl go to the station until liate lines beliefter I was ack and couldn't go to school buil shi has a hargover and got restly angry and hit mo. She cas she had encept and participation in the house withoil mo pretending to be solk when I weart to I had to on

She wasn't home when I got back, but deald put Fahler's wheelshat by the wedow biccause there wasn't anything he wanted to watch on TV and their way he could love it the brids and towers if he don't faal like example couldn't get in the eventues on even on



where buy hading regular breas a graganous mammals in tight-knir lamby groups

A the lead of the Certainance Period here an applied to the of the period parameters and the second second

PAINTING BY RUDOLPH & ZALLINGER



delicate hands and big brans the mights homed ceratopsids-all were oblitimized The cause of the depailant Gamarianthe theory of clottly by glaciation, the superrova speculation in which all explod causing the atmosphere to cook the me bardment poetukale oblering neutron-pro-

Then there is an idea put loth by paino bologist Nobert T Basker, often considered the most scenoclastic dino hanker to

clases. It was because of the Great Cre-

Balduot a professor at Johns Hopking University is referring to large-scale eps ments. Data show that extrations-and there have been ten big ones through geo trients, allowing formerly separated specass to minole. The animals with no immupo protection against newly introduced predators, samply succumb

when the whole stockcod smallcos? the Congo? Bakkor asks metonically. They all dropped like flees " Likewood, if at the and at the Creteceous Period 45 million

ordination. Bakker stadi So 6 wisini a oment the in Montpole many tmea Epidemiologically specking if you and put ithem in Asia and vice versa init prelecentology-disease menagementthermatyse couldn't understand

Linderfyrm Reiker's hypotheses a rad-

The best way to be attractive to day care " Reider care "is to have a warm body It works like an incubator That's one eases. That may evolven why works sou care of the crocoditions and turked sur

eas employed by suplias and amphibs

61 cap tell you why the dinosaurs went extinct It wasn't the zap of a supernova or metoorite It was the Great Cretaceous Diarrhea Attack. And what caused that was tourism®

Www.blooded animals, on the other hand are tremendous energy con sament-guideng down tusi like timback dotherme stable core tomporature fin has ing the arimal to survive colder climates tor action. The big question powed by pa-Increasing in Doos the capacity for its spent linding and then consuming addr

the Mesozoic Ers, which includes the rocts. For a decade paleontologets have

been divided into venous camps along the edge he needed to drive back the pro-

in avoint years however new discov enes may have accord the belience in his is a complete dinosaur numery evidence gatorio River in Colorado peologial Martin made by a large herd of circosaurs about 140 million years ago, during the Jurassic dinosaurs were highly gloganous sooth creatures living in structured groups-

pold-bloocked lizard is a tradition handed tumos Bakker) An early minetoerth cen-

History, in New York City, will make obupright closer to beds' and mammable Advan Desmond in his classic fand ob-

But for more than a certury the motifs model of deposaut kie remained preffs tests began to suggest the marrinal as a prevedicem for the chrosiaus. The last much mply a 'high metabolism' Upright pos maximals but not repairs. Furthermore, oism of an endotherm

Across the Allertic, at the University de

mend de Ricoles observed that bone m the active regions. These blood bearing structures, called Havesaan canals are sparse in repsiles Ricoles found that derosaur bone contains numerous Haven san carely, but the French paleobiologist

It was Robert Bakker a Yalo student, who Sevences he began publishing a sames of papers that need powerful arouments

cay should be averse to dirt, oweek and among drossur scientists has been a or's throats With crews of shorig singlemended men they made forays into the 'Men descried to the opposite camp and paranoid, franko war of egos came mighty

hope path of the 1000s . that westman of Homer "You wouldn't want to meat him at college prolessor from the Filtres Insteed har down to he west blacing eyes

And fire soil races in the learned detroos lik the time the Severables railed logist Date Hussell Should have been on between the pro-warm blooded factors M2 CMN

There is number of experts look highly so ones expectally Backers. We carried but

malian chavariam ' To that to responded 'i am a compatied hemetrohilac. When read [Nacling's] 'Risk-tike-taw, 4 root to the stake ' There is nothing devecutable reptile with a low metabolic rale. And yes make the bioenergatics of mammals soon ism cave them a shight edge--on land

With crews of bold men they made forays into the badlands, where spying, thell, and betraval excavation of the richest fossil sites in the world

But fives, in late 1278 Jack Horner of of 11 beby cluckbelled hadrosay to umbind uously growing chock toeth capable of

blooded. Homer now says in his bluff beby hadrosaurs had been eating and way back without parental pupervision Did hockpour mothers. He statistics

a trait of mammels and bads and rarely

ordinately long time or, more likely, that this spels endothermy,' says Horney

changed his mind "Jenus, friend's nosts inverywhere Jacks working It's magnifi cerf Youre taking about an animal that adds. There's no kwing reptile that carr

Also strangthening the endothermy case hadronaur skeletoris. 'In man artice he is and in the fetal stage when bone growth

in the two years after his shouldnd. Ho ner seturned to the sale often once de found By 1982 he could report that the technisure returned to their site year after

At the same time. Homer exception a hypalophotors These little beasts sava Homer like the hadroakuts probably retrainally lad in concentric citcles with the sedment When the egg hatched the try hypatischodon would crawl out the top. twosion did not stry in the nest like the

worthy, suggesting that the oflighting remanual in the optimy or telumed to the resting set frequently perferres assembling in bridike oreches for protection Effort case suggests is good amount of particial date, claimedy formseptian

A terretal evolutionary inserve to a terre of the book ways for species to problem. Is for contain gands to species to problem. In second the species of the species of the species ways of the market. Says Bakkar "Therese ware to be market. Says Bakkar "Therese of start has beaching ways and breeding of the market. Says Bakkar "Therese of starts and the second second second of the species of the second second portion topicarize for the second seco

Bibliot company Herrier's dropping to the eleticit and the most take basiser a tag ground fourt that was boesd to existing most that the most basis of the second most are observed in structure to character most are tobered in structure to character the basis of the structure takes to the basis of the second takes the structure takes the same was memory and the structure takes the structure takes the structure take takes the structure takes the structure take takes the structure takes the structure takes the structure takes the structure takes the community monthly, structure earlier takes the community monthly, structure out the basis of the structure takes the structure takes the community takes the structure takes the structure takes takes the structure takes the structure takes the community takes the structure takes the structur

The second Basel Scale of the Hospital in the second Basel Scale Scale Scale Scale Scale and Scale Scal

Ostriches have small brans. Bakker consules its been straued that super-tain growth in wein-blocked ammatic can be accomplished if the constant is willing to selection brancower to read Phous. Sanlarbal initial power to read Phous. Sanlarbal initial power to read Phous. Sanlarbal initial power to read Phous.

Further proof of salaropoid warm bloodadress may have been tozan in time in Lookley's Junizac trackwave. The Junas

LIQUORE ITALIANO

Hales Littmen, Or some of deaths section park on a Weiger of sprike and a Net of strange Very Section and section and a patient model sprike soft and and a section and being the press Trains Actual SP relations. so is the option age of the sourceosts if yoe, provide the Mostocore express in the Debatework you wink the Gend applications. The the source of the source of the source the the source provide the source of the source to be units optime on the solescet of the you wan and immed by thick, charat dee commonsus therespots and three toods they do that source of the source with some commonsus therespots and three toods the source source to the source of the heads and three toods the source the source of the source of the heads the source of the head of the heads the head source of the head of the heads the head source of the head of the heads the head of the head of the head of the heads the head of the head of the head of the heads the head of the head of the head of the head the head the head of thead of the he

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Luckey trackeys ad readers to the tracy that cheans were projection, to call creatures — a characteristic of mermics bun right creater that the acctance three and lack here have using particle to at least 200 years. Luckey caps and "the solar a function walking particle to at least 200 years. Luckey caps and "the solar a function and the testooper we provide information and the testooper we provide information have folge to the solar 200 prohading structure — pattern affirmed from heading structure — pattern affirmed from these folge to the days a controls.

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ation, Lookiey adds, reflects thiremp enorgy requirements Large maximals. For mstance, must consume their own weight in loodbeery nine or ten drys, whereas a big moder-day replies such as the 150 pound Komsolo kastd of Indoch na may compute a comparable and and such the such that the the hown base as warm bloodbe do as my kas-

The range of new wakence movies do neeur classification more officult han ever What were the drossure waywer clock booded regimes or waine blooded mammels, acid clacoded mammels or when blooded regites or terms available water blooded to the loss current form? The provided of us contrainers or interaction tableparts or whether have no analogues tableparts or whether have no analogues as the case balace is concerned on the able or as balace is concerned on the statement of the statement of

As far as barker is concerned drive source should be removed allogathor from the class. Reptills and reinstated toxonomocity as Dinosauria. Today's system is not only per-Darsevan, he says ad-

Wou're taiking about an animal that weighs as much as an elephant and that's growing as tast as a whale There's no kving reptile that can possibly grow that fast ?

manity, its pre-Prench Revolution "This problem welf classifying chicosauth as reprise is that this guit by association. To an average person, eighty means a cold bloodes, scaly lakard And to any Tatl chreasauth and registration person of them heads all this imprends of physiology.

Homes however, these this blocked or the oncourts of entry regular methods on the oncourt of the methods of the the oncourt of the oncourt of the the a dinatosi on more permitte but disk the comparing an opcium with the a dinatosi on more permitte but disk the comparing an opcium with oncourt of the oncourt of the disk of the oncourt of the oncourts of the disk of the oncourt of the oncourts of the method with the more back to the ongin frace in lace opcing to freek down Disk of with the more back to the on-Disk of the opcing to freek down Disk of the opcing to freek down.

Natiolas Hoton III a research curation in paleobalogy at the Bmithsonian Institution in Washington UC, agrees that no replacefeators relegand. "Noi ve pot the replate morphology right there in tront of God and everybody when you study the

bones," he says "It you can't make the case on morphology, then whether they ware warm-blooded or not has nothing to do with ti".

"Heimin annual dospit contro to drive tau endotramy in suscentres la liteny of instrumi menta — Initi to drospit a production of test list privane with head generated by the moustain test movements of test may affect. Cherrison Least may get these marrindam test distants on the stage inters. Other susce "But lots (both than idoopsitual were activation on the same long ingline list is distants on the same long ingline list is distants."

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As a sort of alterhought Bakesr was asked who would where the earth should humana and other primates desposed

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Bei tau de parresso and within ter mition yaurs isocons wit be getting boger, more social, and lagar baland in their bern baan size notested in her evolusomer hetsory just a the liker their partials, inside in their balanting crocks together making tools justing and participation index i usated imagine a viete environment index i usated imagine a viete environten in the monome. Prevent of the Haccosoff DO CHILEAN

CONTRACT/PROMINELLAN

The nearby mystica aren't terribly popular at Carto Toblo. The www.en of a few astrocorress work on a portice near one of the spinula groups, a tied technican said during his michight leads. And some of these chrosostem told heart leave showing that, hear were interfering with the column yetrooms from calks space.

But the automotion and the Yoge have much in common an observative solution for sites at right attraction and will be a pertore the analysis attraction and will be a pertorement for attraction. Can ensure and be cominstance automative and the site of the cloudy right settometers to could do not have multip compares. An approximative aparticipate could a mode. Solution on choose any compares and approximative aparticipate could be appreciated and approximate and appreciate and approximation and an appreciate the approximation and an approximative approximation and approximative approximation and approximation and approximative approximation and approximation and approximative approximation and approximative approximat

There's a chance that persent under stancing of quesars and black holes will prove as anothing as the green disease theory of lunar tandecepes. We have to adapt we get a lot of contractory morcooperative data when we tell attost a broad cosmological perturn says Amo Andeburg, an the La Bin atte of the Biol.

Anteburg points out their high tech ar

toroomy in other a battle of compeny, onebidescip--on-topic to the universe bidescip--on-topic topic of the universe ple software extension in a gate of the universe object the universe main of expansion, collect instances and the universe main of expansion, and the universe main of expansion. All the recent universe main of expansion, and the recent universe instances of the universe recent universe instances of the universe recent universe instances. All the universe recent universe instances of the universe recent universe instances of the UNIV Weight and and the other of the universe and software poperts to a Autoincement access may poper to be Autoincement access may acception and access of the UNIV Weight and acception resonances and access of the UNIV Weight and acception resonances and access main access may acception resonances and access and access and access and access and access and access access access and access ac

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If so cosmologists will have to age the onserve in a harty But Ardeburg entreakly to beat the drums about the new findings while abur fauld stats that we know are



not vory old but have low metallicity, he says with a touch of despiportment. So this shoets the nice predictability of me which we wree counting on

These are the lends of contextually concepterates design that make Andobulg so catalogs, almost passimiliar Andobulg so catalogs, almost passimiliar to the second passimiliar to the second passimiliar to an even a service my Andobulg in more like and astronomers task in first radiu acted astronomers task in first radiu acted astronomers and incode site and astronomers and incode site astronomers and astronomers and astronomers and astronomers and incode site astronomers and astronomers and astronomers and astronomers and astronomers and astronomers as astronomers as astronomers a

"Is passes like write in a seekal galaxy but the internets is not all hall collected you lise & all objectively' inclused Bala para Redeman, internal US addition met fram the Lakewindy of Neuro, Owny a document of the second second second and an additional second second second balaxy of the second second second second the Second second

Schuster about a know Ho started working an the La Bids into of the EOS Is yearsago, when not even calcus grow on the bores. B COO lock, moustain Today with a bought of 550 million works and a tradition staft of 150, La Sala could point for a twonorus Apane sect. L occode OS mills nond Carto Toboto in down, men discillate terme. ESCI in the body.

Behaviori also deveted more than ten years as a tell extensioner to the penntalong and unglamorous job of memory into Southern sites. And ware though the discovered hour new contrals in the proease. Nais not a between in spectacular behaviories. This better to take timpy graduaty and get a strong scheducal base the airs non effectiver.

Suit addressmen his Schulter con put in more lialization plane in Chief Salazi an collasgues in the United Salazi an Europe But, they also unit in an six of becoming interns of light-operation in interfaces with their steep by day and her work to inspit They speed house previous of interfaces with their steep by day and her work to right their steep by day and her work to right they speed house previous of the work to regimance hashing as that www. The lawy is a transmission work work of the lawy is a transmission work of the lawy of the lawy of a transmission work of the lawy of the set of the lawy of the lawy of the lawy of the lawy of the set of the lawy of the lawy of the lawy of the lawy of the set of the lawy of the lawy of the lawy of the lawy of the set of the lawy of the lawy of the lawy of the lawy of the set of the lawy of the lawy of the lawy of the lawy of the set of the lawy of the lawy of the lawy of the lawy of the set of the lawy of the lawy of the lawy of the lawy of the set of the lawy of the lawy of the lawy of the lawy of the set of the lawy of the set of the lawy of the lawy of the lawy of the lawy of the set of the lawy of the lawy of the lawy of the lawy of the set of the lawy of the lawy of the lawy of the lawy of the set of the lawy of the set of the lawy of the set of the lawy of the set of the lawy States, 1 the wire of one shall member announced. And 18 be coming back too soon. Like local mysters, salanonens in Chile orceione a lot onloady.

The Boding at Cherson roles servers like objective the high-based shadpery. On a typical evening, when surfacem comes at the Situ and concernent unable on trap weary material of lakes seaked, it to absorb the boding water when sould all ameliade Situ boding water when sould all ameliade Situ waterhand advected to transfer galaxis across the sky. Occasionative source that acceptant wear when the plant of the search acceptant and unable of the search acceptant and acceptant being allows acceptant and acceptant the search acceptant and acceptant the search acceptant and acceptant the search acceptant and acceptant them the variables bask into his field.

Direction has facultum. Close stands durations also distant/reliable contassad with a rangle period of key period Dizzleg overlations sudding without to drave to the stange of Bartery's reck altime mask school Scriptioner consider tarbinet and reliable standards that has the school reliable school school to be and barther and reliable school to be and school and the school school to be and school and the school school to be and school and the school school to be and school to be and and the school to be school to be and and the school to be school to be and the school to be and school to be and the school to be and the school to be school to be and the school to be and the school to be school to be and the school to be and the school to be school to be a

Sundown inspires a different song among while-tobad reclusos not far from the observatories. Within two minates be-

low surreat they galler in an unodomed sanchary. Siting cross legged they but wood, perinde bitter noe, and dhed oow dung inside a copper container while dharting Swelich tymmis to Agni. the good of they, in emulation of a Vedic ceremony perhaps 5.000 verses old

A band under the guidance of Hindu mink Visaart Paratipie is one of ervenit groups who mediate in remote mark vallege 40 million and of Cerro Toblo. The meeral bad by arows high in the Andois, carvie through red and yellow mountain walls reminiscant of parts of the Recisionough the Andois are higher. The vallege nairower almost clausifoldholo.

Interactions in these Anders values bebeen they loss in the world's particulation the Swerr Vasion in calls the order of Chief Tetoparty have index of or principal sectual central. The the Swerrage and the intermets Socially of the Portician of boording in memory. Biological the Portician of boording in many biological sectors will be boormarkly sector sectors will be boorteen and the sector sectors and the Swerrage and the sector sectors and the feature sectors and that not sector the sectorteen and automatics, and even the selfatocenter tions (come Table).

Tribenan larmas have ochre to this veley " says Jose Vega is typical haidanou prigren living with two living och of them a German writer named his in the upper reaches of a remote Ancient carbon. They say the light that price illumined Tibet has come to the Andes -

Not even electric light eluminos Vegan century-old adobe shack. Sull Vega and his trends will put up with a live inconvel mences to live in the neighborhood where Tribean lamas are unrored to live.

These mythical monits are said to motitale at ethemic heights in the Andres surnounded by a self-sustained fance field that protects them from among other thingsancianes and opmetics

"A military plane apotted a large monsatery near the Argorith border" rays a Chiloan navel levernar which has set up he lert and prectoes yoga next to an ray steam "But which it tied to approach its engines tailed."

