EDUDOC SERVICES

CURRENT CONTENTS

MAY- 2019

LIBRARY AND DOCUMENTATION DIVISION

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National Council of Educational Research and Training

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Introduction

"**Current Contents**" prepared by Library and Documentation Division aims to identify the articles published in the learned journals received by the library in the month of May- 2019.

Current Contents are arranged alphabetically under the broad subject headings. It gives the details about the name of the Journal, volume, issue month and year of publication. It will be our endeavour to bring out this as a reference tool, which will make our readers aware about the current contents available in different learned journals of their subject of interest.

Current Contents will be useful to our faculty members in selecting/recommending relevant articles for their research.

Keeping in mind the integration of ICT and Digitisation, attempt has been made to provide the Web-link of the current issues, which will facilitate the readers to access the articles, except the '*' marked journal titles

We eagerly await to received your views and comments.

(Prof. Saroj Yadav)
Chairperson, LDD,
NCERT, New Delhi

Sr. No.	Name of Journals	Vol.	Issue	Month	Year	Pages
❖	**Biology**					
1.	Journal of Biological Education	53	3	Jun	2019	46
❖	**Curriculum**					
2.	Curriculum Inquiry	49	1	Jan	2019	19
❖	**Economics**					
3.	Economist	431	9140 9141 9142 9143 9144	27 Apr 4 May 11 May 18 May 25 May	2019	23-32
4.	Economic and Political weekly	54	16 17 18	20 Apr 27 Apr 4 May	2019	20-22
5.	Economics of Education Review	70		Jun	2019	33
6.	Quarterly Journal of Economics	134	2	May	2019	111
❖	**Education**					
7.	शिक्षा विमर्श	20	6	Nov-Dec	2018	132
8.	Educational Policy	33	2	Mar	2019	35
9.	International Journal of Inclusive Education	23	1-2	Jan-Feb	2019	45
❖	**Educational Research**					
10.	American Educational Research Journal	56	2	Apr	2019	1
11.	Educational Evaluation and Policy Analysis	41	1	Mar	2019	34
12.	Journal of Educational Research	111	4-6	July-Dec	2018	49-50
❖	**Educational Technology**					
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❖	**Environmental Education**					
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❖	**Geography**					
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16.	Journal of Geography	117	4 5	Jul-Aug Sep-Oct	2018	52-53
17.	National Geographic Magazine	6	10	May	2019	77-78
❖	**Higher Education**					
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❖	**Library Science**					
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20.	SRELS Journal of Information Management	56	1	Feb	2019	137
❖	**Linguistics**					
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❖	**Mathematics Education**					
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23.	Mathematical Thinking and Learning	21	2	Apr-Jun	2019	70
24.	Mathematics Teacher	112	6	Apr	2019	71-72
25.	Mathematics Teaching in the Middle School	24	5 6	Mar Apr	2019	73-76
26.	Teaching Children Mathematics	25	5 6	Mar Apr	2019	138-141
❖	**Physics**					
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30.	Physics Today	72	4 5	Apr May	2019	86-89
31.	Physics World	32	4	Apr	2019	90
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34.	Journal of Cross-Cultural Psychology	50	3	Apr	2019	47
35.	Journal of Humanistic Psychology	59	2	Mar	2019	54
36.	Journal of the Indian Academy of Applied Psychology	45	1	Jan	2019	55-56
37.	Psychological Review	126	3	Apr	2019	102
38.	Psychology in the Schools	56	1 2 3 5	Jan Feb Mar May	2019	103-110
❖	**Science**					
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40.	New Scientist	241	3223 3224 3225 3226 3228	30 Mar 6 Apr 13 Apr 20 Apr 4 May	2019	79-83
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❖	**Science Education**					
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44.	Resonance: Journal of Science Education	23 24 24	10 4 5	Oct Apr May	2018 2019 2019	112-114
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46.	Scientific American	320	5	May	2019	129-130
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AMERICAN JOURNAL of PHYSICS

CODEN: AJPIAS
ISSN: 0002-9505

Volume 87, No. 4
April 2019

Cover figure: Curves of the path of the angular momentum vector on the Binet ellipsoid, showing the relationship of the curve and the total phase for the motion. To see details of how this is a classical analog of the Berry phase of quantum systems see the article on p. 245.

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AMERICAN PSYCHOLOGIST®

Journal of the American Psychological Association
https://www.apa.org/pubs/journals/amp

February–March 2019
Volume 74
Number 2

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On the cover: Le Pont Neuf, *2017, by John B. Martin. Watercolor on paper. Courtesy of the artist, http://johnbmartin.com/. See p. 260 for more about Martin and his art.*

Articles

171 The Future of Sex and Gender in Psychology: Five Challenges to the Gender Binary
Janet Shibley Hyde, Rebecca S. Bigler, Daphna Joel, Charlotte Chucky Tate, and Sari M. van Anders

From its origins, psychology has operated under the assumption of a gender binary. More recently, the conceptualization of gender as binary has been challenged. This paper describes five sets of research findings that challenge sexual dimorphism in humans, including findings in neuroscience, behavioral neuroendocrinology, gender similarities, transgender identity, and developmental research on cultural socialization that leads people to think in gender binary terms.

194 An Expanded Theory of Alzheimer's Caregiving
Samantha F. Lang and Blaine J. Fowers

Caregiving of adults with Alzheimer's disease appears to occur cross-culturally as a near universal aspect of human behavior. Standard evolutionary accounts are inadequate to explain motivations to sustain this benevolent one-sided behavior, and attachment theory is ambiguous as to whether the relationship offers benefits to the individual such as security or whether it is inherently valued. The authors propose a shared identity theory to resolve this question.

207 Socioeconomic Mobility, Identity, and Health: Experiences That Influence Immunology and Implications for Intervention
Mesmin Destin

Young people from modest socioeconomic backgrounds who ascend their early circumstances to achieve educational and occupational success might be expected to experience positive health benefits. By contrast, increasing evidence indicates that socioecomomic mobility might have detrimental effects on health. To understand these paradoxical findings, the author articulates a common psychological process centered on identity challenges, which are linked to disruptions in immunological processes.

218 The Source Model of Group Threat: Responding to Internal and External Threats
Katharine H. Greenaway and Tegan Cruwys

Research suggests when people perceive threat from outside one's group, family, or culture, their within-group identity is strengthened. However, when people perceive threat emanating from within their group, within-group identity may be eroded. The authors draw these literatures together in a source model of group threat to understand opposing effects of between and within group threat. This article considers how these ideas can inform political debates, such as domestic terrorism.

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232 APA *Multicultural Guidelines* Executive Summary: Ecological Approach to Context, Identity, and Intersectionality
Caroline S. Clauss-Ehlers, David A. Chiriboga, Scott J. Hunter, Gargi Roysircar, and Pratyusha Tummala-Narra

The revision of the 2002 edition of the Multicultural Guidelines reflects major growth in research and theory regarding multicultural contexts. Individuals' intersectional identities are shaped by societal and cultural influences across time and contexts, including age, gender, race, ethnicity, sexual orientation, social class and employment, language, ability status, immigration status, religion, and globalization, among other variables. A layered ecological model forms the framework for 10 corresponding guidelines that encourage psychologists to consider aspects of identity such as historical antecedents, systemic oppression and privilege, and cultural contexts.

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Jorden A. Cummings and T. Eugene Day

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AMERICAN PSYCHOLOGIST®

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Volume 74
Number 3

Journal of the American Psychological Association
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On the cover: Mill Creek Pine, *1978, by Joanne S. Scott. Watercolor on paper, 15 inches by 15 inches. Courtesy of the artist, https://www.joannesscott.com/. See p. 407 for more about Scott and her art.*

Special Issue: Multidisciplinary Research Teams: Psychologists Helping to Solve Real-World Problems

Special Issue Editors: Robert W. Proctor, Kim-Phuong L. Vu, and Elizabeth A. Klonoff

271 How Psychologists Help Solve Real-World Problems in Multidisciplinary Research Teams: Introduction to the Special Issue
Robert W. Proctor and Kim-Phuong L. Vu

Multidisciplinary research combines methods and theories from different disciplines to solve societal problems. This introduction to the special issue highlights that psychologists have many skills that position them for making major contributions on multidisciplinary teams. The guest editors summarize key findings from the articles in the special issue.

Team Training, Competition, and Collaboration

278 Teams of Psychologists Helping Teams: The Evolution of the Science of Team Training
Tiffany M. Bisbey, Denise L. Reyes, Allison M. Traylor, and Eduardo Salas

This article highlights the salient role of multidisciplinary collaboration in the success of team training, an area driven by psychologists responding to real-world problems. The authors provide a historical account of scholarly progress and the critical turning points that shaped the science, culminating in a collection of lessons learned from the research and practice of team training.

290 From Discipline-Centered Rivalries to Solution-Centered Science: Producing Better Probability Estimates for Policy Makers
Barbara A. Mellers and Philip E. Tetlock

Policy makers need intelligence analysts to tell them the likelihoods of geopolitical events. The Intelligence Advanced Research Projects Activity (IARPA) conducted a four-year tournament in which five university-based teams competed to develop the most accurate predictions. The authors' team pitted psychological survey techniques (i.e., prediction polls) against economic prediction markets in a head-to-head race. This article tells the story of what happened.

301 A Multidisciplinary Understanding of Polarization
Jiin Jung, Patrick Grim, Daniel J. Singer, Aaron Bramson, William J. Berger, Bennett Holman, and Karen Kovaka

Like other social phenomena, polarization cannot be understood at a single level of explanation. Social systems are complex, and multiple factors interact at different levels. The authors' multidisciplinary research team integrates theories and methods from four disciplines—social psychology, political science, social philosophy/epistemology, and complex systems science—to develop a fuller understanding of polarization. The authors describe team dynamics, challenges, major findings, and lessons learned.

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Adolescent Mental Health

315 The Missouri Prevention Center: A Multidisciplinary Approach to Reducing the Societal Prevalence and Burden of Youth Mental Health Problems
Keith C. Herman, Wendy M. Reinke, Aaron M. Thompson, and Kristin M. Hawley
The challenges presented by the growing prevalence, burden, and unmet service needs of youth mental health problems are formidable. Over the past decade, with the support of an innovative local sales tax, scholars and partners of the Missouri Prevention Center have developed a model for how communities can address the challenges of youth mental health concerns through multidisciplinary collaborations.

329 Multidisciplinary Partnership: Targeting Aggression and Mental Health Problems of Adolescents in Detention
Karey L. O'Hara, Jennifer E. Duchschere, Caroline E. Shanholtz, Samantha J. Reznik, Connie J. Beck, and Erika Lawrence
Mental health and related behavior problems are alarmingly high among justice-involved adolescents, yet many communities lack accessible, sustainable, and empirically supported prevention and treatment programs. This article presents the work of a multidisciplinary partnership comprised of clinical research psychologists and court professionals to develop and test an intervention, rooted in evidence-based principles, to address aggression and mental health symptoms in adolescents involved in the juvenile justice system.

Maternal and Child Health

343 Transforming Prenatal Care: Multidisciplinary Team Science Improves a Broad Range of Maternal–Child Outcomes
Jeannette R. Ickovics, Jessica B. Lewis, Shayna D. Cunningham, Jordan Thomas, and Urania Magriples
Pregnancy is a time of profound growth and transition; it is a window of opportunity to impact the trajectory of health for mother and child across the lifespan. Work by a transdisciplinary team improves maternal and child health though an innovative approach: group prenatal care. The authors discuss development, implementation and rigorous evaluation, including theoretical and clinical foundations, impact and lessons learned.

356 Impacting Development in Infants With Tuberous Sclerosis Complex: Multidisciplinary Research Collaboration
Marian E. Williams, Deborah A. Pearson, Jamie K. Capal, Anna W. Byars, Donna S. Murray, Robin Kissinger, Sarah E. O'Kelley, Ellen Hanson, Nicole M. Bing, Bridget Kent, Joyce Y. Wu, Hope Northrup, E. Martina Bebin, Mustafa Sahin, Darcy Krueger, and TACERN Study Group
Infants with tuberous sclerosis complex are at high risk for adverse outcomes. The authors' multidisciplinary multisite team explored early risk and protective factors for epilepsy, autism spectrum disorder, and behavioral challenges in this population. This article explores the critical roles of psychologists in complex longitudinal research.

368 Answering Questions About Electronic Cigarettes Using a Multidisciplinary Model
Alison Breland, Robert L. Balster, Caroline Cobb, Pebbles Fagan, Jonathan Foulds, J. Randy Koch, Thokozeni Lipato, Najat Saliba, Alan Shihadeh, Shumei Sun, and Thomas Eissenberg
Electronic cigarettes (ECIGs) are a controversial class of tobacco products. The controversy can be addressed with objective data obtained using a multidisciplinary approach that spans several areas of psychology as well as chemistry, toxicant inhalation, and physiology. The authors' multidisciplinary team has developed innovative methods and presented several major findings that inform the scientific, regulatory, and public health communities about ECIGs and their effects.

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Workplace Effectiveness

380 The Workplace Health Group: A Case Study of 20 Years of Multidisciplinary Research
Nicholas J. Haynes, Robert J. Vandenberg, David M. DeJoy, Mark G. Wilson, Heather M. Padilla, Heather S. Zuercher, and Melissa M. Robertson

The American workforce is challenged by poor health, safety concerns, and loss of productivity. Yet addressing these complex issues is complicated due to physical, psychological, social, technological, and sociopolitical factors. The Workplace Health Group at the University of Georgia, a multidisciplinary research team, was established two decades ago to investigate worker health and safety and organizational effectiveness. The authors highlight the real-world impact emerging from the team's functional diversity.

394 Bridging Psychology and Engineering to Make Technology Work for People
Rod D. Roscoe, D. Vaughn Becker, Russell J. Branaghan, Erin K. Chiou, Robert Gray, Scotty D. Craig, Robert S. Gutzwiller, and Nancy J. Cooke

Grand challenges in engineering require technological innovations that take into account human thought, behavior, and quality of life. Human Systems Engineering (HSE) brings together multidisciplinary teams of engineers, psychological scientists, and practitioners to confront and solve such problems. This paper describes five lessons learned from successful HSE teams and two strategic approaches for supporting future effectiveness.

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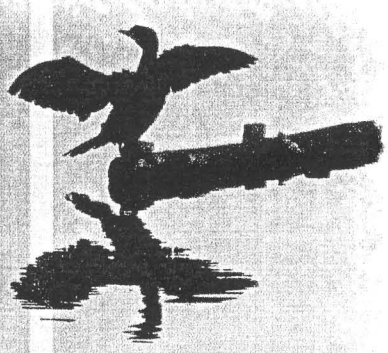
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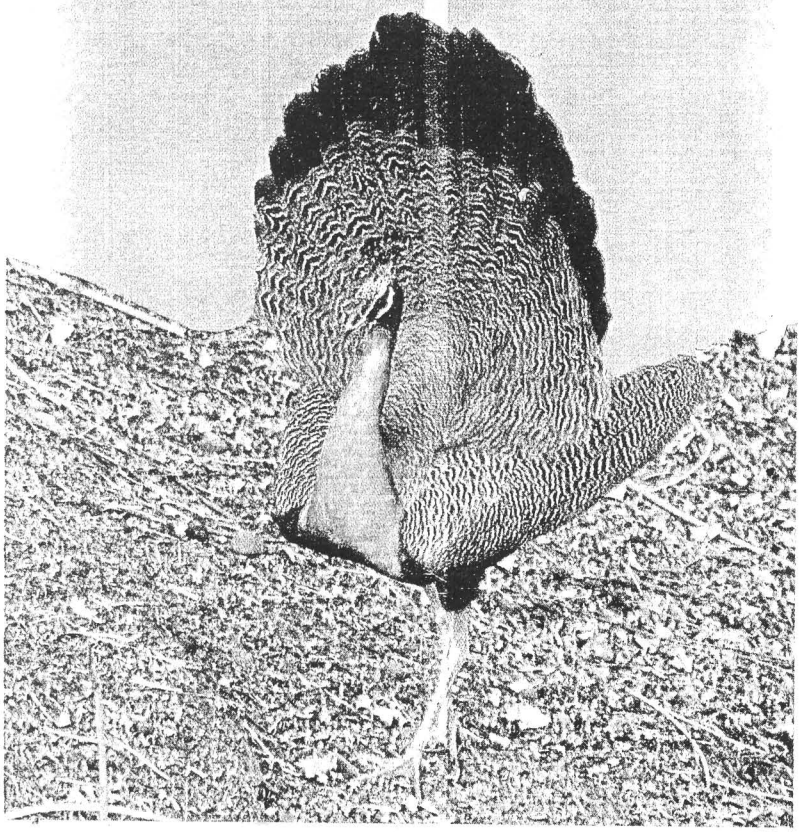
चकमक

पंखों की छाँव में...



