EDUDOC SERVICES: CURRENT CONTENT



CURRENT CONTENTS

January to March – 2022

LIBRARY AND DOCUMENTATION DIVISION

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Compiled By

J.P. Anand

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 January- March, 2022.

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.

(Shipra Vaidya)

Head, LDD

Sr. No.	Name of Journals	Vol.	Issue	Month	Year	Pages
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❖	**Economics**					
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4.	Economics of Education Review	85		Dec	2021	62
5.	The Indian Economic and Social History Review	58	4	Oct-Dec	2021	83
❖	**Education**					
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8.	International Journal of Educational Development	87		Nov	2021	91-92
9.	International Journal of Inclusive Education	25	13	Nov	2021	95-96
10.	Journal of Indian Education	46	4	Feb	2021	121-122
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19.	Australian Journal of Education	65	3	Nov	2021	10
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36.	Library Herald : Journal of the Delhi Library Association	59	4	Dec	2021	132-133
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41.	Language Assessment Quarterly	18	5	Nov-Dec	2021	129
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AMERICAN JOURNAL of PHYSICS

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Volume 89, No. 12
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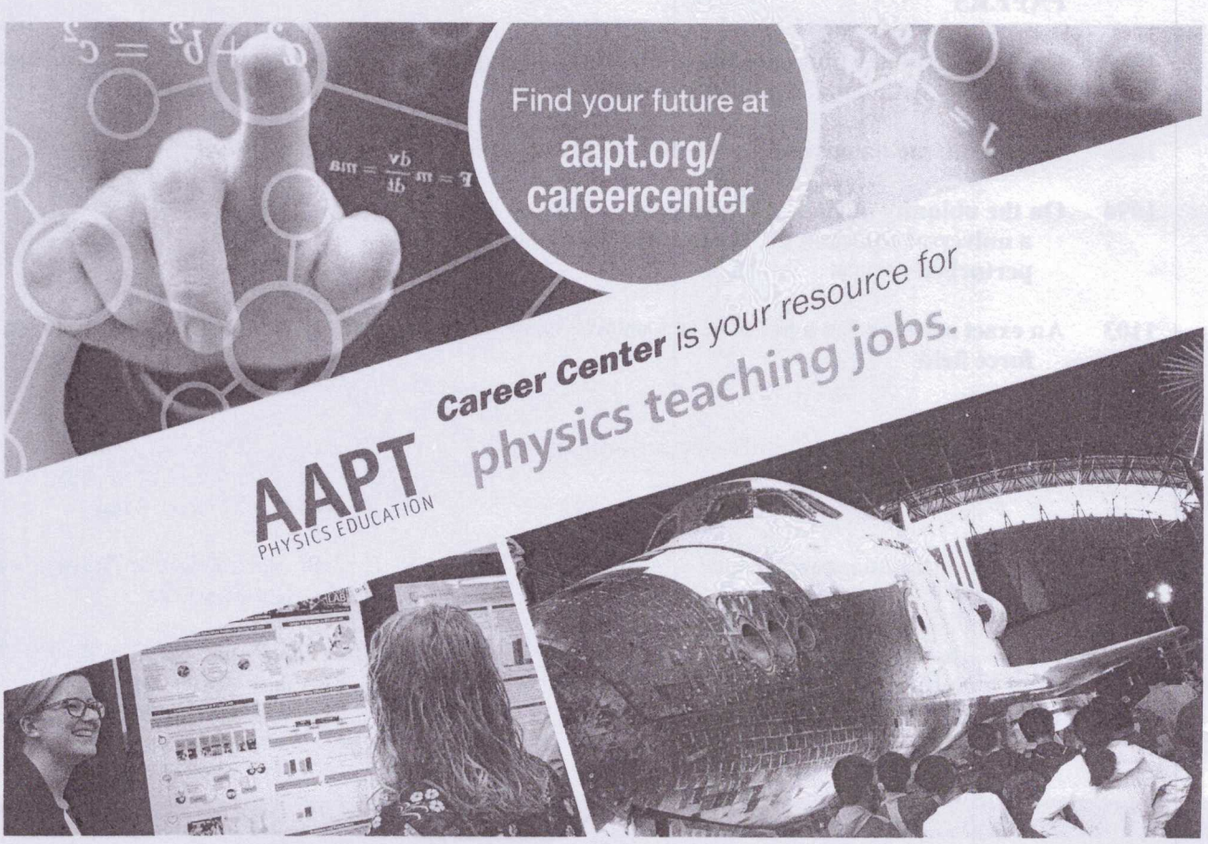

AMERICAN JOURNAL of PHYSICS

CODEN: AJPIAS
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Volume 90, No. 1
January 2022

Cover figure: The viscosity of air can be measured using only this simple apparatus: A funnel, tubing, and soapy water. As the soap film moves towards the narrow end of the funnel, it pushes air through the hose. The applied pressure is calculated from the radius of curvature and the surface tension of the film, and the rate at which air flows through the tube is calculated from the rate of motion of the film, allowing the viscosity of air to be measured.

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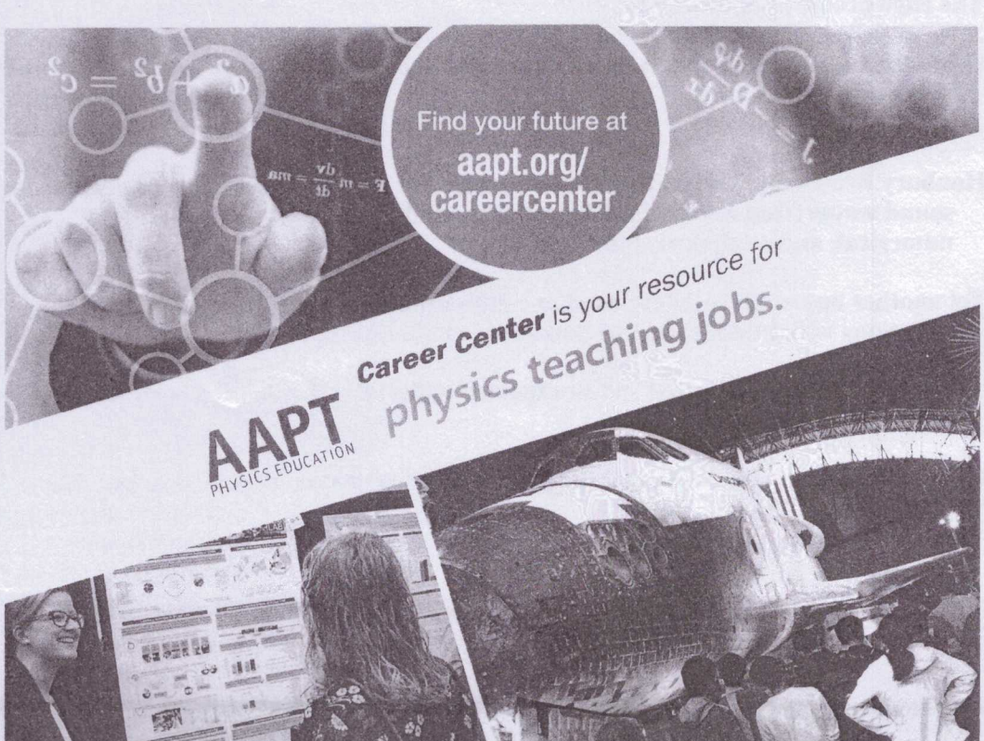

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Challenges for graduate students' mentors during COVID-19 pandemic (pages 841–842)
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XR game development as a tool for authentic, experiential, and collaborative learning (pages 846–847)
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On the cover: In this issue, Terrel et al discuss the benefits of targeting activities with 3D physica models. On the cover are the 3D physical models of ATP, alpha-D-glucose, and Mg^{2+} rendered i spheres with CPK coloring of the atoms used by the students for the activities.

[S] Online version of this article contains Supporting Information.

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Scan to read current issue in Online Library.

Ⓢ Online version of this article contains Supporting Information.

British Journal of
Educational Psychology

Volume 91

Part 4

December 2021

Editor's Choice

1073 **Integrating numerical cognition research and mathematics education to strengthen the teaching and learning of early number**
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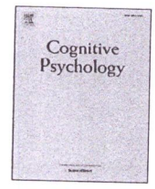

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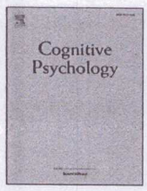

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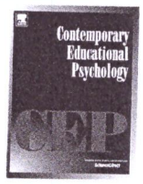

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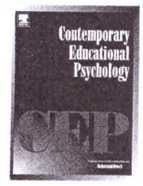

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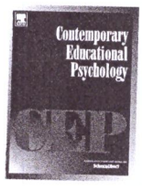

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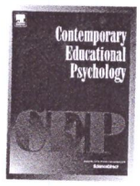

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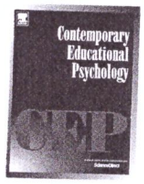

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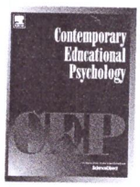

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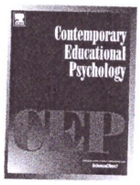

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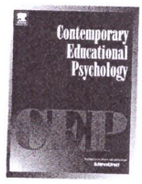

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Middle left provided by Gerard Milburn from **'The thermodynamics of clocks'**, *Contemporary Physics* (2020), 61:2, 69–95. Figure 4. A plot of five sample trajectories of $K(t)$ with phase diffusion as a function of t with $\sin(\Psi 0) = 0.1$, $\mu = \Gamma = 1.0$ and $\sigma = 0.1$.

Middle right provided by U. E. Vincent & O. Kolebaje from **'Introduction to the dynamics of driven nonlinear systems'**, *Contemporary Physics* (2020), 61:3, 169–192. Figure 10. Schematic diagram of directly and indirectly interacting oscillators. (a) Direct coupling via a spring of constant $k0$ and (b) indirect coupling via a common beam AB where the spring constants of the linking springs are $K1$ and $K2$.

Bottom right provided by Nuriya Nurgalieva & Renato Renner from **'Testing quantum theory with thought experiments'**, *Contemporary Physics* (2020), 61:3, 193–216. Figure 1. Multi-agent experiments as consistency tests for physical theories.

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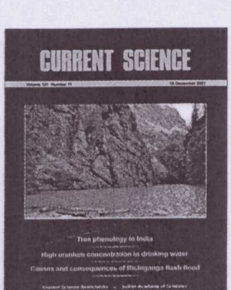

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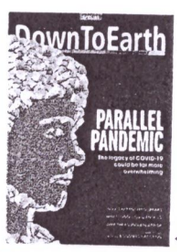

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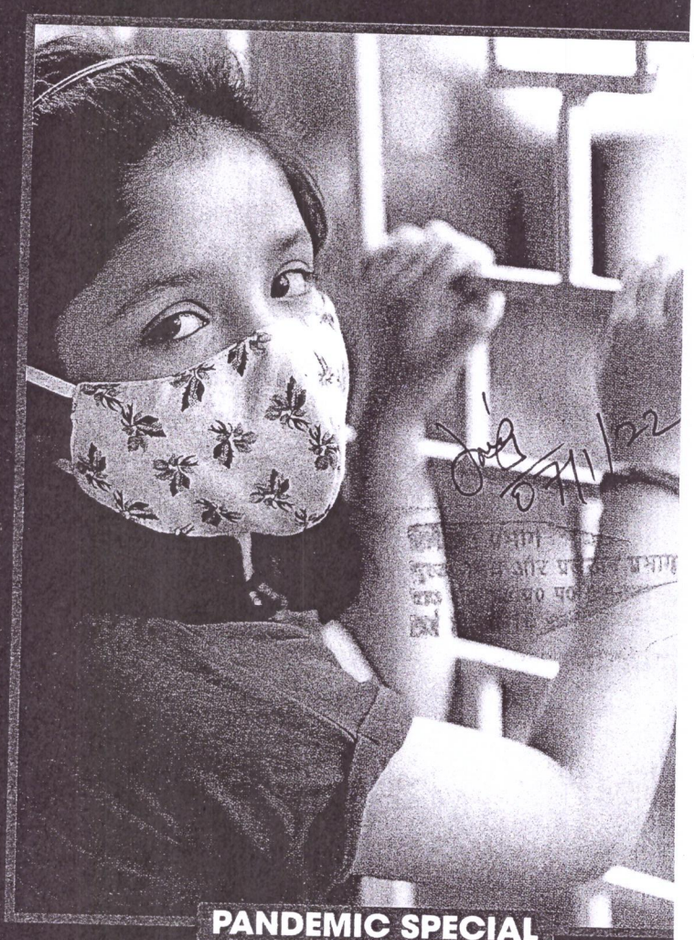

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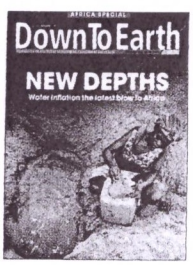

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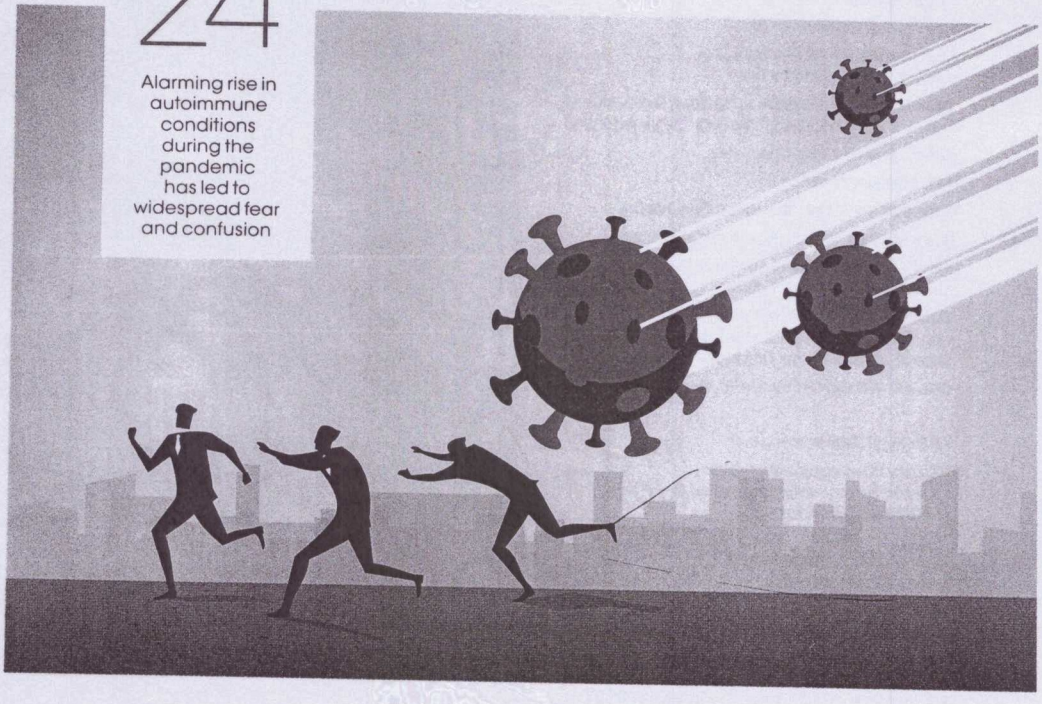



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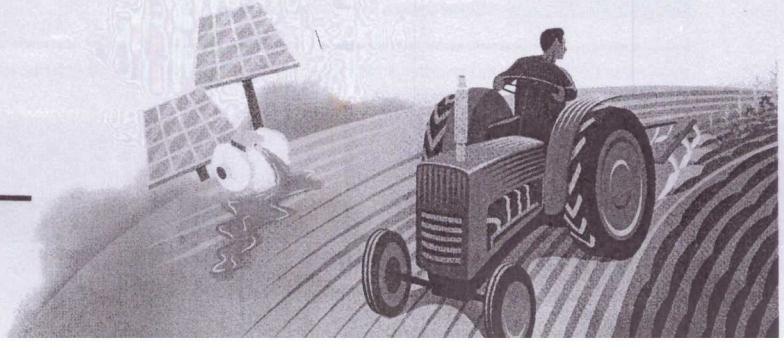

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The Feminist Methodology

10 The feminist methodology in research is explained by discussing the various strands of feminism. — ***Maithreyi Krishnaraj***

Reviving the Lending Appetite of Banks

15 Going beyond the restructuring support, banks need policy support by relaxations in prudential norms in the near term to be normalised in the next four–five years. — ***K Srinivasa Rao***

The SRS Data on Early Childhood Mortality in India

18 Errors in Sample Registration System Data are likely to incorrectly measure mortality gaps across population subgroups, for example, gender. — ***Usha Ram, F Ram & P M Kulkarni***

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21 Here, the examination of the employment ratio indicator of the Periodic Labour Force Survey and Centre for Monitoring Indian Economy data is extended to two another very important labour market indicators, that are, labour force participation rate and unemployment rate. — ***A Srija, Jitender Singh***

Changes in Uttar Pradesh's Labour Market Outcomes

29 This article portrays the trajectory of Uttar Pradesh's labour market outcomes between 2011 and 2020 based on the employment and unemployment situation and the Periodic Labour Force Survey data. — ***Sucharita Sen, Manoj Jatav***

Review of Environment and Development

A set of five papers explores how regulators are dealing with cross-scale problems (of both air and water), how democratic our regulatory processes are, whether the creation of adjudicators has addressed the "regulatory" gap, and the implications of India's international climate change commitment.