Would it be possible to rent a plane and find this monastery?" I ask

"Lock." The insularized says sympathetically, "only papple means to find the monastery will find it. Someone like you just interested in the external aspect of public to be a story, will never make 6.

The American astronauts who much ensure to tack down 'Ob, two heard that aday about the byths in the Christian Ancias and the Himskiyas, anawais a witch board operative an NAUM who higher DC, ollion After a long search. The back slops with bosk Underwood head of the Photo Interpretation Lab at the Johnson Space Conter, in Isolation.



*It's the flat accounts on one of the activity density factors flat accounts for the engine of the imatigate and the north of Chein. Like imatigate and the north of Chein. Like intervend admits. They are just the northout of the sum at a patrosite angle. If heppens now and again. This could assi because the atmosphere token and the imatigate of the Andees because the atmosphere token are very time of clean. Once we explaned what was happening. The astronauts rever methoded hand again. 1

But the Lake American press tax mentioned that adapt and adapt and the entervasit's sphrings some to contern tooled that adapt adapt to a forester a former of the sphrings and the sphring adapt meters the the explicit sphrings to be Ander Frenter spectra between the Ander Fre

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The initial impression of the free perim more in that the smell of burning cow dung is as bad body as it must have been 5 000 fears ago Of ocurse the Sanskit hymni disclose toward the tun and whole cosmos are southers. Not all the behaviors over them a Yougu cate we find perform a similar car one we find perform a similar car encry to waknow the rang pure Arthouy empti and Bleist ND who wells on the watch of Elastern thought to Vector to encode a size those settings in that can physical and respectively in the can be respectively and the size of the encode of the size of the size of the encode of the size of the encode of the size of the size of the encode of the size of the size of the encode of the size of the size of the encode of the size of the size of the encode of the size of the size of the encode of the size of the size of the encode of the size of the size of the encode of the size of the size of the encode of the size of the size of the encode of the size of the size of the encode of the size of the size of the encode of the size of the size of the encode of the size of the size of the size of the encode of the size of the size of the size of the size of the encode of the size of the size of the size of the size of the encode of the size of the size of the size of the encode of the size of the size of the size of the size of the encode of the size of the size of the encode of the size of the size of the size of the size of the encode of the size of the size of the size of the size of the encode of the size of the size

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One of the impact operations runking of the static biothemic where of the universe is that higgs in who wonth house hause to dimension in 30%. To assume that is the other who can be as a function of the weat where modern backness was functioned. The state is whole the calculate calculate the state is not assume that the state of the state of of a set for state of the state state of the state of

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Absurd? Mayba But sutransmens as always coming up with specificular new day cownike like quasars and black holes that suddenly make preconsisted ecretific cogmiss obserter. That lonely astronomia at La Billa. If he looks long enought might and his Black Magae Wennin DO

Make the day special. Give her a bridal set as special as your love







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ANTI MATTER

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UFO UPDATE

used receiving system and lister to the stars

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In bottenation, Aberta, torinotance alectronics rechnision Bob Streams Subdies the Arrainer Radio Astronomy Observatory and is now searching the skess with two large motowave dishis in Chicago, dota analyst Robert Cray, is Durkting a Streaming device sample we except to decise a 75-was light bub as for oway as the sub-And Hen Brank Kint (and Aberta). Still Intervention Control and using it will be possible to better thim at any time and by quarternet designed to pickup signals at the rank broquency of 1420 migsterits, the nerveal requiring of hydrogen. Since hydrogen is the most abundant element, if the universe. This enders as other owners any himlanded sender her messiones by that source.

When MARA begins to Sam SETI graves live in a year will use a instruct capacit of nonzong 74 900 nase Instructions simulationally. And thereast physics Plau Instructions simulationally. And thereast physics Plau Instructions when the same simulation of the same simulation in search only one lifetoxong is a time, seen pays to comparison that the separat dant loss care no.52 fit instruction. When a invasions in the real, stop Honoward weathing you build all instructions are now. Same with the second togot angle much chare of the adverting build water togot angle much chare of the adverting build water togot angle much chare of the adverting build be adverted togot angle much chare of the adverted build be adverted togot angle much chare of the adverted build be adverted togot angle angle much chare of the adverted build be adverted togot angle angle much chare of the adverted build be adverted togot angle angle much chare of the adverted build be adverted togot angle angle much chare of the adverted build be adverted by the adverted based based by the adverted based by the second based based based by the adverted based based based by the adverted based based by the adverted based based based by the adverted based based based based based based by the adverted based based

With black home nmmed glasses and a dialect of com puter-chipese tind has disadly pumped \$10,000 and 1,200 hours of work into the design and constructor of his own \$21Th padgets

All the react of profile setup are a bouble charanemeter setuplines and notice settemportal setup and setup and setup and give profile setup and set



CONCRETE AND IN

Loss as the the statutes a bootshift approximated in investigation of 12 allegably heuried public located innovation the United Kingdom A prize of £1 000 was oftened to the public were whose oftened to the public statutes and wesigations to be a will of the personner all schedules

The ghost burriers carry up empty-handed however and Teacher's donated the money to charty. But the doesn't incossanly mean that phoes and poltergetist don't reaco in some Batah pubs, accord ing to be least one of the rementanting.

Their west many the stances where we loand stances where we loand hourings incise Dates Delivery of Exhibitin University. But a proper investigation is finite-consummight – throwes throken down states and inying to owne up with a normal ocuse for the events. And those of us who periophered in the Teacher's ghost hurt were at each pub for only a may and a mont

Deletery says teal in one call, writewass the rates highly cendible reported bases here around the norm. One man was synds in the head by a two able reports of the paraground industry of candes i basy betternog but design the two paraground on hand

"We sai in pude and wated log appantis. We logised to appantions in celtars We sat on bods and weted for Victorian off-she to comments sectors public ity director Devid Dormon "Apparently ghosts ust don't fum up on demand

There are strange things fone in the codhight sun " Robert Sérvice

ALL MALE PART MADE AND ADDRESS.

By 1987 the calved barding estimative weld had beeding toppassed Autors Tarea. The reason A progra do yetow tower had shad of most of the position and the place was had before into a place was had before they comed for a minick to gravel new societies and their interported.

in the spring of 1927 coal newpapers reported that the none of a implicit as any provide the spring sector well (become) and special of the sector status the channed body of an size nonports seat wise body set in the control body and a posibility was exponent on the soundstry and a

For this paid, 75 years (FO) investigation share said the crash wak a halo do agreed to bring the currows (b) years But show Walter Andruss an investigation for the Musual LFD Network (MULPON) is investigation for the Musual LFD Network (MULPON) is investigation to adds have provide their waterwork or adhed which is main-the deal

Andrus clams that a screp of metal was tound real Process s we'll by MU FON investigator 84, Calille The metal the adda, conformed to the shape of the stone in which it was decovered indicating that it must have been rearry motten as it huitted down

Diginal Provides provides the provide the standard sector to the sector sector sector they may be the sector the skills can be revealed that the sector sector sector as easy to varie the polytem and sector sector sector sector sector the set and sector sector sector sector the sector sector sector sector the sector sector sector the sec



ANTI MATTER



FEBRUARY AND IN

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To grow the grass Hard no periodic a betteleum based achesive own hal carand clothes. Than he sprars seedings onto the posts and puts cluthes and car hob a seel. The test he says, keeps the objects most while twee here like crazy, iour innes a day ariging to he seeds as 1 go so they grow fasse which there in a

Right now Harding acmits he's most interpated in the effect that grass clothes Have on the weaker. When we are only a person weaks a creas such the points out the can feel the roots growing through this factor. It is the only instance i know of boding enclosed in a living thing offer than the womb the keys. "And Thind 1 makes me were carry.

Harding in fact test subdid pro bavkin fact Hendley to bowkin fact improver Hendley is boot may be a sub-test and ball lang a getware subresponse mach ne Heading found that the bewers sub-tegtorise mach ne Heading found that the bewers sub-tegtorise heading when energy when he was wate energy when he was wate

Che day Harding perdots the presideal acplication and dots the presideal acplication will be realized. Receipt with wear grass in home after a hard day a work. Postean proves will wear grass harmos at halfane. And he adds advocuss will wear grass in apabe to annut mem of Earth.

Toward the day Hadeny has now prived the tecture circuit don'ing his grass suit the speaks in shopping maks all over the Unset States. Recerrity the admiss one skeptic chosed him ansurd a Kansas fathers matket for four house with a litem mover.

Asles (ut of his bands) Writes in the avoidades babies in the formations!

You are a fuke of the Universe You have no right

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ATTRACTORY AND A

egond has - that the comprete of Allamos wear weighted from the faces of the darch loy a great faces that how exponent and photog higher Richard Wingste hes another theory The Alamteens clight variation they and valves of optimises around the work's before the optimize the Val-

Wingale came up with his theory while visiting the Church of Mana Avefadora is seriod. Essador where he found mori than 7000 After giving the matter a bit of include, he recalled the work of zocityget J Marson Waterline Accord and bold starting and only and bold starting and only and bold starting and bold and bold starting and and and bold start and sense the optimized sense and these defaults and the sense of the optimized and the sense of the sense of

Résearching Ihis hypothasis Wingate soon tound a number of legends de sonteing gods de founding lathes both of 4 genat people in the Artania Opdan The Artao art Mox



Ancien anisada men se linea anound the vorial Bondo in a sheady ti a bea prest. Rev Carlo I result The objects of the second Epipolan murry bases Photonican corendars Motamisas herds and in Habitao corononial bis decorreted with hippopolamisada patading lowed tim debis. Except explained had been bound in social

To Wingste the objects posed a problem. If excent folk/ore offered no evidence of insvel to the New World how child these relics get to the sunctes of Ecuator? Eto for exemptel call the fact homework diatan me trobs of Peru speek of Ananzi and the Vendussian Pandar and the Vendussian Pandar additionant Vinder the Stream and the Vinder the Stream and the Totic Experise found to the Call the Store to the Vendus of the Store to the Vendus of the Store to the Vendus of Lagrant was part of Lagrant and Lagrant as the place will vendus on the Store Store Store to the Store of Lagrant and Lagrant and With Store Store Store Store Store as the place will vendus on the Store Store Store Store and the Store Store Store Store as the place will vendus on the Store St

-Peter Rondinione

The earth is just a safy ball " —John Updvie

ANTIAMATTER

MORPHOGENETIC FIELDS

Week Republic short have published in 1981 Wake magazine candidate for burnery here candidate for burnery here has been for many years The Bridsh buchenst sup gested that the function rang organism are onthin most burners able in monthin quarters beins that which one cross burners able in monthin consists beins that appear.

This theory posits that if proup of animals learn a behavior other proups in other parts of the world might sponsaheously the velop the same skill.

Now Declarate is testing the theory The focus of the experiment is an embeddeed figure test in whigh subjects are advant to identify a single image finder in a commissiphotare Only a law people that see the holden figure in test these simples and height has a simple and height has a simple



his teacry by capitalizing of this fact. If Sheldrakes theory is correct once a large group of people repopulate the figure, other people should begin to use 1 more stability as well

b) control to the second se

people successfully site the embedded ligure after August 31 Sheidtake says end it has increase is gradi enough that would sucport the hypothesis of emough construction

Since it would be more preventing if the broadback node the image apperent or groups outside Great Bisters Stratekaks volumears have recently shown be repeated image to people ining in Oregon, Casterne, New Jessey, Results initiate by fully enelyized in east than a year.

They speak batter than they know, and beyond your understanding "

-T S Ellor



RUSSIAN COLD CUR

Good rews from the soviet Union. According to resistancer Yuri Miconenio the centrator cold rath now be quited. The new thetiment is paintese quick end fairly integeneive. Miconanio says. Buill has one disscherefligt. You have to solve from the tempore to up to provide the tempore.

The temports are solved in a stress solution and connected to a portugation (server around the cold suffactor nach. Microsoftio Sancer realization and Barness realization and Barness realization and Barness with control and solved realization and solved realization and solved realization and solved realization supported to any the conductor supported to any the conductor supported to any the conductor solved of the conductor solved and the conductor solved any the tes are goole, vincenteur adda this conductor musibe recharged often Bat noi to wonly decentric has also invented a hondy bet tery powered recharges field call be won in your liver pocket.

Do American researchers instructions control has ead cable the common oath has executed has comday Noble assertiant director for pacence for the Centers for Desiate Common parts out 11ths hebre with colosi at all there is orobatily a simple researcher with tempotra you had have with tempotra you had have tempotra you had have the respondry had.

are closer queens

nd obset donkers, but no ne suffers more then the loser psychic

--- Kerny Kingston



\$200 million worth of highly precise optical technology carried put on a massive scale After construction is completed next year. Nova will be two times more powerful than eny lacer built before

The money for News corners from the U.S. overiment, by way of the Department of Francy (DOE) DOE is the mension of our ladoral energy programs, such as synthese-fuels development and fusion-enaroy asparch Loss well known is DOE's the nation a nuclear bombs. Nova and the other large lasers will serve for research in both bombs and ensety. The boss of Nova. howevar, is a laser man, pure and simple.

Ho is John Emmett, widely known among Corvette at very high speeds and likes to think of himself as a daahing technologist shrut-clanet. He concocts rare and exolic been tascaneled with high explosives and a a looned demolfors expert Cocaing expeditions, going out into the desert and blowing large tooks apart with dyna mite in his younger days he graduated emong the top 10 percent of his clean at under Arthur Schwwizw, who had shared in the invertion of the laser and later worth the Nobel Prize for his work with lasers Errmett went on to the Naval Research he built up a world-glass group of lases the laper work at Lovermane

Like most Nede federal science promame. Nova has sprung from a mis of Sectored consistentions and politics. If pol de stast in 1975. At that time Emmell with huiding Shwa, the prepured to Nove It was to be nearly as large in size as Nove but with about 10 percent as much power

In the mid-Seventees the laster world was appg over the power and size of Shive which would teature 20 arms and would fill a very large trey within its outriting, Livwas already time to begin planning something bigger. His laser builders had supreariest in invention new types of reaching rum glass, which could handle higher power levels within a laser. The researchlaser emplifiens and devised means for fabricating particularly large components perholes and lenses even very powerful isser beams could be kept clean and focusable. So Firmelt knew he could build a laser much more comprise than Shiva

The broad outline of his plan was do controlly simple. He proposed to double second bey Within these two bays Nova would also have 20 arms But two of thread SI CHN

arms would have more power and energy the advances he had made in building lasens. He cought approval for Nove and won the backing of the director of the federal large-laser program, an Army general

Emmett was working closely with John Nuckalls, an expert on the design of the pellets to be zapped with the laser beates. The design of such pellets is a complex art, and Nuckol's believed he had a pallet then, in 1977 Emmett's plans began to go swry Shiva want into operation and began tring laser pulses at other pallets de signed by Nackola With the data from these exponents, Nuckolis went back to work on his Nova pellet and decided if wasn't guile as good as he had thought For Emmott this was bed news: It undorout his case for building the full size Nova, with politics was raising its head

6Emmett drives a black Corvette at high speeds and concacts exotic liqueurs. He is a locensed demolitions expert and takes friends on expeditions to blast boulders?

Nove would cost \$200 million, and within test not of money available. A reamber of in the words of Lowel Wood, a leading laing. For only twenty million dollars I can dothus and such Wouldn't the a lot better if you pave Emmett one hundred eighty metion and gave me the twenty million?" Contransmen arqued over whether the lasay programs in their dedrich, were getting their fair share. Of crarse, Novahed to have enough to do something significant oferwan as Wood explains. You would just Inther the money away Like giving one dollar to each otizen and telling him to go support his tworfe laser program-up less hed preter to spand it on a sw-pack."

whether Nove should be built merely as a more energidic version of Shivs, or whethat it should have an extra degree of usefulnew, in later parlance. Shive operated "in the sed." This had nothing to do with cost overruns it referred to the wavelength of to left. Shive operated in the minaned, all long wavelengths. But the pellets did not

readily absorb intraned light. They worked much better at short wavelengths

The way to get these shorter wavelengths is with frequency-multiplying crvetals which look like big siebs of window class set in former. The idea is to share the laser light through a window whoes purps are made from the crystals. The infibred goos in, and green laser light comes infrared. On by titing and rotating the crystals, it can be emerged that blue light comes out at about 30 percent of the orig out these crystals the question was whether they should go into Nova. They would give Nova greater flambility for use in nanerments but would cost millions

in Washington such issues are resolved by setting up a high-level commission to as Barton Richter, of Starriord, who had won a Notel Phze in physics. The commission charman was John Foscer who had been director of Livenmore from 1961 to 1965 and who in those days had been an early and enthusisatic loader in pushing for research on later laters

From the output the Foster committee was sharply divided. Each momber had a chillionent wow of the proper ocurse for the Invendence program Many of them wanted To Emmett such a course would have

At that point Foster made the key angument which deal with the details of peter internetablighten When the laster bearing 240 a pallet and the patet core compresses and heats up, the fusion the begins as a two spot, a momentary flash in the conten the hot spot can act as a metch, which sospacia its fina into the stateounding fusion from a blasting cap spreads into a charge of chroam to Forter ported out that even the full-size Nova would not be large enough for such propagating-burn' pellet propriments. These would have to await the next laser beyond Nove. But the fullbuilt but on a smaller scale than Emmet. had enveloped Nova should be only as terne as would suffice for experiments with this hot spot and no larger

In June 1979 Foster celled a dathering of his committee at his home arred the hills south of Los Angeles. It was a sunny day. and the visitors soon gathered around his swimming cool which lages the Pacific Naturally the talk was of leasers, and as the discussion proceeded, a compromise bubbled up among the group, a solution to the Nova problem They would recommond building only half of Nova with and

Emmett was not happy. He wanted all 20 arms and he was angry at the online Foster committee He also was anony at been a consultant to the committee and Emmett knew, next year Nuckola might deeaon which would achieve propagating

somebody's got to go overboard." What mett. Nova was given the traquency-mulliplying crystals. Unlike Shiva, Nova would

been how to keep all its components m executede elaporent-its amplifiers, lerbeen to build a computer-controlled alcon ment swatern, which was comparison of a was batting the success of Shiva on its showed its worth in January 1980, when

When the ground started to runtile. Fmmatt looked up from his desk and saw a big oaken bookcikse full of books begin ming to sway. He clucked under the desk

strewn all over' The caakes mind and week nagers brought in jacks and mediaute. The computer alignment did the rest Within two wasks after the casks

But sometimes the story of the develber 1981 And durns 1982 Livermore was al the time it was shut down, Shive's pomonts that were extremely interesting. The day it clied it was the highest power launt research facility in the world it was torn

By 1981 with Nova well under says the could provide. The data were needed to problems that had been uncovered using Steva There were two ways to get such data rebuild Steva for improved perfor mences or teer it down and carmbelige some of its parts to build another laser Livermore without a melor layer for some

He chose to cannoalize From the used components of Strive and other parts he fashioned another laser as a stepping most low anough to see over Like Nova.





cienty of power for dependable

older vehicles

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Samo mborwde You can even charne

Newsite learning leng of eleves of toke pices to dring optical companying, relating lacentre intermediate an use of the second second provide the representation of the couple of with the long-rought frequency-multiplyregression. All of the galaxies of the drin advant Avisa-stands in a white room the out-of the token model thereases

Why den't primat rebuild Shire? Emmail snew the earlier system would lived nowhere in hisser design LLN Novelle could pive the way for Nova. With only 2 arms compand with Shives 20, Novim would be less colly to openale.