आलेख व फोटोग्राफ:
दीपाली शुक्ला

सुबह से ही धूप तेज़ हो चली थी। मोर यहाँ-वहाँ उड़ा, फिर थककर एक जगह बैठ गया। धूप बहुत है। छाँव चाहिए। क्या उड़ूँ और किसी पेड़ तले आराम करूँ। तभी उसे खयाल आया, अरे! पंख हैं मेरे पास। बस फिर वह पंखों की छाँव तले हो लिया।



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विनता विश्वनाथन

सह सम्पादक
कविता तिवारी
सजिता नायर
गुल सारिका झा

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Middle left provided by Tiago Pereira from **'Synchronisation of chaos and its applications'**, Contemporary Physics (2017) 58:3, 207–243, Figure 1. Illustration of the chaotic dynamics of the Lorenz system (14) with parameter values $\sigma = 10$, $\rho = 28$ and $\beta = 8/3$. Representation of the trajectory of (x, y, z) = (−10, 10, 25) in the phase space. The shape of the attractor resembles a butterfly.

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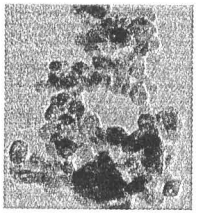
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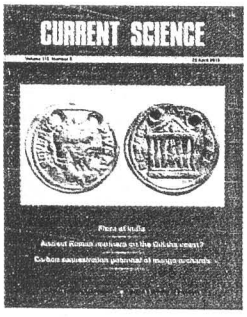
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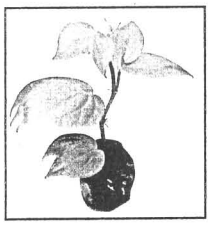
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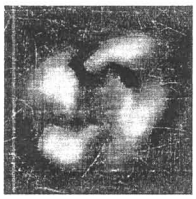
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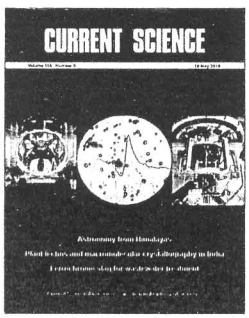
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Provincialisation of 'Transformative' Politics

10 The left and the Dalit political parties put limits on the transformative politics that draws its support and sustenance from the normative ideals available in Karl Marx and B R Ambedkar. These limits spring from the conditions of provincialisation of transformative politics into instrumentalities that are internal to electoral democracy. — ***Samar Kavi***

The Realities of Voting in India

12 The nature of work and consequent socio-economic realities deprive migrant workers within India of their voting rights, while lack of official documentation of internal migration, especially for informal employment, prevents any conscientious policy action. — ***S Irudaya Rajan, Ashwin Kumar & Arokkiaraj Heller***

Undermining the Lokpal

14 The Lokpal law was enacted to set up an independent institution to ensure proper investigation and prosecution into allegations of corruption against public servants. Five years after the law was passed, members were appointed in a manner that undermined public trust in the institution. — ***Anjali Bhardwaj, Amrita Johri***

Challenges for Transgender-inclusive Sanitation

19 The sanitation needs of the transgender community are addressed on the assumption that the community is a homogeneous group. However, designing transgender-inclusive sanitation requires a deeper examination of the role of caste, gender, and age within the transgender community. — ***Durba Biswas***

The Neglect of Ambedkar: Perennial Problem of Sociology in India

27 Indian sociologists and historians have retained a certain foundational bias and blindness regarding caste. The neglect of B R Ambedkar has been part of a strange refusal to acknowledge the political in caste. — ***Manash Firaq Bhattacharjee***

Waste Management and Extended Producer Responsibility

34 The E-Waste (Management) Rules, 2016, Plastic Waste Management Rules, 2016, and Solid Waste Management Rules, 2016 are compared with the first ever rules based on extended producer responsibility in India: the Batteries (Management and Handling) Rules, 2001. — ***Yamini Gupt, Samraj Sahay***

Theory Underlying Labour Market Flexibility

41 The theory underlying the labour market flexibility argument in India is identified and critically examined. A review of the empirical studies reveals that this argument is based on rigid real wages in turn explained by hiring and firing costs. — ***Anamitra Roychowdhury***

Criminalisation of Bengali Muslims

49 The lives of Bengali Muslims in a slum in Jaipur changed overnight after the bomb blasts of 2008. Through narratives gathered on field, it is shown how the criminalisation and dehumanisation of a community was made possible. — ***Kanchan Gandhi***

Accounting for the Diversity in Dairy Farming

56 In response to "Economics of Dairy Farming in India" (*EPW*, 14 October 2017), some of the issues implicit in the special article "Do Producers Gain from Selling Milk? An Economic Assessment of Dairy Farming in Contemporary India" (*EPW*, 24 June 2017) are reiterated. — ***Nilabja Ghosh***

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60 ***Vandana Dhoop*** on the need to introduce restorative justice in the Indian judicial system; ***Mythri P U*** on the *Shinkari melam* troupes in Kerala as symbols of Dalit assertion; ***Shruti Sonal*** on how the film *Dirty Pretty Things* poses a counter-narrative to the "European Dream;" and Last Lines by ***Ponnappa***.

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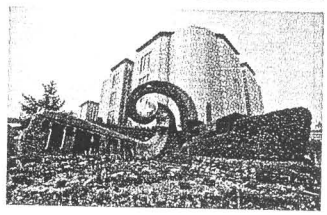


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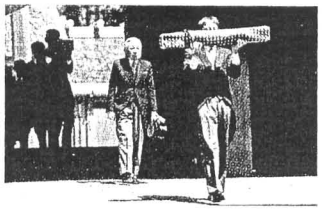
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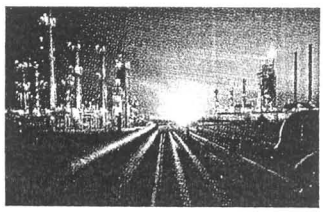
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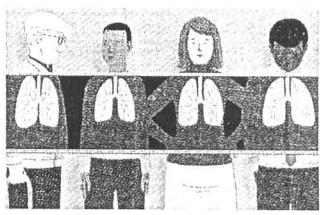
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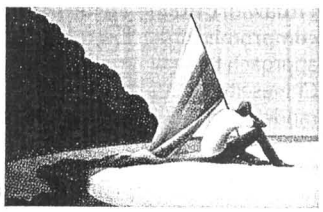
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Volume 431 Number 9140

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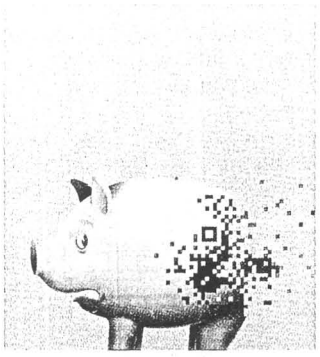
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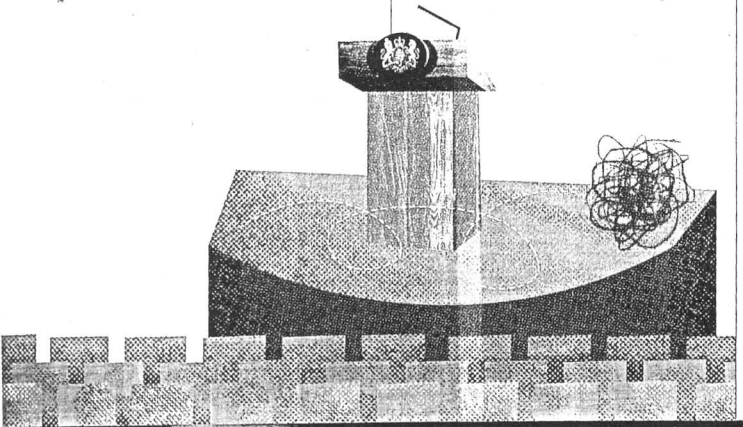
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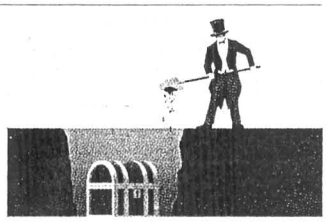


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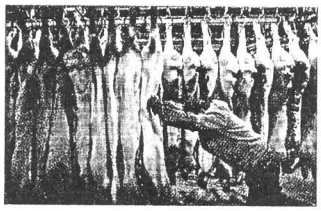
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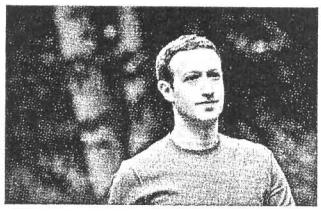
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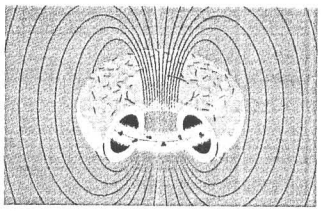
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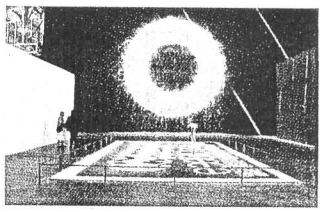
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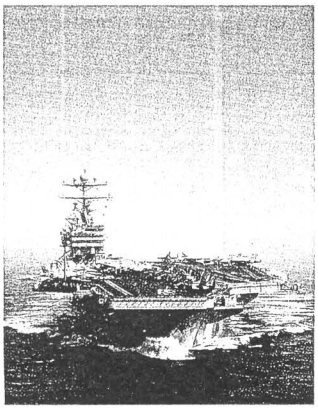
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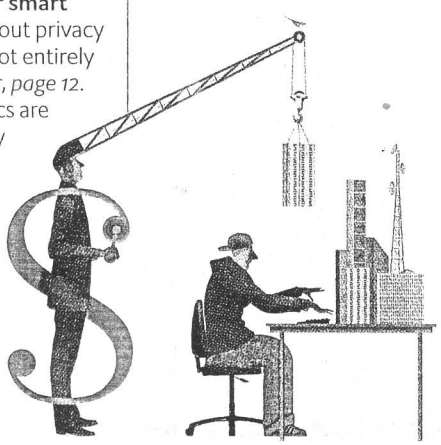
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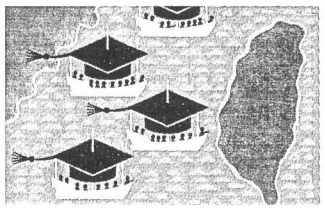
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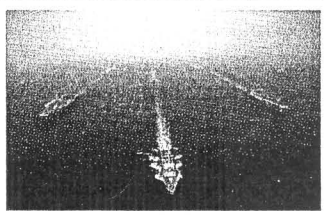
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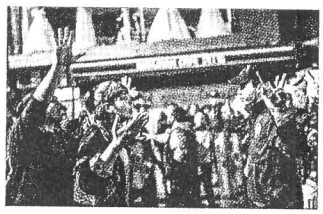
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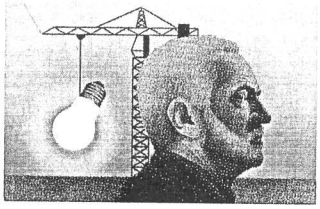
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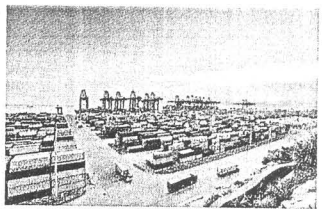
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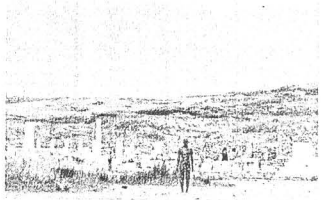
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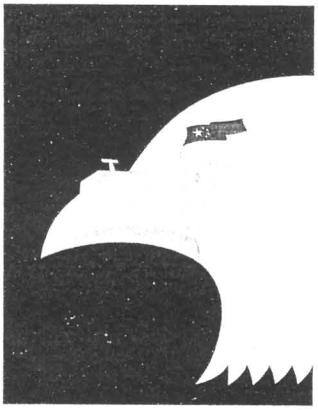
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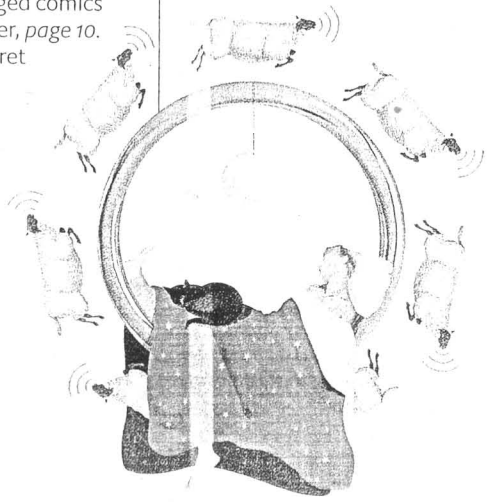
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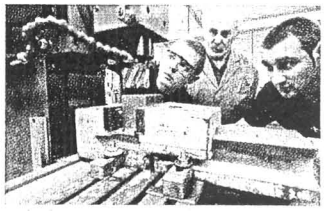
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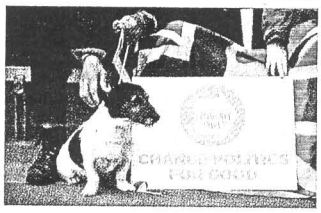
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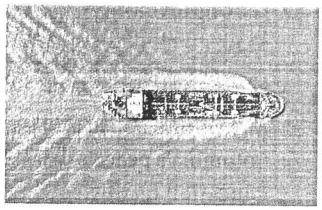
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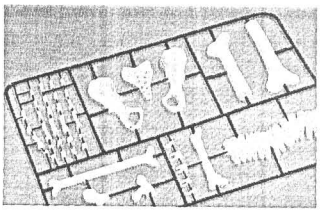
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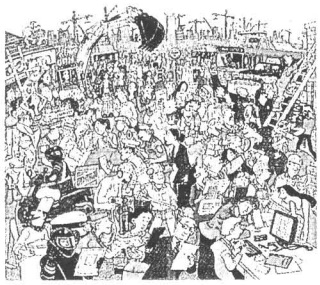
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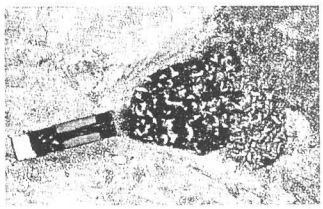
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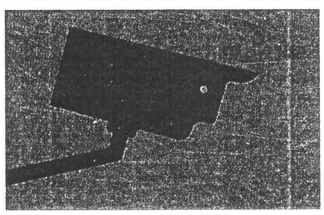
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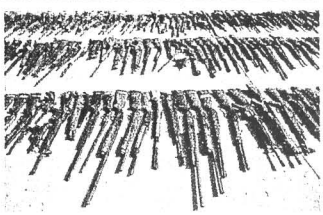
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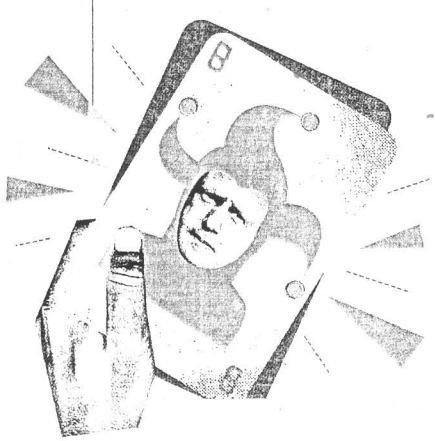