Air Quality Management in India at the Crossroads

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46 The problem of water pollution in India has escalated dramatically over the last few decades. Major gaps in standard setting, including the lack of standards for ambient water quality, poor monitoring, and weak enforcement by the pollution control boards, are the major proximate causes. — ***Sharachchandra Lele, Priyanka Jamwal & Mahesh Menon***

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13 The rationale and the implications of the now repealed Union Contract Farming Act of 2020 for farmers are the focus of this article. — ***Sukhpal Singh***

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21 Sustainable long- and short-term measures are suggested to efficiently develop strategies to control the pandemic and strengthen the health system in rural India. — ***Sigamani Panneer, Lekha D Bhat, Louis Rice & Komali Kantamaneni***

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Loss of Job, Work, and Income in the Time of COVID-19

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सूचनाधार और प्रलेखन प्रभाग
कक्ष सी० ओ० पी० ओ०
सिरी, दिल्ली-16

(50)

Economic&PoliticalWEEKLY

Radical Proposals for Banking Stability

10 There is a sense, especially in the world of academia, that the present framework of regulation may simply not be up to the job of ensuring banking stability. — ***T T Ram Mohan***

Future of People Living in Coastal Areas

12 India is one of the most vulnerable countries and suffers from the severity of climate crisis. People living along the shoreline are in jeopardy because of extreme weather events. Hence, an appropriate policy support is necessary to build climate resilience. — ***Tuli Bakshi***

An Effective Data Protection Regulator

17 One of the proposals of the revised Data Protection Bill is a data protection authority—a cross-sectoral regulator that will significantly influence the Indian regulatory landscape. Against the backdrop of these developments, the appropriate regulatory design is drawn out keeping in mind essential questions of India's existing regulatory capacity. — ***Bilal Mohamed***

Sustainable Development Goals: A Road Map for the North-eastern States

22 The article notes that the north-eastern states have taken many initiatives to implement and localise the Sustainable Development Goals. But achieving the targets requires a multipronged approach, concerted and coordinated efforts, and focus on sectors where the region has inherent advantages. —***Inder Jit Singh***

The NEP 2020 and Future of Masters Programmes in Management Education

29 The higher education institutions offering degree or postgraduate diploma in management programmes are segmented into three tiers. The daunting questions and scaling of the mid-tier institutions are the focus of this critical article. — ***Sai Sailaja Bharatam, K Narendranath Menon***

The Edtech Leviathan

36 Examining the implications of the tie-up between Google and BYJU's, in the context of the commercialisation of education and the increasing concentration of power with monopolistic corporations, it is argued that private platforms in the unregulated edtech sector are incentivised to prioritise growth above all else, and their programmes are sharply opposed to the socially transformative aims of education. — ***Gurumurthy Kasinathan, Amshuman Dasarathy***

Surviving Debt and Survival Debt in Times of Lockdown

41 What are the consequences of the COVID-19 lockdown on household debt? Drawing on the quantitative and qualitative data collected in rural Tamil Nadu, this paper highlights the massive risks of financial fragility. — ***Isabelle Guérin, Sébastien Michiels, Arnaud Natal, Christophe Jalil Nordman & Govindan Venkatasubramanian***

Fiscal Transfers for Forest Cover

50 The national government has paid an annual forest grant to the states since 2005. Here, a model is constructed to show why it has not prevented a decline in cover in highly forested states over 2007–2019, while a rise is seen in states with low initial cover. — ***Indira Rajaraman, Manish Gupta***

Impact of National Lockdown on Rural Household's Income

58 The unprecedented shutdown of economic activities led to a colossal loss of livelihoods. To understand the impact of this national lockdown on rural households' income, this paper empirically examines the determinants of reduction in their income and the effectiveness of the government's response in mitigating their economic hardships. — ***Vinay K Sonkar, Seema Bathla & Anjani Kumar***

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The Renewed Fear of Bad Debt

10 The evidence of a decline in the non-performing assets ratio in India's banking system points to a significant improvement in the health of banks, which may have occurred partly through the use of write-offs that erode the capital base of banks and also because of the time-bound moratorium on debt repayments. — *C P Chandrasekhar*

Anti-conversion Legislation in Karnataka

12 The recent Right to Freedom of Religion Bill, 2021, passed in the Karnataka legislative assembly, which claims to combat conversion, is a diabolical move by the government. — *Cynthia Stephen*

The National Disaster Management Plan, 2019

16 This article reflects on the disaster resilience responsibility framework within the National Disaster Management Plan, 2019. — *Anshu Ogra*

A Mental Health Epidemic?

19 Questions are raised about an approach towards psychiatric epidemiology, which directly imports models in medicine to count disorders of the mind to produce staggering evidence to the effect that 11% of Indians suffer from mental disorders. — *Sudarshan R Kottai, Shubha Ranganathan*

Federal Elections in Germany: The Merkel Era Is Over

25 The Social Democratic Party, the Greens, and the liberal Freedom Democratic Party—who form the new German government—might discontinue a political cycle that has lasted for almost four decades. — *Richard Detje*

Citizens' Commission on Elections' Report on EVMs and VVPAT

35 Based on the first volume of the Citizens' Commission on Elections report, an analysis of the Electronic Voting Machine and the Voter-verified Paper Audit Trail system is presented. — *Madan Lokur, Wajahat Habibullah, Hariparanthaman, Arun Kumar, Subhashis Banerjee, Pamela Philipose, John Dayal, Sundar Burra & M G Devasahayam*

Representation of Haryana in Two Bollywood Films

42 This paper analyses *Gurgaon* (2015) and *NH10* (2015) in the context of present-day Haryana to show how they succeed in highlighting the transitional phase and travails of this state. — *Prem Chowdhry*

Sex Ratio at Birth in Urban India

48 An exploration of the trends and patterns of sex ratio at birth in urban India and the processes behind son preference suggests a systematic worsening of the SRB with increasing urban district size classes. — *Debolina Kundu, Rakesh Mishra, Arvind Pandey & Devender Singh*

Shifting Welfare Image under DAY-NRLM in Assam

56 This paper aims to objectively understand the potential and role of DAY-NRLM in ensuring women's livelihood security in the neo-liberal context. The empirical study is conducted in Biswanath district of Assam. — *Jayanta Krishna Sarmah, Parimita Bhuyan*

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Appointing High Court Judges—I

10 An examination of how quickly the union government proceeds to make appointments of high court judges after the collegium's recommendation — *Alok Prasanna Kumar*

Mainstreaming Urban Resilience in India

12 Disaster management in India has district as the basic unit, while city as a complex system requires different strategies. The city civic authorities need to explore mechanisms to increase their resource allocations for disaster management. — *K Lenin Babu, Moho Chaturvedi*

The Women in CBOs

15 This article is an examination of the various ways in which the community-based organisations in Kerala extended their support in the fight against the pandemic. — *Parvathy V K, Jyothi Kumar*

COVID-19 and Fiscal–Monetary Policy Coordination

18 Against the backdrop of the COVID-19 pandemic, the economic stimulus packages announced by the national government are analysed, and an attempt is made to identify the plausible fiscal and monetary policy coordination. — *Lekha Chakraborty, Harikrishnan S*

Queerphobia over Social Media in India

22 Any attempt at legislation towards addressing queerhobia on social media has not been successful, and hence, there is a need for a new suitable framework. — *Snehil Kunwar Singh*

Interstate Border Disputes in North East India

26 The article tries to understand the root cause of the conflict between Assam and Mizoram and proceeds to point out the stands of the respective governments on the border dispute. — *Jayanta Krishna Sarmah, Parimita Bhuyan*

Discourses around Stigma and Denial in the COVID-19 Pandemic

34 Based on a field study in three districts of Tamil Nadu between the two waves of the pandemic, this article explores the nature of stigma and denial around the pandemic and their consequence for health-seeking behaviour and access to healthcare. — *S Krithi, Kalpana Karunakaran, J Jeyalydia, R Parthesarathy & T Sundararaman*

Migration, Skilling, and Employment in Bengaluru's New Service Economy

40 Against the backdrop of the Skill India policy, the research summarised in this paper focused on skill development centres in Bengaluru and Raichur districts of Karnataka that mobilise rural youth to undergo training and facilitate their entry into the lower rungs of the new service economy. — *Carol Upadhya, Supriya Roy Chowdhury*

Income and Livelihood Promotion through Individual Assets under MGNREGA

47 The potentialities of individual assets, created under category B of Schedule I of the Mahatma Gandhi National Rural Employment Guarantee Act, for enhancing the income of rural households and the increasing productivity of land and agriculture are examined. — *Ashok Pankaj, Mondira Bhattacharya*

Export Performance and India's Tryst with Self-reliance in the Globalised World

55 This paper highlights the need to demystify the concept of self-reliance and argues that any path towards it would require creating new productive capabilities — *Aradhna Aggarwal*

Aligarh Self Reliance Alliance

63 This article puts forth the holistic training model of the Aligarh Self Reliance Alliance that was successful in empowering destitute Muslim women — *Samreen Ahmad*

Postscript

71 *Deepak Kumar Nanda* on the structural exclusion of the marginalised in Kalahandi; *Suyash Saxena* on how intrinsic is the element of cost to the idea of gift-giving; a poem by *Kavya Srinivasan*; and Last Lines by *Ponnappa*.

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Economic&PoliticalWEEKLY

Repeal of the 'Black Farm Laws'

10 Tracing the trajectory of the farmers' movement against the farm laws, this article commends the victory of the farmers with the repeal of the black laws. — *Praveen Jha*

Farmers' Suicide in India

13 Indebtedness, loss of livelihood, and, ultimately, suicides by farmers indicate the multidimensional nature of agrarian distress in India. — *Pradyut Guha, Tiken Das*

Remembering M S Gore (1921–2010): A Birth Centenary Tribute

16 On his birth centenary, M S Gore's strides in both academia and leadership positions are detailed. —*N Jayaram*

Understanding Cooperatives as Social Enterprises

24 This article treats cooperatives as an effective model of social entrepreneurship for development in rural areas. It also examines the significance of cooperatives for the developmental process. — *Roopesh Kaushik*

Review of Urban Affairs

A set of seven papers seeks to throw light on the underlying inequities that led to the differential and extreme impacts of the pandemic on the population and explicate lessons therefrom.

Recovery as Resilience: Domestic Work and Workers in the Aftermath of COVID-19

34 Drawing upon the two surveys of domestic workers in Jaipur in May and November 2020, this paper traces the contours of "recovery" from the pandemic beyond just returning to work. — *Kinjal Sampat, Antara Rai Chowdhury & Gautam Bhan*

Pandemic Precarity: Life, Livelihood, and Death in the Time of the Pandemic

40 This paper focuses on the social experiences of migrant informal workers during the COVID-19 pandemic. It argues how institutions in the realms of the state, market, and civil society interacted and created conditions of precarity unique to the pandemic. — *Aseem Prakash, Hem Borker*

Intensifying Urbanities in Karachi: A South Asian City in the Time of COVID-19

46 Millennial Karachi is an "intense city" with compounding precarities of varying scales. Through an engagement with the concept of intense city, the pandemic's regulation and hopeful prospects in the state's new welfare policies are considered. — *Adam Abdullah, Soha Macktoom, Nausheen H Anwar & Noman Ahmed*

Urban Mobility under the Epidemic State

52 The COVID-19 pandemic has exposed that the shared taxis in Shillong are governed in an exception to the Motor Vehicles Act, thus rendering the lives of transport operators and users precarious. — *Gaurav Mittal*

Understanding Workers' Responses to Garment Factory Closures during the Pandemic in Bengaluru and Srirangapatna

57 The paper looks at the phenomenon of forced resignations in the garment industry in Karnataka during the pandemic. — *Swathi Shivanand, R Prathibha*

COVID-19 and the Women at Work

62 This paper explores the ways in which initiatives by women during the COVID-19 pandemic changed the neighbourhood character of the Sanjay Colony slum in Delhi and opened up the possibilities of reimagining place-making with the objective of establishing sustainable economic engagement. — *Vanshika Singh, Syeda Asia, Shivangi Gupta, Lakshay Talwar, Aashna Gutgutia & Pushpa*

Closure of Schools and Migration of Adolescent Tribal Girls: Surat

68 This paper is an empirical study of the consequences of the prolonged closure of schools and other educational institutions for adolescent tribal girls migrating to the construction sector of Surat in search of work. — *Shilajit Sengupta*

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Economic&PoliticalWEEKLY

Russia Draws a Line in Europe

10 The US and the NATO's exorbitantly overgrown ambitions have led to the creation of commitments in Eastern Europe that might not be worth the paper they are written on. — ***Zorawar Daulet Singh***

Deciphering the Indian Slip on the Global Hunger Index 2021

13 The Indian slip on the Global Hunger Index 2021 is being attributed by the government to the alleged methodological discrepancies involved in constructing the GHI. — ***Neetu Choudhary***

Building Workers under the New Labour Codes

17 This article attempts to scrutinise how the Social Security Code and the Occupational Safety, Health and Working Conditions Code could affect the lives and rights of workers in the construction industry. — ***Chirayu Jain***

The Paradox of Data-based Governance

23 Data-based governance entails not only validated and scientific data but also requires the policymakers to use it wisely by contextualising it to ensure equality and equity. — ***Kripa Ananth Pur***

Population, Health Status, and the Sustainable Development Goals

26 The authors highlight the emerging population and health issues from the National Family Health Survey-5 to monitor the country's progress towards achieving the Sustainable Development Goals by 2030. — ***K S James, S K Singh, H Lhungdim, Chander Shekhar, L K Dwivedi, S Pedgaonkar & F Arnold***

Changing Livelihood Dependence on Forest in North East India

37 The practice of shifting cultivation is declining owing to the steady shift, transformation, and withdrawal from the labour-intensive shifting cultivation to non-agricultural livelihoods. — ***Reimeingam Marchang***

The Role of Finance Commissions in Intergovernmental Fiscal Management

43 The paper addresses how 14 different Finance Commissions have dealt with their constitutionally assigned roles and strengthened the fabric of fiscal federalism in India. — ***Manish Gupta, Atul Sarma***

Impact of State Intervention in Oil Pricing on Stock Market Volatility: Evidence from India

51 The impact of deregulation on volatility transmission between international oil prices and Indian stock markets is examined. Not only did the short-term spillover of oil prices on stock markets strengthen, but the long-term spillover also continues to remain. — ***Vaibhav Aggarwal, Mrityunjay Kumar Tiwary***

Does India Need Vaccine Federalism?

59 This paper focuses on the identification of the key determinants of interstate differences in the incidence of COVID-19. — ***D K Srivastava, Muralikrishna Bharadwaj, Tarrung Kapur & Ragini Trehan***

Hydrology versus Ideology: Flawed Concepts Underlying the Water Sector Reform Proposal

66 Telling farmers to adopt low-productivity crops while promising to extend irrigation to all with imaginary water is not a strategy that India can afford. — ***Chris J Perry, M Dinesh Kumar***

Postscript

71 ***Sourav Mohanty, Sujit Kumar Mishra*** on climate change in *Kalira Atita;* ***Tapas Mitra*** on an ever-expanding mental gallery of material—images, memories, and thoughts; ***Azania Imtiaz Khatri-Patel*** on an increase in the reports of hauntings and paranormal activities during the pandemic; and Last Lines by ***Ponnappa***.

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Economic&PoliticalWEEKLY

Cricket, Technology, and the Power of Money

10 Dwelling on some recent happenings in the field of Indian cricket, this article argues that technological advancement creates new possibilities of money-mediated human interactions. — *Rushikesh Gawade*

Cryptocurrencies Are a Dangerous and Retrograde Step

13 Someone needs to speak up for the benefits of regulated fiat money, which, in the last 50 years, has been associated with more growth and stability than the gold standard era. — *Avinash Persaud*

Trust in Public Health Practice

15 Two instances of trust deficit during the COVID-19 pandemic reveal that trust-building is a process based on past experiences of people, built through engagement with institutions and service providers over a long period. — *Mathew George*

Bank-like Regulations for NBFCs: A Cautionary Approach

19 The purpose of this article is to address some of the lacunae in the scale-based framework proposed by the Reserve Bank of India in a discussion paper. — *Arvind Awasthi, Siddharth Shukla*

Women's Work Participation in Rural Karnataka and Tamil Nadu

23 This article focuses on the south Indian states of Tamil Nadu and Karnataka to understand the proximate causes for shifts in the labour force participation rate. — *Soundarya Iyer, Sarayu Srinivasan & Nitya Rao*

Three Arguments for the Application of Proportionality

27 This article provides three arguments as to why the proportionality principle is best suited to review fundamental rights in India. — *Navin Sinha*

The Buck Stops Here: A Look into the 105th Amendment

31 The principal implications of the 105th amendment to the Constitution are discussed. — *V K Natraj, G S Ganesh Prasad*

Geoeconomics of Trade Agreements and the Pacific Rim

39 The Pacific Rim region is a dynamic geoeconomic space of great power and competition where many trade agreements and economic blocs have evolved over the last few decades. — *Nitin Arya*

Who Cares for Labour? An Empirical Inquiry

45 Around one-third of the informal workers in urban areas earn less than the minimum wage stipulated for unskilled workers. — *Krishna Ram, Shivani Yadav*

Income Distribution and Aggregate Demand in the Indian Economy

53 Does there exist a trade-off between the labour income share and output growth rate? Or does a reduction in the wage share reduce the output growth rate? — *Zico Dasgupta*

Political Churning in Punjab before the Elections

62 The assembly elections are going to be held in Punjab this month. All political parties are gearing up for it. The standard parameters of prediction of an election result seem to be non-functional at this moment. — *Paramjit S Judge*

Methodological and Econometric Issues in the Wage Determination

69 This article is in response to K C Baiju and T C Shamna's "Determinants of Wage Differences between the Inmigrant and Local Labourers in the Construction Sector of Kerala" (EPW, 3 August 2019). — *P K Sujathan, P Azad*

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Appointing High Court Judges—II

10 With the union government's practice of segregating recommendations and the refusal to appoint nominees even after the reiteration by the collegium, it is questionable whether the present system of appointment can be called the collegium system of appointment. — ***Alok Prasanna Kumar***

Housing for Migrant Workers

12 This article examines the effectiveness of the Kerala government's housing policy called "Apna Ghar" by exploring the "housing–work" relation in the existing housing sub-markets in Kerala's Ernakulam district. — ***Malay Kotal, Saurav Chakraborty & Priyank Pravin Patel***

Political and Electoral Dynamics in Punjab

19 The current elections in Punjab reflect a clear decline of earlier hegemonies, particularly of the landed aristocracy of the region, which has controlled state politics over the past five decades or so. — ***Surinder S Jodhka***

Unfolding 60 Years of Political Process in Goa

23 Discussions on the concept of independence and liberation are essential in the democratisation of politics in Goa. This article traces the history of Goa's electoral politics starting from its independence or liberation till the present and identifies the key phases in its politics. — ***Nawoo Varak, Prachi Naik***

Revisiting the Role of *Mandis*

33 Based on the insights drawn from the fieldwork, we suggest a strategy to help the farmers earn remunerative prices. The central argument is that *mandis* can be strengthened to generate favourable outcomes for farmers if farmer-oriented entities play dominant roles in them. — ***Gopi Sankar Gopikuttan, Gopal Naik***

The Political in Shame

39 The questions and challenges of our times have thrown up emotions such as shame at the centre of both social and public life. But there seems to be not enough engagement in the discipline of political science to understand emotions in their own right. This paper tries to bring out the characteristics of shame both as an emotional as well as a political concept. — ***Jigyasa Sogarwal***

Mobile Phone Manufacturing in India

46 The analysis of the five-digit Annual Survey of Industries data for 2016–17 and 2017–18 makes it apparent that the impetus towards domestic assembly of mobile phones through various policy measures has made a positive impact on the growth of investments, particularly in plant and machinery assets. — ***Chidambaran G Iyer***

COVID-19 and Market Failure: An Indian Experience

54 Since vaccines provide a limited period of immunity, the slow pace of vaccination, as witnessed in the case of the African continent and Indian subcontinent, may result in the repetition of doses. Any country or region left behind may infect the whole world once again, which necessitates collective and concerted efforts of the whole world to attain herd immunity and make it COVID-19-free. — ***Anish Gupta, Shaveta Kohli***

Postscript

63 ***Soumyajit Patra*** on researchers' reincarnation in the pandemic; ***Andleeb Shadani*** on grief and seeking closure; ***Jayanti Dutta*** on the unexpected consequences of an unusual spelling of Punjab; and Last Lines by ***Ponnappa***.