But Errorett also had his evel on political Any move to upgrade Shiva would give ammanifion to his orbos, who would ask delaying while the program work forward with improved versions of Shive. Emmett ski warteri al 20 arms far Nova, and it happened that Shiva was occupying the soace in Building 391 in which Emmeth of ten arms. He had not been able to win support for his plans within the GOE But he had the support of Mel Groot a key staff Committee, and with this support, he Emmatt's ortios have charged that when he fore down Shive. he was really engage includia political play to make room for the second group of Nova arms is any case Green's help proved unavailing, although

And what last severe how's "5 under sind the sectors, consider the energies of high cover, wasts, when they als UAL packs, a magazitie being the energy of a half pound in type explement, magazities as eposite an energy of a sector of the aspect of the explement of the explement as eposite of the explement of the focused by brace be in how in divide a through case at about al 650 for 0, if it is focused by brace be in how in divide through used as the packed layer. The other sectors are about al for the explement work, tage, alternation and show in the the events with the packed layer.

Now and tasken of 1 magazouk By the associates of the Nation 2 ways of the hard of modulin ison 200 more plants for any second second second second second second second and may well be the bing of the Basers Appropriately the superfaces is to be many 200 more plants and the second second the Olympian except of his to now 1 for magazous, manya to traject the second second second second second second second budgets them mg/st them? Amount second to make a second budgets the second s

And what will the country gain from Nova and Zous? A trp to the offices where Emmetra, scientists work demonstrates that much of the research is a med toward a payall in new military strength.

The security precautors are evidence of Livermores long etanolog involvement with nuclear weapons. A lear microscopiosion amounts to a nuclear finitiation a laticratory scale is model useful to designers of future bornite.

'We are already doing weepons phys-

Elt was like people out in a Meboat. There's not enough food. Somebody's got to go overboard And what went overboard was ten of the new laser's arms?

ios" says Hal Anlatom, one of Emmet's cose associates. We can study the be have of meteralis within a racidiat explore survey, and densities that are spontpristal to nuclear weapons. There are no other laboratory systems that can achieve the perificative cost.

"The release and has nuclease weapportedloss. To relid to part order experiments an everyone effects, see nano al listor dely selected and the relative selected and the selected and the relative selected and the weappoint of the second value of the weappoint second to the second value of the many part of the second value of the relative second value of the second value of the many part of the second value of the relative second value of the second value of the relative second value of the second value of the relative second value of the second value of the parallel no second value of the second value of the parallel not account of the second value of the parallel not be been weappointed to the second parallel not be been weappointed to the the properties of the second value of the second value of the properties of the second value of the second value of the properties of the second value of the second value of the properties of the second value of the second value of the properties of the second value of the second value of the properties of the second value of the se

These laser experiments in periodial would add a new dimension to our underground nuclear-weapons tests in Newsda-

Receipt previouslies to poor in bolloams and into of thom bolls but has institution again can unclear-weapons executive that as point theory years design put has in the subscription where the previouslike the part of the previouslike the subscription of the part and in year rebys, and there is the completion, and they're usually operticate conversions in the features. Names Bollow and the design and the anti-subscription where the there results and the subscription of the anti-subscription of the subscription of what was expected, if is difficult to repair and make expected, if is difficult to repair and make expected, if is difficult to a subtion means your experiments at well.

These big lesers could be sapecially useful to weapone descripts if a treaty should ben all nuclear testing the underground tests as well as the aboveground ones that have been barned ance 1963. We would maintain a cadre of trained thermonuclear designers," says Alexander Glass, prosident of KMS Fusion Inc., a major pollet-research lab. "You could share pocole in thermonuclear design, train them to understand thermonuclear physics. If program. the nuclear-dasign laboratones-Los Alamos and Livermore-would competent designers because they would have no data to work with " But if the huge lasers work as planned, 'rasearchers could maritain their design capability by working on pellet designe

The big Lowerford spoor will be well which is this weights reproduce that will not be the second network that will not be statutes to thready to be the neddy to the second second second second second provide the second second second second plane to cool alisen. That a will a problem and how to the the their rotat and be at the second second second second second plane to cool alisen. That a will a problem equal to most the rotat the second second rotation and a power primer a store of each to be a power primer a store of each to the second rotation through the the end of the second second rotation through the of each problem second rotation through the of each plane to be able to the second rotation through the of each plane to the second rotation through the of each plane to the second rotation through the of each plane to the second rotation through the of each plane to the second rotation through the of each plane to the second rotation through the of each plane to the second rotation through the second second rotation through the second second rotation through the second second second rotation through the second secon

Their regurements can be met with other laster whose emplifient are chain been full of gas. Can lasters also heart up when find. But they can be cooled much more easily then glaiss, and hey cannot etwine or casols when hot is a researcher can fina hem many times a exocatif Levthee, sych lasters offer higher afficiency than glaiss can provide

The center for research on gas lasers is at Los Alamos, and when large lasers come to be taken scrously an electricity produc ers. Los Alamos will take on even more son ficación.

The largest of its leaves is called Antares The star by this name is big and langhtmat, realizing copicity in the intraced The Antares leave also works in the infrared with a wavelangth an times longer than that planned for Nove. This has put Las Alerros di a disativenzge sono ta the short wavelenzge tat vivo beer with lear pelitis. Still ges levers are polititativi polimontaret tati in augit in mon riktativi polimontaret tati in augit in mon rikneseli yana luvenzuan kivat anatara lea only 40 pascent of kivata power, or kivata instrumentare and source and a source samy wert, into lai opasiatan in Occober yess, mon than u year anatara di Kivat unes in operati and conselitati and di kivat unes la conselitati and anatari aleritati and unes lovera is operativa. Anatara witi kado unes lovera is operativa.

An interval former in the base process process gene intrody which is some programs of the some the programs of the some through the length is only a long wavehardly need to the some the some time to the sotard the sole is the sole of the sole of the sole and the sole is command length to an advert the sole is command length to advert advert the sole is command length to advert probability metaparties. The sole wavelength as the polyhold ymmogainer. The sole wavelength as the sole is command length to the sole advert the sole is command length to advert advertised phenological command length to advertise advertised phenological command length to advertised advectise advectised phenological command length to advectise advectise advectise ad

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Artistine that believe in processo souce of experiment in building gang pain letters the generation of the building gang pain letters. The pain means that Artisties seare will south every source that Artisties seare will not be every source that artisties are and an every source that are also and artistic search and artistic search are also and artistic search will have to achieve much stored watch when the to achieve much stored artistic search are also and are also also and are also and are also also also also also also are also also also also also also also are also also also also also also are also also also also also are also also

It was first tested late in June 1983



As long as there are two like you. magic will be made.

Nestida in the redecod cappee boyond the Valky of the Noise is a reputical place caded Korkel Here senses 1896, Korkel Champagne has bee booght to dimere, longh and colefence hil. Beery sportfling they of Korkel Champagne has been suitariby for most of heart the constraints for the most care when a sing for the

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Unconto the magic

F KERKE & MOST, BORTHRYELE, SCHMAR SDUNY CA. ROOLIDIET OF FAIR CALIFORNIA OF PURINES/ROOM TVIA 105 KEED Bather time baing named for a good on a sain in a called - concentrative the Knystein Flagoride Larger. Their sains in kinkle bit is more provide the sain of the sain sain and the sain larger than the sain sain sain sain sain sain sainter time and the sainter sainter larger than the sainter sainter and the sainter and the sainter and the sainter and the sainter the s

The keyptin Flucose Later is set of an 20 keyptin Flucose Later is set of an 20 keyptin Flucose Later is set of an 20 keyptin set fitter is a set of the set of the set of the set of the later is a set of the set of the later is a set of the set of the later is a set of the set of the later is a set of the set of the later is a set of the later is a later is a set of the later is a later is a set of the later is a later is a later of the later is a later is a later of the later is a later is a later of the later is a later is a later of the later is a later is a later of the later is a later is a later of the later is a later is a later of the later is a later is a later of the later is a later is a later of the later is a later is a later of the later is a later is a later of the later is a later is a later of the later is a later is a later of the later is a later is a later of the later is a later is a later of the later is a later is a later of the later is a later is a later of the later is a later is a later of the later is a later is a later of the later is a later of the later is a later is a later of the later is a later is a later of the later is a later is a later of the later is a later is a later of the later of t quercy multiplying crystals. This short wavelength permits the best possible performance in a later pellet.

This Los Alanico system is a later amplier it would read much adatorial dopair againment to quarky as a full folged and signal much adator in a full folged and signal it was built to know the solution to matchaigh decision of the monitor and and signal it was built and adverted and cooporting that bases Los Alarma diagon in this area of the highest differences yet achieved in a large later and can be fired in any times a second

Bunoing large laters strit quirte like building assolite He dusting creates, suit will be availed batter we will really be suit that the lass Alarnes design can be scaled up a hundrediati en sere to the point of being usels to an adection power class. Here, theses, laser building and compared to the scale of the series of the point of the scale of the series of the series of the point building and the scale of the series of the scale o

Large krypton huonde interes may other even more. They may well be the key to an entrate more type of mouth engine, with 1000 times the performance of the engines in the spece initial. Such rockets have been studied for a number of years by Robenck types, an execution of upwell

Wood's at Livermore. Signil carity Wood's work in advanced laters formed much of the basis for Predietr Resigns's take wear speech. In fact, Wood originated many of the laser-rocket aleas that Hyde then developed Limfer.

These recision engines would not off the son mecooppoints when a notive nonable formed from majoristic hields. Proved in would offering this testellate that the inmost offering the testellate that the the testellate pool could be the obtained from the local pool could be the son testellate would be the notive than the obtained from the local pool could be the Such as report a model could by to Mean may like a situ would be the notive than the obtained from the test obtained obtain in could not be the source the beat offering the son the source could could power repring the the mean formation (PRE).

Bocause of the observices between the research and containing work out highly an aoning, the news that outh increment and the car to be using the second second behind the lands of milling rescurity, service drawning about instantion works in the drawning about instantion in the drawning about instantion in the service second and the period of the most power parts between the parts of the peak of the most power parts in the peak of the most power and the bears of end the most power built bears of end the most power while bears on end the out boars of end the most power while bears on end the out boars on end the out of the ou





LENTINALD PROMINED IS

organs from hundreds of boars. He compares it to the drug trade. A gathetication may charge trade size times, he explains increasing in value from 560 in the first deal to \$500 in the task. The same per may set to \$500 in the rate. The same per may set and his men ratified disaste in other states, wernes them to watch for the trade.

Officials in those stores will not comment in detail bocause their investigations are still under way. But what little they do say hatte that the scole possible providing market has spread across the country.

In johns and eastern Washington agents are probing several imps sending gelbledders to California and avanees. Thereis one instructual who's killing bac huntited black beer per year says a Washington official who sakes not to be natival. We insvert been able to put a nose ascund him will.

In Minipager Orients have been active https://diministration.com/section/protocy/diministration/proben/diministration/prolimed active probability function on the houst them intervalid, says meeting alor and General to many features of the prosent of the same and the prosent of the same and the protect of the same and the protect of the same and the protect intervalid and the protect intervalid and the protect intervalid and the protect intervalid and the propertion of the protect intervalid and the propertion of the protect intervalid and the propertion of the protect intervalid and the pro and the proand th

The results mean trouble to which is been in Certificities, Wisconsin, mid-there strates are becoming younged all the innoescent and the strategies and the strategies before that many an all which before they can reproduce "We have a real bad ferming block the perspective and they be the strategies before the bodget Lating Select In performance the scene areas we can it even the encourse beams to do an age study " says Laved Obbeams to do an ege study" says Laved Obexiting and the strategies of the strategies and the scene areas of the strategies and the strategies and the strategies and the scene areas of the strategies and the strategies and the strategies the scene areas the scene areas and the scene areas areas and the scene areas and the scene areas areas and the scene areas are

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Still Thetes & approach worky boologues had inherence a softmely work/times species gains monetary value. After al., I was contenterated beard for measure and infe handska in the Sweetless that booght the Anton thin to indea-isothacter. Could the same lappen to the black boar? Kein sage why? As interests, whilenews people get dollar signs in the regist.

ENGINEERING A BETTER PARKA Sometimes means going to Considerable lengths.



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arenation for TV commercials which may help to account for the relativity straight, persons line presents to the world lodgy (That he is a student of analytical philosophy in his spani time also acids to the image of respectibility)

Seven years ago Do Landa was IFING how took why politium-many monthrous, appegings, befin and wws athwall to cotransglamed neuron, wancus arrested potential and the seven and the seven attempt of the many part of public poperty and possession of many part built was increased a few hours that A a second sevened a few hours do not be gatable-realeng activity of that period, the destructed protocopies of the backes appendix a corporation notes

Apartition the basis instribute Dai Jandes grafte orazimaki of indivisuali words partical al over New York with a spray can al use a loss of the second second second second al use a loss together to tom contentrossecret messages observative or you pao ple watching the movie user. Local second ple watching the movie user. Local second ple watching the movie user. Local second second second second second the second second second second second second second second second pressure second s

In one of the two rooms of De Landa's apartment there are two walls of book shakes that reflecit his interests in physics. philosophy and technicopy A reservit book that interests him repictually is a study of competiar cines For De Lands the lowestern of sectinological secarity will come into through cannot planning but through the machtal of perveste minded teen agent who, for the shere hall oil, are clearing up ways to jink the country's computer sections.

In the other room of the flat is the most transaction may be about the room of the second second operation of the second second second second second from topic and 500 inter across It is a more drong preval comparison of a coupling of the vertuality to other the planet in num a law Wortbarwse (A) portion in our discussion. In a transmission of the comparison of the comparison of the comparison of the second second second second second second in the comparison is quin (1).

Despite De Landas respect for softnology la espacial social de la companya en contra dicinityle robeis whose forms of companya en energy and prenduchal than his own. Pertaps the most detime of these in the legendary Protosol Memboroup an unexpland certoonis and whose explaints whose service the protease a sepaciation that makes to be cardia-

Characteristically, when Mamboloco mer underground firmsaker John Watera at a premiero several years ago, ha un conventional form of paying incurs was fo inca Watera is hand. More frequently Nam-



boozoo's speciality is to put warmourn bill on his cheet tage a along of financiality both put them allon a single face replace his shirt and cost, and blow firmfall upan act he performs for the carmera in Ancostaneos, all the while teaping about less the Wild Man of Bornso

But the mean indexions of all bits largest an average against perspansion of the life at the average against the second second second largest the second second second second the store organizer (Distances with the agent with pages) and second second second agent with pagest middle size significant with a store organizer (Distances with the velocity and second with store as devices barries of the second se

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Most otton, however, the volume of plant in his work, is internalized and formatized in the term of his according to Day Ge obtain and gidly optical diversimisang one heal actives the a hine said mode a blender. In Ascentravice the image spits into lakes characteristic crop here nowhere into a room, and Membaruoo enwer the severe in grandown and them to some

In Nave Navda where the parsh scheme are even logics me instritually disovers that the discrean natitating vice of the summary logical control of the scheme scheme and the scheme scheme scheme scheme scheme nghe make although scheme scheme scheme scheme parale scheme scheme

As Distances posses "Desistions in earlier mit Cheshal search in an annual model ease wern space to a public cold wern pair less reconstant with larging that your less reconstant with largings in away. I constant with largings in away on annual this constant and annual this constant. Boll and works both saces of the street with a greatment to approach the street with a greatment to approach and the street with approximation approach and the street with approximation approach and the street with approximation approach and the street the DO



cells-eggs and sparm-would presum ably have accumulated a possidemble Why are balaes born young?

cells in the body undergo a special type trivenion the offernosomes meder this type. tary pars (each consisting of chromounded with a raw mate when pool and

Fascented by this claborate process

For from being a dispase size would apwould be born old DO



BEST OF ALL ... IT'S A CADILL AC

let's Get it Together -Bucklo Up



Non Complete Than Rooming

Meeterback group was a more complete work our-Mare Effective Than Exercise Bikes

Nord-Rivek's stand up sking metoon more up-





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money is already being spent by companes and not by public-school systems

Otent: How would you stack the problem of education and readuces on in a depresend area like, say, Michigan?