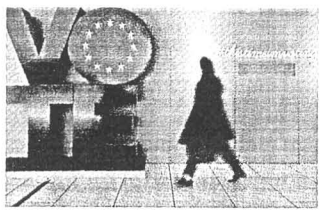




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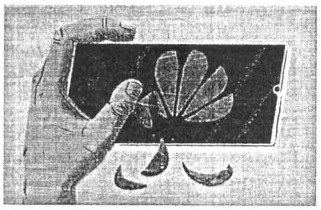
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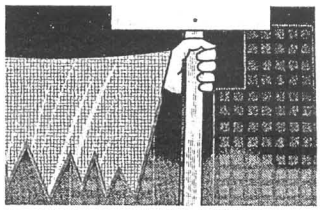
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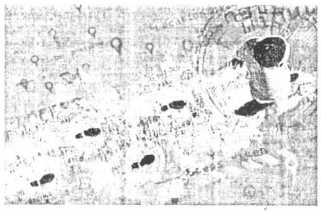
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Vol. 70
June - 2019

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0272-7757(201906)70:C;1-B

ISSN 0272-7757
70 1–214 (2019)

Printed in the Netherlands

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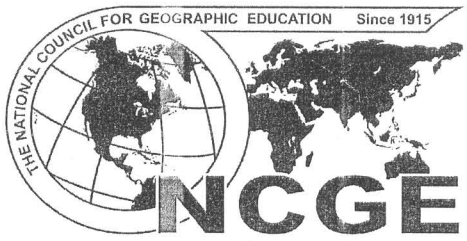
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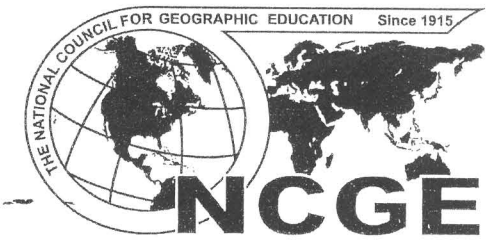
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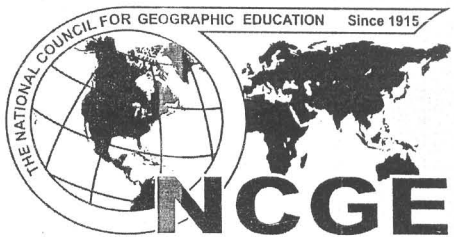
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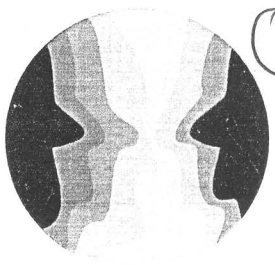
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Journal of the Indian Academy of Applied Psychology

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Political Parties Jettisoning Moral Values

The ongoing 17th general elections in India have already proved two points conclusively. First, the quality of the political leadership in the country has abysmally gone down. Secondly, democracy in India is now under peril. For every right thinking citizen the time has come for taking note of these two deadly cankers.

West Bengal, the State known for its political volatility, has remained true to its reputation in the second phase of the election process. Although the Election Commission observers have tried to pass it on as a peaceful election exercise, field reports point to a different story. The most serious allegation has come from Phulbari in the Raiganj parliamentary constituency where voters of a particular community are said to have been prevented from casting their votes. Then there were the violent incidents in Chopra. Satellite channels have shown footages of open hooliganism in the presence of the State Police. Remarkably in almost all the footages local people are seen to be demanding the presence of Central forces for conducting a proper poll process.

How can the West Bengal Government deny that this is a telling comment on its credibility? More devastating and shocking is the incident when two journalists of the local TV channel were mercilessly beaten up as a result of which Parthasarathi Ghosh, one of the above mentioned two, did receive a serious head injury. Due to the serious injury, the sincere young man discharging his professional duty, was seen to be finding it hard even to move.

Under these circumstances the run-of-the-mill statements from Partha Chatterjee and Sadhan Pandey, two senior Ministers in the Mamata Banerjee Cabinet, that they never support attacks on journalists looked pathetic and lacking in conviction. Attacks did take place. What were the two Ministers doing when the journalist was being beaten up with bamboo poles?

But West Bengal is no isolated case. It is a telling commentary on the Indian political leadership that the Election Commission had to forbid Mayawati, Yogi Adityanath and Azam Khan from electioneering for certain days. Nor is the Election Commission, once commanded by no less a person than T.N. Seshan, free from blame. The Supreme Court had to step in to shake this lethargic constitutional institution. Its face changed immediately after the highest court in the land held out a veiled threat. No doubt the role of the Election Commission, in this case at least, is a bad omen for the country.

In this vitiated atmosphere one's mind goes back to the 1977 elections when sentiments ran high in the wake of various omissions and commissions during Indira Gandhi's Emergency. There were arrests of senior Opposition leaders and, above all, the high-handed shadow of Sanjay Gandhi. Still there were very few unparliamentary words from either the

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VOL LVII No 19 New Delhi April 27, 2019

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FROM N.C.'S WRITINGS

· BJP'S DANGEROUS POLITICS

Beyond Poll Rhetoric

As we go to press, Varanasi is witnessing a mega road-show of Prime Minister Narendra Modi in the temple town before the Ganga *arati* in the evening; the PM will file his nomination for the Lok Sabha polls from the city tomorrow morning. At the same time, as is the norm these days, during the road-show the media, mainly the electronic media, went out of its way to ridicule the Congress on the belated decision of party General Secretary Priyanka Gandhi Vadra not to contest from Varanasi despite having initially expressed her desire to do so to give a tough challenge to the current head of the Union Government.

If one dispassionately ponders over Priyanka's eventual decision, one would find that the move is not a sign of weakness on the part of Priyanka or her party, as is being made out by some sections of the media to curry favour with the ruling party at the Centre, but a highly mature stand conditioned by the necessity to reinforce the Congress' election campaign in the entire eastern UP which Priyanka is presently engaged in. If she had stuck to her original decision to contest from Varanasi she would have not been able to carry out that onerous but imperative task.

The election process is now in full swing. Polling has already concluded for over half of the total Lok Sabha seats with the end of the third phase last Tuesday (April 23) that recorded an overall 66 per cent turnout over 15 States and Union Territories.

Yet what is noteworthy is that the level of the campaign this time has declined to an all-time low. All sections of the contestants and political leaders are responsible for such a development. Yet the PM, the principal campaigner of the ruling party, and his lieutenant, the BJP General Secretary, must bear the prime responsibility for this situation. What is also most significant, this decline in the level of campaign has struck a body blow to our democracy. This is the grim reality which we cannot overlook or ignore.

In the midst of such a dismal scenario there is a ray of hope. A young scholar from New Delhi's Jawaharlal Nehru University, Kanhaiya Kumar, is contesting the polls from a constituency in Bihar which had at one time been described as the Leningrad of India due to its communist base. The point is not the politics Kanhaiya subscribes to but the maturity with which he is able to put forward his viewpoint. It is he who was incarcerated in prison on the specious allegation of having resorted to anti-national utterances; but the charge was later found to be totally baseless. It is Kanhaiya who is calling for not just Left unity but a broad secular-democratic unity to resist the Narendra Modi dispensation's attempts to alter the Constitution that the PM and his followers are openly advocating.

Beyond the poll rhetoric, it is essential to comprehend what is at stake today. The defence of our democracy, secularism and Constitution is of utmost importance in the light of whatever is happening now. That indeed is what Kanhaiya Kumar has been highlighting. Regardless of the outcome of these elections Kanhaiya's position on this score is of inestimable value.

April 25 S.C.

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VOL LVII No 20 New Delhi May 4, 2019

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Grim Reality of Ongoing Electoral Battle

The fourth phase of the 2019 Lok Sabha elections is over. It took place yesterday. The maximum city of Mumbai, known for its electoral apathy, turned a new leaf by recording a 55.1 per cent turnout, the highest since 1989. The polling in West Bengal (77 per cent) was significant as the high percentage was recorded despite some clashes in the State.

Meanwhile PM Narendra Modi stirred a hornet's nest: speaking at an election rally in Hooghly's Serampore, West Bengal, he claimed that 40 of the Trinamul Congress' 211 MLAs were in touch with him and will switch over following the poll results on May 23. Promptly the TMC leaders attacked him for engaging in horse-trading.

Last week an article appeared in this journal seeking to highlight the BJP supremo's signs of desperation. One wonders whether this claim by Modi was also the outcome of desperation.

But such pronouncements are not in the least uncharacteristic of politicians, especially those of Modi's ilk. However, what is really alarming is the manner in which Modi and his colleagues are seeking to divide the people on the issue of nationalism. The PM and his accomplices, including his supporters in the media, do not bat an eyelid before dubbing his opponents, and the radical youth opposed to him in particular, as members of the anti-national *"tukde-tukde gang"* whereas the irony is that Modi and his cohorts are themselves trying to divide the country on the same lines.

More than a hundred years ago, Gurudev Rabindranath Tagore had on February 9, 1919 delivered a speech wherein he had pointed out:

> "There will always be many, who, by tradition and temperament, find special solace in belonging to a particular sect; and there will be others who think that the finding of search solace can only be allowed as legitimate within the pale of their own. Between such, their needs must be quarrels. Making ample provision for such inevitable and interminable squabbles, can there be no wide meeting place, where all sects may meet together and forget their differences? Has India, in her religious ideals, no search space for the common light of day and open air for all humanity? The vigour with which the sectarian fanatic will shake his head, makes one doubt it; the bloodshed which so frequently occurs for such trivial causes, makes one doubt it; the cruel and insulting distinctions between man and man which are kept alive under the sanction of religion, makes one doubt it. Still, in spite of all these, when I turn to look back to India's own pure culture—in those ages when it flourished in its truth—I am emboldened to assert that it is there."

The relevance of these words remain as valid today as they were a hundred years ago.

Indeed the 'sectarian fanatics' whom Rabindranath had assailed a hundred years ago are today running the country and taking it towards its inevitable destruction. Unless they are dislodged from power in the ongoing electoral battle the country and the nation cannot survive.

That is the grim reality before us today.

April 30 — *S.C.*

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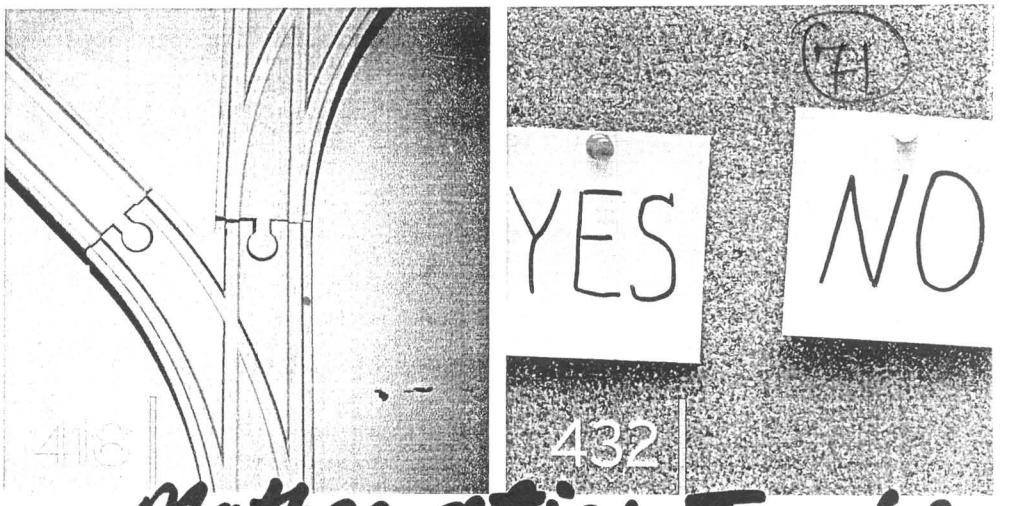
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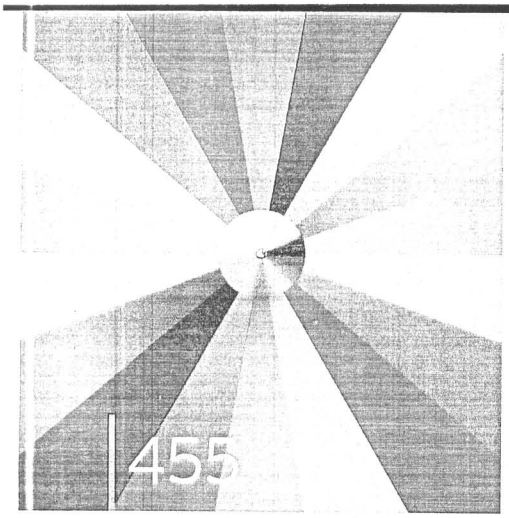
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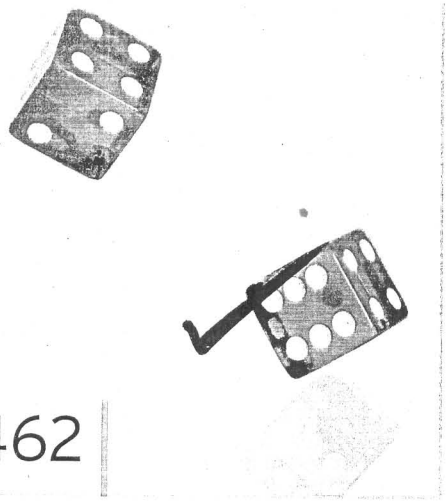
Misconceptions in mathematics can take many forms and appear in many different areas, as attested to by the wide-ranging articles in this Focus Issue, exploring such topics as algebra 1, geometry, probability, testing, FOIL, and calculus, to name a few.

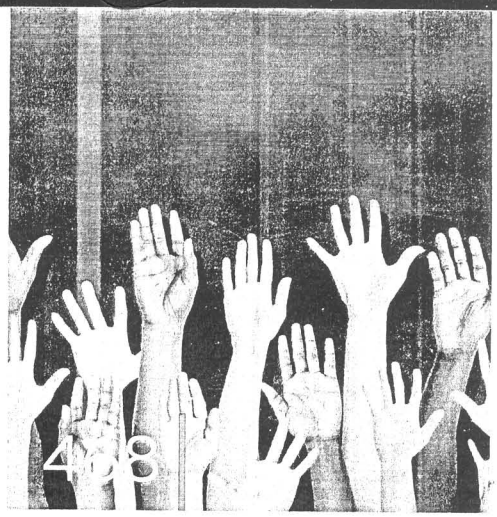
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Dear *MT* Reader,

The transformation of NCTM's existing practitioner journals into the new *Mathematics Teacher: Learning and Teaching PK-12* (*MTLT*) begins in May 2019.

That May issue will be your last issue of *MT*. Before you start receiving the monthly *MTLT* in January 2020, you will have access to three separate themed publications, containing articles that span all three school practitioner journals.

This Best of *TCM*, *MTMS*, and *MT* series will include "Questions, Discourse, and Evidence," "Fluency, Understanding, and Productive Struggle," and "Goals, Tasks, and Representations" and will be available in July, September, and November, respectively.