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Punjab with an 'a'—*Jayanti Dutta* (65),
Last Lines (66)

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Who Controls the Levers of the India–US Relations?

10 Modi's charisma and persona has done little to change the trajectory of India–US relations. The change is largely driven by the shift in the American strategic focus towards what is now commonly called the Indo-Pacific. — *Atul Bhardwaj*

Inflation, Debt Sustainability, and Government Borrowing

12 High food inflation and the adoption of inflation targeting will impose severe constraints on the ability to expand borrowing and maintain low levels of debt-to-GDP ratio. — *Rahul Menon*

Current Situation of ASHA Workers

17 Despite their stellar role during the COVID-19 pandemic, ASHA workers face neglect and discrimination by a callous government that draws upon the free labour of women. — *Kiran Moghe*

Biodiversity Management Committees in Madhya Pradesh

21 The state's multipronged approach with a focus on bio-finance, regulatory flexibility, convergence with other government schemes, and enabling policy environment holds the key to building empowered, *Atmanirbhar* biodiversity management committees. — *Indrani Barpujari*

Privatisation in Education and Populist Budgets

24 The delay in releasing grants to 12 constituent colleges of the University of Delhi shows a correspondence between privatisation and populism in implementing the National Education Policy, 2020. — *Narender Thakur, Vaishali*

Housing Rehabilitation in Coastal Kerala

29 This article attempts to analyse the process of housing rehabilitation among the coastal community through the perspectives of traditional fishers. — *Preethi Solomon*

Workers' Safety and Monetary Compensation

38 Monetary compensation has been incorporated into institutional corporate strategy and state control where reimbursing deaths with money has become an everyday business for employers. The new labour codes continue this strategy. — *Ananya Pattnaik*

Drivers of Child Nutritional Change in India

44 While there has been a saturation of persistent government interventions for immunisation, antenatal care, and institutional delivery, education and economic status have become stronger predictors. Therefore, the future of child nutrition lies largely in the improvement of quality education and inclusive economic development. — *Biplab Dhak*

International Migration and Caste Dynamics

50 The understudied nexus between international migration and caste in Tamil Nadu is examined. The findings indicate that the Backward Classes were the forerunners in benefiting from international migration opportunities. — *H Arokkiaraj*

Assessing Marine Plastic Pollution in India

57 Providing a picture of marine plastic pollution along India's coast, this study points to the dire consequences in store if no or limited action is taken. — *Saudamini Das, Prabhakar Jha & Archana Chatterjee*

Performance of the PMFBY in Maharashtra

64 In Maharashtra, the coverage under this scheme indicates a skew, with the drought-prone districts in Marathwada and Vidarbha showing higher coverage under insurance as compared to the Konkan districts. — *Sangeeta Shroff, Manasi Phadke*

Classical Economics and Keynes

70 The author of *Macroeconomics: An Introduction* responds to Rahul Menon's review of his book, "Competing Frameworks of Economic Thought" (EPW, 18 December 2021). — *Alex M Thomas*

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Iron Ore Mines in Jharkhand

10 This article reviews the contract labour system as maintained in an iron ore mine in Jharkhand. — ***Johnson A Minz, Amit K Biswas & Rohit Toppo***

Chilean Elections of 2021

13 The voting of Gabriel Boric to power marks the end of the traditional alternation of power between the centre-right and the centre-left in Chile since the return to democracy in the 1990s. — ***Alexis Castillo, Ranjeeva Ranjan***

Durable Growth Revival

16 The unevenness in growth recovery is hurting the consumption of low-income households and private investments, which are vital for sustained or durable growth. — ***M Suresh Babu***

Policy Landscape for Diet Diversity in India

19 The relative lack of diet diversity in India has resulted in an increased burden of malnutrition along with rising micronutrient deficiency. There is an urgent need to shift food systems and policies for a healthier and nutrient-adequate diet. — ***Ravneet Kaur, Priscilla C Ngaihte & Antony K R***

Ukraine: The Anatomy of a Crisis

27 The decisive role of the continuous expansion of the North Atlantic Treaty Organization and the hegemonic designs of the United States in precipitating the Ukraine crisis is analysed. A possible road to dialogue and peace is outlined in the face of intensifying escalation. — ***Jawahar Bhagwat***

Land Pooling Policy in Delhi

34 An unprecedented large-scale land pooling policy has been enacted in Delhi to facilitate planning and development by making landowners partners in development. Although the policy proposes a paradigm shift in its approach by empowering the private sector and landowners, rigidity in land use distribution and development control regulations at the sector level make its implementation difficult. — ***Rima Mondal***

Food Insecurity in Rural Eastern India

43 Using comprehensive telephone survey data from 2,599 households, this paper estimates the status of food insecurity by relying on the food insecurity experience scale in rural households in eastern India. The results indicate that households belonging to the lower social strata with less land and fewer years of education are more likely to suffer from food insecurity. — ***Anjani Kumar, Vinay K Sonkar & Aditya K S***

Quantification of Services Trade Restrictions

49 This study attempts to build on the services trade restrictiveness index of the Organisation for Economic Co-operation and Development by proposing an alternative that makes the OECD data more amenable to policy purposes. — ***Manoj Pant, Sugandha Huria***

Extreme Flooding Events and Land Cover Change

58 This discussion is a response to Aniket Navalkar's article "Extreme Flooding Events and Land Cover Change: An Empirical Assessment of Western India" (*EPW*, 16 October 2021). — ***P N A Vaishnavi, M Dinesh Kumar***

Postscript

63 ***Sanskruti Yagnik*** on forced vaccination during a pandemic; ***Rajlakshmi Kanjilal*** and ***P P Vijayalakshmi*** on lessons in animal activism from *Isle of Dogs*; ***Nabeela Siddiqui's*** poem "Don't"; and Last Lines by ***Ponnappa***.

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Don't—*Nabeela Siddiqui* (66),
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Economic&PoliticalWEEKLY

Privileging Shareholders over Policyholders

10 There are serious apprehensions that post IPO, the LIC would have to change its very business model. The neglect of the rural businesses will hurt the interests of the lower-middle and poorer sections who look at LIC policies as an instrument of social security. — *Amanulla Khan*

Sustaining the Blue Economy

13 Subsidies provided for commercial fishing activities directly contribute to overfishing and decline in fish stocks, threatening to affect the food security and livelihood of millions in coastal areas. This article analyses the most recent text tabled at the World Trade Organization on the disciplines related to fisheries subsidies. — *James J Nedumpara, Sunanda Tewari*

Pandora Papers and Illicit Financial Flows

16 This article highlights that India is a net recipient of illicit flows, whose actual scale would be higher if commodity-level trade data is used in estimating trade misinvoicing. — *Praveen Tiwari, Javaid Akhter & Saumen Chattopadhyay*

Bailout Barometer for State-owned Banks

21 Using the disaggregated data covering 2007–20, the study estimates the bailout barometer for state-owned banks in India. The findings show that the magnitude of the bailout barometer, in 2020, was $400 billion or around 18% of the total liabilities at the upper end of the scale. — *Saibal Ghosh*

Performance of Indian Information Technology Sector

25 In this age of computers, the development and advancement of the information technology sector in a developing economy can push a developing economy into the developed countries category. The present study found that the IT sector of India has experienced boom and prosperity during the first decade of this century. — *Inderjit Singh, Nirvair Singh*

Critical Importance of Cooperative Federalism

34 In addition to the three-pillar framework suggested by the Fifteenth Finance Commission, the study suggests four constituents, namely the finance commission, NITI Aayog, goods and services tax, and de facto decentralisation, which will help strengthen the "cooperative" element in Indian federalism. — *Abhay Pethe, Mala Lalvani*

Household Consumption Expenditure Inequality

40 The comparative role of the determinants of household-level consumption expenditure inequalities in rural India between two sub-periods, 1994–2005 and 2005–12 is examined, using the three rounds of the National Sample Survey Consumer Expenditure Survey. — *Balu Pawde, Tara Shankar Shaw & Pushpa L Trivedi*

Poverty and Deprivation in India

50 Building on the asset-based indicator, this paper estimates deprivation in India. The results suggest that there is a difference in the regional ranking of poverty based on the long-term picture of vulnerability provided by the asset-based indicator of deprivation. — *Debosree Banerjee*

Entrepreneurship at the Grassroots

57 Taking the view that the official practice of clubbing medium, small, and microenterprises in one category is not sound, this study points out that these categories are substantially different from each other in terms of size, structure, resources, and business perspectives. — *Asit Banerji*

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Seeking India's Global Normative Power

10 Through a reading of the United Nations Security Council resolutions 2593 and 2615 and India's call on Ukraine, it is argued that rising powers like India need to be more attentive to the politics of strategic autonomy. — *Shweta Singh*

Ukraine and the Weaponisation of Everything

13 Unless the world ends the war in Ukraine today, we are all losing. — *T Sabri Öncü*

Mapping the Morphology of Liquor Ban in Bihar

16 This article seeks to analyse how Bihar's prohibition policy is oscillating between hypocrisy and moralism, and how the act of banning alcohol is turning out to be a big failure, legally and socially, because of the rising consumption of illicit liquor. — *Ravi Ranjan, Ankit K Singh*

The Hijab Issue and Muslim Women's Movement

21 Instead of diverting the energy to the sectarian agenda of enforcing a dress code and perpetuating marginalisation, Muslim women's movement should uphold the "Shaheen Bagh spirit" of constitutional values and unitedly fighting for rights and equality. — *Razia Patel*

The Political Economy of Plant Biotechnology

29 This article examines the importance of farmers in the political economy of genetically modified crop approvals in India. The evidence shows that while the farmers may not be important in shaping policy, they do have the clout to defeat it. — *Bharat Ramaswami, Milind Murugkar, N Lalitha & Carl E Pray*

Price or Income Support to Farmers

37 The present study explores the scalability and feasibility of some of the major union government programmes, such as the Pradhan Mantri Annadata Aay SanraksHan Abhiyan, the Pradhan Mantri Kisan Samman Nidhi, and other possible methods of direct payments, by analysing their fiscal costs and physical storage requirements. — *C S C Sekhar*

Environmental Impact Assessment in India

45 One of the most contentious changes proposed in the draft environmental impact assessment notification, 2020 in India is the circumvention of public consultations for the expansion of projects for up to 50% of their original capacity. The minutes of the meetings of the coal mining expert appraisal committee between August 2017 and January 2021, which reviewed the requests for coal mine expansion, are analysed. — *Sneha Thapliyal, Meenakshi Kapoor & Krithika Dinesh*

Tracing the Transformations in Delhi's Taxi Industry

54 Studying Delhi's radio taxi industry, this paper traces the transitional process of traditional taxi services in the capital to radio taxi services and finally to the current app-based taxi aggregators. The radio taxi companies ruptured old kinship ties and informal relations with a combination of technology, surveillance, and finance, as process app-based taxi aggregators have further refined. — *Mithilesh Kumar*

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63 *Abu Mounir* on little magazines in Bengal and counterculture movements; *Rajeev Anand Kushwah* on centring care in ethnographic research during the pandemic; *Basudhara Roy's* poem "Aid to Forgetting"; and Last Lines by *Ponnappa*.

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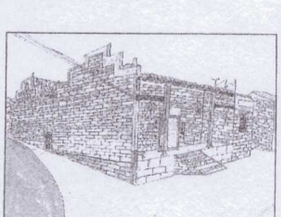

About the Artist: Max Harrison attends Medlin Junior High School in Trophy Club, Texas. He enjoys drawing, building things, and playing at the park. He is curious and enjoys learning new things. Max was adopted from China a little less than 2 years ago at the time of this writing. He is doing exceptionally well in his U.S. schools and is learning English quickly. Although Max is partially blind and has hearing loss, he does not let them hold him back. This drawing, titled "Remembering the Village," is how Max remembers his childhood village in China. This piece of artwork was done in pencil.

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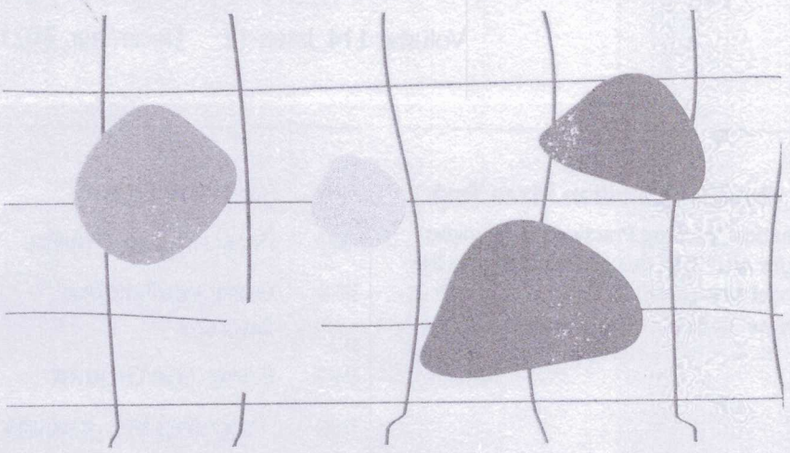

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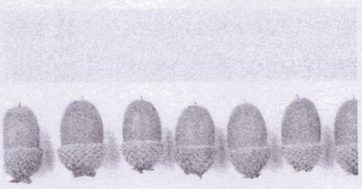



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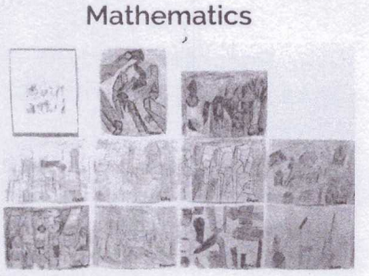

From Masterpiece to *Math*-terpiece

NCTM NATIONAL COUNCIL OF TEACHERS OF MATHEMATICS

Use this QR code to access the online version of this month's *MTLT* and take advantage of the digital enhancements.