Debail: These problems cannot be astacked successfully within one steer. They can hardly be obved within the country the sating of the problem is the onlare world. You can make Michigan a more ashistories problem within a more ashistories problem within a steer as the Undamentally at a a makkets their of the problem within one gate

Other What you seam to be saying is that our problems, whether political, technological or reproved, are related. One alfects another

Asimal The Groat Depression of the Thetain came to an end through the accords of World War II in visitation to the posserel world analism and its recession. I think that the solution may be to end the arms race. Far too much means its great the arms race. Far too much means its great the arms race. Far too much means its great the arms race. Far too much means its great the arms race.

Dress: And yet militalism is not always a hegaliwa is in? The English spont a great deal of their delargy on tengtowa and statisty whes and wort on 30 become a great halon. Throughout heats whe domment hebros have other last is cubure and isofitnings haven they?

Access (6) the paid this methanic recent protection of the paid this methanic recent protection of the paid the paid of the paid the paid methanics of the the paid the paid the paid the second within the paid the paid the paid the second of the paid the paid the paid the paid of the paid the paid the paid the paid the paid paid the paid the paid the paid the paid the paid paid the pa

Aarmore: The United States protably became the world's Nethnological leader in Economismic 1166 to data it from the rwrition of the light build. I trink that she peak of our domination of the world came in the 1380s. The Britth define I always data from the inner of the Boer War, which was there Wintham.

Other Are we losing ground as quickly as the British ware after the Boer War?

Astroy We are so far. This does not mean that it will continue to happen. Since the Vetram War our technological leadership has been variething rapidly.

Owner Couldn't if be more like Rosso? Couldn't we lest for seven hundred years instead of one hundred?

Debold We have a very Western view of technology and its advancement. During much of history Christ, was decised to hundrada of years sitead of us. Why is Christ now a "loss developed ocurry?" White our anotetors in the West were patring thesiselves bus the Christor had developed and engoged the most sophislocated cubies and lechology.

Asimov: Chris was corveninged their is was the most advanced nation. It is passy when you are at the top to feel you do not need to change. The near was that other less well developed nations did change, while Ohna clubol to its percention of these.

Debold Still doos The meaning and measure of development, of course is all lectivelogical and scientific. There were automations being designed in Persai, in the Britisanth carriary modeled after the Greek original haudhats of years before such a delign was attrompted in the Wear. Other limit these a penalty for change? The movement of tobols into jobs formerly ocouried by turnew vorkers for instance, will create economic hardships for a lot of humen beings. Can a society be risk-like and still be productive?

Autoro: 1.36 resil herk is in freedom from the her people are company to an much as cruids to of risk. It accentring is built from which some people without at purposed official lass wary threa, it is proceed as official lass wary threa, it is proceed as official lass wary threa, it is proceed as the lass wary threa, it is proceed as postations at the lass polera of the postation at the lass polera of the postation at the lass polera of the polera of polera of the pole



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NTERVIEW

CONTINUED FIRZIE PAGE 90

school of all "Building and the school of all school of al

Central What will the United States look like in the July and?

Barbaier The Strute in here will be associated and server with the Topported structure of the Structure of the Topported more under servers with host borotes with undidensity of the Structure of the Structure of the constructure of the Structure of the Structure and the Structure with host borotes with the origination of the Structure of the

Behalar, no. 1 for exertiple, is on empty or strange body werray millionan--opercaretas hol was a trivil of the wester to a doubt the pipelo werray of the wester to a doubt the pipelo with wester to a doubt the pipelo with well by Behalar Linker Donas takes at the a 1 before the milticity of the strange werray the strange well and the strange werray well by the strange well and the strange werray the strange well and pipelo strange and the strange well and pipelo strange and the strange well and pipelo strange and the strange well and wears an external strange werray the meet to the for pipelo the strange and the strange and the fore pipelo the strange and the strange and a form more than the strange and a form more the strange and the

Orms: I ve read a lot about the trage system, which proposes that we should help only those animals with the best chance of survival. What are your vews on that?

Schaller, I think the idea of triage is uttanly indecideus. The tast this you leak the quertion indecides the clowmend threetony-edour thoughts regarding our ecological to task who is to judge which to the early and the rol to save? And on which belies any we

going to make those judgments? What we consider inconsequential new may be oncally-important, when that animal is anylyzed in terms of its role in environment on what drugs it produces. We haven't got a club. So we musit light to everything

Owny Alo there any specific container goods that are threatening valious one main posterior?

Schaler The biogree concurrent photomer in the Linets Gaussian is the pert hodo—importation of wild minimise an epith. Topolasi final statistics because being with mitions at a time basis as a dealing with mitons data minimise the state of the minimised every year, most of them hom certain hometers miller inpead lish are migrorited every year, most of them hom certain hometers and an excertain to some diffuse particle micro certain constant to the a long time and an excertain to the floataand datases approach to biotecher minimise basets micro certain to every an apposite to certain the every and possible.

In incka tigers wander through some valages at night. Can you imagine even a harmiess mountain Bon showing up in the suburbs? People would pame, they'd have the militia out ?

Once The smugging of exote birds has getten ike the drug hade with boots, dropeff users and the exceptions of training

Scholer: The regont of ell works annuals and paren wands be benned, succed for from reacidad by detacements, and scholer bear southed by detacements and a scholer bear souther be bear and a scholer bear and bearts and annuals. Usually die a toler and bearts and annuals usually die a toler death hay's maritaned at mergen famperatures and deter die ol alevation. Lange adapt bearts and on they and usor Precent despensive first to are term of and here them all.

Geen if no one did anything to save mdangated species might we end up with a world full of nets, reaches and other anweak that always serve to survive?

Schalter WH, we containly would elemmete a good personage of the species that easy which samply would mean weld have lost most of our generatic diversity. The thing most people aregul losting at the most weld have these representations are the poly of the termidia policy or plan. This strept writing allong, each eleministration deviry which is the present eleministration deviry which is the served and the terministration deviry which is the served and the served served and the served served and the served served served served and the served ser

were: Date developing contrains condution the united basis to landerening in conservation and to guardance on enterest mantice that cau goalstmeet spream the services may be the service of the services of the extensions: mail to the service of the services of powerly and social annex are certain to belies obtains to that a service of the services mail to further and the services of the services of provides Julia marging how much pedication of manuals. Services of provides Julia marging how much pedication of manuals (concervice) prohibition.

Openny What is it is a to work in this table to himk about those thoughts day after day and to be faced with such gloomy statetes? Do you have nope them will be come you of mage awakering or are you pair trying to slow down what you paircline to the the unevaluable clemag?

Sociale in Control Intervences and Applications of the second sec

Ot ourse, everyback that to hit month when in which a does. Neverthesis it hink there is an oblighten to light for presevation to stragglis to the best of one is whilight to assume ourselves, as well as the miferred instruction on or preserver when a person astutation on no preserver when even though there is only a tollow hope that one is easily of hebo.

Onver Do you think there is light at the end of the turnel?

Scheller So fair I also only the dark at the end of the turner. But the good thing is that there are more and micro papels intreeased and magazines like yours are do would willing to do process in the ani/conment. The evening mixes sometimes has better and paped about concervation, but TV does har too little it is seriously dolled the evening. Turde outling the meaning. mental news wrtually every right it is of far more relevance then the odd assorment of accidents mundles, and other trivia that make up the bulk of the news

Otto: How have zoos tared in trying to preserve vanous species?

One consisting first car are also and the second se

Orion: The begger the herd, the bodger the chance of preserving genetic variability is the same rule of thimb true with managing preserves in the wid?

Between this Lask awy work have a settively remainsmere that has only an inpartively remainsmere that has only an inparmetry of exclusions are then those will use interfer of exclusions and when the those will use available when the advectory of the those will available when the advectory of the available when the advectory of the exclusions and the thermal best any exclusion of the advectory of the exclusion of the advectory of the exclusion of the exclu

Orner What about genetic engineering with regard to protection from exanction?

Registria da accession and allowed allowing the trist step to feature central man allowed allowed allowed allowed the trist and allowed allowed allowed allowed allowed the tristance angli from central. They look the tristance angli from central they look the tristance angli from central allowed allowed to all and allowed allowed allowed allowed and fait her central allowed allowed and and fait her central allowed and allowed allowed when then you could normally allowed has not really pointed anyone transfer and central is anyone transfer allowed allowed allowed and the the could normally allowed anyone the really pointed anyone transfer allowed allowed central is anyone transfer Sensitive Tree Treet has a future list energy of the Other Data (Sensitive Treet) and the Other Data (Sensitive Treet) and

Orms¹ is it possible to take a piece of gerefer code and store it so that it is species desired in the wild, it can be re-created and bred anew?

Brailer 15 accomplish the we seguit here to lawn here to receive the matched is to lawn here to be receive the matched we could use it if was needed again. This is all very difficult We derive were have here to law or the germ of strong species and matched to lawler, there will be see they to law or the species of the secondary sin portanoe at present. The entry elosities were particular to energy entry in this charge at law or the species of the secondary sin portanoe at present. The entry elosities the addition to energy entry in this charge at law or species of the secondary sin portanoe at present on said a terminate of a laber parts.

Overy. It is arreading that indea, for example, that been able to knock its togars.

Bohlar Interest Tights worker through both the second state of the second strength of tables. One real to online the second state Can year might even the technologies mountain loss showing on it the second state Can year which have been state and and overyfring also. There is be parts for a risk of these pprocess under your light to even them in this well there no real round in the second or can write the second state in contrast or second states and round and the second states and the second states in contrast or states and states and the second states and the second states and contrast or states and states and the second states and states and states and second states and states and states and second states and stat

Onny. You're studying the panela right new Would you give us nome background?

Behalfer This particular and reforms comparity (Chron Service) They have always facilitized by in Chron second factory the second by in Chron second factory the second second second second second second rest of chronic second second second rest of chronic second second second rest of the second rest of the second rest rest of rest of the second second second rest rest to the second second rest of the second second second rest of the second second second rest of the second rest of the second rest of the second rest of the rest of

In the past most areas have had a couple species of bamboo but people moved into many of the vallags and out down all the bamboo at the lower alliudes. Jeve in some

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What liss behind all expresses? Is every thing a product of supernatural design? Any horsens withful chastle by an arbitrary will like pieces on a chastleard? Or does a stapendous energy, without reference to paperse, being abasis a casasies tension maken from shares to stars and to bit shell?

Mind-Order-Energy-may these set be summed up in one word Conscisus wear? Behind all a Universit Conscisus when important desired. It composes the order of matter, the sensitivity of Life, and their arrows in over most that as KeV

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crate large areas if the barrhoo bicoms and desithere is no alternistic float or the panels. They starve, as happened in the read Seventes Nobody knows how many panets observed their, but one linudree thety-legit bodies were found. Thets an ammal of which there are only about one thousand left.

The Christel were very concerned, and they invited the World Widthe Fund to collaborate on a panda study and prepare a management plan for the conservation of the pendas.

Genty: And the World Widlite Fund asked the New York Zoological Society to do sowhile creatively?

Behaller Vol. The programs really in three ports One is in provo breading in captrely Parcial just do not do well in capitality as far as beging is concerned. So Wiliam Conway, a director of the Zoologoal Society, well sole. China and worked with the Chinese to dosign a coprove breading the dirty whe taken weiterhintering. Tim Ocolity, whe taken weiterhintering tim Ocolity whe taken weiterhintering tim Ocolity whe taken weiterhintering tim Ocbert weiterhintering production and to forth taket-reservation production and to forth

That's one part of the program—coolway management. The second part will setable table an amaginary prior in case barrhoo dos again. And the their part will doub the ecology and behavior of pandias so that a setal conservation management program. In the well near her instantion.

Over The heard that the pands has the digestive system of a cominione Why car'l if est things other than barrboar What happens if its given med?

Schaler: The juristic close have the closetice waysing of a carrieror like to close a basa. This bate is a good correponden as great number of batters was as any structure and batter takes data agreat number of batters accords—boods right in soluble carbohydrates Consislager of all the number have made to the weiner actives of this fait. The partial has being of bit The partial has accessed to go the other way. He a constant response on et all is dwarf batter a loss the more may. He all one have in win in ordinaries loaking

A data is compared of two parts nutribranky. The is the dell content. And the other is the dell wall. The below dell contains indigeable manual like contained with contains because the colonant, of which there is relatively (fite: 50 the annual here both there is the year pounders the load through all day—a completably different system from the bare is

Oriver Pandae are not well equipped to hunt, and there is not a lot of game in their emerorment. But could pandae live if they wate lad meat or oran?

Schaller. They love meal, and when they are in ceptwhy flwy eat all sorts of things, including pointdoe.

Other A pasda has a hendly appearance yel in one encounter you were chosed up a tree. Are they generally approxime?

Schaller: They are generally very ronalg grassive and self-contained. It is very diftra cvery bad to have what a pando to therhing it to you have a card or got a home you auxility wow what it a scientific source and the science that the science of the science of the science which makes in difficult to provid the science main actions or evolve file field excitations. Not if somethy evolve the science of the card to name days and a science of the science and the science of the science of the science of the time inter compares at the science of the card to name days in the Charge and Landon tools. In Charge people there is the science of the landon of the science of the landon of the science of

Oney Yes merioned soul expressor to you thrue an any investigation of the acoustably depict to enclose or the optimal Scheller. They certainly depict encloses Oney When you see an animal that tools and it is stilling, do you thruit in the they? Scheller. You have to teem such spaceter sources when you would be recessarily amanta to use represente the made of an entral can make any humbers

When a tiger is attacking, you don't see the toath. Yet, you see stuffed bgars with a big snari That's a learful response--not what a hunter would convey ?

of things depending on the kind of amile the invested mining and the kind of the technologies as an expression. Being of the technologies are an expression flattering of an attended and other the latter kind the technologies compare you aware the technologies and the proceeding of the technologies and the technologies and a teg and the technologies and technologies and a teg and the technologies and technologies and a teg and technologies and technologies and a teg and technologies and technologies and a teg and technologies and technologies and a set of technologies and a set

Certainly an animal file a gonta convays a trainendous amount of information through its eyes. They are subtle and elent minors of the mind inelecting a changing pattern of emption.

One three Levelshee's a make bon clea allow a hight with another make and I saw the amber hose hade from his eyes. It was and and deaply moving. If a hard to know how any your ambanes and newelsky perceive is happening or it you ano mereky propering your ambanes and newelsky protection any your profibers and new so called do a yevy begin profiber in our so called do. peters served "borver or dubut read accurs a small problem in physics. The very find" that you are looking all interviewer find" that you are looking all interviewer that a different outpermap paraval and the server a different outpermap paraval and the server into a different outpermap paraval and the interviewer outpermap paraval and the interviewer outpermap paraval and the interviewer outpermap and the interviewer outp

Other in working with the Chinese in the panda study have you found any concepts or techniques in their methodology and research that differ from yours?

Behalise: The basics approach is the sume time one advectage linker is the Chrisinia has as much polytical furnois in the part has been much polytical furnois in the part and sub gathing struct their second is furnishcharting about their work. They have an object subcigation in Chrisinia and Ledgend as them for many linking. Here, bottees of interview of the control of the control control on control colds.

Dessit is the Chinese concern for the pendia emblements of a alightly bettar-defined national policial policy on endergoned speces than we have in the West?

Binatian twike with Ensensor, when Comminal topic over 10% the Unit wave in at Begaring to a gat Parage in certain wave in at Begaring to a gat Parage in certain the Dustine the Unit ensemble and the Unit wave in the Unit wave set of the Unit wave in the Unit wave in the Begaring the Unit wave in the Unit wave in the Begaring the Unit wave in the Unit wave the Herbed and so them The Year new set Herbed and the Dustine The Dustine The Year new set Herbed and the Dustine The Dustine The Year new set Herbed and the Dustine The Dustine The Herbed and the Dustine The Dus

Owner The largest cat is the Sibenan tiple, and there are just three hundred or four hundred latt in China. Is there is program to preserve this animal as wel?

Solution this, they are earling up a program to study in Unfortunately, them are probably free than three hundred bit it would benefit their program if an outbable pericepted and brought in a nucleotianety system. These tigers move over such a large one that it is very official to determine their mings without the addice. Devel What is the range of these racks.

and what hand of difficulties do you have in trying to trace an animal with one? Schalter. The transmittler is completely seded the batteres are inside and they should no about eighteen months. But they

sometimes don't run as long as you da-

poor. Transmitters operatio on direct line of or phil which causes problems in mounlines because you cartinectwise through a mountain. What you may receive a la you have to be sure yours getting an accusate nadato be sure yours getting an accusate nadato high which means that you may work from a high respect termine point, where signate (on be received from all directories)

Orms: When you are trying to trace an animal, how do you parpoint its location?

Scheller We use a Sanas of feed points from which we take neodings, then by tranguilator we take neodings, then by tranaddition, the transector has an activity montrol inside. If there's a slow begin the amment or inactive if there is a feet begin the airmain a active

From that we can determine precisely whill percent of the day the arenal speeds acrive or inlative A pends, for example is acrive for about two thints of the day usually suffing inself with barrhoo

Other: Speaking of heading hebre, lons seem to hunt with an organized group dimbogy that is unusued for cets. Most cats hunt on an individual basis. Why heave long taken up that behavior?

Bichaler, Kernella antiere in a weyte braake He waiter model auclosatiol Lis hearselves By success one ulteratery name survey more hirdword officiants Lave assersation of their hair groups having in an addition of their hair groups having in and additional of their hair groups having in addition of their hair groups having in benefit easies to survey of her wind eashearth groups become when groups are in the here survey about the survey of the leves harding Staphter can all begre antime survey about the survey of the leves harding about the survey of the leves harding about the survey of the leves harding about the survey of the surve

Own: Would you say that is a learned be

Scheller, I hank it is learned, the actual humbring leichniques, like exception pation etalking ave part of their inform pation. But applying that inhere humbring knowledge to cabch liemething is part of learning. Overse is it those as a rule that the formate





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lions do most of the work on a hunt?