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282 **Detecting and Reduci g Bias in Questioning Patter**
Beth Herbel-Eisenmann and Niral Shah
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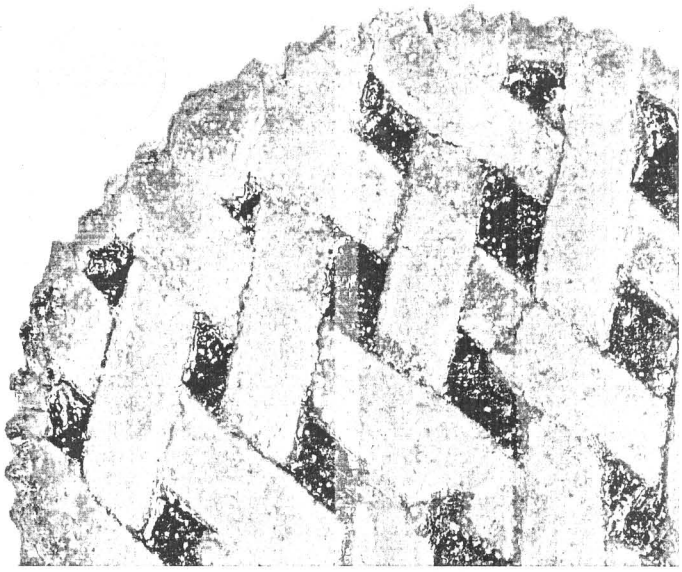
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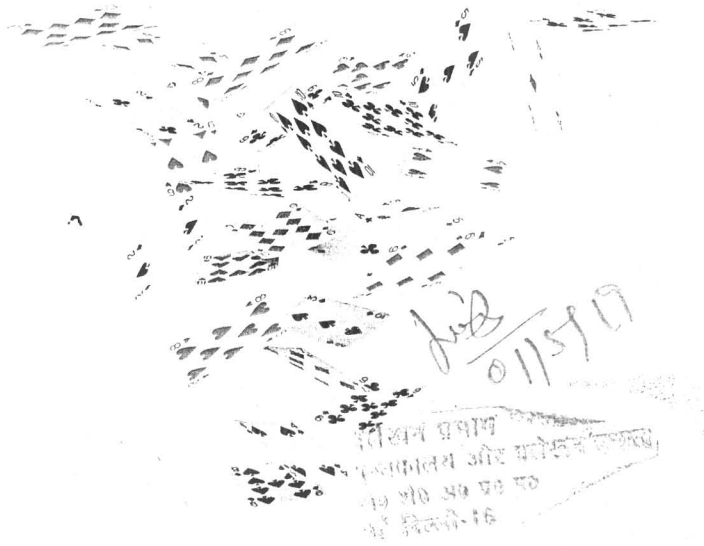
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354 **Tools for Facilitating Meaningful Mathematics Discourse**
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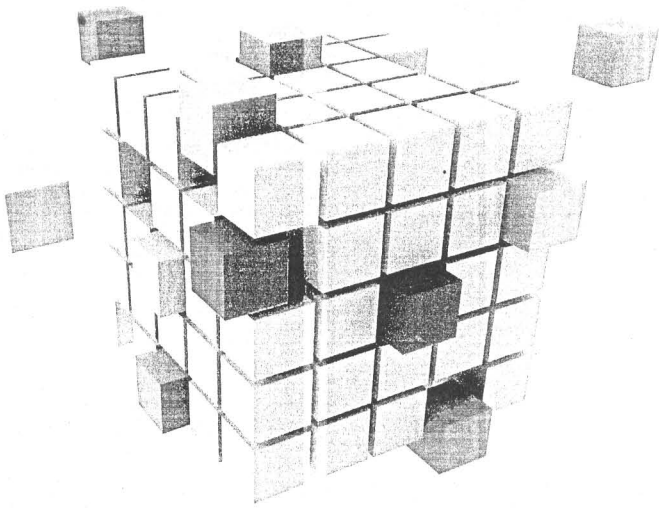
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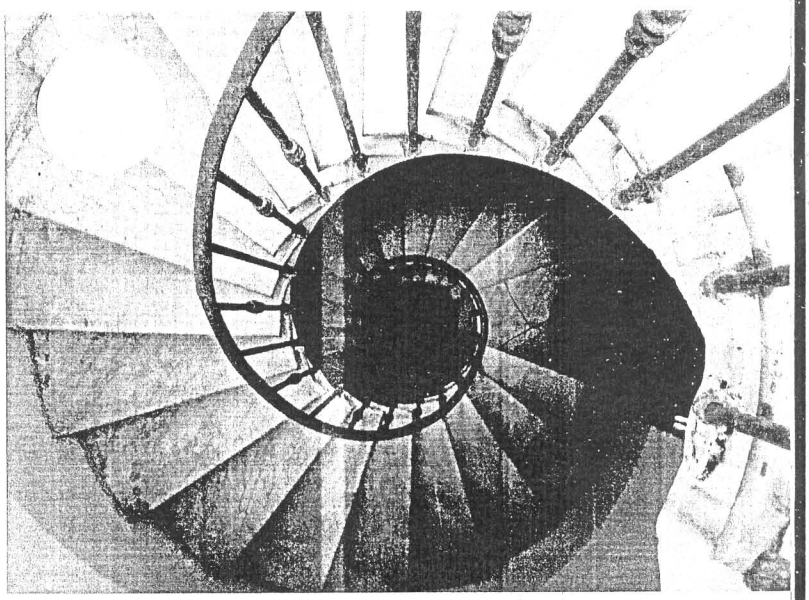
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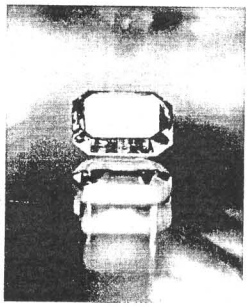
Modern Girls, Ancient Rite
A village in Spain welcomes spring the same way it has for centuries, by placing a few chosen girls on flowery pedestals.
PHOTOGRAPHS BY DANIEL OCHOA DE OLZA

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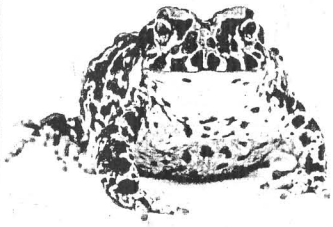


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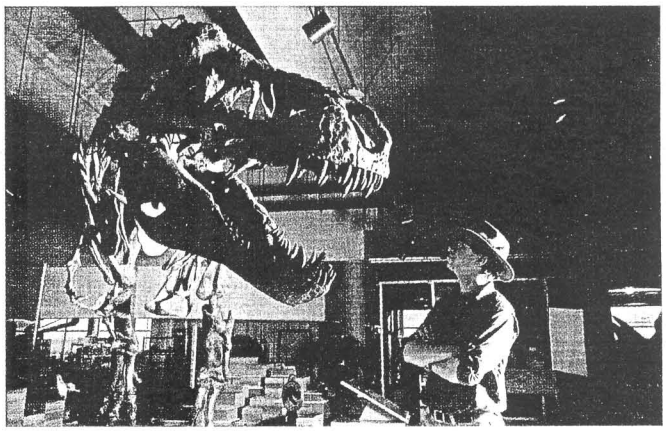
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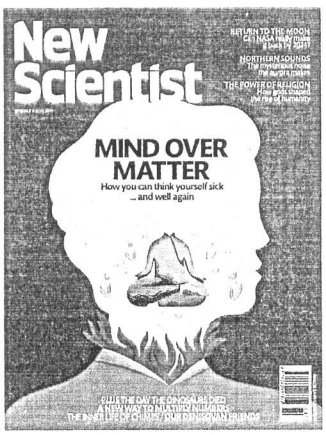
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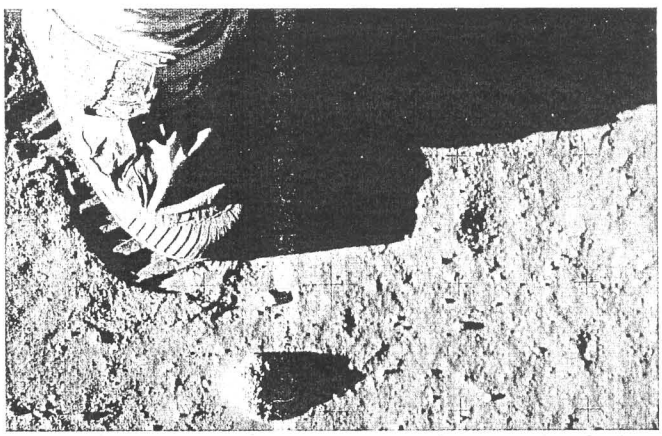
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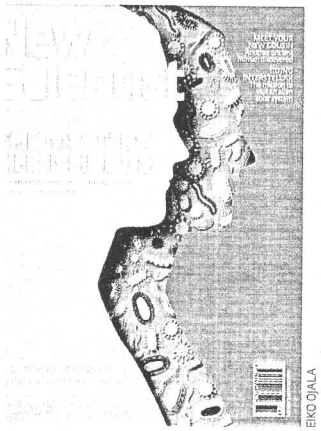
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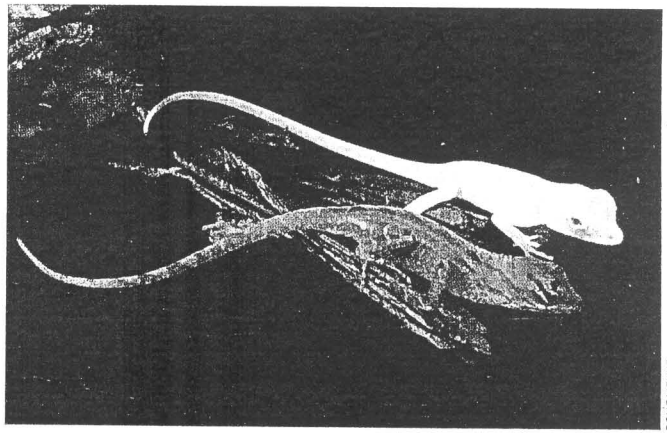
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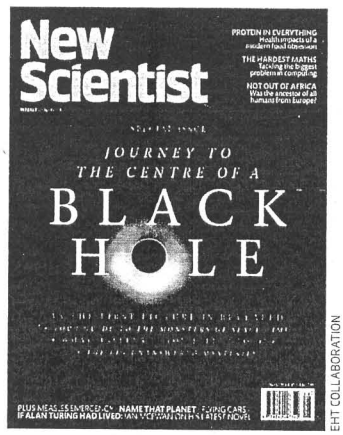
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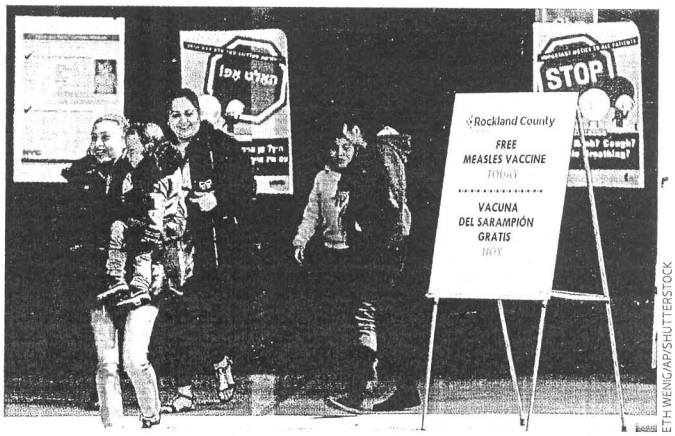
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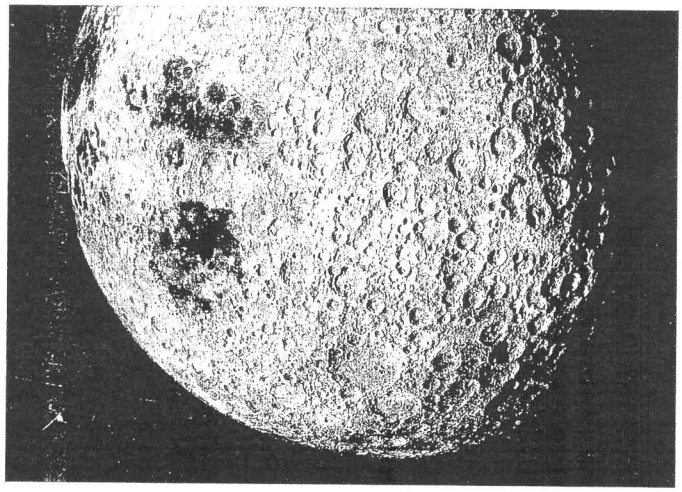
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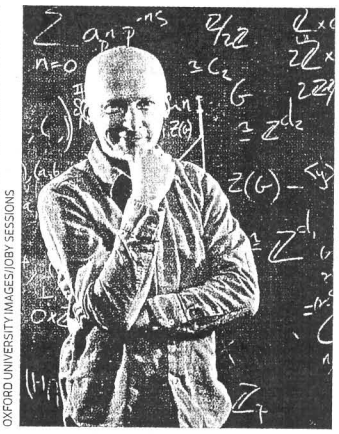
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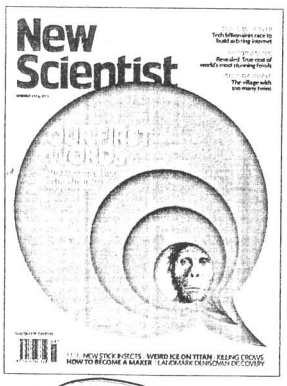
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A note on today's new-look magazine



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Cover image: Matt Chase

New Scientist is devoted to innovation, and occasionally we need to turn the mirror on ourselves. It is more than a decade since the magazine has seen significant changes, and even we had to admit that parts of it were looking a bit jaded.

We know from talking to you, our readers, that you love the magazine and aren't looking for wholesale change. So we hope you enjoy this first issue of a modestly refreshed *New Scientist*.

First off, we have slightly updated the design, with what we hope is a fresher, brighter feel. And we have created a dedicated "Views" section between our news reports and in-depth features. This brings together your letters with comment and reviews on science, culture and society.

We have an exciting roster of new columnists, too, starting today with Annalee Newitz on novel tech. (Keep an eye out for James Wong on food myths, Chanda Prescod-Weinstein's adventures in space-time and Graham Lawton stalking the environmental front line.) There are also now columns in the culture pages, kicked off in this issue by Jacob Aron on games.

For a bit of light relief, our expanded "Back Pages" feature a cornucopia of delights. Besides old favourites Feedback and The Last Word – now *Almost* The Last Word – we have a weekly crossword, plus a new puzzle (good luck!) and quick quiz.

Over the next 10 weeks you can also learn how to be a "maker", in a course designed for all ages. On the very back page, there is now a light-hearted Q and A slot. Do please let us know what you think of the changes by emailing me at: editor@newscientist.com

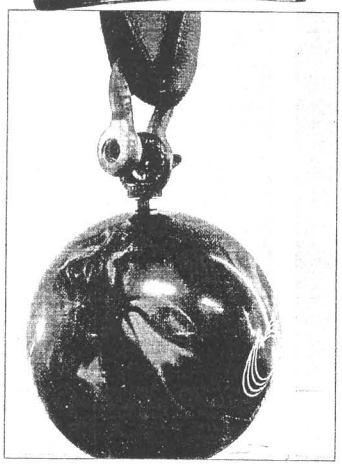
Emily Wilson Editor

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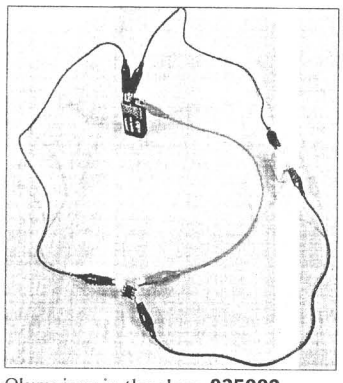
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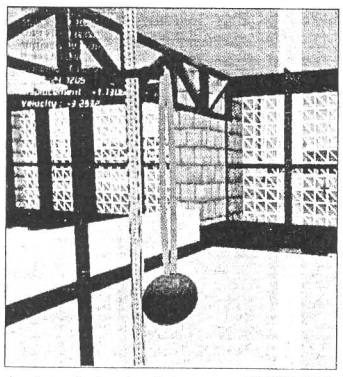
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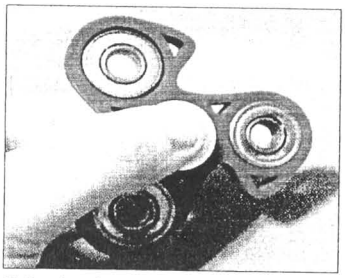
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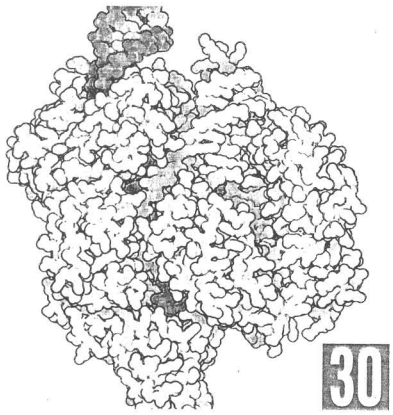
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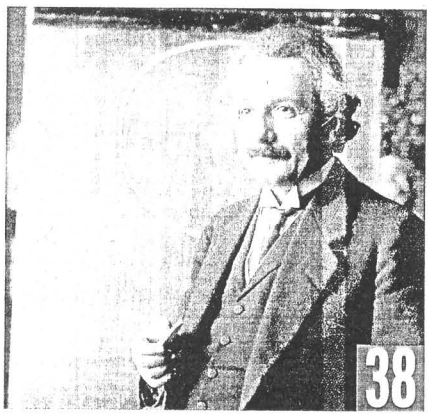


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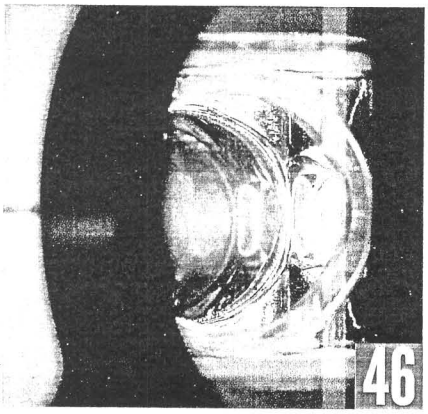
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38 Albert Einstein, celebrity physicist

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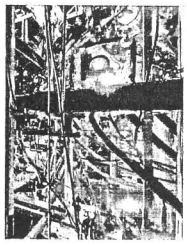
In Einstein's later years, although his contributions to physics became increasingly marginal and abstract, the press continued to trumpet his far-flung unification schemes as if they were confirmed scientific breakthroughs.