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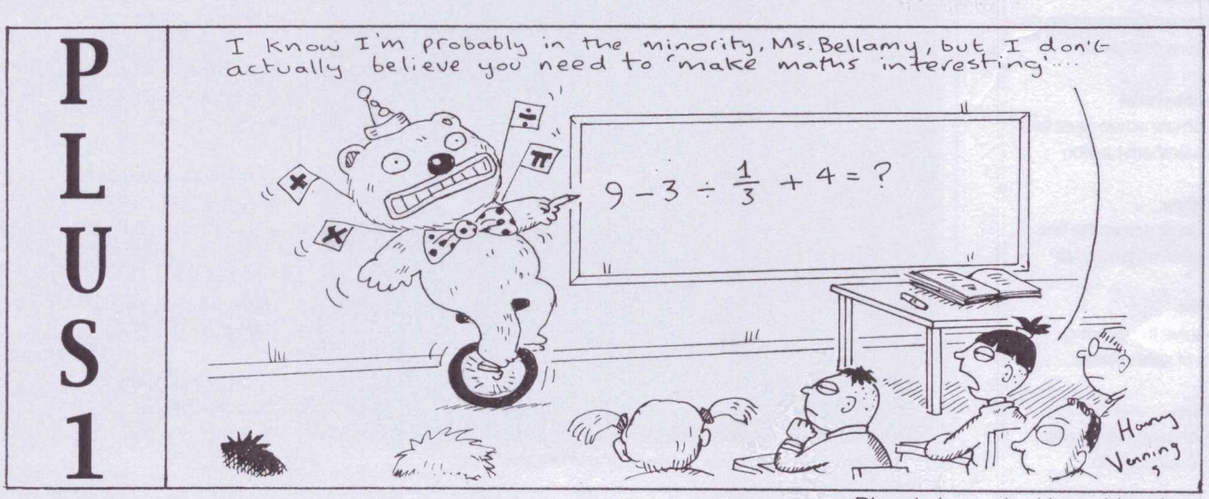

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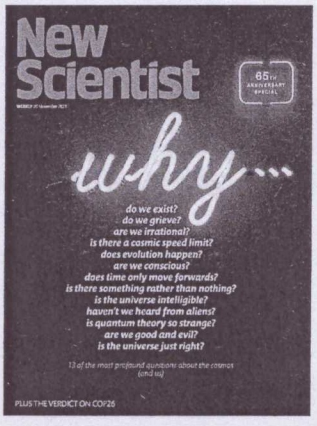

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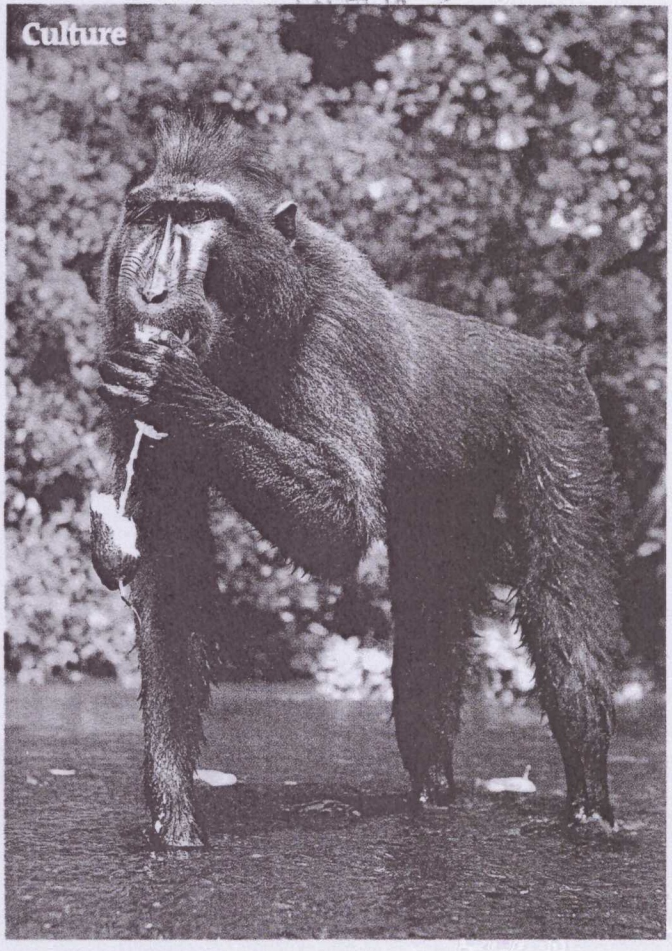

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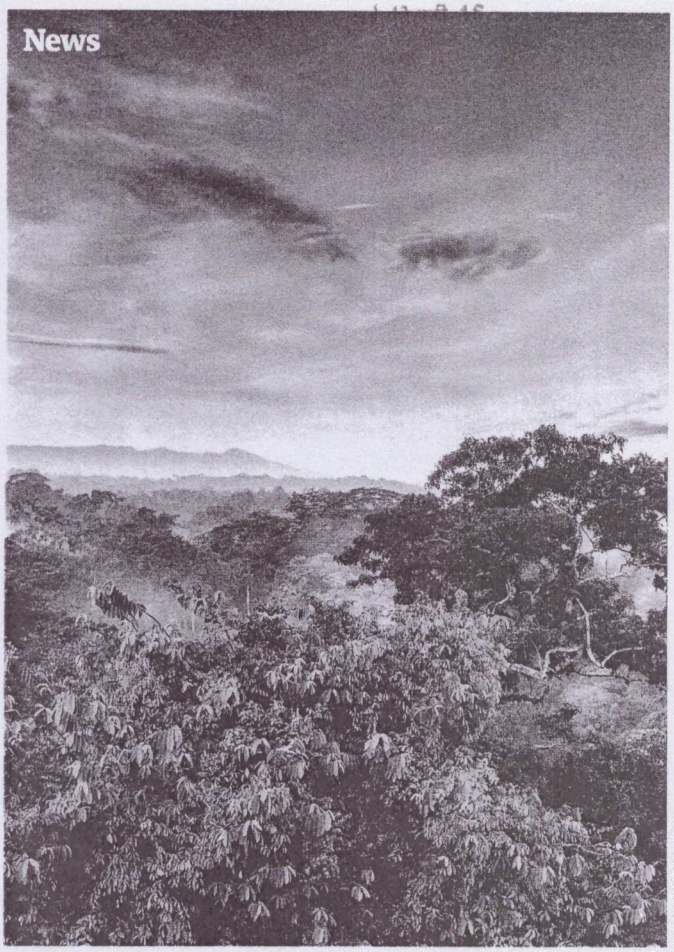

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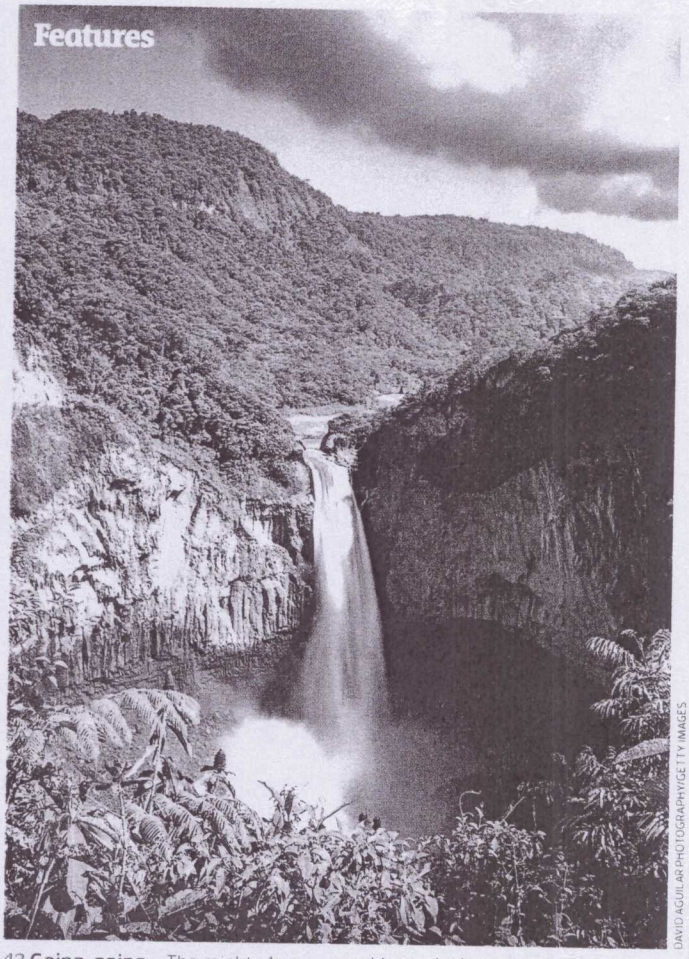

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Welcome, dear readers, to this bumper edition of the magazine, packed full of puzzles, snowflakes, animal magic and many other treats. We do hope you enjoy it.

This has been a long pandemic and it isn't going to be over any time soon. But on behalf of everyone at *New Scientist*, I do wish you a wonderful holiday season and a happy (and healthy) new year.

Science has played a blinder over the past two years. Here's to more of the same in 2022!

Emily Wilson
New Scientist editor

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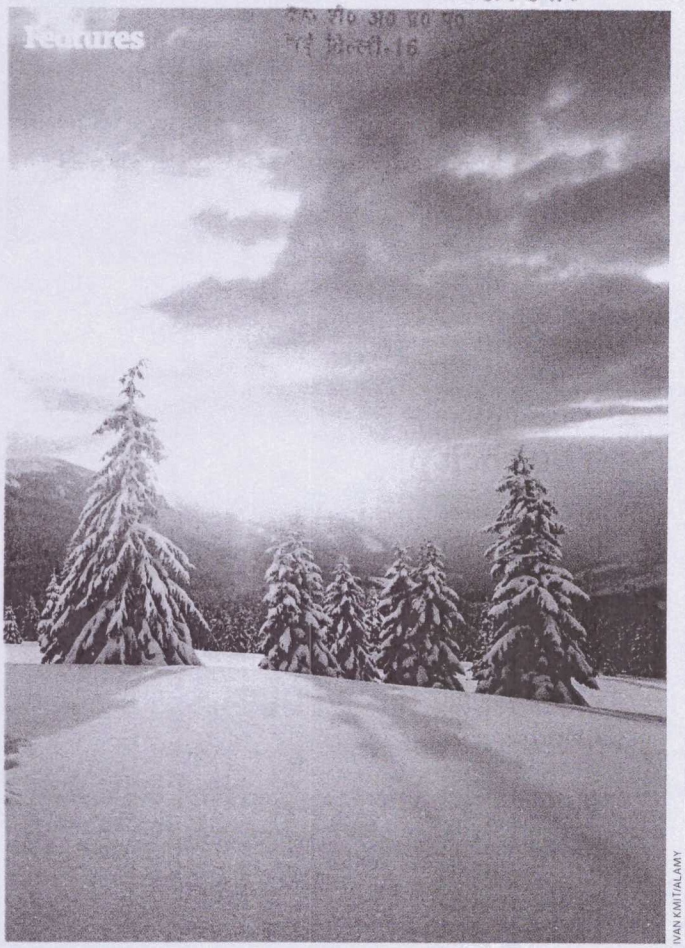

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New Scientist Live

Our mind-blowing festival of ideas is returning to the stage in a new venue, combining the best of in-person and virtual experiences. We will welcome more than 9000 visitors, 40 speakers and 30 exhibitors in person for talks and hands-on demonstrations. Join us from 12 to 14 March 2022 at Manchester Central, UK. The first two days are open t all, with the final day dedicated to school and home learners. Find out more about what's happening online:

live.newscientist.com

Video

What's so funny?

To find out, we visited Laughter Lab, an exhibition and social experiment at London's Cartoon Museum. The exhibiti explores our reaction to humour, showcasing a wide selection of cartoonists. Don't forget to subscribe to our channel for more great videos:

youtube.com/newscientist



Podcast

Weekly

The team discusses why the omicron coronavirus variant might dodge immunity; climate journalist Emily Atki drops in to chat about new Netflix satir *Don't Look Up*, about two astronomers attempts to warn humanity of an approaching comet; and Steven Pinke talks about his new book *Rationality*. P the bubbling sounds of melting glacier and news of a GPS-like navigation sys that uses cosmic rays to orient itself.

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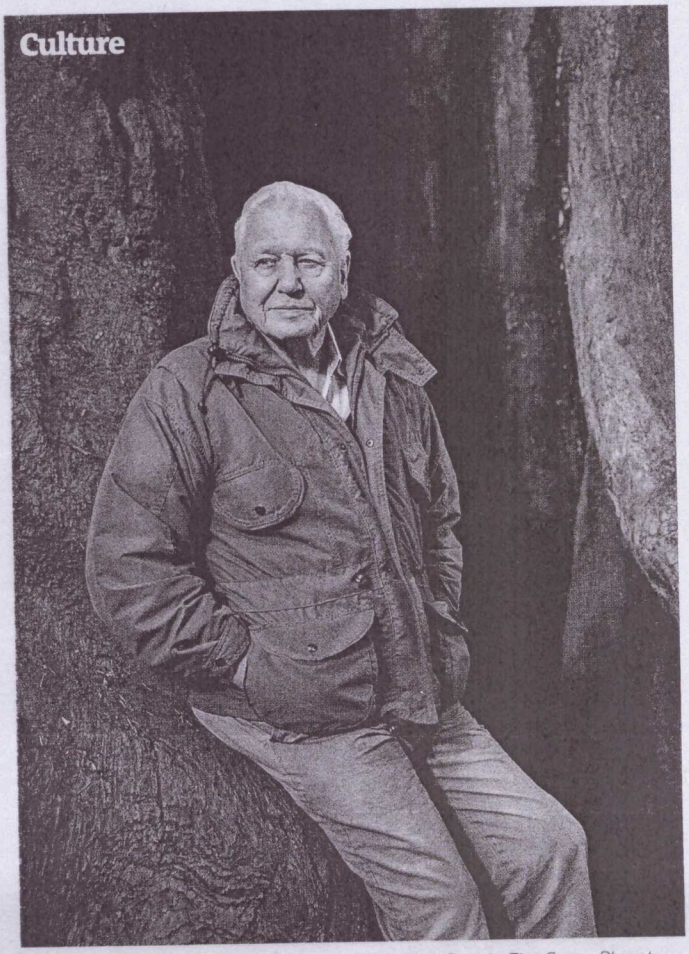

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Discovery tour

Wildlife of Sri Lanka

Join us on an unforgettable 12-day holiday to Sri Lanka, a paradise for wildlife. Your guide will be entomologist and presenter George McGavin, who will take you to the wild corners of this extraordinary island in search of leopards, elephants, whales and plenty of more unusual species too, including pangolins, sloth bears and lorises. The tour departs on 5 March. Find out more and view the full itinerary online.

newscientist.com/tours

Online

Covid-19 daily briefing

Stay on top of all the most crucial developments in the pandemic – from variants to vaccines – with our essential briefing, updated each weekday. There are also links to exclusive interviews and features.

newscientist.com/coronavirus-latest

Podcast

Weekly

In this special episode, *New Scientist* staff give their expert picks of the scientific and cultural events to look forward to this year. Highlights of 2022 include the launch into orbit of SpaceX's Starship, the opening of an upcoming Stonehenge exhibition at the British Museum in London, the TV adaptation of Kate Akinson's novel *Life After Life* and an innovative new breast cancer clinical trial.

newscientist.com/nspod



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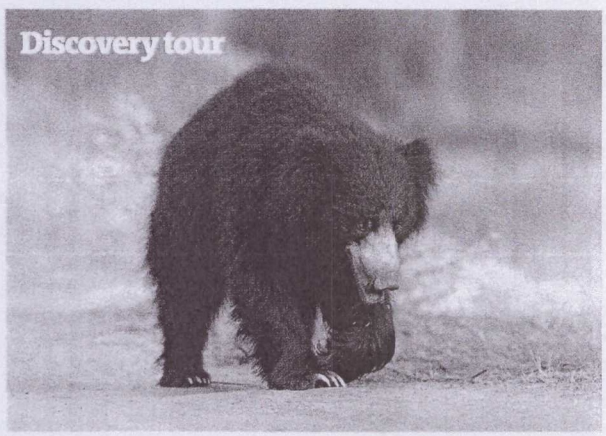
Set in stone An exhibition tells the human story behind Stonehenge



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Bear hunt Rare sloth bears can be tracked down in Sri Lanka

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Understanding the AI revolution

Beth Singler studies the stories we tell ourselves about artificial intelligence, while Shakir Mohamed works at cutting-edge AI firm DeepMind. Join them for an evening talk on how AI will change our lives. This event takes place in person, from 7pm on 24 February at London's Conway Hall.

newscientist.com/ns-events

Newsletter

Health Check

Get reporter Clare Wilson's unmissable newsletter on health and fitness delivered free to your inbox each week. In the latest edition, she looks at how many of us have given up the booze this January, and why the positive effects on people's health are extremely difficult to tease out.

newscientist.com/health-check

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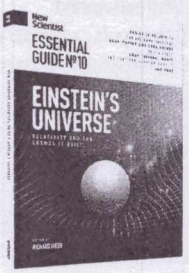

Essential guide

How did the universe begin? What is it made of? Do black holes exist? Albert Einstein's space and time-warping theories of relativity have revolutionised our view of the cosmos over the past century. Find out how in the 10th *New Scientist Essential Guide*, available now.

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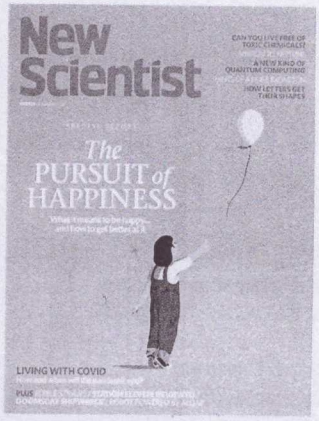

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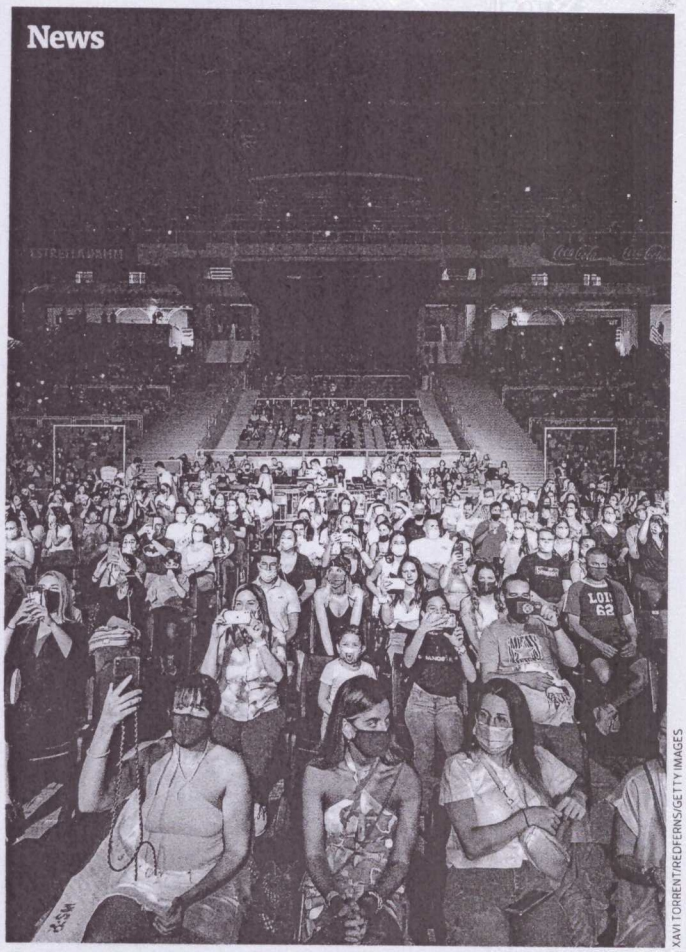

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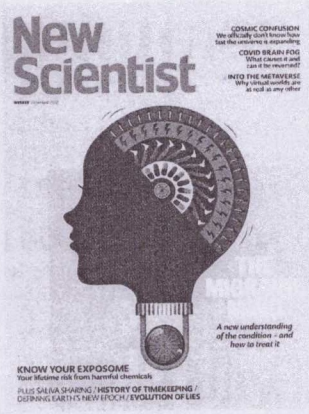