Schater has in a group it's usually the tomains that hurt. Many solarity mates, however hard for themates. The mate is big and tuzzy—her more compression and out run as test as the timerie. So there is a better chance that the female can catch oncy if the male sits back and werks

Orever There was a tight known as the tion of Chuchuchi In Napal he kitled a couple of poople. The researchers were with ophcorned that this young tight regist jum tho a man-aatar having once tasted human feeh. Its there any wild by to that?

Scheder it is not the kind of subject for which one has valid statistics. Animals in general are after consistent Animals in the foods they ear, however it is mother raises here cubs on human hish it would think the chances are very good that they will also take to man -option.

Genes A large cat is an amazingly effective station and human

Bichaller Vou could walk trem my orbien to the hospice and star which may orbit fail the inpertant understands that spruce tree helps that so well have another make non-lenge and hydro could more could make non-lenge and upda could more could make non-lenge and spruce transit and sput don't have to worky walk with pertanct repurity in the darkans gene transit and sput don't have to worky unless thereits an ammet that is known to have a main notifier.

Omni: What causes some animals to be

Behavior Termenina Here yet bean rgund and all their directively. They will beam rgund and all their directively. They will beam development is a man eater a yourgrow of a source growing beam a lob. Here you they are the source of the source they are the source of the source of the source of the will be an easy and another branch and the source of the the source of the word here in the source of the or beam of the source of

Animals living in the open can be shot with a tranquilloing gun. I ve got a jaguar project in Brazil right now in which were using dogs to chase the jaguar up a tree that were can transmise the animal

Geest Is there any evidence that after an annual has been tranquilized it changes between permentinity?

Schalaer, There is a most obligation to cause the ammal is activate with the statement as possible. If an ignoral is accident with this the proper drug to that it does not arrive anything, the event is not going to have much affact. But some drugs are just much elasonts which means the ammal can 560 32. Cell everything that is going an and/ dan well bacteria more that yo or otherwore be elfected. Then an autyped that needs a search. The main thing you always worry about with drugs is getting the attinual back on its let signs. The attinual back data happens built out so then it was not unused to search projects in the States to budent end of the combined adoption. You can well magnets be target when it instruction

Clevel Describe your best cky

Bahalan The balk and of days for mail thesk alls how when at arms to access the same to access the them and the same to access the them to Bahadon of Sorm – Numanking that the Bahadon of Sorm – Numanking that become an outsider. Navity all ammetic are achieved to access the the next bit because it well known that it immetics are not accessed in an anne they don't have much near. The long in the Car band to all officials for companies, hang assumed the vi-

> The pands sent long, drawn hoots across the silent hills Sometimes the fog obscured him it was hard to believe he was real a subtime experience?

lages, where they catch cows. You can well to within ten feet of some of those lions if you core to They don't run away, they just took at you

Near one national park in Canada, bagtoors always come into town and wander around the titest, because they're not bettered by people. This can be the case with vitually all animals if they are not hunded So when operation advisors when an exercisi people and advisor when an exercisi people to be used from 4.

Onter, What are some particular milances where you've lait webcome in the animal isosciout?

Bohater I van studyng muchtan pontaswinch is cryaas were trought to be rethertensoraus. One day net too long after I strategi has been been on too long after I yne. The gonitas were cursus about ne and near of here uinset up mit her the and as on her bandh with mit to look me ow. Weil I had a great feeling to give mit hat, much al a datase, to reph out for me

Another similar instance happened in the Serengeb Park. I was walking across the plan in the middle of nowhere, and I saw

a cheetsh. I just quistly waked loward it I got clown on my hands and kneets to kwer my silhoutet and crawled closes, and i just kept looking at me. I then sat down quistly whin six heet--os between you and me. And we stayed them also by side. Centenyt this cheatain just never had a person on foot that close.

Such exposure are exhibiting At an other level there are meetings with rare and socretive amounts in the well—white its sleeping on a mountainside close by a snow separat has style near a kill or seeing a penda for the link time.

Otter: How long did it take for you to see your first panda in the wid?

Solution: Years in the treat event damcells, well Faily and the investigation of the outof the solution of the solution events in the solution of the solution range and benefits in the solution of the solution solution of the solution

Oversi Have you ever had a close call with an approal in the livid?

Benatise On I via tosen no official tithurs anos but ory locates of contentions. One time in instal i was installing forwards to be to send and applied at a big tock. And I had this why alroing teering that rematisative and the send to the send to the send transmessy postportion. It may be the L senders domesting or heard terrority at biotective of the send terrority at the sender of the send terrority at biotective of the send. Cultification were about their to three data the sender terrority and the title of the send. Cultification were about the to three bits gast the foreign events.

But annulak do sensa. I hnih, il you ve mada a metales they can orien your lake, of aggression Soi cauchy backed of and went up atmo. The toper just came out end au underneath the tree i ont of lacking at me out of cauchity. After a fee minutes I calapped my hands and back. Go away the per go ways, and the toper got up the a the Start Bernard and warked off.

The earne with the gont a Linemantice one carry viewing Line with thirty of home Betava I know LL was right in the motion of a gontia gont. They all when a sting opety underswatch the theor in the cain and there I was among them. They all looked up I just backed of the way Loake and op I agents meed or model a stand Again, how simple a stand a stand a server interest també a stand a stand the server interest també a stand in the work in the server interest també a stand in the work interest at stand the server interest també a stand in the work interest també. gives you a cocky dameanor that animals certainly can series

Once is there any animal that you are afraid of? One that has such a disposition that would other word an approximation that would other word an approximation of?

Solgier only topic unnet is coloretely, despired a posterior to coloretely of calculated (1) or extended to coloretely of calculated (1) or extended coloretely of the coloretely of the coloretely of the telephone to socce only newly, Maria annual newly based on the coloretely of the telephone table on the coloretely of the telephone table on the coloretely of the telephone telephone

Centre Can you think of the instance when you were the most uncomfortable?

Schaller, Not havily. I ve never been in any aturken where I lot onbody womed about survivel. Confert, or the lack of it seems to be a constant presence when you are in servene environments, hot or cast. A turk senses exusten would mean that you re made an error along the way.

Oriver is there an explorer of the past or a

naturalist or someone that you hold up #a a here or model?

Seturate Mary have row writer elecentry on both care row writer elecentry on both care of a construction of ancura or executy Delie ANO-Lapetic, ancura or executive Delie ANO-Lapetic, ancura or executive Delie ANO-Lapetic, and the ancura of the set of the ancura of the set of the set of the an ancura of the set of the set of the an ancura of the set of the set of the rook Sectory Wei, happing of the set of the rook Sectory Wei, happing of the set of the an uncertained of the set of the an uncertained on another the set of the an uncertained on the set of the rook Sectory Wei, happing the set of the an uncertained on another the rook Sectory Wei, happing the set of the rook Sectory Wei, happing the set of the rook Sectory Wei, happing the set of the an uncertained on the set of the rook Sectory Wei, happing the set of the rook Sectory the set of the set of the rook Sectory the set of the set of the rook Sectory the set of the set of the set of the rook Sectory the set of the set of the set of the rook Sectory the set of the set of the set of the rook Sectory the set of the set of the set of the rook Sectory the set of the set of the set of the rook Sectory the set of the set of the set of the rook Sectory the set of the set of the set of the rook Sectory the set of the set of the set of the rook Sectory the set of the set of the set of the rook Sectory the set of the set of the set of the set of the rook Sectory the set of the set of the set of the set of the rook Sectory the set of the set of the set of the set of the rook Sectory the set of the set of the set of the set of the rook Sectory the set of the set of the set of the set of the rook Sectory the set of the set of the set of the set of the rook Sectory the set of the set of the set of the set of the rook Sectory the set of the set of the set of the set of the rook Sectory the set of the rook Sect

Offers' If you think back over your life, what is the prazest or wildest thing you have near charge?

Scheiter, if you were to ask mo what is the bast thing I vo ever done. I would say it is manying my wife, Roy, Bee has followed time at over the world and has been an indispensable holper. In fect, I would say althe hal been the one statistic thing acount which has been the one statistic thing acount which has been the one statistic thing acount which were statistical which are also been as the statistical which are also been as the statist of the statistical which are also been as the statistical which are also been as the statistical which are also been as the statistical statistical statistical in the statistical statistical statistical and the stat



everything else has revolved

But the respectively "I decision has the one-based on the second transfer to compare the protects but based by it, it was that the protects but based by it, it was that the protects but based by it, it was that the respective based by it. The protect based by the second based by the respective based by the respective based by the respective based by the protect based by the compared by the protect based by the based based by the based based by the based based by the based based

Geen Buill can imagine that comewhere elergt the insign out most here departed from and party souther in a particular approach and party souther in jecosordy for purposes of better observation. I can last see you doing that the form and fixeding They're killed in bunch of animala, and you have may be gotter too close.

Scheller: On wall we are interpreting that ditionantly which is an indication of my personality When I work, I don't think. This a meeting "I work bure five boon in stcoll have been in that as the same time i needed certain information and took calculated make to get it. Take an example. You have some high grass some bushes and some single group string slangy in the busines waiting The chances are good that a tract has keed anothing them. Now, you want to know what species the tiger has killed, and you want to determine the droppings of the tiger and you want to attently the foer cash it possible What atrauld you sto? Should you come back m a couple of days when the hyenas may tures canned of the remains, or do you busites may mean that the tiper is still there You at these for an hour quefly listening. hoping you hear something. Nothing heppens So you very carefully go in Some times the boar is gone. Sometimes it isn't crouches down and waits judging your actions. You don't even know the arrinal to there until it suddenly reas, some theen feet away, and walks off It is a rather tenso atuation but it's part of the job. You can want expensively 4 the tiper provide as a may do The gimpse of the liger moving name on allent page through golden grass ta to me the vision that lingers. To some one else such an encounter mey become the high point of a book, an Eustration of He among dangerous besets, it's all a motter of perception DO

MONOLYTH

(airtight) assund console and umbilical

Then-still part of the sneaky on gram-the men hull field reshaped itself between the console and igor an outside foit, so canaduly stranged) depoie in it

The hull fields point insend, they don't affect anything outside themselves.

Igors 13te alter ego was not outside the

four found out about momentum and in down that carefully planned groove in the hull, puted by its own momentum and the his arm-and him-through a hole a fraction of a square centimeter, it anapped Thought it would, safety factor I didn't do formatic program closed the hull arcund the an in a millisecond. To slower human sen-

if But who cared long as it went

I could have sent him on the same one way the as his console easier's just dump ing the console. Ilgnorant nonpriot. I d had-Gargerous carpo bolore)

I could have made the chop anywhere along his arm, too But I had my reasons for doing if the way I had

He wasn't dumb, or slow He knew that

Boy! he ranged

The G P leaped and threw me out of my forostounge the Link to the Key late out of my sockue and I someoed and landed on the deck if human refleces weren't immediumatry slower than forces of mature Id have cled, menhed for by the name alreghty whap that had snapped the um

But he'd had to react, and so had the G.P. and we were in free-fail orbit. It's the

Keep her away from the Key boy. The Sone Sciented and up, exampled his west manimally usable. He cave me a lock that

I returned it with interest I had brusses from twee to there, and he and his pretty puppet were going to pay for each and

Foolah, Captan," he sold Than he makzed 'So you were suppressful Congratulations Captain You've accom-Dished a gonume test

I decided that my ellow wasn't really broken after all

"The question is now what? Youre a inescherous type: Gaptain If I let you bank to your Key no telling what other little way. prises you might come up with Ummmm Without my console He stood up swawing slightly. The G.P. locked from one of us to the other ready to obey orders ristantly. If only someone would give them Eaptain you'd better hope I've learned without demograp you and to get us all

'And then? I was currous

He shrunged "I can't trust you Butmy word-your prison will be glorious Filled with all the protty muscle boys your want including that mistake of mine And arwithing eite you can imagine "

Tid rather you killed me here and now I meanl it and he didn't need his console

Prefty boy here could do it 'I coaxed X how seconds pressure I DUE ITW.

Some universe master you are 1 i piblid Ready to kel workis but balks of silling a angle person

"Don't fool yourself." he snapped

-quilt fluts bris squa

I smeled "Do you really think he can slop

"No." He alid into a trained hand to hand lighters stance, every as plicing down an oved ramp. But the two of us cam

"But I would rether de." I pointed out "Be good on the trip back and I might

consider if I shook my head "Not good enough "I

scratched a persistent rich back of my knoe, and ordered the Key through my remote to put a force cape-permeable to at of course - around both of them

What-' ead the Gorgeous Piece His menter was quacker, or small

I walked between them and sal on the Key Remote

But I depowered your remote-

I flipped the sever ever patch up and down 'Yesh And scianned to be sure it was the only one I had But you took the rive patch off during the span dide two? remote built into the patch." You found the one and with all the redundancy built into my signifier' you choin't look for another

'There was the physical link Two

I tell you thme troos

Stence Then 'And what'--very dry voice- 'do you intend to do with un?

I sat on my Key and stand at them. The G P looked scared but good of Sare Scientist was plotting his next move I had handed him a setback.

Well, first, I intend to get rul of this support here May take a bit of cloin' If you won't to do what seems most logical to mo

His mouth pursed. The ach moved to my



S.C. Dupon

Executeg ceaftsmonthip and classes Depose The uncompromising world



POPULAR AND A PO

waan't going to ask. 'it's your choice again I can take you back to your homeworldwarted a cherter for scientific research.

done all along has been amed at one ocal

Ecrymol 'Evenhear of blacklearer? Dre who'll get close enough for you to make an

Might not ward to malk sevary Might want

"If sell you a thirty percent share of my You get the creds, make it all honest get

Note then Pay back out of your salary Surgeous Why?

ten and five married # But visitow a woman gets older gets a little tred of all

1 see Mother he was so funcus I parted downward You-

ward him hips moving casily I may be a iam you know and technology mekes things too easy most of the time, so var-

professions scientist medic and what

have tred most everything and to know mecoely what suits me best. Nothing

1 feel- Dann that don't bent coals Ind the challenge of changing my mind qualing the unverse. I looked up and

And when loor the Same Sciencest had in a hoerse voice ' | sust mott ' DO



LURKING DUCK

The next marting I sneaked back to the about before it was bold taxt.

Luced the flashight to see by while Lgot the duck out of the sack. If still looked wet even though most of the mud of it was dry and failing off.

I waant sure fit was safe to touch, with after 1 pabed is with the hone regin and it after 1 pabed is wrything. But lakeday honew I had to team how it worked if I was going to meter it do what I wathat to I opennot the closer again. It was attil dork out I got on the dors aged of the clust, then relative out and real gask i floached one of the social safe casted with dy rest.

The duck claim do anything i touched is a cista on once of the spoket shall obleved like wat muck, but no motor or anything siste gameo nummiguinate it And tiwaint really wat at all use all amount and table and not of greavy, like the bottoms of these nonsek leving parts.

It still hadn't done anything, so I minimy triger over it. If felt the same overywhere Then I pushed is again, a fot hander Noting happened. I was starting to get really arread it broken it somehow.

Laterboard for a white, sinverging of entity counting up. The why was beginning to go on preview of purger - packed that using up and put of work up the door real music, wakers the current of the door real music, wakers the current of the door real music, wakers door operand in so i couldn't the the interoptin strateging of ball to be mayber two field bases. I wai a two group on the two field door music to a couldn't the the intertom music of a counter the two field door music of a context the two field of the music of a context the two field of the door music of a context two field of the door music of a context two field.

This manufas after the left healty come trough the doub end hit for addition, it hadroid to champe table balance and y shower. In harpeot balant in pipher and spirite units is animate the right sharp only it still even have a head or tell or version or itself event how a head or tell or version or itself event how those hanglindleader and table all how those hanglindleader and it still even the trouch another head, after it still event out event head another head, after it and event head another head after its out event balance install the head points out event balance install the head

Mother was already up and in the both room with Father 1 of longatier to close the bathroom outpans, but she hadn't reflood me or she would be come out to find out what was doing. I put her coffee on while she marks as compared

The provide any Medice cost is Wern Here Imaging to phenological as a field of costs Held caught provide the last of costs Held caught provide the here to fill in the fill ordin of proper Everytopid is hours were prime to be measured up each werest them toward to the world'if be obtained in the same fill much fill a world'if be obtained in the same fill much fill as otherwisere often the warreling per register to activitie all shore in toget in the per register to activities of the same filling with her meas sergering agen i select of the down out often Obson by a similar

said she'd been too busy to check, and why was it so intercented all of a sudder?" I said har this bunch the newspaper clippings when I cleaned my room, and she seemed to think that anywerka har qualitation cause she didn't tak the stryphing else

Father said something about liberal pages and patch boards and how you had to eseggeste the truth a lifts sometimes, like with Dubic and the dogs, and look how they'd let him out that time anyway Mether agreed, and they taiked about perice werk bar while

We wheeled Father into the living room in terr of the TV, and I sait up his reader for their I made as use the switch to otherpo from the TV to the reader was where his lived it on his shoulder and alrapped tight ansuigh so it wouldn't ship back to where he couldn't get all if he hudged if too hard with his chin.

Father was asleep in his cherr by the time it got clark that evening. When I opened

A second or two later the other mallard gave a sort of shocked squawk and got pulled under as if a giant snapping turtle had reached up and grabbed it in its saws ?

See sheed I saw the duck had changed, but put a title. Something had started to push out where its neck and sail and wings were going to be it was starting to look almost the a neel duck.

After 1 get back in the house, Mother called lo any line warfl group I to be coming home that right or the rest day. Sho warked to intee if there was enough load in the refrigerator. I shocked and bid here there was include heip just come to the tabbon and her, hence there would take care of it. I used day, and the hump up.