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Igor Ferrier-Barbut

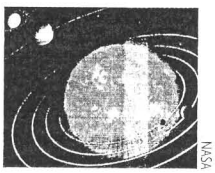
A new class of quantum mechanical liquids is stabilized by an elegant mechanism that allows them to exist despite being orders of magnitude thinner than air.



ON THE COVER: In 2016, researchers at the University of Stuttgart in Germany created ultradilute quantum droplets of dysprosium atoms. The red and blue scattered light surrounding their optical table, shown here, comes from the lasers used to cool the atoms. On **page 46**, Igor Ferrier-Barbut explains the mean-field energy correction that led to the droplets' prediction and describes their subsequent realizations. (Photo courtesy of Wolfram Scheible.)

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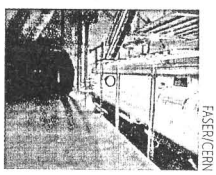


NASA

Planet proximity

Venus is often referred to as Earth's nearest planetary neighbor. But although it does get closer to Earth than does any other planet, it's not the closest most frequently or when averaged over time. That honor goes to Mercury. Three researchers do the math and show that Mercury is also the nearest on average to each planet in the solar system.

physicstoday.org/Apr2019a



FASER/CERN

Dark-sector search

A newly approved experiment at CERN's Large Hadron Collider will hunt for low-mass particles that could make up dark matter. The $1 million Forward Search Experiment, or FASER, is expected to begin collecting data in 2021. PHYSICS TODAY's Toni Feder explains how the detector gained fast-track approval.

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STEFFEN RICHTER HARVARD U

Seeking inflation

In 2014 the BICEP2 team claimed detection of a 13.8-billion-year-old signal that on further investigation turned out to be the signature of galactic dust. Five years later PHYSICS TODAY examines the ongoing search for primordial *B* modes and the implications of the results so far for various theories of cosmic inflation.

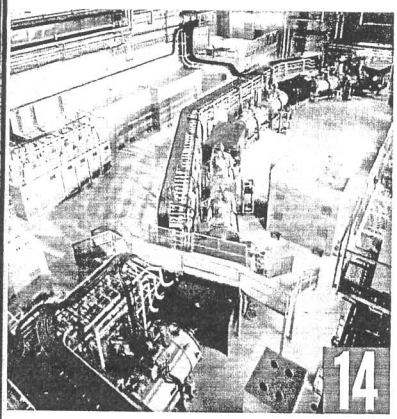
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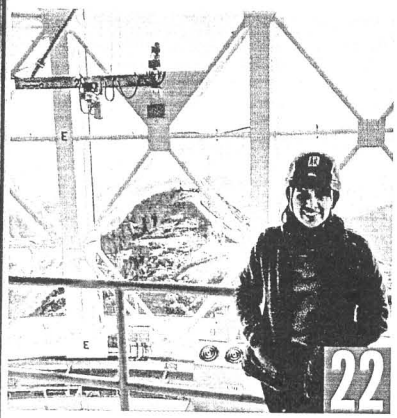
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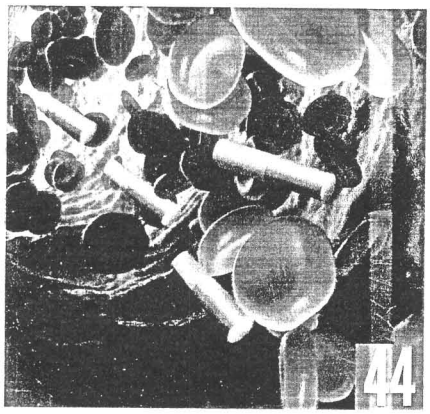
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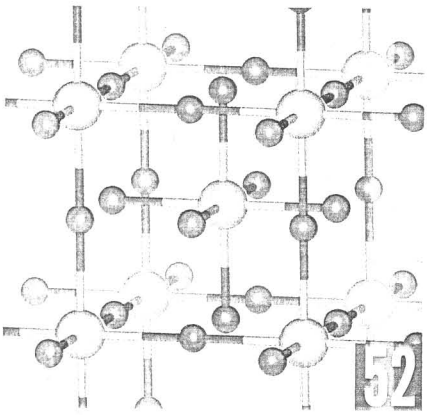
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36 Tracking the journey of a uranium cube

Timothy Koeth and Miriam Hiebert

A mysterious object led two physicists to investigate the German quest and failure to build a working nuclear reactor during World War II.

44 Microswimmers with no moving parts

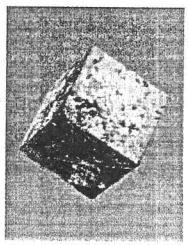
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Microscopic self-propelled particles could one day be used to clean up wastewater or deliver drugs in the body.

52 The quest for room-temperature superconductivity in hydrides

Warren Pickett and Mikhail Eremets

Whereas previous discoveries of superconductors were largely serendipitous, the latest advances have emerged from the close coupling of theoretical predictions and high-pressure experiments.

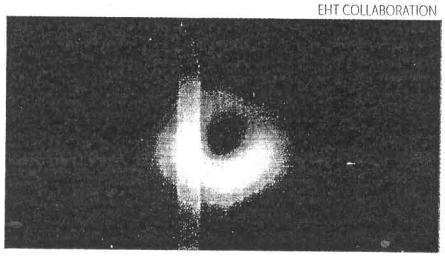


ON THE COVER: During World War II, a team of German scientists led by Werner Heisenberg attempted and failed to build a working nuclear reactor using the small, pockmarked uranium cube shown here and hundreds more like it. On **page 36**, Timothy Koeth and Miriam Hiebert recount their detective work over the past six years to uncover how the cube traveled from an underground laboratory in Berlin to College Park, Maryland. (Photo by Cynthia B. Cummings.)

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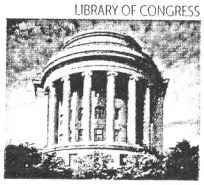


Black hole revealed

On 10 April the world marveled at the silhouette marking the position of the first directly imaged black hole, M87*. The raw data behind that image were obtained during an April 2017 survey by eight telescopes scattered across the globe. PHYSICS TODAY breaks down the time stamps, calibration, computational imaging, and general relativistic modeling that enabled the Event Horizon Telescope team to transform petabytes of disparate radio astronomy data into one captivating image.

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physicstoday.org/May2019b

PHYSICS TODAY (ISSN 0031-9228, coden PHTOAD) volume 72, number 5. Published monthly by the American Institute of Physics, 1305 Walt Whitman Rd, Suite 300, Melville, NY 11747-4300. Periodicals postage paid at Huntington Station, NY, and at additional mailing offices. POSTMASTER: Send address changes to PHYSICS TODAY, American Institute of Physics, 1305 Walt Whitman Rd, Suite 300, Melville, NY 11747-4300. Views expressed in PHYSICS TODAY and on its website are those of the authors and not necessarily those of AIP or any of its member societies.

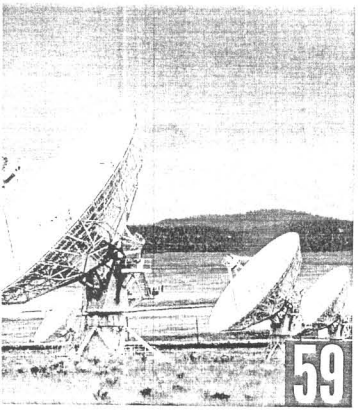
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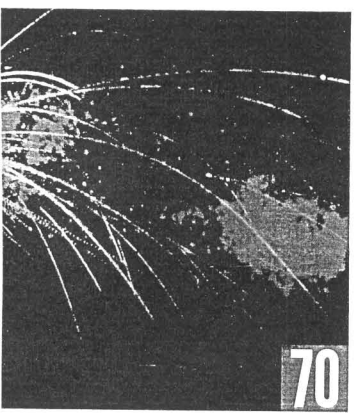
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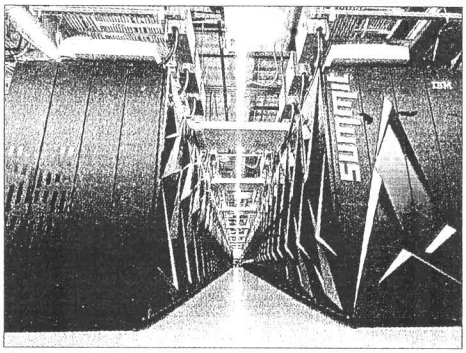
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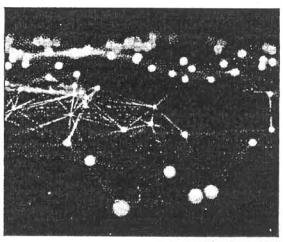
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Physics World is published monthly as 12 issues per annual volume by IOP Publishing Ltd, Temple Circus, Temple Way, Bristol BS1 6HG, UK

United States Postal Identification Statement
Physics World (ISSN 0953-8585) is published monthly by IOP Publishing Ltd and distributed in the USA by UKP Worldwide, 3390 Rand Road, South Plainfield, NJ 07080. Periodicals postage paid at Rahway, NJ and at additional mailing offices. US Postmaster: send address changes to *Physics World*, IOP Publishing, C/O 3390 Rand Road, South Plainfield, NJ 07080.



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Indexed in CURRENT CONTENTS ISSN 0304-4289
Edited and published by Amitabh Joshi
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Printed at Tholasi Prints India Pvt. Ltd., Bengaluru

Registered with Registrar of Newspapers in India, Vide Regn No. 24935/73
Regn. No. KRNA/BGE/337/2018–2020, published on 10/01/2018
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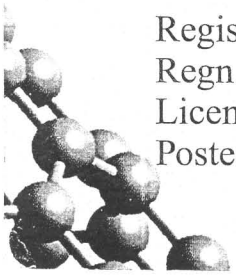
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Edited and published by Amitabh Joshi
for the Indian Academy of Sciences, Bengaluru 560 080
Printed at Tholasi Prints India Pvt. Ltd., Bengaluru

Registered with Registrar of Newspapers in India, Vide Regn No. 24935/73
Regn. No. KRNA/BGE/337/2018–2020, published on 10/04/2019
Licensed to Post without prepayment No. 49
Posted at Bengaluru PSO, Mysore Road, Bengaluru 560026 16/04/2019

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Edited and published by Amitabh Joshi
for the Indian Academy of Sciences, Bengaluru 560 080
Printed at Tholasi Prints India Pvt. Ltd., Bengaluru

Registered with Registrar of Newspapers in India, Vide Regn No. 24935/73
Regn. No. KRNA/BGE/337/2018–2020, published on 10/05/2019
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Posted at Bengaluru PSO, Mysore Road, Bengaluru 560026 16/05/2019

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OXFORD
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QJE 134(2) 557–1120 (2019)
Print ISSN 0033-5533; Online ISSN 1531-4650 No. 538

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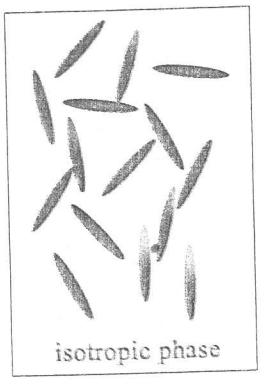
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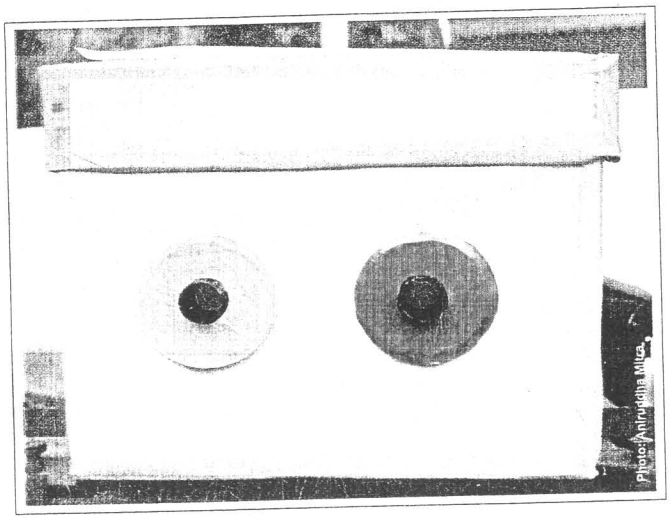
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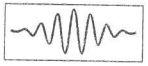
Onsager's regression hypothesis introduced in 1931 forms the corner stone of irreversible thermodynamics. It says that relaxation (regression) back to the equilibrium state from an initial nonequilibrium state follows the same dynamical evolution as that of an infinitesimal fluctuation at equilibrium.

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Lars Onsager (1903–1976)
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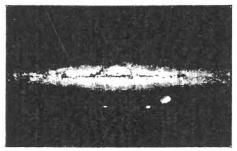
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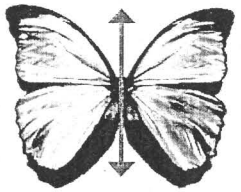
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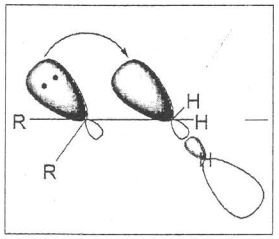
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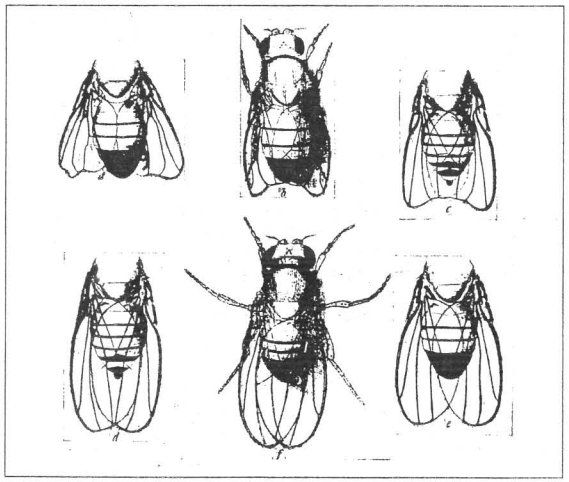
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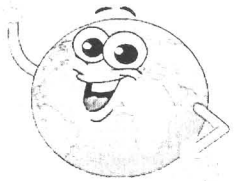
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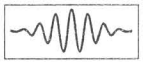
Common *Drosophila* fruit flies that only need a banana to grow in the laboratory are responsible for some of the major advances in the field of biological science. All started with the genetics experiments in the early twentieth century.
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Hermann Joseph Muller
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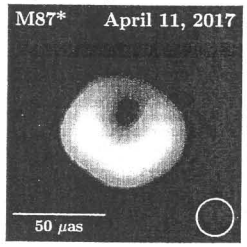
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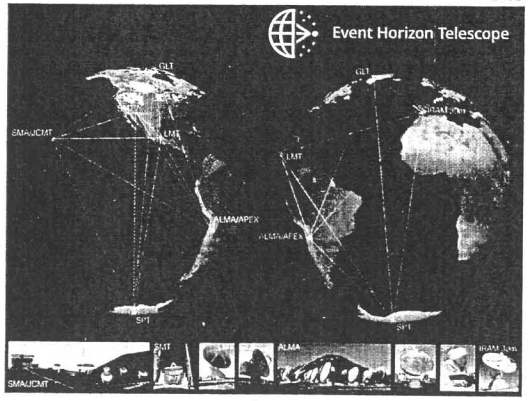
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Health & Safety

For all practical procedures described in *SSR*, we have attempted to ensure that:
- all recognised hazards have been identified;
- appropriate precautions are suggested;
- where possible procedures are in accordance with commonly adopted model risk assessments;
- if a special risk assessment is likely to be necessary this is highlighted.