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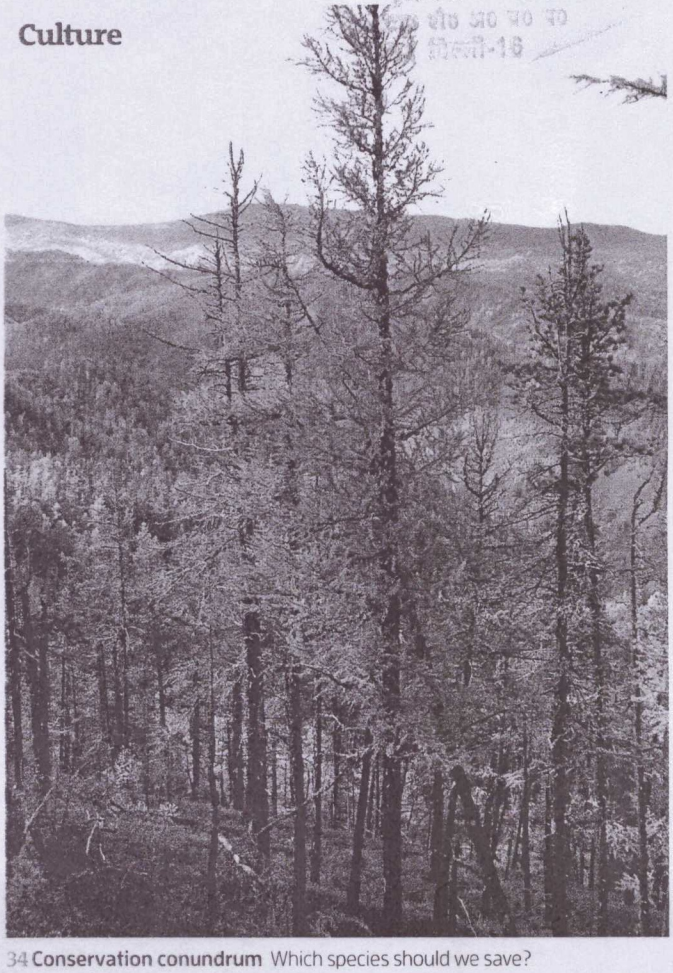
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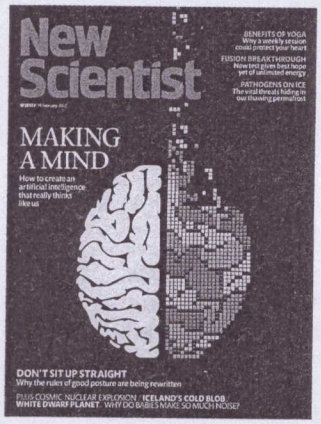

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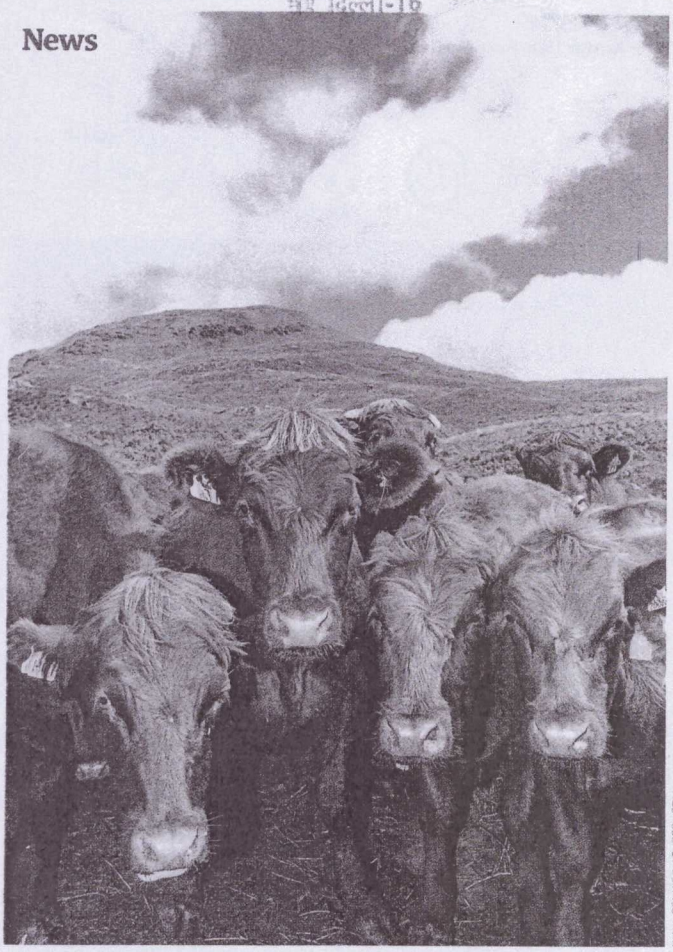

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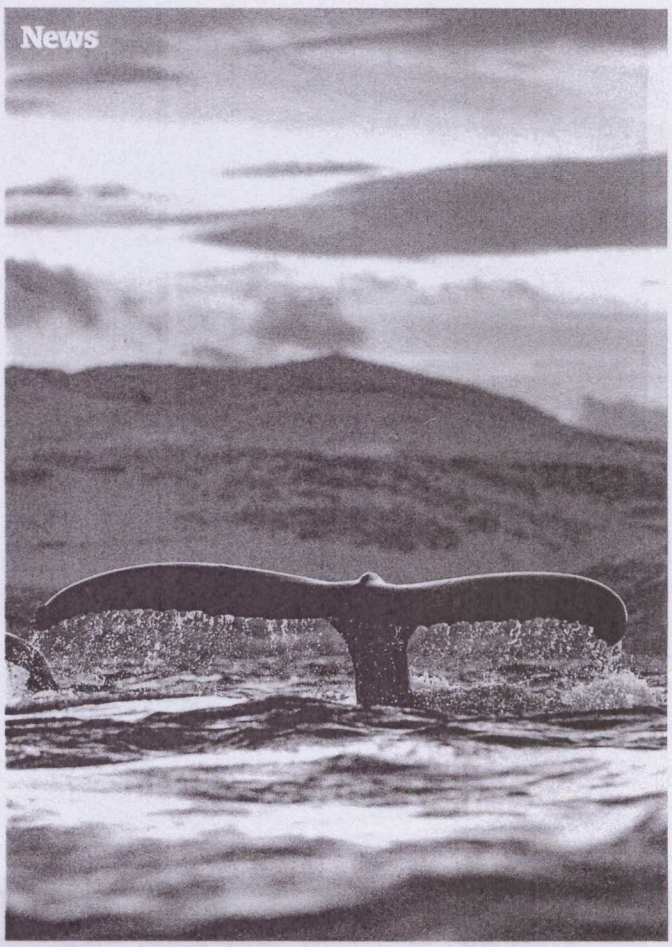

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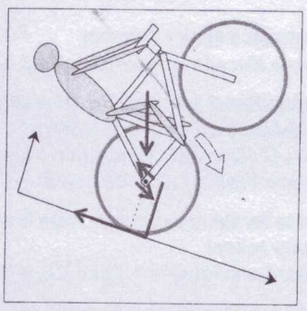

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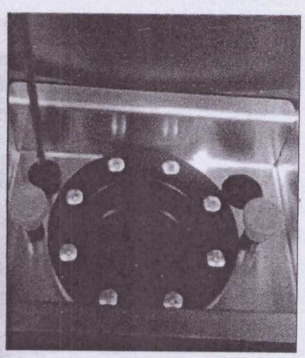

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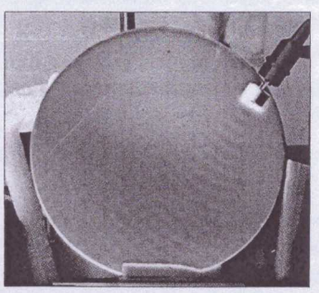

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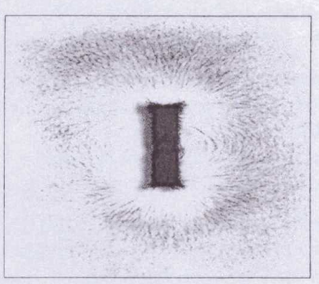

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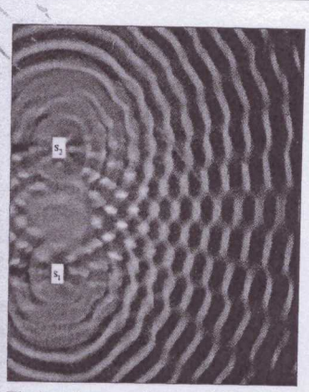

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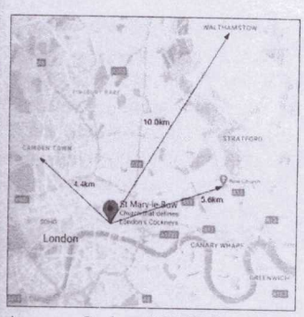

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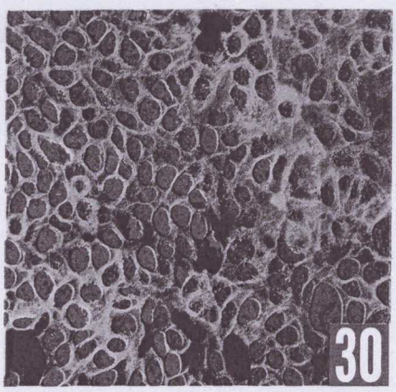



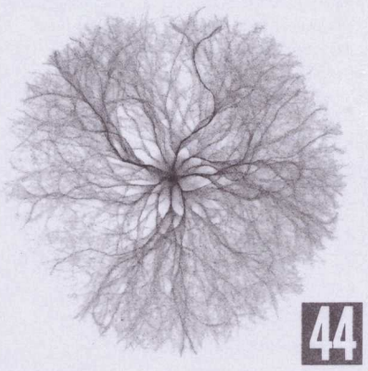

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Amanda Parker

How can researchers geometrically tune the extent to which a material embodies a stiff or flexible structure?

38 Colloids out of equilibrium

Bas G. P. van Ravensteijn and Ilja K. Voets

The fuel-driven assembly of colloids has opened a route to new, biologically inspired active materials.

44 Branched flow

Eric J. Heller, Ragnar Fleischmann, and Tobias Kramer

In many kinds of irregular media, propagating waves enter a beautiful and relatively neglected regime called branched flow. It affects sound, light, water, and matter waves over vastly different length scales.



ON THE COVER: The blue-ringed octopus's distinguishing characteristics owe their bright color to the self-assembly of colloidal particles. On **page 38**, Bas van Ravensteijn and Ilja Voets describe colloidal materials whose self-assembly out of equilibrium requires light or molecular fuel to sustain it. On **page 30**, Amanda Parker describes how the soft tissues of humans and other organisms can be regarded as mechanical metamaterials. Together, the two articles provide a taste of the vitality and variety of the physics of soft matter. (Photo by kaschibo/Shutterstock.com.)

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MARTIN WHITE

Joanne Cohn

Before there was arXiv, there was Joanne Cohn. As a postdoc in the late 1980s, she started an informal exchange of string theory manuscripts that eventually became the physics preprint server. Three decades later, researchers submit some 16 000 manuscripts to arXiv each month and download 30 million.

physicstoday.org/Dec2021a



BLACK IN PHYSICS

#BlackInPhysics Week

PHYSICS TODAY and *Physics World* recently copublished the second annual #BlackInPhysics Week essay series. Five Black physicists detailed their experiences with burnout, a critical topic as Black scholars confront systemic racism both within and outside of academia.

physicstoday.org/Dec2021b



TITO PONTECORVO

Tito Pontecorvo

In 1950 nuclear physicist Bruno Pontecorvo defected with his family to the Soviet Union. His son Tito, six years old at the time, was later forced out of his job as an oceanographer by the Communist Party. In a Q&A, Tito tells his family story and explains how in 1997 he left the country for the US with 75 horses.

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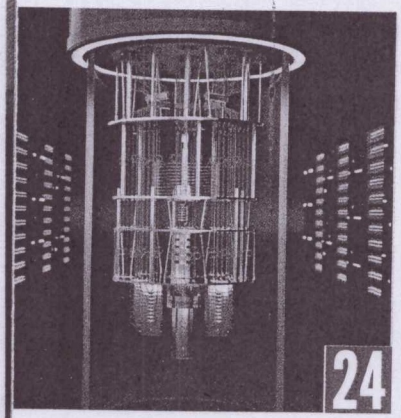

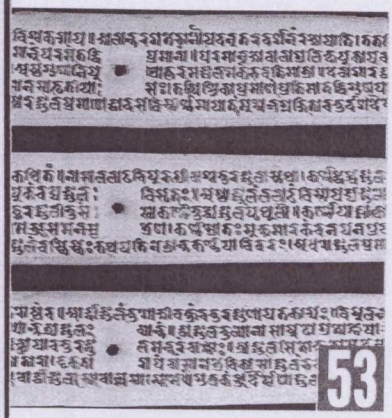

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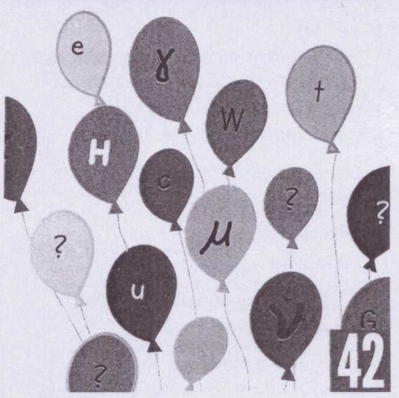

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Sammie Buzzard

The frozen continent's ice shelves are melting. Where is the water going, and what does it mean for the future?

34 Cometary chemistry

Kathrin Altwegg

Celestial messengers carry a link between interstellar matter and life on Earth.

42 Advancing equity, diversity, and inclusion: A how-to guide

Rowan M. Thomson

Physics remains one of the least diverse fields in science. Here's how individuals at all career stages can contribute to fostering an inclusive environment for everyone.



ON THE COVER: Comets have been observed for millennia, and their appearances were long thought to be harbingers of floods, famines, and other disasters. This illustration from the 16th-century *Book of Miracles* shows a comet that appeared in 1401 and was followed by a plague in the German region of Swabia. Though not actually omens, comets do carry a wealth of information. On **page 34**, Kathrin Altwegg describes how *in situ* cometary measurements have uncovered details about the bodies' compositions and the solar system's history. (Image from steeve-x-art/Alamy Stock Photo.)

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D. PADIAN/F. PAGANI/C. CUMMINGS

Best of 2021

Take a look at PHYSICS TODAY's most popular articles from last year, including several available only online. Topics include a recent step forward in laser fusion, a nearly forgotten climatology pioneer, the importance of Albert Einstein's handwriting, the origins of arXiv, and the orientation of icebergs.

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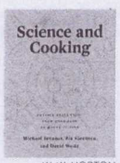

W. W. NORTON

The year in books

PHYSICS TODAY's Books editor, Ryan Dahn, looks back at 2021 and compiles a list of recommended books for physics and history-of-science enthusiasts. Selections include a primer on the science of cooking (complete with recipes) and a guide to the end of the universe.

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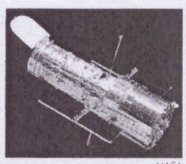

NASA

Dual-anon review

Since the adoption of dual-anonymous peer review for the *Hubble* telescope, higher percentages of women and early-career researchers are getting observing time. Now NASA and other agencies are trying out the approach, in which neither applicant nor reviewer knows the other's identity.

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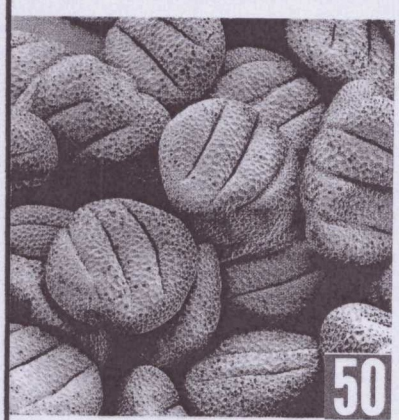

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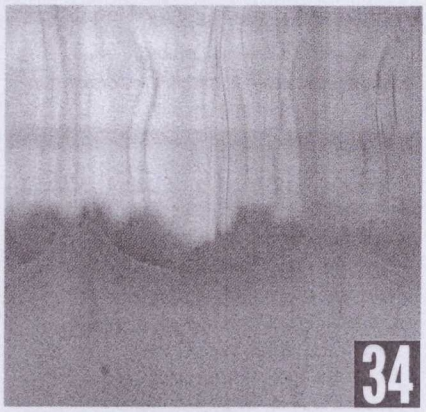



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Complex physical processes that affect the solidification of multicomponent fluids have implications for materials science and geophysics.

42 Water makes its mark on GPS signals

Clara Chew

In addition to being a navigation tool, GPS signals are helping scientists observe Earth's hydrologic cycle.



ON THE COVER: The Southern Patagonian Ice Field, which straddles Chile and Argentina, feeds glaciers, lakes, and rivers that ultimately flow into the Pacific and Atlantic Oceans. Scientists now can remotely monitor sea ice, snow depths, and soil moisture there and elsewhere by using GPS signals reflected from Earth's surface. To read about how GPS antennas sense the hydrological cycle, turn to Clara Chew's article on **page 42**. (*Landsat 8* image, courtesy of NASA's Earth Observatory/Jesse Allen, using data from the US Geological Survey.)

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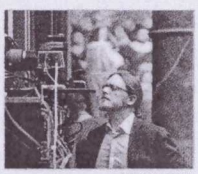

RIJKSMUSEUM

Art analysis

Materials scientist Robert Erdmann talks to PHYSICS TODAY's Toni Feder about how he combines x-ray and IR imaging with neural networks to understand artworks' physical features and how they were made. His analyses of old paintings have revealed covered-over figures, the composition of pigments, and more.

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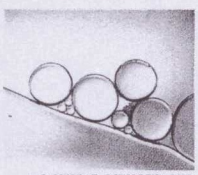

A_DIFFERENT_PERSPECTIVE/PD

Oil and water

Why don't oil and water mix? The classic explanation is that water molecules are polar and oil ones are not, yet oil droplets can have negative surface charge. PHYSICS TODAY's Alex Lopatka examines a new study that may explain how water can transfer negative charge without promoting mixing.