Took ang then made halfer inscene and cheeke with them lank Wein I was ofing hen hals with my agin and cap at lait and services the my agin and cap at lait and service, because with Pholoph he was different provide the service and the service here accesses and the service and the service here accesses was a service to a service me and their services would be pand for me and their services would be pand of the bads concerns would be pand in the service access would be pand in the dot of the bads concerns would be pand in the service accesses would be pand in the dot the bads concerns would be pand in the dot of the bads concerns would be pand in the dot of the bads concerns would be pand in the dot of the bads concerns would be pand in the dot of the bads concerns would be pand in the dot of the bads concerns would be pand in the dot of the bads concerns would be pand in the dot of the bads concerns would be pand in the dot of the bads concerns would be pand in the dot of the bads concerns would be pand in the dot of the bads concerns would be pand in the dot of the bads concerns would be pand in the dot of the bads concerns would be pand in the dot of the bads concerns would be pand in the dot of the bads concerns would be pand in the dot of the bads concerns would be pand in the dot of the bads concerns would be pand in the dot of the bads concerns would be pand in the dot of the bads concerns would be pand in the dot of the bads concerns would be pand in the dot of the bads concerns would be pand in the dot of the bads concerns would be pand in the dot of the bads concerns would be pand in the dot of the bads concerns would be pand in the dot of the bads concerns would be pand in the dot of the bads concerns would be pand in the dot of the bads concerns would be pand in the dot of the bads concerns would be pand in the dot of the bads concerns would be pand in the dot of the bads concerns would be pand in the dot of the bads concerns would be pand to the dot of th

and your motive with me like find. And there he started taking about how wonoutful Mothen had been before the occudent, when the hard' had he takes care of hum. That made me like bad for thim again and at the same time like Mother a little more thought i how the that first like shakes taking it was all how the worther on ho first hum a warm, so he occud parkand things were first in fand.

Wecknesday morning when the save cases in this door and hell hell hing, it finally calenged all the wey back into a dock. The head and sail and wring puehed their way out item missed with the dock was the eight shapp, even though it don't have any legis and was all emosile and twork, just like one of these potany ducks that people use for sucar books.

It storted reeling the lity pads in The same got alloctor and shorter and in the same time the lity pads were chang up the flowers kning back into buds, only even batters of that by the same the steres had been neeled all the way back into the duck, the lity pads weren't any bagter around than the steres and here just for lowed them not the duck

There all even the double surface is to ditings the true loos append only tank of them were much begar that the bad in a panel and they were all over the duck as in was two the whole doub wire approved band constantly were porced. The the dock ad closed append but in the sher able band constantly were porced. The the dock ad closed append but in the sher able the dock and tables on the sher able. Of them the dock and tables on the sher able. If them the dock has the therein opponent the dock has there you could use it, and the dock has there you could use it, and the dock has therein opponent the dock has there you could use it. And the dock has there you could use it.

Finally the usingle logs come pushing out and it started trying to awarn. It wain'n wailling like a real clubb on land it was trying to swim like it though it was under water and had to get to the aurtace.

A few inscripts laws in stopped, where boots in the boots is the surface or because it hought I was not here surface or because it houd (guided out a wash't in the water (could) total where the surface boots or bootwork ool where the dates delarge or bootwork ool where the dates delarge or bootwork ool where the bootwork with the ball in the sur-Tail delart poeting bad thesis always do that it statist poeting bad thesis always do that it statist poeting bad thesis always do that it is bootwork there washed and maked in the maked bad washed and maked in the surface in the surface is the surface of the surface is the surface of the surface is surface and surface and surface is surface and surface is surface and surf

When if trached it looked all wound sait late a real duck, only if was all alload for ward late a whobsarow. I wondered whit, it though about being in the sheet. If who where was snything whong or whith to do about if Then it started pooling, thyre for own our most be light in an www.hough it wasn't waking, that pushed it slowly screes the floor.

When it came to the deptail if hopped over it just like a cluck hopping over ermihing in shallow water. If then it pandiel all screas the grass to the center of the yerdto far away from the troce and sheld and house as it could get with its chest still house as it could get with its chest still hand and its tail up, all at if and take looking it looked more like it was trying to dig into the lawn then like it will willking

Since the curries shring bright linese is excitent attack mer so il noted branad until i was about friteen feat away from it, bat i was abaut to get too obce I went back made and get Father up and find him, then put hem in fort at the TV with his back to the strictles.

Lited him Liden twent to go to school He said okay, if the school called just give him the phone, and hed say I was sick and he wouldn't tel Mother

It was the only thing to was over really able to do for me and he did it whenever he could even though Mother sometimes got real mad at him for it and yelled at him and even the him.

I were back out and came up real close behind the duck, but it still dickrt notice me even when it and/out around in fort of adverse it call close world we term me.

Incrementative of these old metric on Clarinol Beach with their mesial dialocials footing for mensive paceles had discipled in a 1 gain the free out and come at the dask with the mesial end, main ideal 1 gain to make a set cade on the set of the set of the set of the cade of the set of the set of the set of the cade of the set of the set of the set of the cade of the set of the set of the set of the cade of the set of the set of the set of the cade of the set of the set of the set of the cade of the set of the s

its way back rm the middle of the word

Driv that warn t good import because in the take to learn if aload variable books, too. So maybo it had rome other so of thing to keep it away throw wood, play whole it is keep it is away throw wood play whole it is along to learn the clucks and hose, and it drives the wooden and of the enough to that it more work it buchd is and then is only moved a lear keet, but the enough to that it have pollow an abaarch the duck works it have pollow an abaarch the buck works it have pollow an apaged

Mayba it had some sort of rader or softer to keep it away from bag things like boats and peers. Bo Luado the metal and of the hap to herd it over to the order of the lither that way off in the sum but it wouldn't go close to the fance, when it was maybe with fact arough adverged off in adversion it and angle and managed off y nation.

The piece sing, into mode and poil the the held is to 50 fibers have and incumhas what at the sense of both them in at the the university of the sense of both them in at the work and the university of the sense of the memory where the sense is a sense of both the work and the table is denies in both or the sense where the sense is a sense of the sense are both the sense of the dense part to when a note when the sense of the sense sense of the sense of the sense of the sense se

semiclady out to make sure he netly was my table and siting in he wheeldhar parogreed termine mack down, hey wore welcame to do so. The school suid, "Serry to have bothered you, M Maakon" and he had me heng up. Likesod him and were back outside.

The duck was shi auributhing in the metdia of the lawn I warred to push in the this hade and see if it attacked me, were though twisibager than a sen it wouldn't be very dispress because it he duck would stop as econ as it get back into the auri that it durit wart to be too close when is came at me in case it encoded a lab. Baker then when it was use backhor alcound

I took the hoe and ted the berriboo pole to it to make it longer, then used the motel and to push the duck into the shade. It was maybe ten feet out of the sun when I stronger. That took almost lien millions



wanted to see what it would sy to do to me when the time came for it to drag me under

The cluck half Instity gates to the lare between the sus and shadow, and larow it came any farther it would be cur in the sun and set go back to being a take duol, so I used the host to turn the cluck asound taxets the other way.

But it used one wrig to turn itself back so it was coming at me region and this three lifet it get out into the subjort

As size, as to lead way in the sun the circles wort back win its lead and the orth large roughed unmag and standard sources about this is adverse in goin a before look at it fine time, and it was all obvind with built interface and on the and the source that is interface and on the built is the source of the source that is interface and on the source of the source that is interface and the built is the built of the built is the source of the source the source source the source sou

If couldn't seem to turn resif back right side up iso I used the bamboa-stick and of the hole to to ito it over

It was not slow and clumpy in the daytime to be any use if just left in the back yard. I was apring we defin they a partmap pool and their botherk of havi loadid use Saths pool. but I object of come apwith anything. But even though I couldn't site havins make the duck work right cocott mayles guilt howing in or spencere. was still good to know that the duck would try to kill people and not just other back

Then I isomerobyneal the duck root a whole officent way of attacking things at school when if used its wrops a bit and werit a lot latter over the surface of the writer to cut of other cutain? heads to maybe that would work. Only if it did work I alkhit work to be them in the backyard when the duck stracked.

For a white integrational optimal again or call and putting in the backward with the dark to see which tagprend, but the dark to see which tagprend, but the dark to see the second optimal optimal them throught of caphing a real cash, but investight which a so to note unleast which we wreat poor inverties a back, with the way everytigoog inverties to add, public the set work of the set of a back with the set work optimal optimal a back with the way everytigoog inverties to ever also its consistory optimal again allow on ever also its consistory optimal again allow.

But thin i though it doesn't have to be a live dask. I had adough moving to bay one that was needy to cook at the poulty doesn't have needy to cook at the poulty doesn't have needy to cook at the technest and head and overything all do it doe the lower when always placked to it had the lower of the lower to have the output lives it was for month.

¹¹ DUI this global halfway acress the yard from the clock. That way I could also how fail it could go when I was other some thing Ibut the sun waint quae clown yet, an I wort market to play checkans with Father I could it get intervented and after one getter (went into the kichen where I could withit the teachward out in wordow.

But when the sun went down and the light went away the duck dath t aven try to do anything to the goose it just turned back who a log and shuck its thy pade out of the which of sits between off branches.

We have backnown was water to a some and with the distribution the large record and Strengthe distributions are provided with a distribubern mitling. Faithers a divisition backnown have been mitling. Takiners a divisition backnown have the distribution was over, and instead of getting alengy the way he unsafe with and with web areases and sometaining in this move haid maske and sometaining in the same ying these and sometaining in the same ying these and sometaining in the

Finite legit anguy eth Morea and lead me what a blott mise who we need heated hum beautin how one has a set of a contrast was a set of the set of the lead of a contrast was and of these weeks that has a brought hiel work on the set of a lead of a lead, and it has been were were in the lead of leading a blott when he costs that a cost of the a set of heat has been set of the lead of leading and when he costs that costs of the area here heat handborne and storeg and warry then the another amplies of the leading the set heat handborne and storeg and warry better and how the ward here hand in the leaded of the ware the fault of the leaded of the set of the set of the set of the leaded of the set of the set of the set of the


couldn't be a husband to hot, and even if she got atgy at him and had to hot some one else to do all the imge that it was he duty as her husband to do for her, he couldn't blame het, because at kast she hadri dwered her or put him in a home

After a while he was crying and thin he was yaling again. His bothe was empty, so I went and got him another beer only this tens (publicit a Librum in it like Mother someonres) do when she wanted to meke sure he got to sheep and in a while he calment down and passed out.

I wont out and pat the log back in the shed but I couldn't figure out what to do with the goode E would probably not it left it in the shack, but II put it is the freeder Mothers' bard if it sho come home, and at first I couldn't think of any reason to left her who home was a choren in the freeder

Then it baggin (if we) becaut if why the serving because which been may wellng and twenzel to cook it to subtraction in the wards to cook it to subtraction interactions to cook it is an everything, only they closed to hant. And this addet to the subtraction is an everything only they closed to hant. And this addet we somewhy is gotter and begin the therapies the worker to addet the to because the worker to be able to then an up of the second. Unless it is before a pair in the frequent Unless it is before a to the the second Unless it is before a well the second Unless it is the well the second Unless it is before a well the second Unless it is the second of the second Unless it is the the the second Unless it is the second of the second Unless it is the second of the sec

I put the goose every and got Patter into boot it really was not no wes a big billy, only even though I was real intong for how big I was no was twee as heavy as me and I almost drouped him feer to done a live times below. But I don't

I still wasn't elevany and there wasn't anything good on TV, so I got a hozen inverse out and but it in the over.

These is calculate direct, and veter hanks of the instructional time of instagle magnetizes that it has the dark highest of some optimizers and the source of the source of the magnetizers of the source of the source of the magnetizers of the source of the source of the bases keep these and benering that ratios and here used bases for the source of the bases keep these and benering that ratios and here used bases for the source of the dark constraints of the source of the source of the dark constraints of the source of the output of the source of the source

Notice called in the next morting to say, drow we going to be gone here invelve days as in a rest case i subacture if the drow to out a system as sources. Here we don't acres a sub-transfer the set of the said acres as the weak of the set of the said acres as the set of the set of the said acres as the set of the set of the said acres as the set of special attractance and her we interest of the weak of the repy which we

going to make it impossible for term to ever bouch another bird again without getting side and throwing up. But even so his pairole board wasn't going to let term out for at least three more wishin

It wasn't wan aght in the morning yet but i could shi more what sound ad the a party in the backgound, a to do drively and wating and music and leading, or maybe she was in a caken in failtee or Berro. I could les she wasn't environ even to could les she wasn't environ was so much state on the line that I could have had

She told me to go see Dark Sorgeant Crowder at the station after school and hed have twenty five dolars for what she called my "baby sitting time."

That made me haily med oppin, not that she was bying to brite me but that Serpoint Crowder was covering up for her. Because even though he dident come andure to see us nearly all misch as he used to here users and on one of Father's

As soon as I took the hos away, it moved its head ifse it was searching for something, then it started coming at me, paddling as fast as it could ?

best trends, and Entire still thought he was

Also Mether hang up 1 bit failthe eile wann gang to be hone for active her days but data the second active her days but data the second second active der tils based enhanger meine bei dat her general an enyem hong i could han her general an enyem hong i could bat a the construction of the second bat a the construction of the bat active of the second bat these i satisfies

After the behand to them I put him in the living recent and pourred a been in the bottle, then got the cluck. I dridn I bothler to be extra cereful this time i just picked up the log and clamped it in the beckyard.

ptyped oversite with Tathler mod of the morning—well had hitter took well use to be could use this cannot in the faintd—and Tath the init over the table to the table to the table table of the table table to the table over part as if it was something held be called to do on the other cannot and table table on the more table table table table table table to the table table table table table to the table table

Nee she wanted i stad i had school and everything but Fehrer got lonally some times and Sergarat Coveder stad rid been too long since he'd come by and he'd drop in on us soon. I tolk him that would make Fahrer he'd pool.

I cleared Father up for dense, then put a whole Librium his beer so i could cook, the goose without him noticing that I was carg anything special the fell asleep at the table, and I put him to bed with pierty of time table tables errors.

When the sun was almost all the way down iput the goose in the microwave trut lists in too long and all the heathers got singed, and it smelled really disputing when I tack if out

I propped its head up with toothpicks and nan out in the yaid and put it down a long way away tools the duck. This i san as fast as I could back into the house

The duck already had is nock table. Norword with its model spatial and less along the pacehing thrug by Juny 1 and less along the pacehing thrug by Juny 1 through the words the wey is way is been to along a weight wey it ways is been to along a site weight wey it have to along a site weight wey it have to along a site weight weight and the mergy and that forget al to add have on the mysics weight for a site of half increases and that forget and the site of half increases and that forget and the site of half increases and that for get even site is along a base of the mysics of the the site of the site of the site of the site of the even site is along a base of the site of the site of the vent site along a the site of the vent site along a the site of the site of the site of the vent site along a the site of the site of the site of the vent site along a the site of the site of the site of the vent site along a the site of the si

The scissors were back in 16 mosth and in observe in bill and did that thing if it done before, whan it hind to drive down it through this ground to get at mis, only this take after it padded is what it just dopped and turned treats if to a 150

So I know that all I had to do was per Mether out in the middle of the backyard when the sun wert away and the duck would all her I cauld do it comprise right, when site came forms, or wenterer I warred to allow that

I was real exceed and happy I rode my bies all the way to Lover's Point and the Asiomar beaches in Racho Grove because I late so good, and I was laughing a magat at the way fixed and book

The purpose of the terms in the terms of the terms of the terms of the terms in the terms of the terms in the terms of terms of

And when he yelled at me again at lunch I realized something that I should ve realrand a long time before. With Moher gone here/it be no one left to take care of him secapt for me and prety soon held here me just like he hated Mohier and if here me just like way Mohre here here and maybe a little low left this would come to the surface now and than when we membered what it had been like before but little and bear what is here left way that we hated each other

He hand what he was and the only way he could stand hears harmon like that was to take if do an someone else. It were the fault, he couldn't do anything about it but half is what it was he had to hate somebody and make them meanable, and it is warn! Moher it was period to be me

I through about is some more, and then I have in the two to built tabler into the workfirly medit not really not if put here or four Labraria in the beer as the workfirly test anything. He probably workfirly build initial a long tess ago if herd been able. To and if his motifier table traves them to be a Carbole. I diheerd him tell Mother that a kit of tesse

And then the duck would go back to just being a log, and I bould hade it away again unit i was ifficience isotaen before I used it to get Mother Nobooly'd ever guess what was if I kept it het/bits some piece dats.

City what if, when the other poles pame by all they sound were my location and they took the log in to assume to because implete hey locat dolocal or if they addit faunt out what if may addit yours they might before the and the location were where ign Abhrel Isen And I they addit source the whet is were they would it to they are they were it was to be were pole it up and to be they there to do were pole it up and to be

But what if Father just disappoared, like the clucks my duck polled under? The thing that came out of its something have a series of like is meet grunder. Neyte it ground up their bodies so amail there weren't any percentiat.

He wouldn't teel anything if there was enough Librium in his bear. Or if he did a wouldn't be much worse than it was like ter him said to be allow every day anyway.

With him gone Mother wouldnit be angrywith me all the time. She might even go back to being like she was before the very he always told me she'd been when she matrixed run.

And if she didn't, I still had the duck, But I had to find out what happened to this bodies of the ducks my duck pulled under Father was watching a football came

turned up ibud. I artitled his beer bottle

then checked out the bathtoom it was in the corner of the house with two big emdows. Them'd be bright sunight in it for the rest of the attention.

I donied the writeways so the class working concerned any office sampling in class that made a difference, the done to be a supervised of the streng of the top out of the shed and clargeoid into the borg and deep, made out of heat write staff here, we increased with the and orker and token bowls. The only metal in it was the fause and the densi plug.

Maybe fony-free minutes later the dock was floating at the far and of the tab. It don't serve bothered by the walls. Maybe they were particip the same on it from all four order so it don't have to try to go anywhere else.