However errors and omissions can be made, and employers may have adopted different standards. Therefore, before any practical activity, teachers should always check their employer's assessment. Any local rules issued by their employer must be obeyed, whatever is recommended in *SSR*.

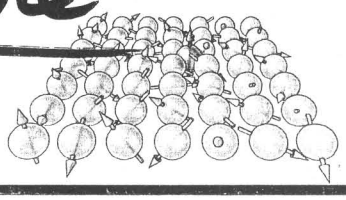
Unless the context dictates otherwise it is assumed that:
- practical work is conducted in a properly equipped laboratory;
- any mains-operated and other equipment is properly maintained;
- any fume cupboard operates at least to the standard of CLEAPSS Guide G9;
- care is taken with normal laboratory operations such as heating substances or handling heavy objects;
- good laboratory practice is observed when chemicals or living organisms are handled;
- eye protection is worn whenever there is any recognised risk to the eyes;
- fieldwork takes account of any guidelines issued by the employer;
- pupils are taught safe techniques for such activities as heating chemicals or smelling them, and for handling microorganisms.

Readers requiring further guidance are referred to:
Hazcards (CLEAPSS, 2016 and updates)
Topics in Safety, 3rd edn (ASE, 2001; updates available at www.ase.org.uk/resources/topics-in-safety
Safeguards in the School Laboratory, 11th edn (ASE, 2006)
Preparing COSHH Risk Assessments for Project Work in Schools (SSERC, 1991)
SSERC hazardous chemicals database (www.sserc.org.uk/health-safety/chemistry-health-safety/hazchem_database-2/)
Be Safe! Health and Safety in School Science and Technology for Teachers of 3- to 12-Year-olds, 4th edn (ASE, 2011)

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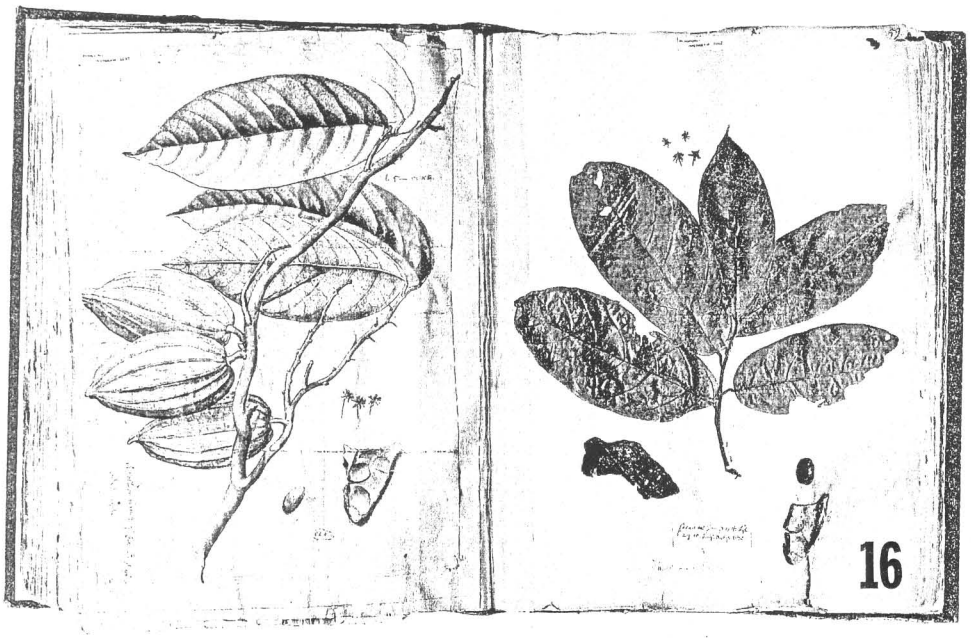
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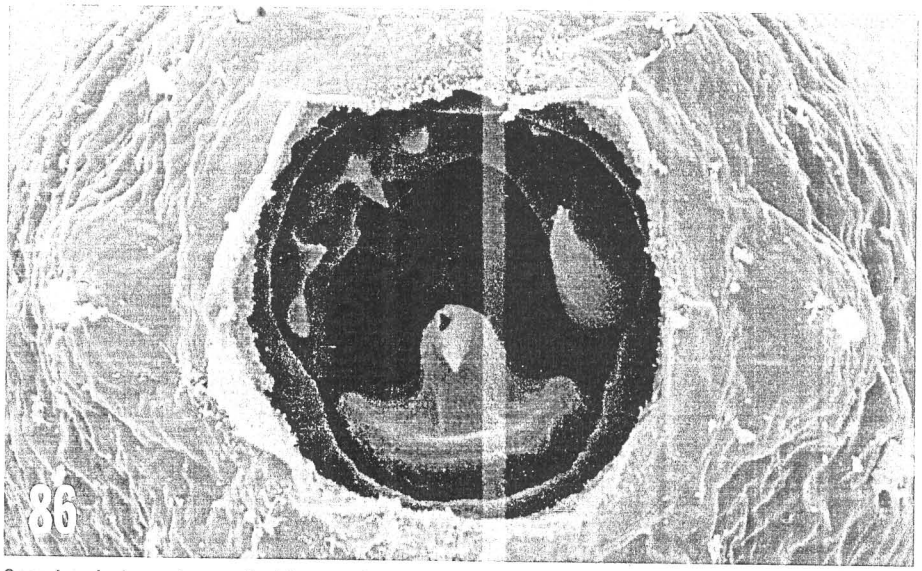
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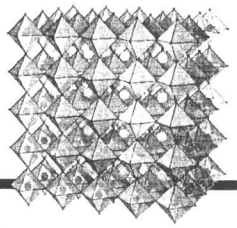
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Male flowers of the maize plant (*Zea mays* L. ssp. *mays*). Maize cells undergo a complex series of steps during the introductory stages of meiosis. Single-cell RNA sequencing analysis of developing male germinal cells reveals distinctive patterns of gene expression and sheds light on meiotic progress. See page 52. *Photo: Brad Nelms*

SCIENCE (ISSN 0036-8075) is published weekly on Friday, except last week in December, by the American Association for the Advancement of Science, 1200 New York Avenue, NW, Washington, DC 20005. Periodicals mail postage (publication No. 484460) paid at Washington, DC, and additional mailing offices. Copyright © 2019 by the American Association for the Advancement of Science. The title SCIENCE is a registered trademark of the AAAS. Domestic individual membership, including subscription (12 months): $165 ($74 allocated to subscription). Domestic institutional subscription (51 issues): $1971; Foreign postage extra: Mexico, Caribbean (surface mail) $55; other countries (air assist delivery): $98. First class, airmail, student, and emeritus rates on request. Canadian rates with GST available upon request, GST #125488122. Publications Mail Agreement Number 1069624. **Printed in the U.S.A.** **Change of address:** Allow 4 weeks, giving old and new addresses and 8-digit account number. **Postmaster:** Send change of address to AAAS, P.O. Box 96178, Washington, DC 20090–6178. **Single-copy sales:** $15 each plus shipping and handling; bulk rate on request. **Authorization to reproduce** material for internal or personal use under circumstances not falling within the fair use provisions of the Copyright Act can be obtained through the Copyright Clearance Center (CCC), www.copyright.com. The identification code for *Science* is 0036-8075. *Science* is indexed in the *Reader's Guide to Periodical Literature* and in several specialized indexes.

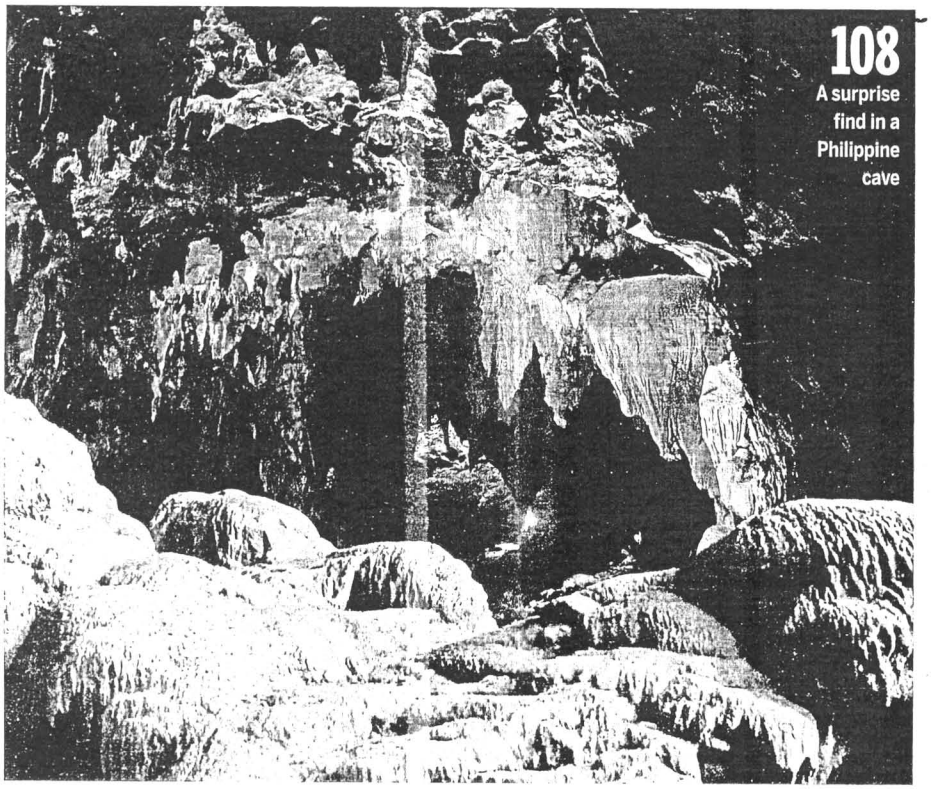
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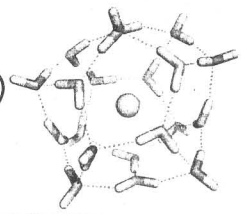
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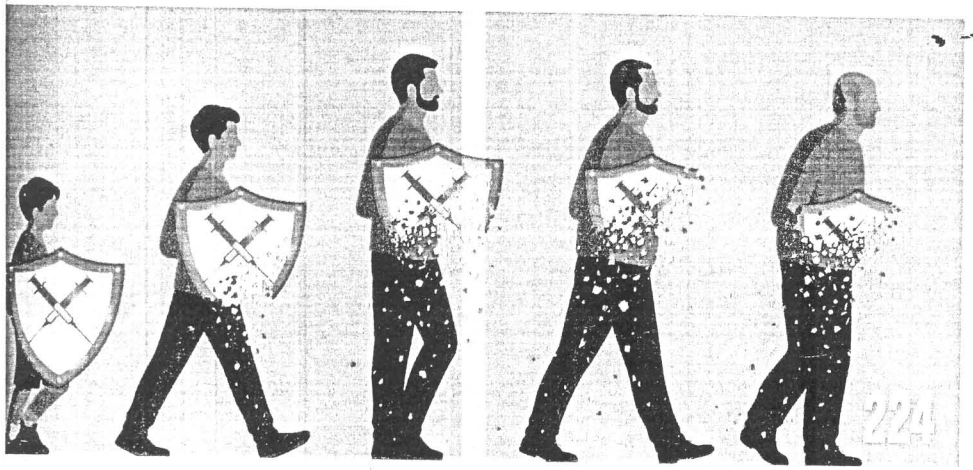
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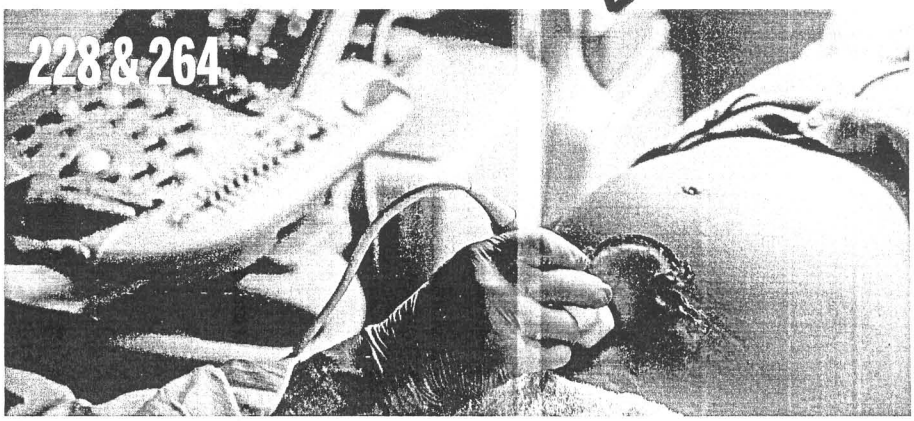
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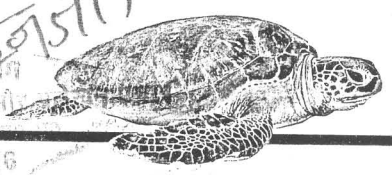
The near-Earth carbonaceous asteroid 162173 Ryugu, seen from the Hayabusa2 spacecraft. This super-resolution image was produced by combining seven separate exposures. The view has been rotated; south is at the top. Hayabusa2 measurements of Ryugu's shape, density, surface features, and composition indicate that it probably formed from reaccumulating rubble ejected from a larger asteroid as the result of an impact. See pages 230, 252, 268, and 272. *Image: JAXA/U. Tokyo/Kochi U./Rikkyo U./Nagoya U./Chiba Inst. Tech./Meiji U./U. Aizu/AIST*