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JULIETA LABATUT

Labatut Q&A

In *When We Cease to Understand the World*, Benjamín Labatut uses scientists such as Fritz Haber and Werner Heisenberg to explore the destructive potential of science. The writer talks to Books editor Ryan Dahn about his interest in physics and the book's special blend of fact and fiction.

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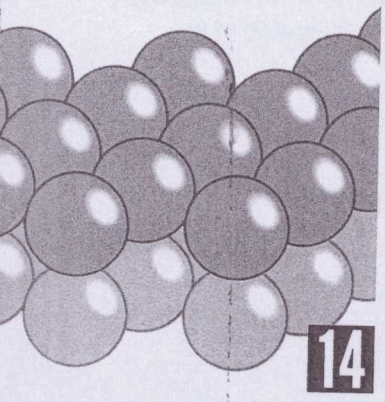

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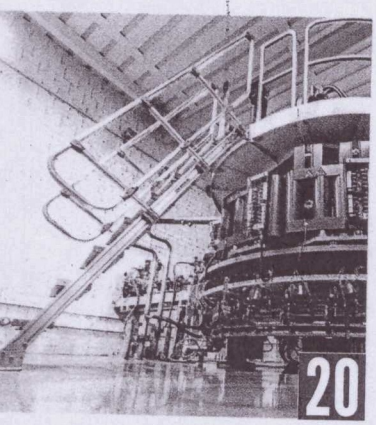

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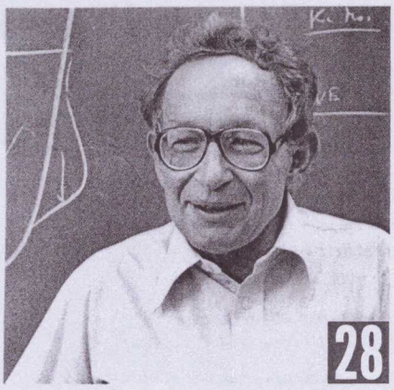



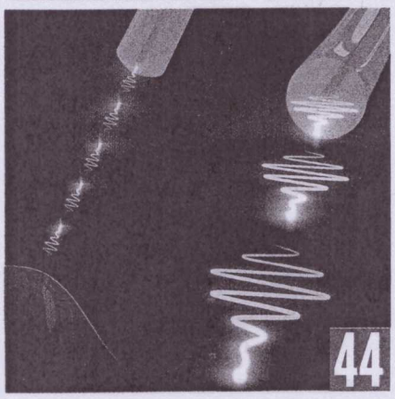

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28 Philip Anderson: Virtuoso of condensed matter

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The theorist's work on disordered and magnetic solids earned him a Nobel Prize, but it was his profound influence on the condensed-matter community—and well beyond—that set him apart.

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44 A deterministic source of single photons

Peter Lodahl, Arne Ludwig, and Richard J. Warburton

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ON THE COVER: Kazimir Malevich's *Tochil'schik Printsip Mel'kaniia*, or *The Knifegrinder* (1912–13), exemplifies the fragmentation of forms characteristic of futurism and echoes the superposition of states characteristic of quantum mechanics. On **page 36**, Tim Langen describes dipolar supersolids, a class of quantum materials that are simultaneously solid and superfluid. On **page 44**, Peter Lodahl, Arne Ludwig, and Richard Warburton describe how advances in quantum materials are leading to new applications in quantum computation. (Image courtesy of the Yale University Art Gallery.)

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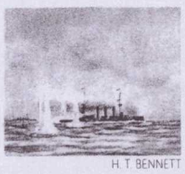

H. T. BENNETT

Coriolis myth

When discussing the Coriolis effect, textbooks often recount an amusing miscalculation from a naval battle in World War I. But Christopher M. Graney of the Vatican Observatory discovered that the story is a myth. He describes his journey into primary sources that disprove the tale.

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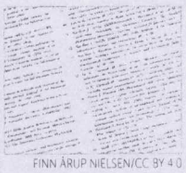

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Citation gap

A recent analysis shows that physics articles authored by women are cited less than those by men even when factors such as seniority are taken into account. Dalmeet Singh Chawla recounts those findings and possible solutions to that enduring gender bias.

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NOIRLAB

Dark skies

Artificial lighting and satellites can interfere with ground-based astronomical observations and impede humanity's ability to enjoy the night sky. Rachel Berkowitz reports on astronomers' efforts to reduce light pollution through legislation, education, and working with companies.

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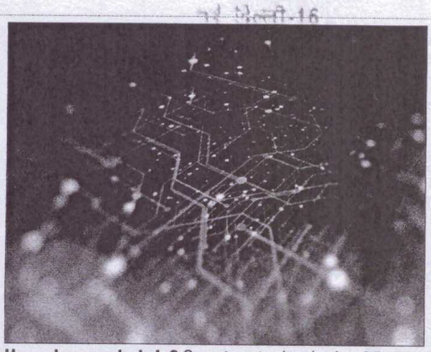

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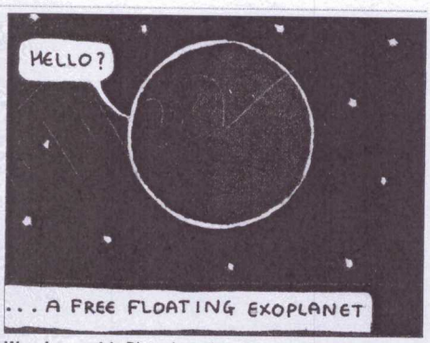

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एन सी ई आर टी
NCERT

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(ii) प्रशिक्षण, तथा (iii) विस्तार।
यह डिज़ाइन कर्नाटक राज्य के रायचूर ज़िले में मस्के के निकट हुई खुदाइयों से प्राप्त ईसा पूर्व तीसरी शताब्दी के अशोकयुगीन भग्नावशेष के आधार पर बनाया गया है।
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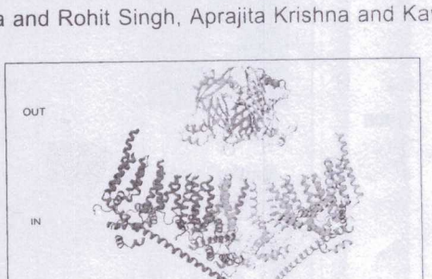



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Peter Marler (1928–2014)
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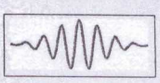

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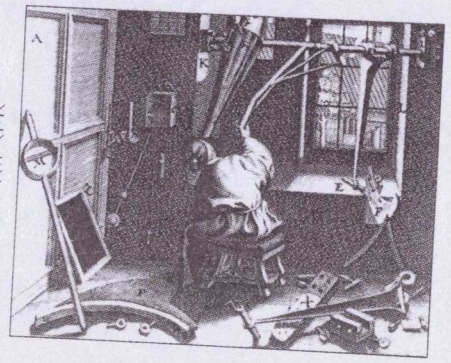
पेड़-पौधे कैंसर से क्यों नहीं मरते?

1986 में घटी चेर्नोबिल दुर्घटना विश्वव्यापी त्रासदियों में से एक है जिसने वहाँ के समूचे जीवन पर चिरस्थाई प्रभाव छोड़ा। इस दुर्घटना की वजह से हज़ारों लोगों को कैंसर हुआ और एक बहुत बड़े इलाके को वर्जित क्षेत्र घोषित करना पड़ा। परन्तु बाद में हुए शोध में पाया गया कि वहाँ अधिकांश पादप जीवन कभी मरा ही नहीं था और सर्वाधिक रेडियोसक्रियता ग्रस्त इलाकों में भी तीन वर्ष के अन्दर ही वनस्पतिजगत पूर्ण रूप से व्यापक हो चुका था। आखिर पेड़-पौधे इतना विकिरण कैसे झेल लेते हैं और ये नाभिकीय हादसों के प्रति इतने सहनशील कैसे हैं, पर्यावरणीय प्रभाव किस हद तक जीवजगत को नुकसान पहुँचाता है? इन्हीं सब रोचक तथा महत्वपूर्ण सवालों के जवाब के लिए पढ़ें लेख में दिए विवरण को।



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प्रस्तुत लेख प्रकाश की चाल ज्ञात करने की कोशिश में हुए विभिन्न शोध और उसकी प्रकृति पर चर्चा करता है – विशेषतौर पर प्रकाश की गति सीमित है या असीमित, यह पता करने के लिए जो बहुत सारे विभिन्न तरह के प्रयास हुए। एक सेकण्ड में प्रकाश कितनी यात्रा पूरी करता है, गैलीलियो की कोशिशें, ग्रहण की समझ, प्रकाश की गति को पहचानने में रोमर का महत्वपूर्ण योगदान – इन सभी अहम बातों को समझते हैं इस लेख के प्रथम भाग में।

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न जाने कितने स्कूलों में शारीरिक दण्ड और अपमान एक नियमित मामले की तरह सामने आता है। बच्चे न केवल अपनी पीठ पर पाठ्यपुस्तकों और कॉपियों का भार ढोते हैं, बल्कि मूर्खतापूर्ण कारणों के लिए बेंत का खामियाज़ा भी भुगतते हैं, जैसे जूते का मेल नहीं खाना या फीता बँधा नहीं होना। बच्चा आसपास की घटनाओं को देखता है, सोचता है और उसकी नकल करता है या प्रतिक्रिया देता है। इन सबसे मनोवृत्ति परिवर्तन के अलावा मनोवैज्ञानिक नुकसान भी हो सकते हैं। बच्चे यह मानने लग सकते हैं कि हिंसा करना अच्छा है। या तो घर या स्कूल में, बच्चे को अनुशासनात्मक प्रथाओं के अनुसार ढाला जाता है। आज भी तमाम नियम-कानूनों के बावजूद भारत समेत कई देशों में अनुशासन के नाम पर पिटाई, स्कूली शिक्षा का अभिन्न हिस्सा है। प्रत्येक शिक्षक को लगता है कि उसे बच्चे को अनुशासित करने का पूरा अधिकार है। क्या इस हिंसा के पीछे सामाजिक या भावनात्मक कारण व ग्रन्थियाँ हैं? पढ़ते हैं लेखक के अपने और अपने दोस्तों के इन्हीं मुद्दों पर अनुभव जो आजीवन मस्तिष्क पर छाप छोड़े हुए हैं।

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साये में बैंकिंग

एक अच्छी तरह से काम करने वाली वित्तीय प्रणाली आधुनिक अर्थव्यवस्था के लिए आवश्यक है, और इसी क्रम में बैंक एक अहम भूमिका निभाते हैं। आम समझ के अनुसार, हम सभी जानते हैं कि अधिकांश बैंक जमा स्वीकार करने और उधार देने का काम करते हैं। वे बचतकर्ताओं के लिए धन के सुरक्षित भण्डार और उधारकर्ताओं के लिए वित्त के स्रोत के रूप में पेश आते हैं। इस तरह बैंकों का प्रमुख व्यवसाय बचतकर्ताओं और उधारकर्ताओं के बीच एक तालमेल बिठाने का होता है। पर क्या होता है जब यह तालमेल बिगड़ने लगता है, जब बैंक की विश्वसनीयता पर सन्देह के बीज अंकुरित होने लगते हैं? आइए, इस लेख के ज़रिए इन सभी अहम मुद्दों पर अपनी समझ को और पुख्ता बनाते हैं।

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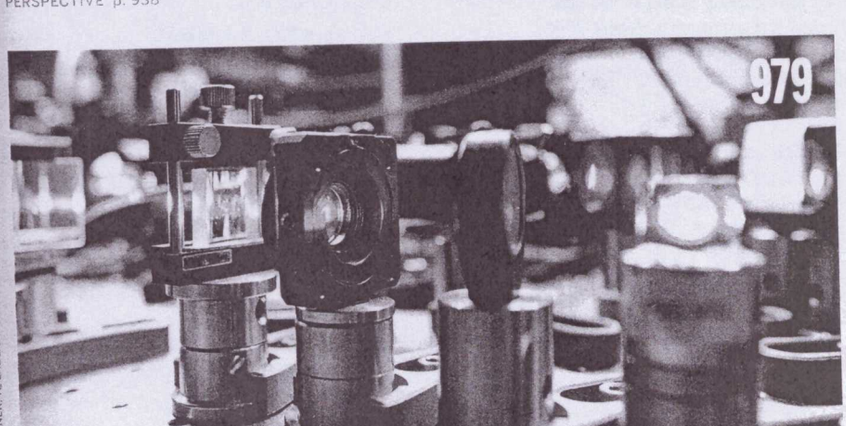
Optical image of Jupiter's atmosphere, taken by the Juno spacecraft. The cloud top colors vary because of differing compositions, probably mixtures of water, ammonia, and ammonium hydrosulfide. The large elongated storm in the lower left is known as a barge; a more circular white storm is visible at the top right. Microwave and gravitational field data from Juno constrain the depths of the gas giant's storms. See pages 964 and 968. *Credit: NASA/JPL-Caltech/SwRI/MSSS/Kevin M. Gill*





Blue laser light is used to show quantum statistics effects on light scattering in an ultracold Fermi gas.

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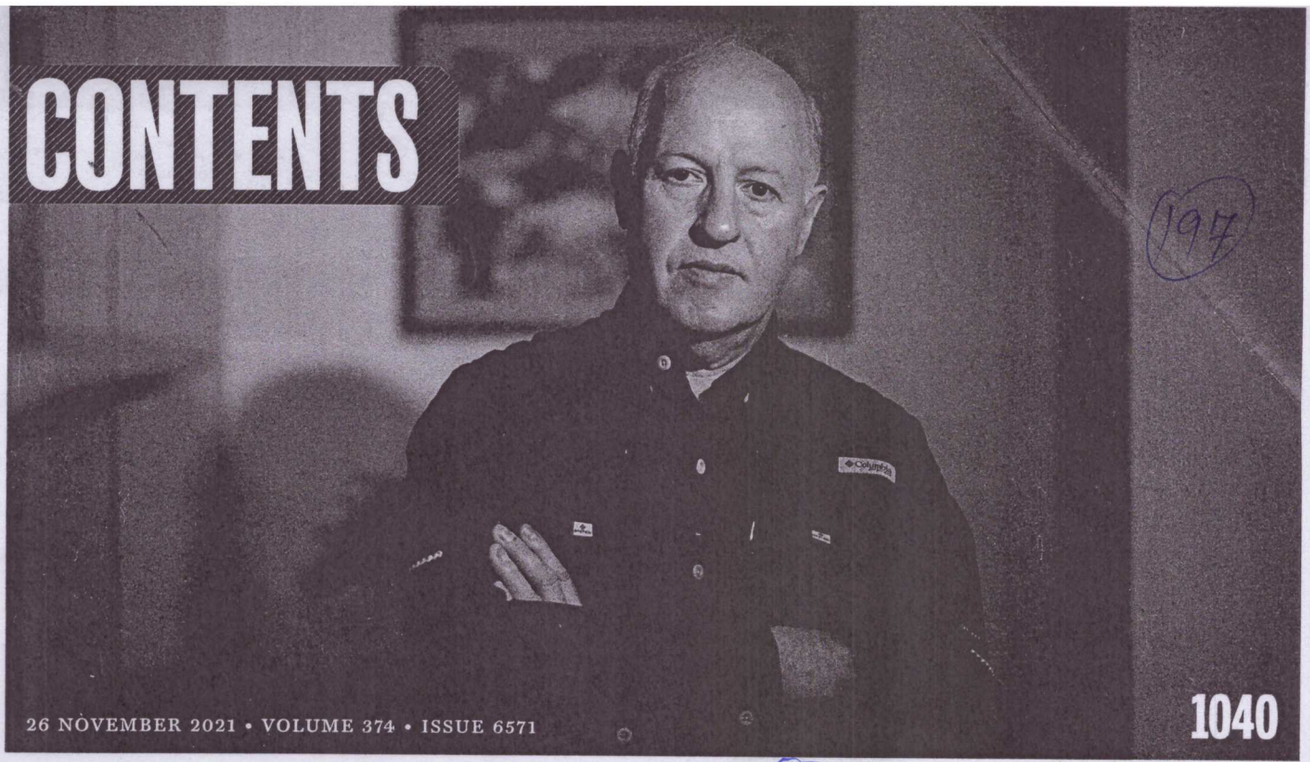

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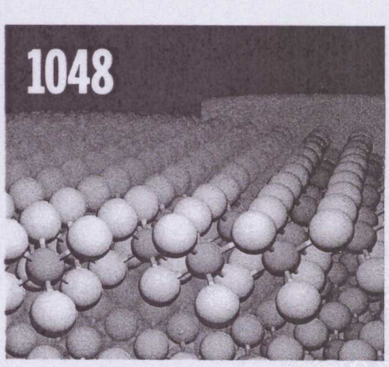