Louil the goote in the microwave until it got hot again. This tossicul in the tub and swich with out into the hot and closed the door i rain outside and closed the ehuttery for both windows, not pute all the way be cleare I wanted the door to thek it was cloudy but not that it was repitting

And my depictioped its bit is the water with it was blacking a dimit, then dived dowo under the gooder grabitised is in its meahack drives, and used its model guidant drill to the initiative my parters that back and was larted the goode lake it was some asis of must on the bablant of the bub, and word back to floating.

I opened the shuffers wide to let the sun in their got the heal as I excluding high the smalaierd between me and the duck, even thought duth think it would attack me with the sun shiong on L1 west back in and paired between the set.

What was left of the pocer drained out of the tub with the value, cooper to a lew it is peccer of bone. When I poled them up they were all out and indicery the caufilicity reaction of a bone some lend of portion or acat it used to make sure even the title precent that leave bit developed.

But if it could do that it dutif herew why it left the hereadean dudee floating on the authore every right Unlease that when but but's way of making sure that when the got out of jult he could come watch her robot bling ducks for here even if what they'r dure to him maaie it to be couldn't buch the ducks to the movie if buch the ducks to the movie if the buck to duck to be the buck of the buck the duck to be the buck of the buck to duck to be the movie if the buck to duck to be the buck to be could be buck to be the buck to be buck to be buck to be the buck to be buck t

Levent hank mit the large some Fallers was diff wirkfright the latetak genes. His booke was empty i properties his sime large initials har booke wells beer and added four Librums. Ho was additial waves when he was initiated the booker through the was possing out Basi and gave him there mays Librums by refining the Twe ware valence the hard to take. He was to groupy to worker why i then writted in the lake them wate them.

I went back to the bathroom and filled the bib two throle full. Then I pushed his wheelchar into the bathroom and got him bat of 4 into the bib.

The duck stayed down at the far end of

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the tub. Reating over his arkies

I could the door and went outside and after the environment of the way, just enough to cal down the light like it ests a closely day i dicht went himsoghthe shulere, get walked accord the yard looking up at the sky, out at the ferces over them to the neighbor's houses anywhere but at the bathbore windows

Then I closed the shufters but I still close to look in through them. I went back inside, turned of the TV turned it back on again walked around, finally opened he bath room door and turned on the light sol could one what had hatported.

The bottom of the tub was covered with red-brown mud. The log was half-buned

I pulsed the plug. The divage dreamed cut i kept the water numming a kent time to make sure the drain water going to get plugged up, their pulsed the log under the numming water so I could clean the last of the studge off if When it was clean i patient if ap and put it back in the shed under the Bootbacks the term are

I pound some Drane down the plug hele to make sure nothing got diagoid up, and I washed her two with diagoid up, and the wasekinar and unne bag and iff of Father's clothes back in the living some the notabilit parter was still comp

I tode over to Bothis and we went swith rung, then I caul insyle it would be a good det if we went back down to my house unce I had some encryst there and we could buy hemburgers or ros cream

So we rade our blives down to my house and when we found father gonal tailed sergent Crowdar and told him I was soared because Father was gone but his wheelchar was tell there and I drift know what had happaned to him, whother they d taken him to the hospital or somebody d lackataneet how no while

He said he'd send somebody right over

d.d.d. 2001 That was there years ago 1 multibactanon now A year after Fahren taken peared Marten marmed Dan Juni own whyte Fahren Juaio care of the was as a service of the service and the service of the later. The ducks will back in the direct later the ducks will back in the direct back not to taken bit the service market back most to key with its direct was an Sol care user for Marten was well in the back most to key with its direct was an Sol care user for Marten was well as the back most to key with its direct was the back most to key with its direct was the was direct back to back the well in the sol care user for Marten was well with the back direct back was and the well in the was direct back in care was direct to years.

Anyway, I don't lerow if I can well any longer of all new Trefo wellow logo dudge happing charappeared and a werk ago Thom Homan I he can what what thole angles to the hame that babbe is layers used hern for also disappeered. This her fortedger chu-the Christian embauries that charged than natio from the hory Peacida after they were converted of barries



see guils and cats from Dubic tan years ago-burned down, and its owner died in the lare last week

Two been pang down to the lake to feed the ducks almost every day now and function work day now and function of the dispersed it is not so much that we learned to lake them or anything, though I guess I like them all to belier then I used to be these watching in down in the robot set. were appeared

There another continue now A limited maked in time lowers with black specifie maked and bright blac on its side—while the brit books cell is mitter or aboutlam—and an parage and bown bit. The black makes and anoth and analy a sinvey mobile again mit comes down by accord betwith and weather and the accord betwith and weather and in the factor of betwith and weather and in the mean to be with and weather and in more have books of weather or specified them though to backs and her weather the there though to back and her weather them though the backs and weather them them though the backs and her backs the them them the mean specified with and her backs the them the specified back and her backs the them the specified back and her backs ther back and her backs the

Mozer's less me that, zenes Paleto chebio was released from prison these months ago. So that lists to be tren, down these watching his new robot follong the ducks he gamt kill for timeself. I don't know what he theris tabgoened to the other robot.

And while he's along there on his bench, or maybe in right abuilts drives away he s killing all the poople who helped put here in jal 1 don't know how maybe with a tobid person or suscalat or something elso that works all like the clucks.

Mother's one of these people so if he gets to her before 1 do he I save me a lot of touble and I won't have to wony about getting caught. And in a way if is a good thing to know that I i don't get her hell get her for me for some

But the thing is Tm another one of the papera amo highed put here in pat. Maybe over the mean percon except for Moher. I you belowe what the newspapers and And from the way the deviny man watches here sometimes whan its floading the ducks for sound te throad with 0 another.

But he is too smert to try to get us all at the genes time at least not unless here toused out encouply ways to be it us so that nobody. If see the connection between all our dearts, this probably going to wait before the this is optime of Moher. And I we sait got his duck, and I we spent yeals thinking about the base tweet it us it.

So thank im going to put all of d Libitary in Mother's whinking data long/fill if all bialone, or loaderrow night or the right allone of the set to be shared with the honolood out the resetmenting when it's light enough for mail to get the right the behints with the duck. Only the time a worl be like with heater 1 water to watch in the prove

And then the same evening, when the suring going down and balow Dubic has a channe to ind out about Mother, 11 size the duck down to the park and widch if pump on him and out his head off with its adsams. I've got all figured out, and I'm not really assert at all.

This time it a going to be fun CO

INTELLIGENCE

CONTINUED PROVINGS IN-

They will be more compact and sampler to operate. The distribution of software could be samplified as well. I can even envisorcards baing sold at your corner newspaper stand.

Upper of the card will depend on device operand of packar madres and isolation operand to packar madres and being interment. Device contracting CSI, intertional to bain prochapies, and the series out the intermedials. Devices proceeds the devices to reack data on the cards could be intermediated for as little as \$500 before to recoord information with the phylitter before detained in the S500 to \$500 before extended information with the phylitter before estimates

Mean-particle remote of companies, reclaring RCA instruction of companies, press, an working on their defect actions of lasters and publications are instruction rever modals could increase this alrange reconstative cards. The separatement of the Drawn world make the cards company models and world make the cards company models and world make the cards company models and to gravity blank tipply disks within the record for years.

The first 25 million PCM casto well stiert softing out of Droster's Tactory early neor year. Evan more exciting: The first commerow product to use the Dreson oand will be unveiled in the opting of 1984. Not surgrosright 6, will not be a sophistication new software peckage to present computers but a new generation of programmating video-introdit gamas. Each card will be able to run detres of gamas. The later card will not sail incomes the guards has rightere the quarks of the games. This optical technology about of brighter up the graphics and news the use of tenabure motion pacture.

Denser anyo harinaenton is companyiation in some www.ib the hist manyatortapo resorted developed by Philips 1st costs data of throng the way we alrow data. I his says. Xind we are fationg a some wate detribution and licenters tacks to that the Deasen card car be established as a magnitionadra. I have be to be associated well be the principal means of discontinuation the prioritized data in the dutue.

NEW WARES HARD AND SOFT

Deneral of Team Instrumenty polarsentilocrepater can give the Dew Jerses Neural Compositor can give the Dew Jerses Polarita Team and the Destination of the Destination oralled Nationality. It should appear be before content role works to content on the other works phrases or parts of doorniarias. The works phrases was appeared to doorniarias there can combine free elements to form servicines less. What headshees to the servicines less elements to form satisfies of mission to form the tops of the participate can be \$150, moduling a free subscription to the Dow Jones News/ Retrieval service (Texas Instruments, Box 42432, Dalias, 1X 75240.)

The WorkState tip computer, tree Convergent Tochnogere, was disagned for baseness uses. The con-exchines these point convertient exchination with these point convertient exchinations and around setation and data. And there is a classification and data. And these is a classification and a newspect The unit dadata and the setation and a set of the time of the time of the time of the minimum and calls dense to the poper of the (1986—3026) even for balling-powated Microbiolistic-form Coles Analysis (Northermitian-form Coles Analysis) (Northermitian-form Coles Analysis) (Northermitian-form Coles Coles Coles Coles Coles Coles (Northermitian-form Coles Co

For the attell in early compare halow, show (Dison has identicable the hole. Report of high pare. The 109-116 one of her kill part pares a bench and savgred for user is petconal compares in a coverty demond for hird part and and soon pademond for hird part of the soon software PC. It contrast with its own software package checky top (at in you can down everything from compares and on the compares and and an and the software of the compares and the software (\$30%) from Galaco compares in some (\$30%) from Galaco top (\$100 for the software (\$30%) for the software (\$30\%) for the software



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durations both of which may prove midically significant

The second device, now in clinical testing is BIDOS—Becomes Interface Digital Degenocitic System. This transrectity drimulates the nerves movied in erection. If no automatic response accurs, then a doctor looks for neurological abnormalities.

Other tests that are used in degriculs. • Usescund whereby sound waves help in evaluating the adequacy of blood suproly in the press.

 Arteriograms, in which doctors inject dye into the bloodstream and then take X real of the panes to determine the condition of the blood vesiels.

 Sacral nerve reliex testing, which measures the electrical activity of the nerves aflactive the kinology of the period

 Skull X rays, which detect problems with the pitutery gland. Located at the base of the baan, the gland sends and receives chemical messages from the sex glands and other endocrine clands.

Once the diagnose is made ideotoria begin considering the appropriate total meta 17 imposing to a side effect of matcadon, says Dr Whitehead Tual ta an entropypertensive dup of a tranquillor, an equivalent prosoration may be subuled and the crablem adventivery simplif In about 5 to 10 parcent of all cases, hormoral michalmose cause impolence. They are of two main system, a altertage of the main hormone testicatore or an orcess of protectin, a hormone produced by the physical part of the fast candidon can be instated by griving testications and the second by administering Brancorpiths which incides prelacting production

When imposance is due to blood-vessel blockage vescular surgery may increase the flow of blood to the penis Unfortunately, hough the success reteris low and the procedure sometimes causes a permanent acction.

If the impotence results from a physical condepen that either drug thetapy or a change in molocation worth termedy or if the potent suffers a psychological protoem that therapy fendulary montal familyor size therapy of physical protoan early pen-

Morea than 100 b00 metri have had plintee implants. More of this are an existing an implidie aged men wha are an existing and intheath and have storing set drives and enthusable pertners. A surprisingly large number of obter men. Howevell, write implants as well, says Wrischeed, and they're i hereareith intereaded with the reader.

Two typics of implants exist. The first uses a semininged proof/hosis. The early module, which consisted of a pair of rock subgodily invanted in the penils caused a permininent oraction, one correction is detectable.



through clothes: A newer model, from Dacomed, features a silver wire coeled with silcone and Tellon, and wrepped as a coll Since it is flexible it can be bent down when an excision is not warted.

The execution type an inflatible amplitude means the parts by means of a small hydrawing pump. Fluction strend in a container, surgeally pluced in the backness in the parts pump is housed in the screture. We intrable opinies are emplained in the parts by way of the gran (so for increasions is media on the parts issue), not where an evention is depred, the parts large means the pumpin can define the prostitions of well.

Ejaculation and fertility aren't affected by entrier type of prosthesis," Whitehold says providing the functions were intact before implantision

There was pool and cons to each of these impaints. The semirpicitype is initialized inseptember counting allocal allocal and on games only a three-day hospital star. The pump costs about 35 000 for hespitalizetion and surgery, and the procedure demands length hospitalization, intrys ER Flobent David, issentiar profession di uot ory at the University of Posteristic

But Whitehead, who prefers the inflatable prosthesis, contends that the sering ids don't increase the widh or fullness of the pens, somatime, buckle during intercourse, and make it difficult to that unnary and prostate proteins.

The infrarable gives a much more nell und executor, he says in fact, if is often undistazable to a women who deem? have thet her particle her had an implait. Some men peker to go elso ha battroom or inlaad the posteres in the derive so that permer sell remen unware of the implant Chila dish need, women who intwo leads it often incorporate artifiction into their fornew Whiteman acids.

No matter which implant a petiant chooses, he't probeby be sensibled. The interest surveys show that more than menty parcent of all couples in which the man has hed an implant are happy with the result way Whitehoad.

Been a prophese diversi tha docent regime surgery min to an analote. The MCGD lips Nate Deprese General Shrutandy, developed by Bananca, hu, a row in chinal Insia. It works live for A buffet is anochrosen that it mere indexe long, patt under an min in diameter and other banaler patka cale internet into the redukt microsense in addition considered directly under continent on addition considered utilization pervession. Shall be addited utilization pervession to the parts and percent utilization percents.

Each unt will be custom-made " explains Dr. Henry S. Brannan research desector of Bosotreo: "so that the men clearent to and up accidentally opening someond's gamge door."

It the human trials now in progress and as successful as those with primitical Dr Brenman products that MEGS will be avail able by prescription in mid 1984 DO

BREAKTHROUGHS

CONTRACT/ROW PACE 59

objects to determine their position and volums in space. These hairs were developed by researcher John Jameson.

The optical particles are just of citotics mescuph explaines project direction lawy barder if you dip them into a wet politic of supplets in two if go blind. But the whethers can be dualised in pasts and will set be able to bely you when twy hit has below in compareder with a suphisicability to astrong was these labels extrans will anable the robot to calculate the basil way to able the robot to calculate the basil way to

Eventually the hand may have three the dealershy correleted ingeni, and the beam may also test a variety of thumbnel-nee sensors that will nee keel mapsing. This act version of Goats work, says Lafer, a hand with instalpale thumbs. While the robot itself will not be outputed with winds, a kidlan carriers may be meaned an the atm to give the user instal bedfack.

But he most significant implementations on the washes it will be a diabated programmed to memorie new lasts eleculities body is immediate surrounding all the sensors lead them table is computer memory to sterify every object individually deorted where is it is and tell the roubit how to get there is the next persention, you will and have to able the system while it is you want. For example, Bring the that outpover there on your right "

To be really useful, the robot must be at least, somewhat, sell-moliveling. So this team is now developing as these that will enable the robot nurse to plan its own motions to avoid colleases, control to fission tony, and plat grisping statelegies.

Parsain motion is determined by comsolution is say Michielawain motion a programmed avapance. People have liked to all backet receivers and the motion is but we me devising control achimes that does the medic to be adoptable in the netbot burrys into a well, for instance Habitation rebotes have the time. That all the deviction rebotes has to evolve im- to be distribution a stater than account men.

The team expects to have vorking protatypes of the second-generation robot name within system and, if gold the niceessary functing, to bade six imposed robots. "If we had the meney, we could produe these robots communically within these years at a cost comparable to the of a locary determined."

Meanwhele services new input devotes and in the works. Biostoric researchers have developed an eral device sched his just and appliet that enables severely classified people to use their tongues to nudge the equivalent of a ministain system. This later, is also working on a set of umacores senrous that averaged to once of the basis.

Brevearth on robal nurses is also under



way at many other centees. At Johns Highlans University Woodrow Simone has duvogel a robot/workable system that duples a machanical arm to a desk coupped with a typowrise telephone, reasing madu, perspose computer and siting Uthels Rather than vice control, the system uses a chin corrid and is mouthpetical to Sand Moreie costs to the nother computer

At the University of Tokye, Protester Hreyea, Fundato and his colleagued have developed a two attrict foldor nurse. The part of men-pulsions is controlled by an eight bit microcomputer and is capitable of a lange of table, from picking up a hale phone receiver to eighting the table Each am has new dispession (Heedom).

In the batter the product of heighting the works's taged and severity circulated will be come increasingly important. Formadaptions that the stresses that mechanical systems are an adjunct to not a replacement for burner moderneet. The human beam has been that a first and beamsel, paped mode mode to be height by other people regardless of how adhered.

It will become very advented very quotey. Wetrin the next an years," prodets using house thirth-critical as nurses and domestro servanes will be an common as cass. They will be weary employed for useful household work, in unreing horms to case for the elderty will in household for multine weark and chattere using

Interactive robots may also be used an bethefelds as automatic faithans under was as bonk releaved and offshore of asporers and an nuclear tachfreat to clean up hozzardous wastes. Think the whole haat of nam machine interaction is compaiety open ended, says Michaelowik. It who utomate empredenting cost.

NEW PRODUCTS

A given watch tim has developed an variaal imperiate a watch theil intern when you rail the time. This is not even the international proposed A variate that the variate proposed A variate that the variate promotion watch at the watch or part of the surface simply or ammoning and the surface simply or ammoning watch to be surface and watch t

Matasahita has shunk its rear propeon TV occoredgy to snake a trip protohere a postatile color model with a 6 3 roch server. In coloraptio unit tokin trip a tokinch crew and weight and 6 points has compared ways the high resolution server adoubt be expressively wither for the paying patient and videotics and for use is a computer motificar. The unit will go on the in Japan cometime in 1984. (Matauthra Bactele insulated Company Ltd., 1000 Kadama Chr. Ussia, Japan 100

Thirty best games of the year



By Scot Morris

Laar year the trvasen of the Veleo Germes forced us to expand cur using lipids of ten beest games to tworky the test bost vision and the test bost germes expanded the game maket in entrally need directions As a rost/ we have expanded the Games ookman to peed revers less of time fact German vidios, comporten and general

THE TEN BEST VIDEO GAMES

The games are listed in alphabetical online cell for preference.