PHOTO: NOAH CLAYTON/GETTY IMAGES

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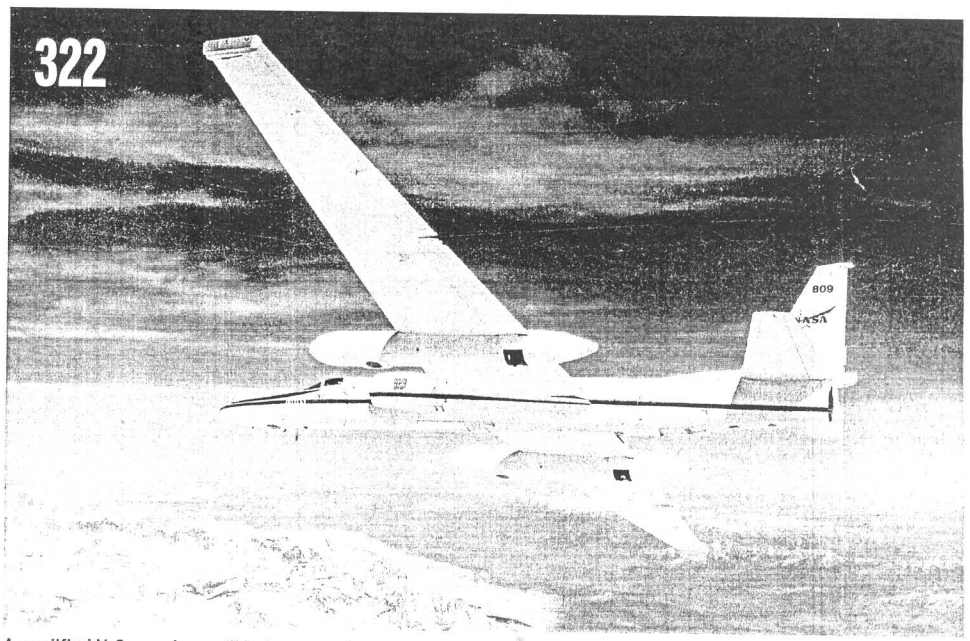
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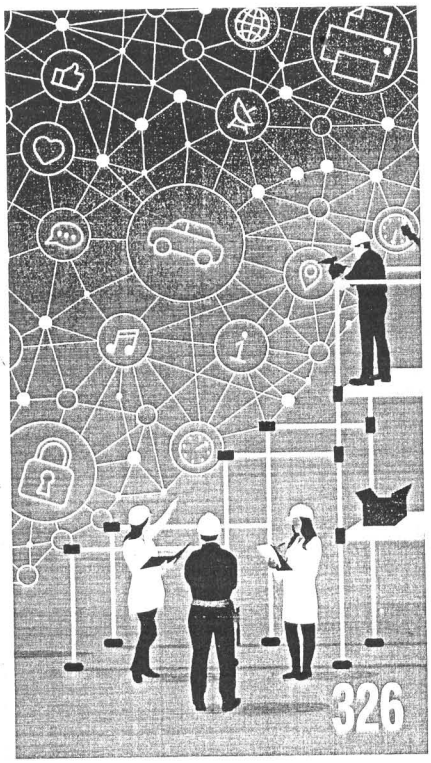
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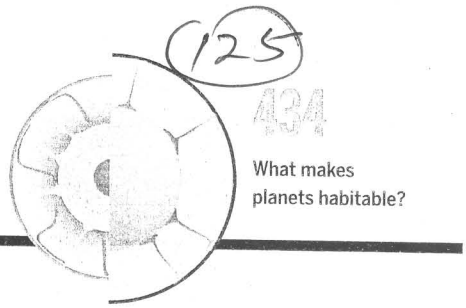
Chemists have long sought to understand the atomic-scale motion and energy dissipation pathways associated with covalent bond formation. When a hydrogen atom (white) collides with graphene (black), a transient carbon-hydrogen bond may form. As a result of rehybridization, repulsion of neighboring carbon atoms leads to rapid energy transfer through sonic waves (white rings), which stabilize the bond. See pages 331 and 379.
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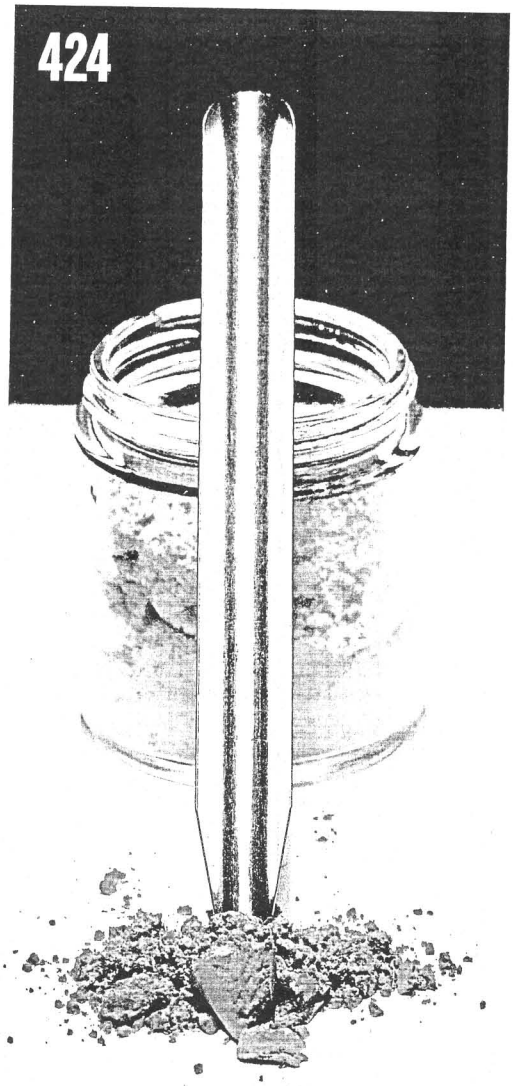
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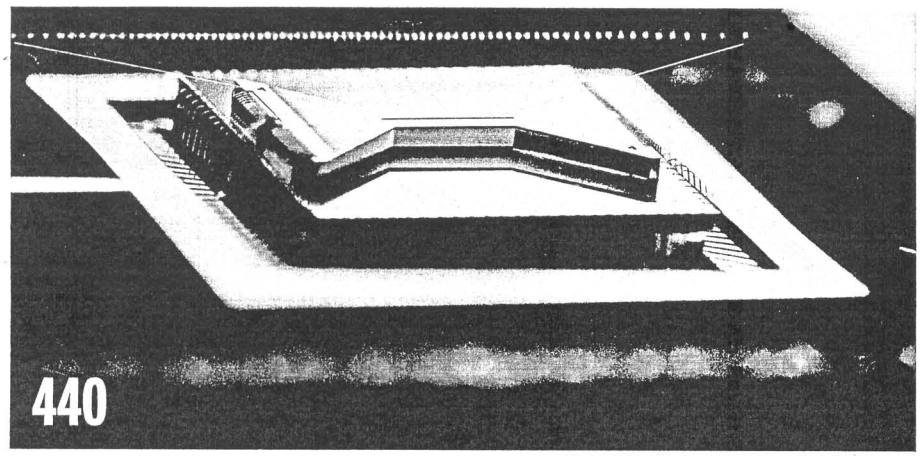
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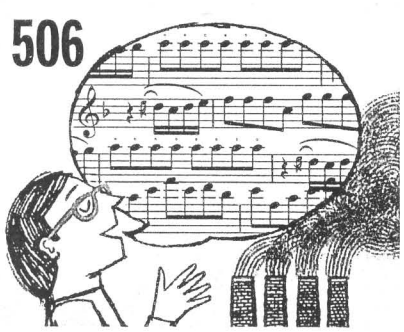
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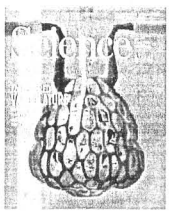
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Focus-stacked photograph of a 3D printed multivascular hydrogel containing a bioinspired alveolar air sac (width at bottom: ~4.5 mm) surrounded by a network of blood vessels (diameter: ≥0.3 mm) mimicking distal lung architecture. The ventilated, distending air sac provides oxygen to human red blood cells that flow through the ensheathing vasculature. A materials innovation provides a means to build and study multivascular topology within engineered tissues. See page 458. For more on the process behind the cover image, see https://scim.ag/2ZDHCB6. *Image: Dan Sazer, Jeff Fitlow, and Jordan Miller*

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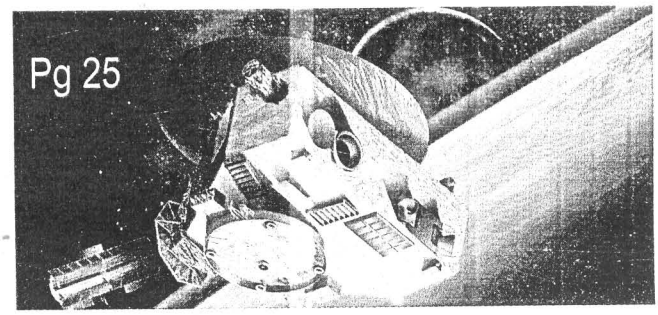
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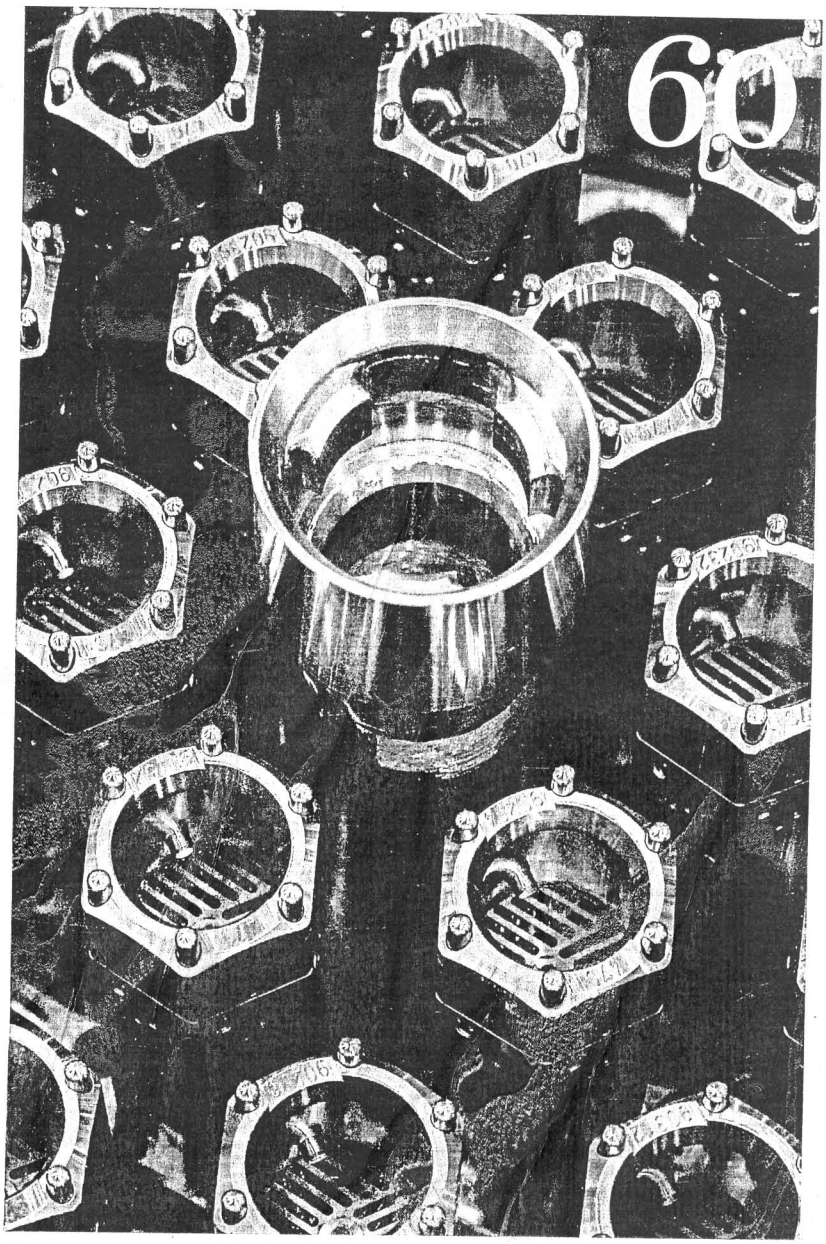
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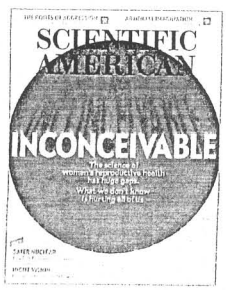
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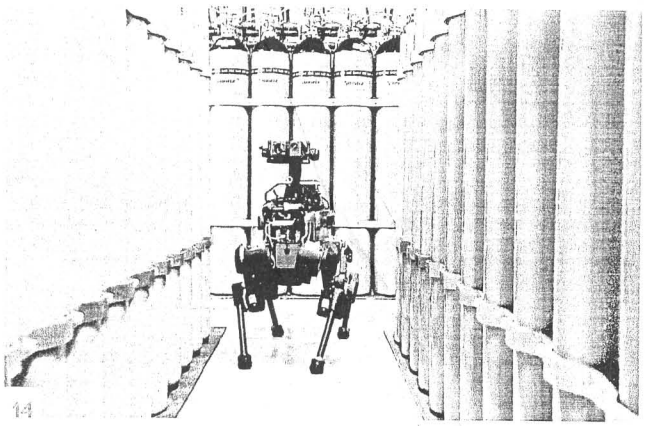
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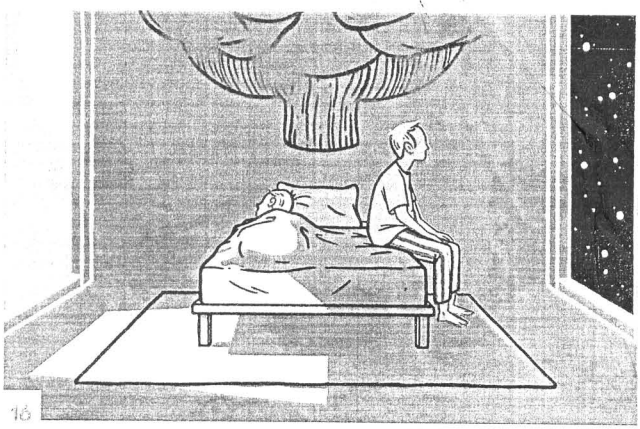
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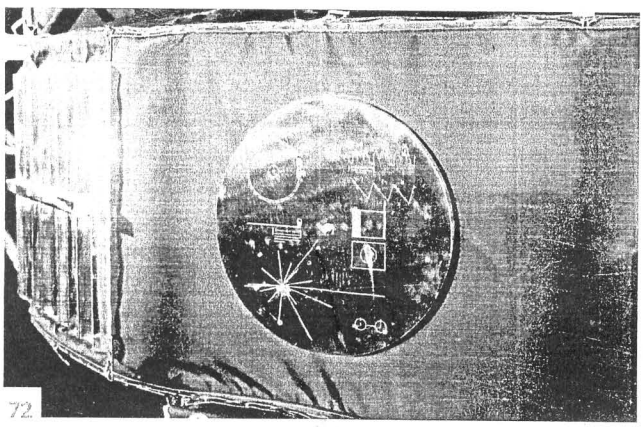
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Scientific American (ISSN 0036-8733), Volume 320, Number 5, May 2019, published monthly by Scientific American, a division of Springer Nature America, Inc., 1 New York Plaza, Suite 4600, New York, N.Y. 10004-1562. Periodicals postage paid at New York, N.Y., and at additional mailing offices. Canada Post International Publications Mail (Canadian Distribution) Sales Agreement No. 40012504. Canadian BN No. 127387652RT; TVQ1218059275 TQ0001. Publication Mail Agreement #40012504. Return undeliverable mail to Scientific American, P.O. Box 819, Stn Main, Markham, ON L3P 8A2. **Individual Subscription rates:** 1 year $49.99 (USD), Canada $59.99 (USD), International $69.99 (USD). **Institutional Subscription rates:** Schools and Public Libraries: 1 year $84 (USD), Canada $89 (USD), International $96 (USD). Businesses and Colleges/Universities: 1 year $399 (USD), Canada $405 (USD), International $411 (USD). Postmaster: Send address changes to Scientific American, Box 3187, Harlan, Iowa 51537. **Reprints inquiries: (212) 451-8415. To request single copies or back issues, call (800) 333-1199. Subscription inquiries: U.S. and Canada (800) 333-1199; other (515) 248-7684. Send e-mail to scacustserv@cdsfulfillment.com** Printed in U.S.A.
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शैक्षिक चिंतन एवं संवाद की पत्रिका
वर्ष 20/अंक 6/नवम्बर-दिसम्बर, 2018