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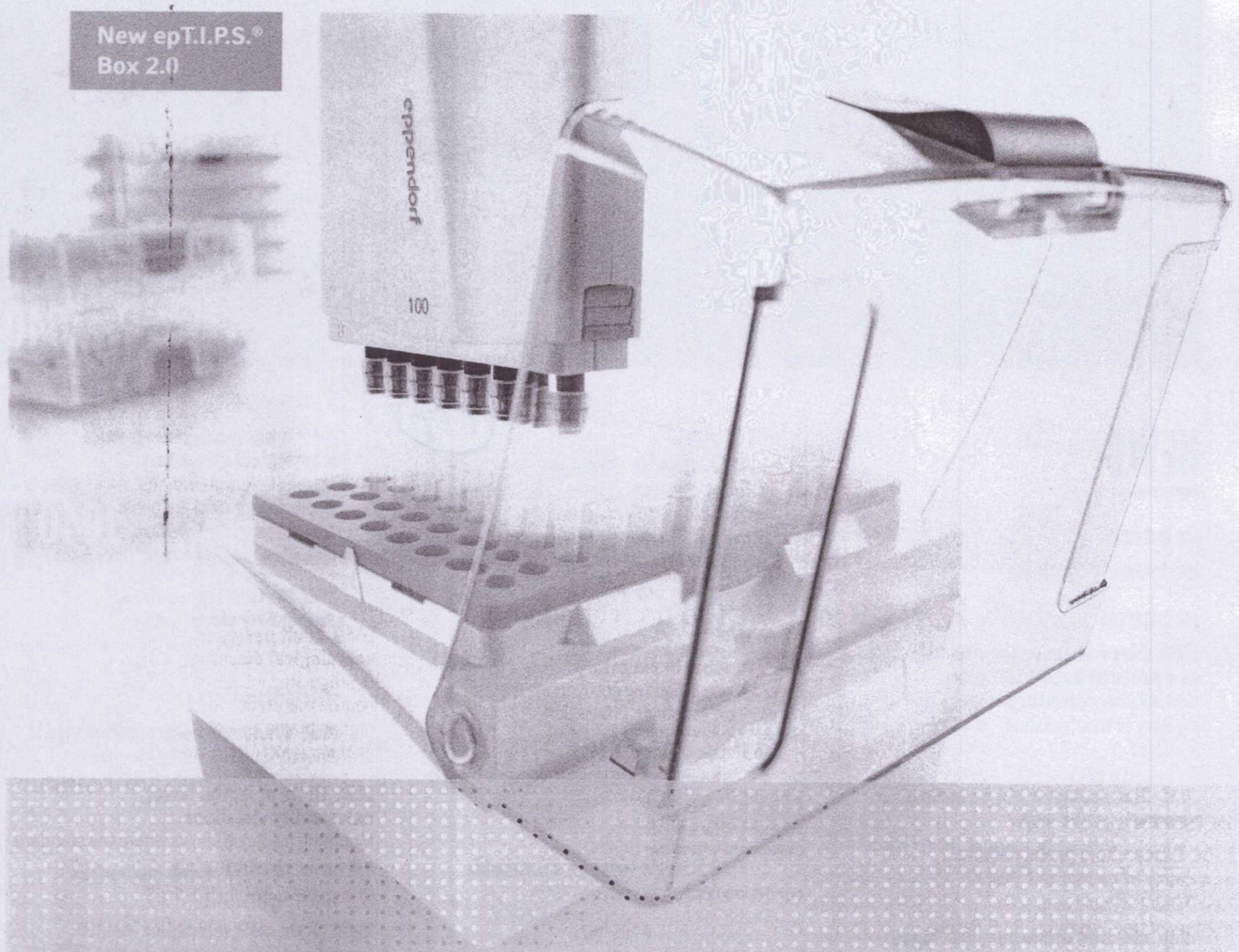

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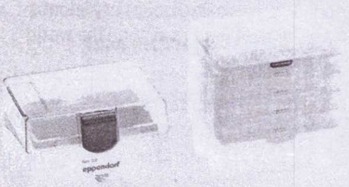

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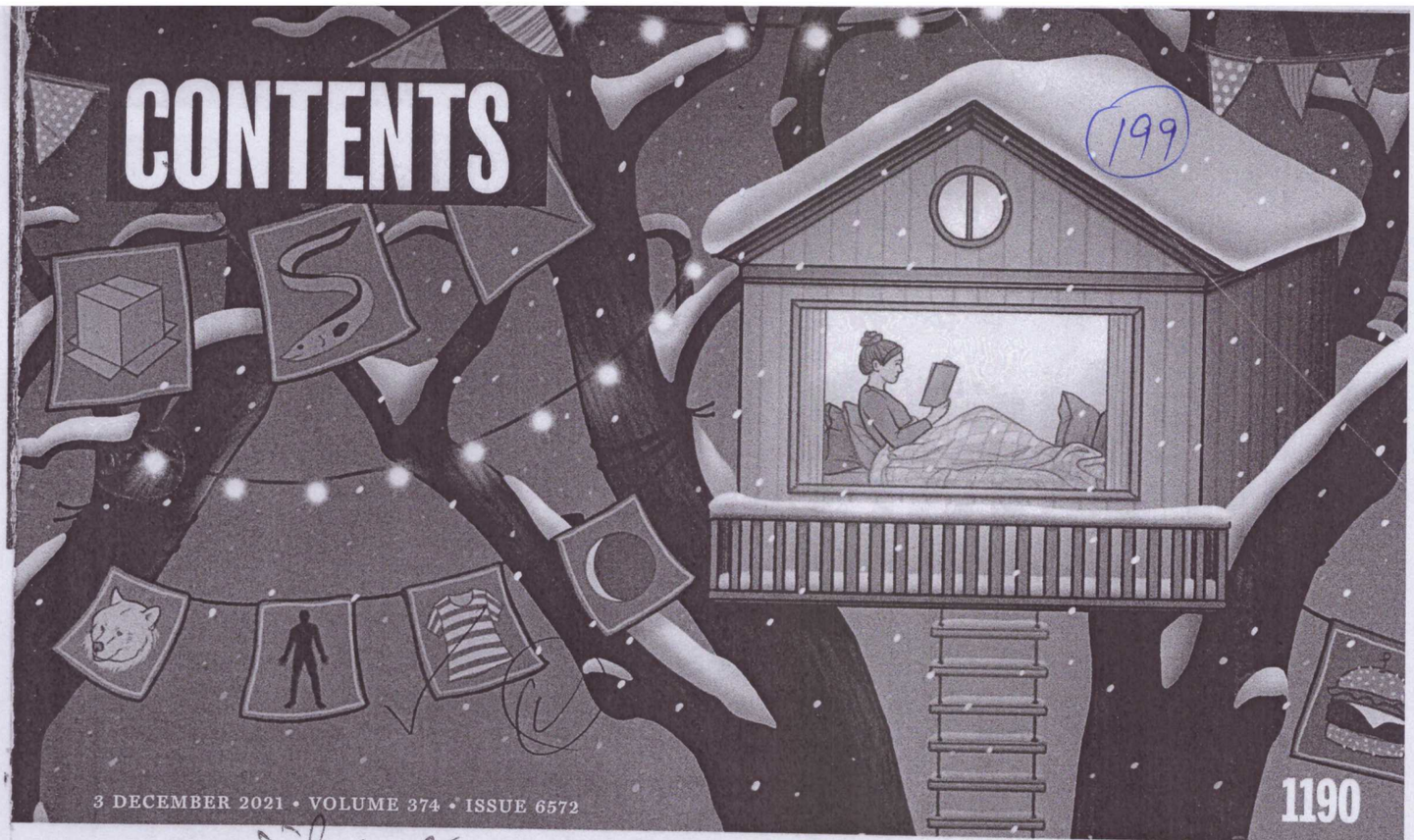

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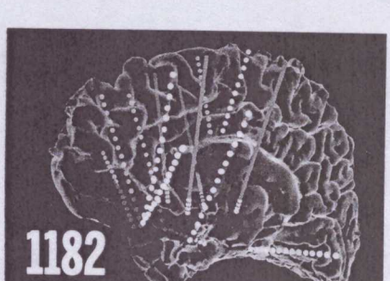

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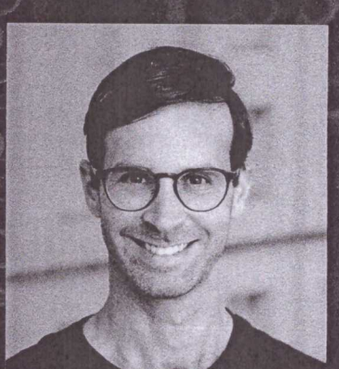

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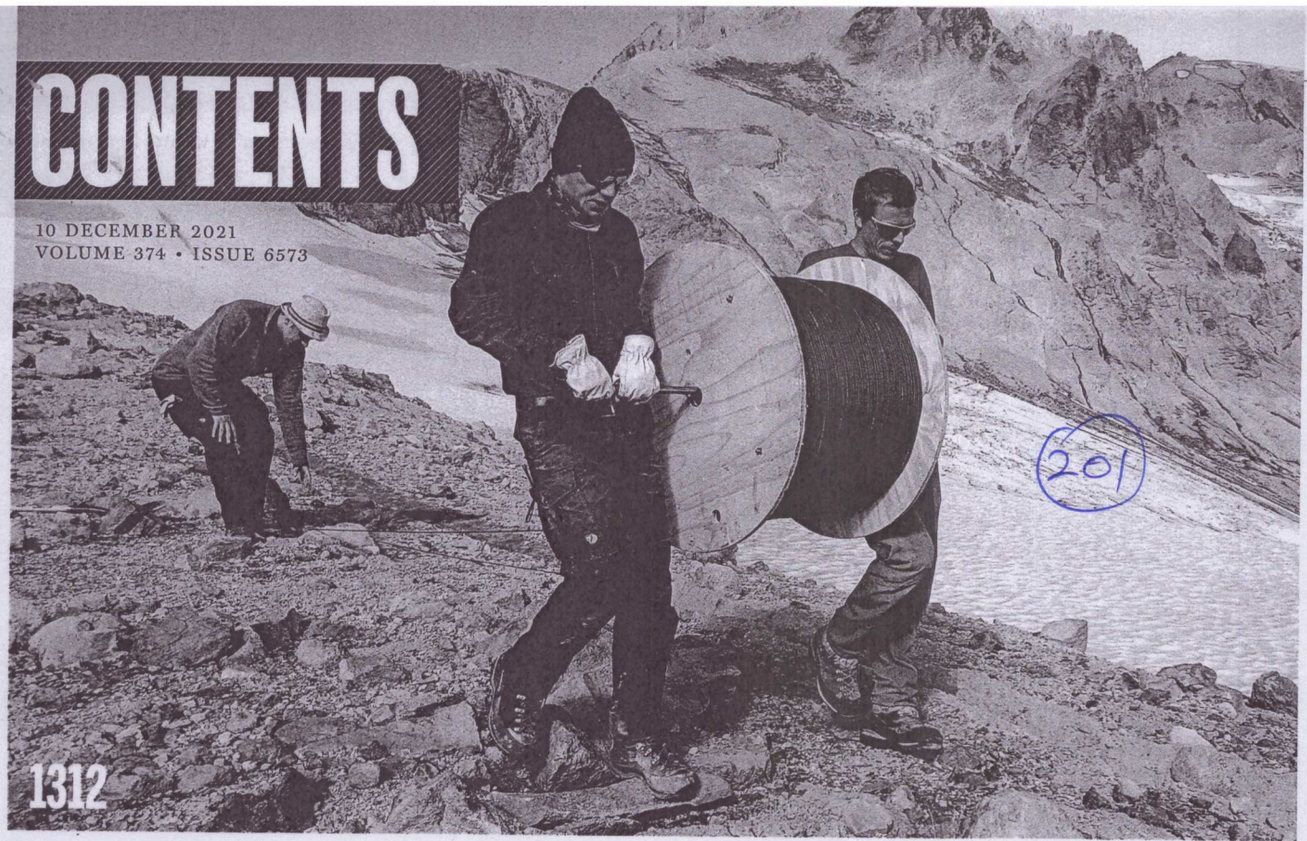

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A stem of the grass *Andropogon gerardii* (also known as "big bluestem") emerging from a leaf sheath. Grasses, like other monocots, have tall, cylindrical leaves that visually differ from the wide, flat leaves of eudicot plants. By means of computational modeling and developmental genetic analysis, researchers have uncovered similarities in the leaf development mechanisms of grasses and eudicot plants. See page 1377. *Photo: Bruce Leander/Lady Bird Johnson Wildflower Center*



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ILLUSTRATION: ROBERT NEUBECKER

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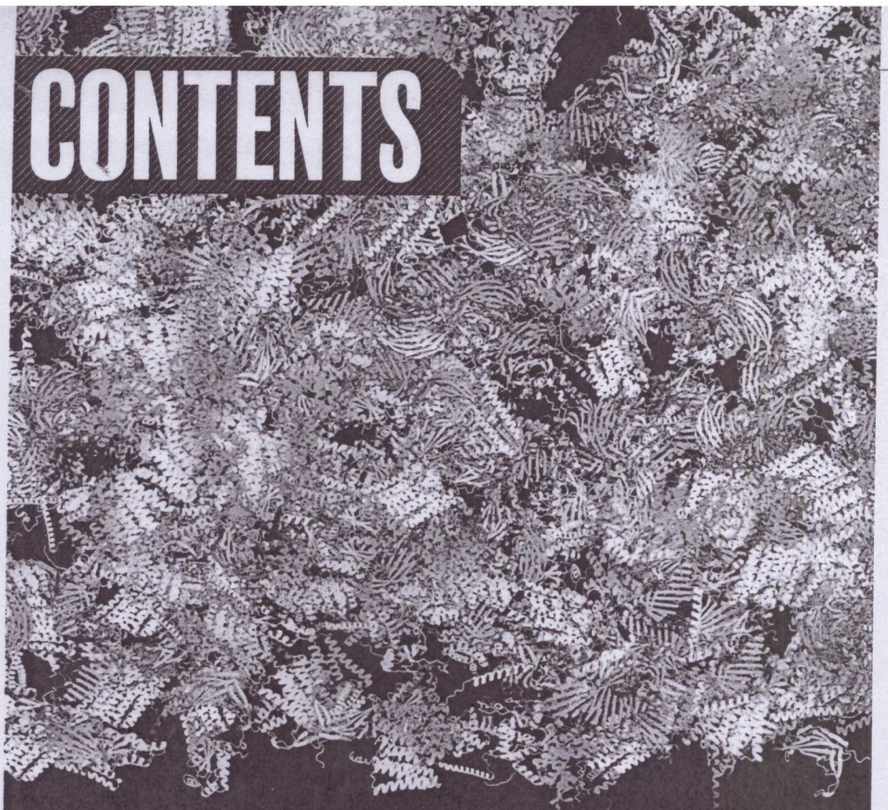

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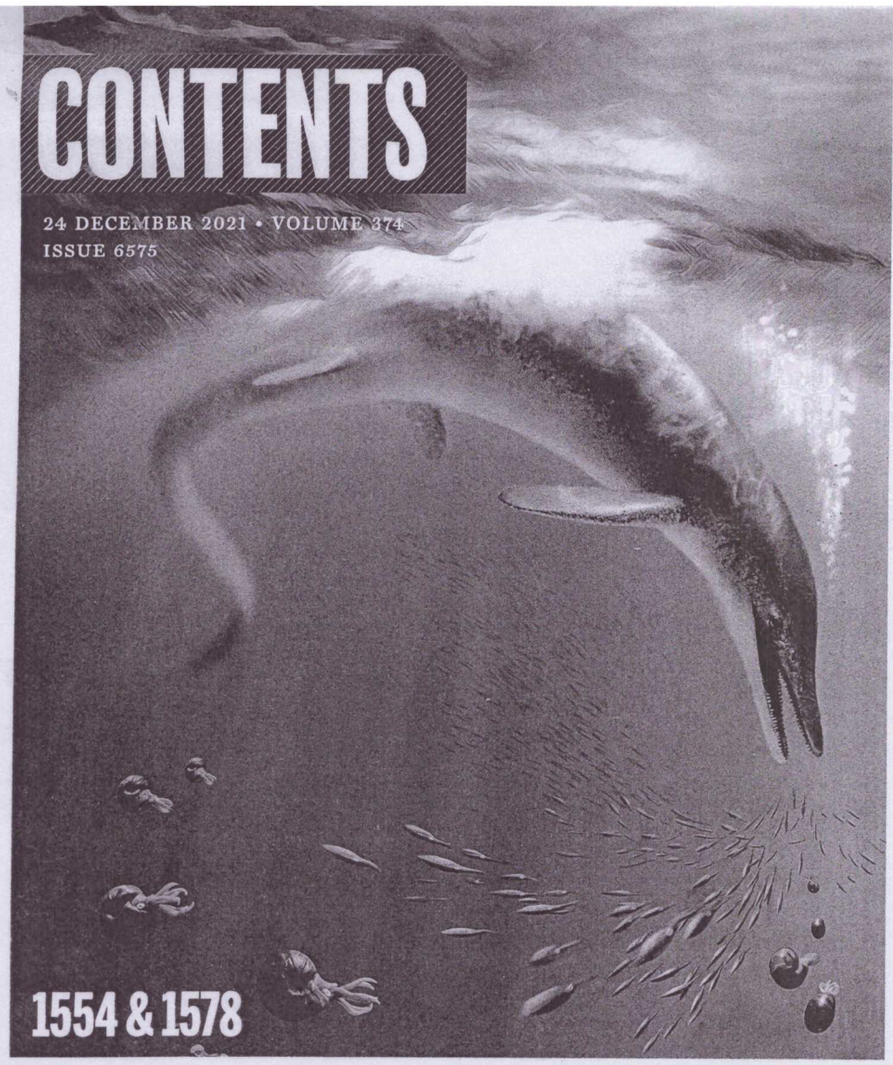

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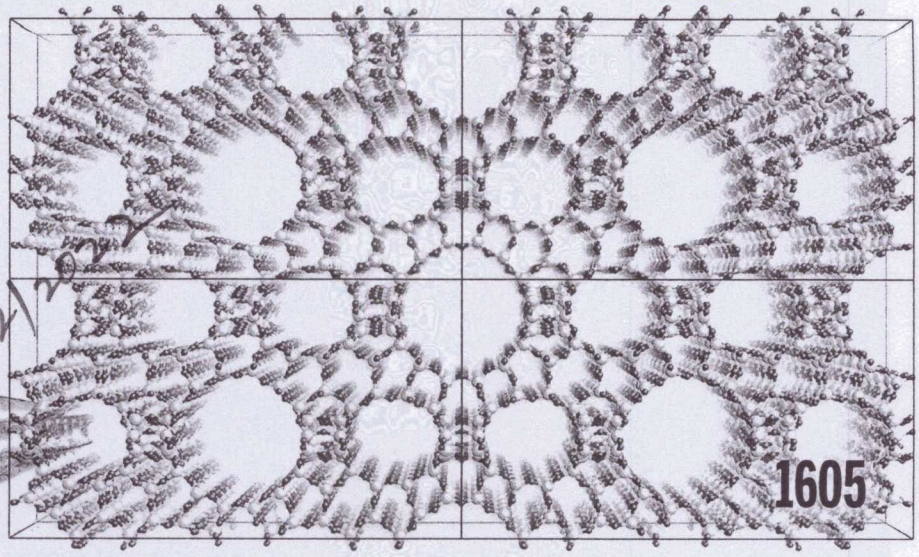