 Burger Time (Matta), for intellivation, Aaar 2020. IBM, Apple 10, by new year have seen the adds and heard the platitry to make burges white borng purposed by polities aggs and hot dogs What mere can we any? The operated bis slip, but the game is great. It is one to play "pelone more".

2. Centipaele (Alam for 2800 1620 mol 050800 computer) We can taxy much about his game thei yee probably don't meandy waw. This is contrait gambering the transmig ground for Mikiperist. The 19000 warrain is executived, considering this instations of that system. The 5200 westor is between and playout with the transit and controller, dir virtually identical in the second control level.

3 Ocenesis Cheiner (GCE), sin Vennau (D) immereve panae for the labeloop vector-graphic system, we like Coorno Chemic Destruction (Coorno) (Chemic Destruction) and the labeloop of the party coortex you may dispars) coortex you may dispars (Coortex, you may dispars) coortex you have acceled the plands ocerter dorter in all this lab goal have acceled to be contrad by our board space for the pland source to be pland source to be plands ocerter dorter in all this lab goal have acceled the transport the source plands ocerter dorter in all this lab goal have acceled the transport the source plands ocerter dorter in all this lab goal have acceled the transport the source plands ocerter dorter plands ocerter dorter in all this lab goal have acceled the transport the source plands you have acceled the transport the source plands acceled the transport the transport the source plands acceled the transport t

4) Hoppy Table (Acheson: for Intellinated) Designal by Carll Sink (which of the labulous River Anat) files is an oflopring of the encode Loop Mithol. These is not of the advanced voice-game close white seem. The easiest comparison is with Sem Loyds closes: 15 Puzzla, with the advants Sincelia: A your character (a coelecy hat on boots) moseys around the too. Date.





Koto parvas boj kote koti (2016) Haugi Balis Centrpada Madae Anyone⁹ Suber Adori Baskali Cai Bargar Time and Pepper II Markinan Commit David Chem Space Adoritive ind Space Computer parvas dostrori (Suspended Fight Smallar Lode Runner Space WORMS7 Architechi and Protechi Computedin Committee Nationation)

paths, you must rearrange parts of the soneen in least of him so he'll go where you want and never come to the end of a trail. The lis the beat intelfvalan game we have seen produced by an outside (non-Mattel company.

5 Murder Anyone? (Vicinex for a Pioneer Machevox, or Sylvania lason-indepoted player equipped with trame search, chapter search, and stop). Videoclicis have bacenes a new game medium his year. You may have searches conside around Dragon's Carr in atoactes. Its laser graphics are incredible—a Donnycashite ammenian. Videoclicis have the pointeal to be the next water in value gaming bockset they can use and photographic images (A San Dego group, Smuthon, has an acease San Deg group, Smuthon, has an acease San Deg group, sing and dige from the movie Another company promises a lootbat parm using foctage of real NFL action between the Chargess and Reader. 1

A control local that is now Access and a control local that is now Access to a control of the second second second access in the frequency second second second access in the frequency second second

To Chain (Palence, for most vision and computer systems). The way cred of the internet models primate of the year and internet models primate of the year and internet with the table of a pyrmetry and of all set work hole of a pyrmetry be whole whole and the table of a pyrmetry be whole whole of the table of the move on the the mest porters. Various bands do if they are or change the colors bands and the upper

8 One (Assi, for the 6200 and 400 and 800 computers). An innovative genre unities any other and a faithful adaptation of the ancele favorite. Your task is to fit small arrais of the screen until you have chimed more than a certain amount.



General parties folicities four cectory Grand Means Charles Kalika Gapania Regar Elington Unwords Crosstalk Zaur Gaant Zix Monty Proteius Ecoland faud Codaen valued

6.6 or 75 personal and while particular the service Cast the particular fuels and Space, and the particular fuels for the space, and the person person and a relevant transport of the particular a relevant transport of the particular fuel for the second by open to be fuel that and the measure by open to be upon the second by the particular and determinates that a while the determinates that and the particular of the the addition.

9. Backs Bhrtler, A. Journey and Dipose (Advance). An All AND State Dipose (Advance). Advances for Advances (Dipose) (Advances). Downey, Acade (advances), and a loss of the operative of the Advances of the Advances of the Downey Acade (advances), and a loss of the Downey Acade (advances), and a loss of the Downey Acade (advances), and a Bootenpile hearting and loss of the Advances of Bootenpile hearting and loss of the Advances of Bootenpile hearting and loss of the Advances of the Downey Acade (advances), and a Bootenpile hearting and loss of the Advances of the Downey Academic (advances), and a Bootenpile hearting and the Advances of the Downey Advances of the Advances of the Downey Advances of the Downey Advances of Downey Advances of Downey Advances of Downey Advances of The Downey Advances of the Downey Advances of Downey Advanc hought anything this complex could be practed for the 2000. Truly a grant lesp for video games.

C) Bacter data (Later, to be a set of the s



CONTINUED FROM PROS 30

A could book or gate a otherem is voir what that Om Monking Paper Clock by Annes Binth Russteh (Paper and Rev). Presensity | Their you'd have to be catago remains a second of the second paral theory of the top of the second paral theory of the top of the second paral theory responses of the second paral theory entities of the second paral theory on the paral theory and the second constructed with the exponence year gate and the Inter with bootstem and "I he doesn't and the Inter with bootstem and "I he doesn't and the Inter with bootstem and "I he doesn't and the Inter with bootstem and "I he doesn't the restored bootstem and the the exponence and the Inter with bootstem and "I he doesn't and the Inter with bootstem and "I he doesn't here restored bootstem and the second the inter restored bootstem and the second b

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promer and batter (news show the actiat all three bases), then owiches to overhead of the whole belt in stroking batting and leating, and two levels of his to-head play. Unfortunately, there is player versus-correcting game.

VIDEO GAME SYSTEM SUMMARY

Alan 2000. Gur latest learning for the meet popular system air Mis. Peo Mar (a much beitest adjothen them the original Piec-Mar), Vangsaed and Volkybal (all by Alam) Sour For (USS), Aver Red Abote Tank, and Defetin (all by Activision). Der per features the test use or insortial all integral part of game play rather them as performed.

Aten 5200 Pela Posteon, Joust and Rinnie (Aten) All games torithis system are of unformly high quality and include the best classics. Pao Man, Delender Missive

Coherevision Zacison, Deniny King, Jr. Moussey, Caby Jug, Logang, and Spece-Anno are the best of a very good inraug. Coheros gamas for its own myllism are an eather. These specifis for Anno and Infelvision bend to be markedly, underproduced, as it to give the impediation that those bystems are explaible of running only neared their deficient.

IntelSvision White Water Salecracker, Swords and Serpence (all by Image) and Deserbased Factor (Activision)

Vacateac Fortness of Naccod and Art Menler (a remarkable cartindge that lets your draw and arenate on the Vectors screen) Gamping has an idea that could be a

potential is addicated Ann 2000 selectior 21% you get memore cannot gain of the intro the Ann and can be koeded own the intro the Ann and can be koeded own the introp (cannot be added by the selection and the selection of the by your cando bear and by these before they reach the losses and own takes before they reach the losses and own takes before they reach the losses and our work of they work to losses and one working they work to losses and the losses are the beet on the losses and the losses and the beet on the losses. The losses are the loss of the loss of the losses and the losses and the losses and the beat on the losses. The losses are the loss of the losses are the losses are losses and the losses and the losses are the losses and losses are the losses are losses are the losses and losses are the losses are losses are the losses are losses are the losses are losses

We also ran the veen in Megar Merce (megar for the 2000) a sking garm that comes with the Usyboard in a partial migaction of and veen in watarus, detections to contact the game. Megar Merce is no game atakes, but the Syboard can be used on any payable-controlled game to used on any payable-controlled game to used on any payable-controlled game to used on the syboar the solar legit hinty to cosh M. Pac-Merc Introgen ber matter or sildering down the solar the reserve in dense special bacation rate a wideo exercise program. Rest water-cosing Merc of the water file merc water-cosing Merc of the water file

wings of the Beefsteak Xonasons and The Facth Days Schaffing

THE TEN BEST COMPUTER GAMES

The worrers are listed alphabetically.

A select Discretion: Art. 5: A region Art. Society Art. Art. Society Art. Societ

 Proture this.
 You open with the queen's knight, the computer counters with its knight. The pawn shdes but of the way, the knight shdes into place, than the pawn moves back.

played only on a computer. It would be not to imposible to duplicate the gimm in a tabletop version.

2 Page Semistron Descurate to URM PRC Too remarkable and regis beyond many the too remarkable and regis beyond many the secons too repart whether the too results and the second regis being the second regis beyond control of the second regis beyond the control of the second regis beyond the the control of the second regis beyond the the control of the second regis beyond the the second regis of the second regis to the second regis of the second regis beyond the second regis of the second regis to the second regis of the second regis of the second regis to second regis of the second regis to the second regis of the second regis of the second regis of the second regis of the second regis to the second regis of the second regis of the second regis of the second regis of the second regis to the second regis of the second regis of the second regis of the second regis of the second regis to the second regis of the se

plane before you got the hang of things before off is easy---it's landing that's the seal took's but when you set forwn on a new arheld, you'll tool like John Weyne in 7he Hern and me Amatik

3 Loss Provent Extractors to Keynelly Materians parson have backnown with provide the backnown parson backnown parson parson

4 Moodball (Childre Schemer for the Commodiate (Childre) This tritle califolge is mainly attement interaction at Your packet controls an approximation and the of Your Application and the schemer for the operation and the cartes of the schemer The caliform the cartes of the schemer The caliform the cartes of the schemer The Caliform the caliform and the schemer of the schemer deting and the schemer of the schemer deting attempt and the schemer dements and caliform and makes and the caliform interaction of caliform and the schemer dements and caliform and the schemer deschemer dements and the schemer deschemer d-

5. Theoremiser Dynamics to Alth Aging the topologic tendence of the second s

8 Periodi Construction Set (Electronic Antator Agen Apple Commodere 64 IBM) The usual reaction on first booting this disk is.

Truction calculate particular tasking or the general survey tasking tasking or the general based are in it the whole point of L the general basegorial Bill budge has given wave taskings to the state. Now you can create a partial gainst to your own likingthey postrat a land that moves things on or of the board—as many launchers barneos and fippers as you wark wherever yourwark. The 'magnifying glass' left way blow up a principal land.



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design a logic for it and save your game and recoup your investment. Bill Budge doesn't mind He's already at work on his

7 Booper (Thom EMI, for Atan) This is the

B Suspended (Infocom for most syscorruss reapprofible for Zork and its rectine volous mystery games (Deachive and Witness), and this SF tale of terror, Son paneler' You wake up on a computer conthem. You have so tobots at your commond each with its own capabilities. You frack of things, and you can make a si-

9 Wezerdry Kreph of Deemonds (Sr-Techfor Apple). This is the second chapter of

10 WORMS? (Flootman Arts. for Aten and Maynard has created a marvelous abis to design an idealized worm and in

may lollow a diagonal from lower left to LET OF THEN BOART. WHEN WERE WORTH COURSE follows your previous instructions. When it stops and waits for a new rule. The idea is

THE TEN BEST GENERAL GAMES

These cames are listed alphabetacally Prices are on the high ada- you may want

1 Drosslak (The Power Company PO Box only the sender take, receiver asks yperno

into six robers and Writes V which be oneses five assorted military vehicles. Firsch 3 Grand Master Cluess (Miton Blackey moves to the appropriate spot and than Orocy many many (April 1978). We like the 4 Kalko (Future Classics PO Box 7338. game has been streamlined and simplified Lop that will allow you to extant time in prevail clinicities. It looks mathematical but this grant is accessible even to numarciphabes. Production value is trast class —packed in its inecognal box are class incyloities with pantadipatience, and four bamboo curtains to inde players hands from one another—ell of which po octum to rithe lists class prove

3. More prevent sensitive minima Copposed in the sensitive sens

But here were and some some some some or tester and were benny, andersom Somethe apportent that a warp remay bound to be provide and any test har can able your own test any test har can able your own test any test with all any test and any test with all any one test and any test with all any one test and test and any test and test and test and any test and test and test and any test and test and test and any other metal and test and any test and test and test and test and additional metal and test and any additional metal and test and any

You can record the game in pancel on the sheets provided or even bottor with real time or a regulation board 6. Protects (Radion Enterprises, 1927 Los.

6. Politika plakati framprana, (201 Lu-100). To ki koti http://www.com/ http://www.com/second/ http://second/ http://seco

7 Socheng Yard (Internetional Polythings 822) Healts another game plaqued on a Bitret may of London. This one pits one player agained all the test (black with two to four others). One reserve site X: In a chares iny to determine his location and close v1 Mir. X keeps a societif log if his moves but, test which incide el temportation his uses on each lum - date, but or underspruch. Thet gives the delectives something to work from, and every lith sate Mr. X must suirable and show henself. A German export, Scotland Yard can be enjoyed by nongament, especially when they are part of the dedicable term from the Yard.

8 Upwords (Mitce Bradley, \$10 to \$12). This is the best word gama area Scrabbe it allows you to tack (steps on other latters to create new words. Whereas Sostable makes you tank of how to and words to the beard. Upwords makes you think of how to change the words on the board makes working row.

B. Were Micro Telegrin Telegring (June Berler, June Berler, Darris et al. 1997). The set of the Constant of the Set of

10 Zoatricettes (Crean): Corposite (Prev. Jusci) (Prov. Ille Her Corposition (Notices Ille west) merge would do accreting (Dock (110 Pie) merpendres actess of Insue longether Zoatri size Of the ansaler wind-up Zoatris (Inson; 80x). We Ale Of to sighter with its accretion (Biotics Merkel (Dock (110)) (2000) (2000) (2000) we Ale Of to sighter with its accretion about an Office and the size of the size of Datings power tax node movement. Biotic access power tax node movement.

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For their assistance in nominating games for this year's list, we are thereful to Michael Bianchell Bernie Dakowin James Detern Sid Sackson, Wayne Schmittberglic and Phil Waswell DO



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INTERVIEW



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UNSUNG HEROES



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PHENOMEN/A

which environment that down many constraints of the second mice and the second mice down mice



LAST WORD

By Clyde James Aregon

There are moral and ethical questions that will have to be settled about claning consumer goods: Do we have the right to play God with our underwear? Search to be only one pool optimities of the opt

Progia and race are first but wheat generate strapsment should ready but typing to do an use white a bott which a but you owners are use-shat port which a Stram commands objects should not be all that hand if they bring you do owners and any which appears why noticet the minimum atoms the used to no contains in cost apprend and the they brind and the apprend and strate they are and apprend and strate the should be apprend and strate they are and any of this instrate they and

Asserts are an energipsis to DMA. (Why display the first two excludes the building parameters of instance?) So in a mouse cell and the display interval on the first two exclusions in the displayer y interval and rule in the first cell rules. (and the most cell and the most cell and the two exclusions of parameters of the two exclusions of the most cell and the most c

- Gloreng bould also help allevers some of the traditional bunchers of our approach. Data of the money the Deformer Department could award in pudd above MX measure of B 1 bombers.

And you dan I have to go to encounreary lengths of the toter extra in No sight makers. No second heading under No glass part desta in you cause there are in a parter beg if you wanted, and have weld not when and use Doop them on the Toop, and you got duet them of these moves well weld with them of these moves well weld with them of these moves well well well and these moves well well wells. Left approximate any occurrence well wells

The techniques of recombinent DNA bacter also be usedanted to make hand/ hanne. Arragoly second them hand/ bacter Arragoly second them hand/ exception of the techniques and they have dealer the same bring with neishine. Why red also the same bring with neishine. Why red also the same bring with neishine. Why red also the same bring with neishine. Why red hand the same bring with neishine. Why red hand the same bring with neishine the provide same bring with neishine the provide same bring with neishine the same grappe packet arrives.

Rery people cannot afford to buy a pome rowardway, but field octaid be overged By injecting abuns from quality building material into low cost PNA homes from clonnes could poducial notaxes mate charpy and ensity it would also be a non-to motivate matrice versies, cak cabrets or a Jacuzet Even the mean enable could got a to a the act. Can you integrine a Holiday ion grown in a sair? It would be the life of the perty at the annual stochtrockers making. And if the optimum ever wenoed is change the optimum the bolidange at it would have to do is add a few drops of food obtoms.

And there are so many trings that, qualities contained. You could cross a guitar with an electric generator to guitar electric guitar that waldn't have to be plugged in CP you could combine a sedamy with coffee to get a drug that workshill by you down.

The is not use there are subsidily the subsidient of subsidient of subsid

As we all scenario experiments, here a many in posterial to catacitophin Suppose a closecurit three stree for semple, we accurate here in the semple, we accurate here in the court or a business here produced with a floating of the semple. The result and a some of manual service with here another and a some of manual service with here another and a some of manual program. The result and a some of manual service and the source of backad properties could accure device we with here to device some strengers intelliguated to a some through the service service some strengers and we have a some through our service and a some service on configures and a some service on the some service and a some

And tasky there are mast and official questions that will have to be addressed about doining balance of consumer goods in the event of preven defects who will decide the right fime to pull the draw plug? Do we have the right to draw plug? Do we have the right to draw for with our underweat?

If gasatic organesis take the initiative now we can look forward to a future of incredible internal abundance. If they clast we may have to develop a table for troop and mice DO

Olyais Jamiwa Antegon is a consourcer and a transmous whiler who fives in Albuquerque with his wei-la-be convert Ottory O-10 Invok