प्रधान संपादक रोहित धनकर
संपादक प्रमोद
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संपर्क
शिक्षा विमर्श
दिगन्तर, खो नागोरियान रोड,
जगतपुरा, जयपुर-302017 राजस्थान
फोन : (0141) 2750310
मोबाईल नं. 9214181380 (प्रसार प्रबंधक)
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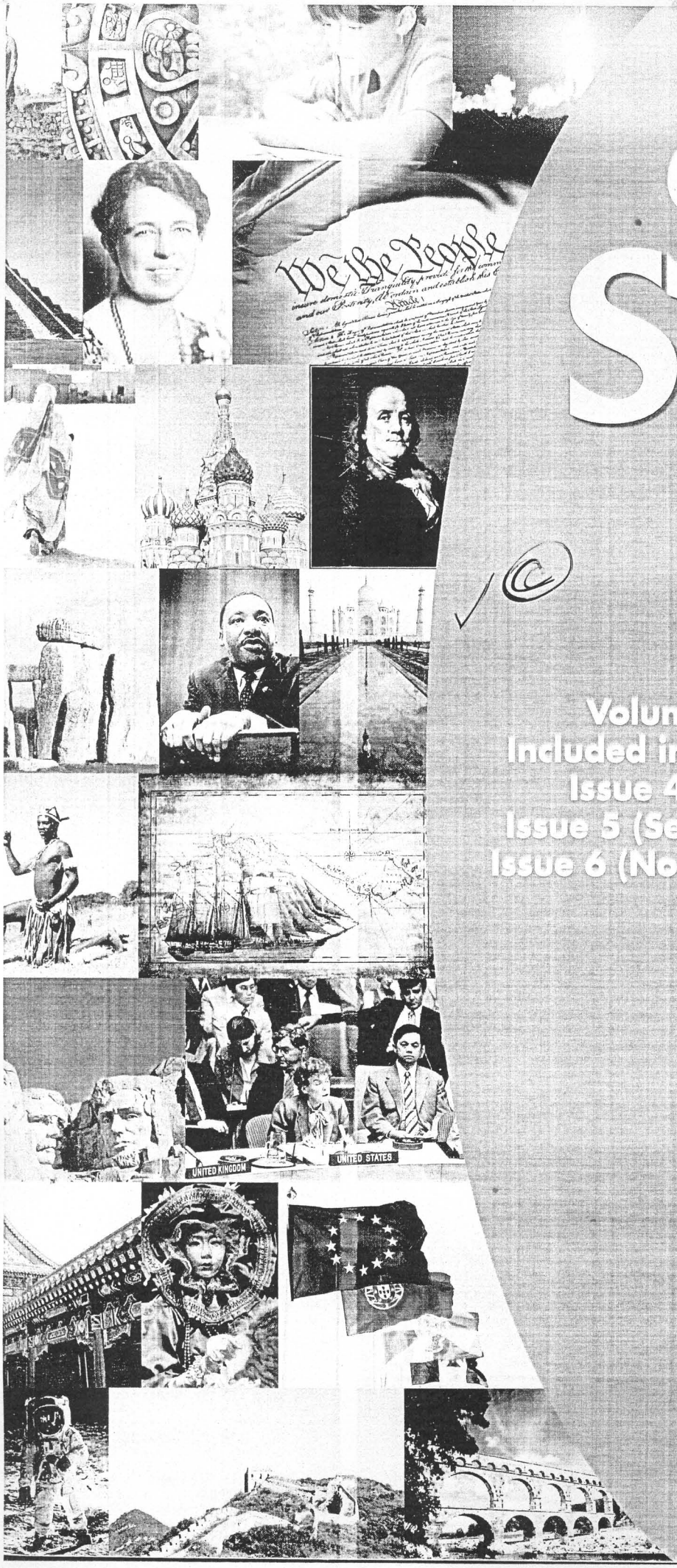
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The transformation of NCTM's existing practitioner journals into the new *Mathematics Teacher: Learning and Teaching PK–12* (*MTLT*) begins in May 2019. That May issue will be your last issue of *TCM*. Before you start receiving the monthly *MTLT* in January 2020, you will have access to three separate themed publications, containing articles that span all three school practitioner journals. This Best of *TCM*, *MTMS*, and *MT* series will include "Questions, Discourse, and Evidence," "Fluency, Understanding, and Productive Struggle," and "Goals, Tasks, and Representations" and will be available in July, September, and November, respectively. Then watch for ***MTLT*** in your box in January 2020.

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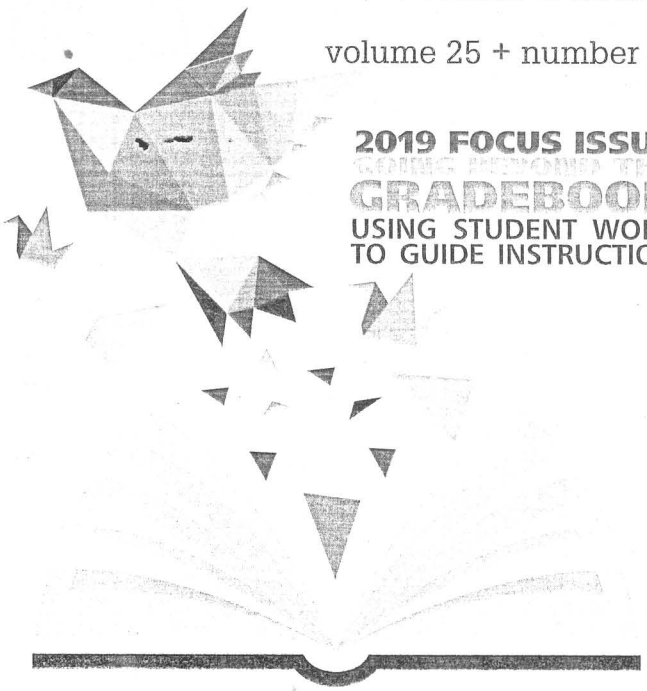
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Print subscriptions are available for $12.00 a year for individuals, libraries, and institutions or $30.00 for three-year subscriptions. To subscribe, contact Chris Lovett, clovett@emporia.edu.

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No. 16 2019
Price Rs. 25.00

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Technology, Cybernetic Character and Human Renaissance

Umrao Singh Chaudhari*

"This is brave new disembodied world of virtual reality," Observes S.S. Gill, "which the electronic generation is inhabiting. Youngsters were spending hours, forging friendship, holding chat sessions, making love and having sex in cyberspace. They live cocooned in a remarkably sanitised and soundproof universe liberated from the hassels of daily commerce ..... As people are too busy to form abiding friendship, they carry the electronic pets to give them a sense of dependable Companionship". These lines are part of Gill's article: "Life is Elsewhere," in which through a metaphor of a child's 'squarish plastic pet', he has tried to bring home the disastrous consequences of tremendously expanding growth of technology without any concern for real love and life. Such breathless advances would soon, perhaps, enable man to live without humans, and gradually dispense with the process of living itself. Surely, the forward march of technology cannot be arrested, but we can certainly check and change the direction of the growth culminating into a 'technopoly', in which the people would become tools of their own tool, and who knows, they might use their natural and artificial intelligence to sell their own souls. The time has come to rethink and reconceptualize science and technology to make them value-based and humanized (Chaudhari, 2018).

Freedom of spirit is much more valuable than techno-mania and techno-surrogation. Eric Fromm (1955) has, therefore rightly emphasized the need of a 'human renaissance'. "Even a fraction of the reason and practical sense used in the natural sciences", said Erich Fromm, "applied to human problems, will permit the continuation of the task our ancestors of the enlightened century were so proud of..." The disease of civilization is not so much the material poverty of the many as the decay of the freedom and self-confidence' No doubt, the human degeneration has been quickened by the temptation of comforts and consumerism, made available by science and technology. Further, a bigger divide has been created between 'haves' and 'have nots' of knowledge by the information technology, Hence; the question of legitimation of technology has to be answered without delay. Present day world is facing economic polarization. On one side, there are 'monster' economies making quantum leaps in growth, and on the other there are "nymph-soup' economies which are cultured to meet the former's requirement of meat. These political ideologies, serve to their economic strategies, which are basically exploitative. The reality has not changed even after the collapse of communism. The non-cybernetic character of capitalist economies is inherent in their exploitative nature.

Some scientists and thinkers believe that the solution of the present

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UNIVERSITY NEWS

Vol. 57 April 29-May 05,
No. 17 2019
Price Rs. 25.00

A Weekly Journal of Higher Education Published by the Association of Indian Universities

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Learning Outcome: The Emerging Educational *Mantra*

M Anandakrishnan*

The National Curriculum Framework (NCF-2005) and the syllabi developed as a followup for various curricular areas for each class consciously do not provide class-wise learning outcomes but inherently discuss stage-wise curricular expectations. Curricular expectations define what each child should know, be able to do and the disposition that should be acquired over a period of time. These are not to be assessed class-wise but need to be achieved by the end of a particular stage as these are long term targets of the curriculum expressed in terms of abilities, attitudes, values, etc. The learning outcomes are generally treated as assessment standards and equated with the expected levels of learning on the part of children. Learning indicators are expected to provide evidences of learning and other changes taking place in child's behavior. These indicators can be used as check points to assess child's learning at different points of time. However learning indicators, when given along with the pedagogical processes, are likely to help teachers and children to achieve these curricular expectations as well as learning outcomes (NCERT 2014).

The NCERT has developed draft Learning Outcomes for each class for Mathematics, Environmental Studies, Science and Social Science upto the Elementary stage in all the three languages Hindi, English and Urdu. Care has been taken to develop the outcomes following consultations with States, UTs, SCERTs and education experts from organizations including civil society organizations. The Learning Outcomes developed by NCERT are the minimum levels of learning to facilitate the monitoring of students against expected benchmarks.

The expected learning outcomes have been developed class-wise (from classes I to VIII) for subjects such as Environmental Studies, Science, Mathematics, Social Sciences, Hindi, English and Urdu. This is intended to help all stakeholders make their efforts; in the right direction to ensure learning among students, and help provide quality education. This will also help agencies at the district, state, national or global level to conduct various achievement surveys.

The primary reason for the popularity of learning outcomes at global level and particularly in India is to improve the current deficiency in learning achievements. In India, different achievement surveys such as the Annual Status of Education Report (ASER), reported wide disparities in students' achievement of basic skills across states. Reports of Joint Review Missions for *Sarva Shiksha Abhiyan* (SSA) in the past few years also mentioned that the learning levels of children are not up to the desirable level in spite of all the efforts made by the States and Union

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UNIVERSITY NEWS

Vol. 57 May 06-May 12,
No. 18 2019
Price Rs. 25.00

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Education for All: A Reality through Massive Open Online Courses

N Sundararajan*

Transforming Higher Education

The Higher Education scenario in India is rapidly undergoing an unprecedented transformation. The reasons are manifold. The imperatives of globalizing world and the indispensable role of knowledge in building better quality of life had created tremendous awareness among the diverse strata of Indian society for higher education. From a nation's perspective higher education is an indispensable handmaiden for sustainable economic and social development, environment security and overcoming the challenges of modern times.

Turning to the status of higher education in India, the report of All India Survey on Higher Education for 2017-18 published by the Ministry of Human Resources Development under Government of India clearly brings out that the Gross Enrolment Ratio (GER) in Higher education in India is only 25.8%, which is calculated for 18-23 years of age group. In terms of magnitude, the total enrolment in higher education has been estimated to be 36.6 million. While this is a huge number, what is of concern is that the growth in enrolment over past five years is only 13.3%, leaving large gap year after year. There are two important implications. Since India's demography is characterized by predominantly young population, there is need to increase gross enrolment by leaps and bounds from the present 36.6 million. Secondly, since our overall Pupil Teacher Ratio is 30 for regular mode, in case of University and its Colleges, there is tremendous need to add teachers. Over and above these two factors, there is all round concern for elevating the quality of higher education. The quantum jump in higher education needs cannot be met without an effective use of modern technologies and out of the box solutions.

MOOC's Role for Higher Education

Massive Open Online Courses (MOOCs) are definitely a notable innovation that had been evolving continuously over the past one decade and has been capturing the imagination of young Indians in an unprecedented way. MOOC is a form of distance education, where the student can access online the educational courses in an extensive range of disciplines. MOOC courses are openly available and thus an Indian student can access content from anywhere in the world. Many high quality courses are freely made available through MOOCs platforms like edX while a few providers of MOOCs such as Coursera or Udacity are for-profit organisations. It is normal to find some fee requirement if certification is done. Many reputed universities in the world like MIT and Harvard in USA and even Indian higher education institutions had developed contents as well as established MOOCs platforms. For instance NPTEL (National Programme on Technology Enhanced Learning) which

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UNIVERSITY NEWS

Vol. 57 May 13-19,
No. 19 2019
Price Rs. 25.00

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The Role of Technical Education in Country's Development

D S Hooda* and Satish Kumar Malik**

Technology is perhaps the gift of the present generation to the world. Imagine a world without Internet and Cell phone. There would just be vacuum! Technology has shrunk the world and brought everything within our reach. Be it travel or communication, everything seems to have become so localized and familiar. The making of global village is perhaps the most valuable contribution of technology and the concept is bought to strengthen with coming time.

The history of imparting formal technical education in India can be traced back to mid 19th Century; however, it got momentum in 20th century after the constitution of Central Advisory Board of Education in 1943. After independence 1947, the Government of India felt major concern about the development of technical education and set up All India Council for Technical Education (AICTE) by a Parliament Act in 1987 to bring new boosting to economic and industrial development.

The villages epitomize the soul of India as more than 70% population reflects the very essence of Indian culture and civilization, therefore, holistic development of India as a nation rests on a sustained all round development of rural India. Technical education consisting particularly information and communication need to be an essential part of rural education to reach out to the people at grass root level. Main profession in villages is agriculture, so to boost the farm products and to supervise education and research in agricultural sciences at national level an organization namely ICAR was also set up.

As envisaged in the Act, AICTE controls and formulates new policies regarding technical education in universities and institutes of engineering and technology. It advises the Government for the planning of the technical education in the country. It operates the scheme of National Manpower Information System (NTMIS) in collaboration with the Institute of Applied Manpower Research (IAMR), New Delhi as a lead centre. It has set up 21 nodal centers in various technical institutions and other departments all over the country. The objective of the scheme is to generate a database and supply of technical education manpower. It is to ensure and maintain the standard of technical education in the country.

AICTE advises the Ministry of Human Resources Development on all academic matters related to technical education including norms, standard, model curricula, infrastructure model facilities and structure of courses. For the purpose of maintaining academic standards and

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UNIVERSITY NEWS

Vol. 57 May 20-26,
No. 20 2019
Price Rs. 25.00

A Weekly Journal of Higher Education Published by the Association of Indian Universities

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Strengthening Research, Innovation and Creativity in Indian Higher Education: The Way Out

B M Naik*

Where do Indian universities and colleges fall short with respect to world best? Research and Innovation has to be the new agenda for New India. If India ignores it, future Generations will not pardon us.

What drives employment is the research and innovation. Resources in research, innovation and education are the most important growth stimulating instruments today.

Indian universities and colleges today do not stand high in the world list. Thousands of students every year are going abroad for higher education to improve their own knowledge and capability by spending huge sums of money. They are rejecting best of Indian universities. Can Indian universities not be revamped and be brought at par with world best? Where do the Indian universities fall short with respect to the world best? What needs to be done to improve? We have too much of rote learning, they have more of research and innovation. They are far too ahead in brain race. Foreign universities have become birth place of New Technology Based Firms [NTBFs]. For example, Stanford University has given birth to as many as 3000 firms, and they get royalty from them in millions of dollars, which is ploughed back in research. UGC and AICTE are behind time, and in fact so India is failing in creating vibrant educational ecosystem that supports cutting edge research. Service conditions of professors are primitive, consequently they are pigmy in state of the art knowledge and do not grow to world standards. How can they adopt proper vector direction? Graduates have degrees in hand but no jobs. Educated unemployed is a major problem. They work hard but fruitlessly. Innovation and creativity is our weakness. They need to install Innovation centres, Incubation centres, Patent and IPR centres, Research Parks, Technology Transfer centres, Life Long education centres, start-up centre etc. This has to be the main agenda for new India. Should the Government ever ignore it? At what cost? Who pays? These centres are existing in foreign universities from many years and it is more on account of them that they have improved the quality of life and became developed. India must have to learn from foreign, preferably through collaborations to go in a massive manner. No reform is more urgent for India than this today. If we fail in doing this, future generations will not pardon us. Installation of all these centres on campus costs, but not installating them is far more costly. Youth will remain less competitive in global competition. Can the youth afford to remain behind? Indian universities are not short of money, they are short of *new visions of new world*. A paradigm shift in universities and colleges in respect of research and innovation is the need of the hour. Can the

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ISSN-0971-8400

Website: www.yojana.gov.in

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Since 1956 A DEVELOPMENT MONTHLY

May 2019

Volume-63

Let noble thoughts come to us from all sides
Rig Veda

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Website: www.publicationsdivision.nic.in
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