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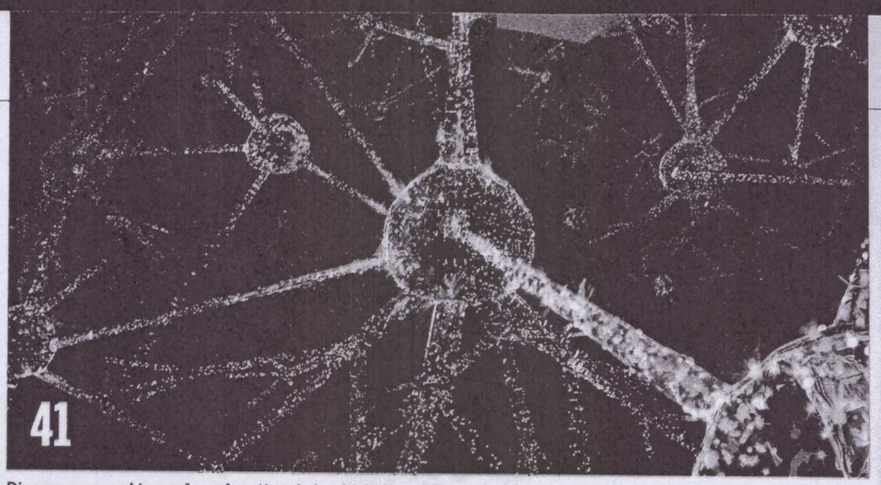

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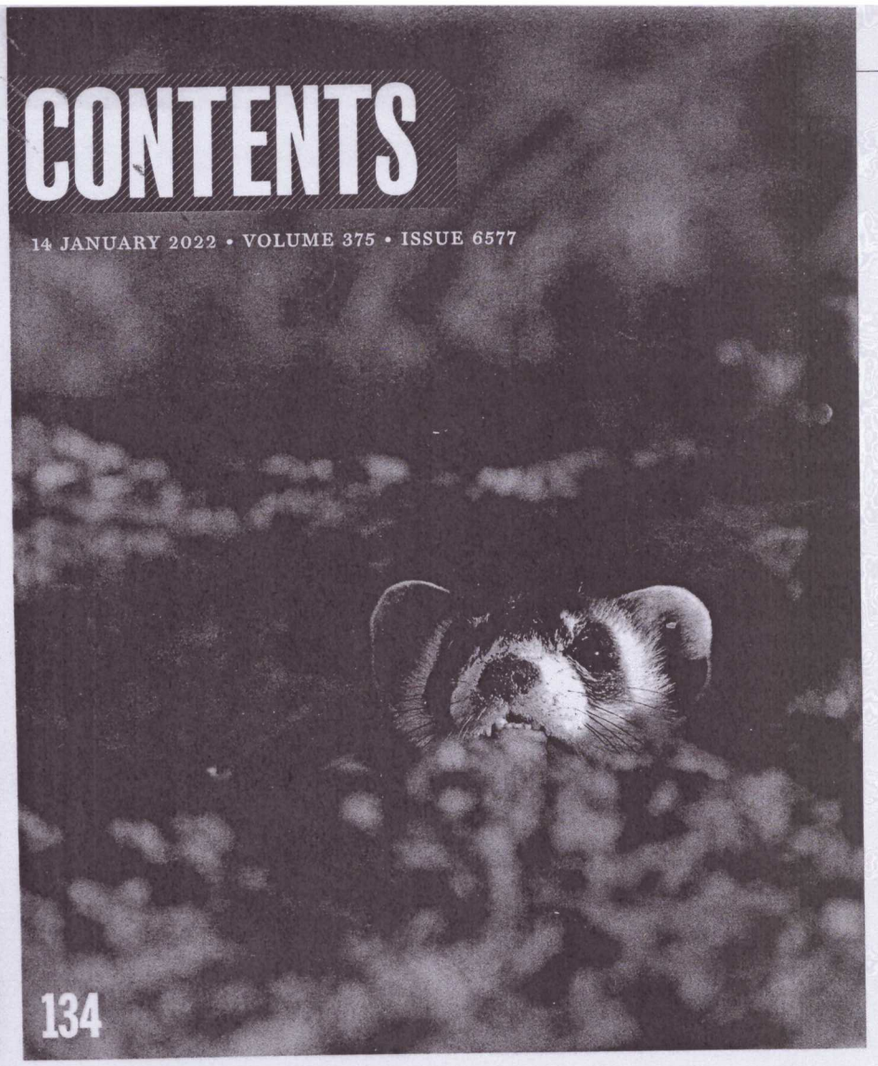

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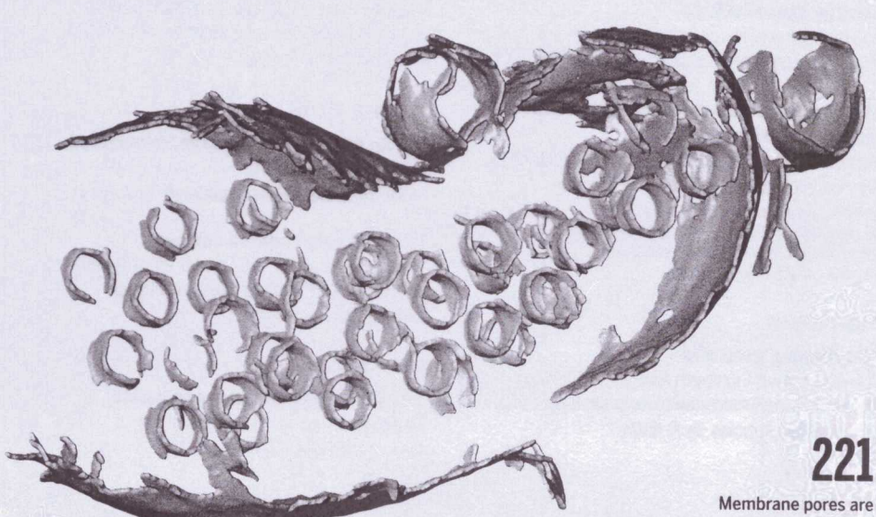

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Membrane pores are formed by bacterial gasdermin

IMAGE: ALEX HALL AND MEGAN MAYER

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A blue-throated barbet (*Psilopogon asiaticus*) eats a fig in southern Bhutan, dispersing the seeds within. Seed-dispersing animals help fleshy-fruited plants adapt to climate change by moving seeds to suitable habitats. However, many seed dispersers are in decline, endangered, or extinct. Bird and mammal population losses have caused an estimated 60% decline in seed dispersal, limiting plants' ability to track climate change. See page 210.
Photo: Christian Ziegler



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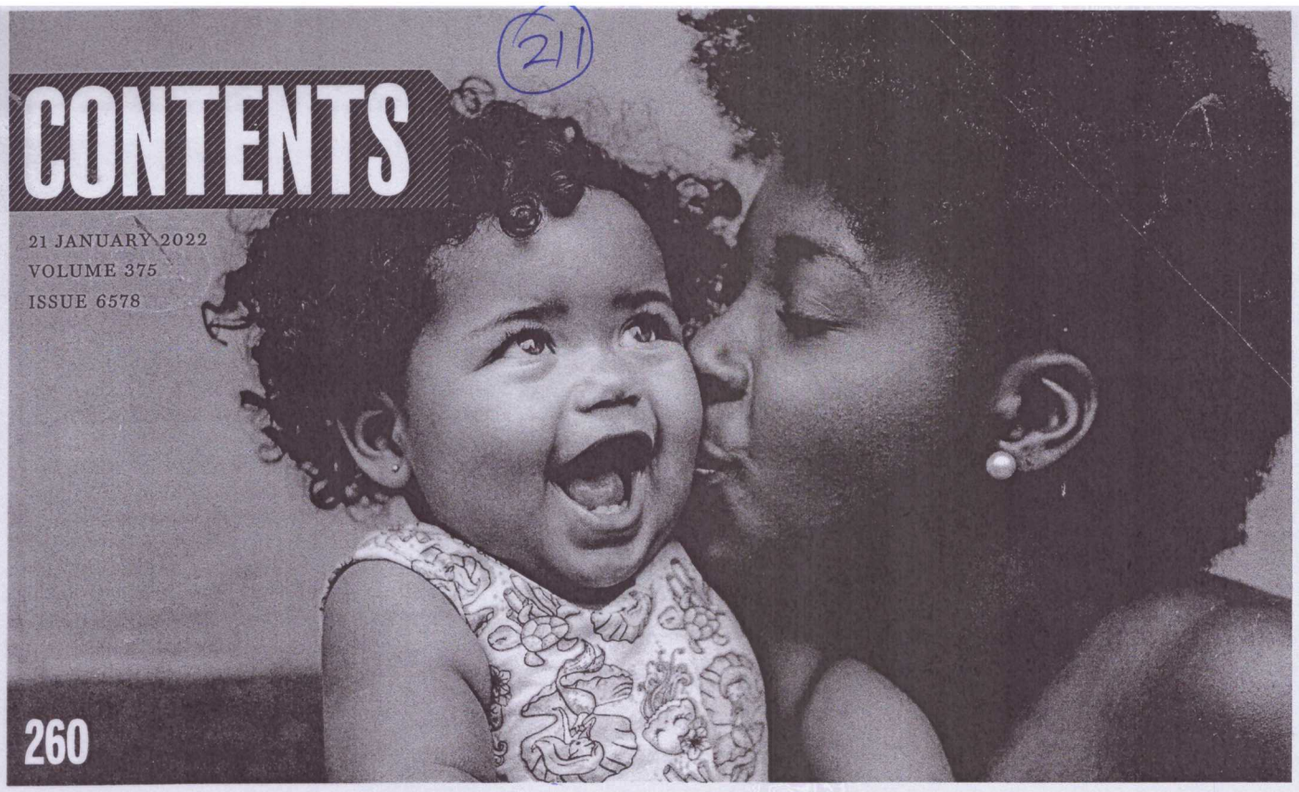

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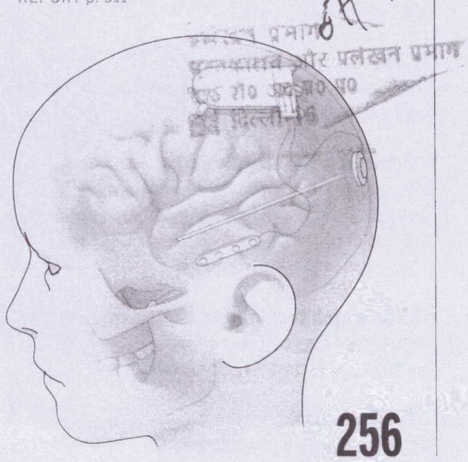

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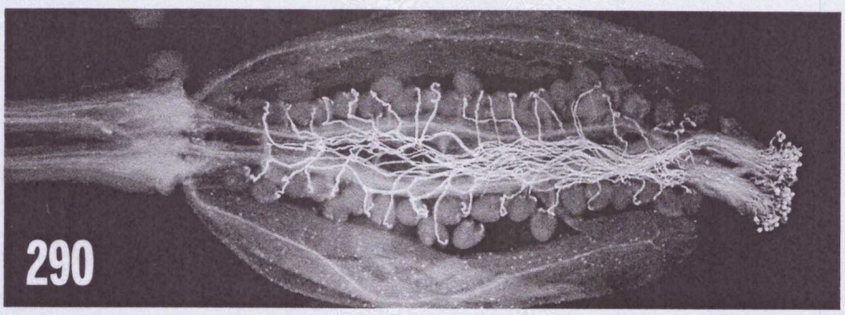

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A target cell expressing a fluorescently tagged protein (green) is illuminated by a blue laser and selected from a swirling pool of cells. New cell sorting technology combines the throughput and quantitative power of flow cytometry with the spatial resolution of multicolor fluorescence microscopy to enable isolation of cells with complex phenotypes at speeds up to 15,000 cells per second. See page 315.
Illustration: Tobias Wüstefeld/Illustratoren.de



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Fluorescence microscopy image of pollen (bright objects) on maize silks (long strands). Pollen is the ha[illegible]generation of higher plants that is sandwi[illegible]d between diploid generations. Each pollen grain is a multicellular organism with distinct cell types and active gene expression. New RNA sequencing results identify when this generation "comes of age" and begins its independent gene expression program. See page 424. *Image: Brad Nelms/University of Georgia*



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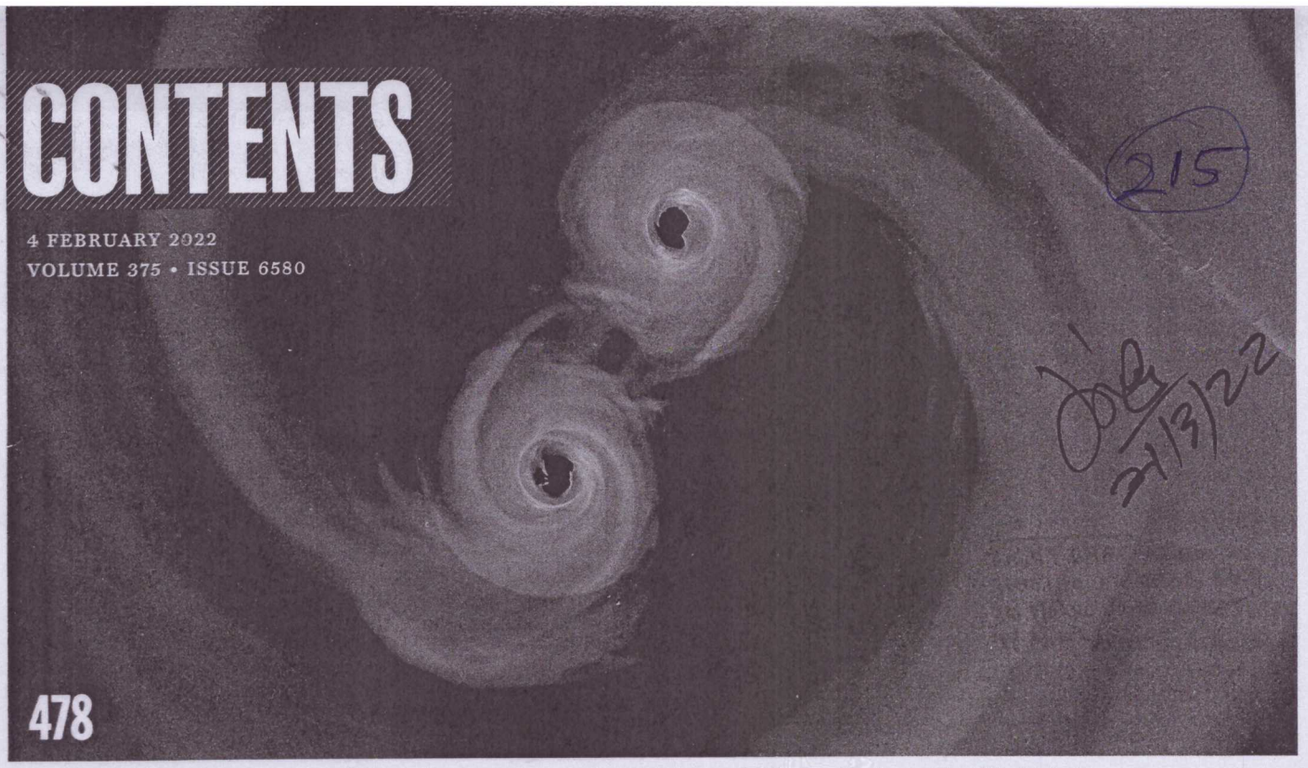

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In this visualization, giant black holes are on the cusp of merging. A team of astronomers has predicted an imminent merger in a distant galaxy.

IMAGE: NASA'S GODDARD SPACE FLIGHT CENTER

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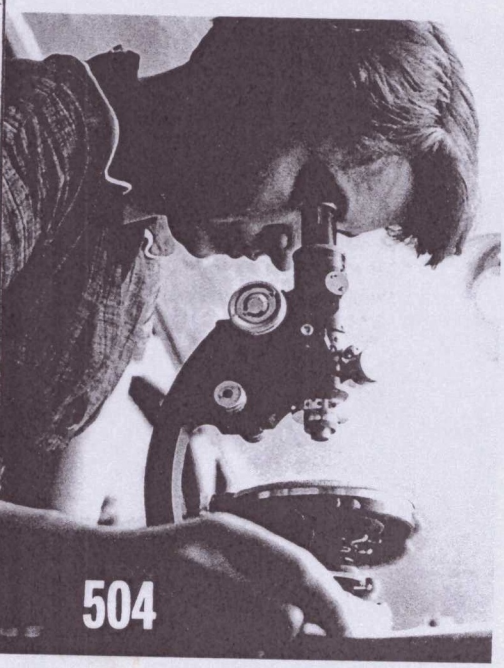

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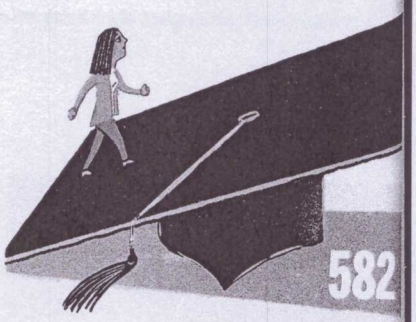

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An *Empoasca* leafhopper feeds on a wild tobacco plant (*Nicotiana attenuata*). Leafhopper pests select host plants by detecting consequences of jasmonate signaling, a hormonal signaling cascade elicited in response to physical disturbances. By studying recombinant inbred lines of tobacco plants in their native habitat, researchers have identified chemistry created by the union of volatile and nonvolatile defenses in leaves that bolsters plants' resistance to leafhoppers. See page 514.
Photo: Danny Kessler



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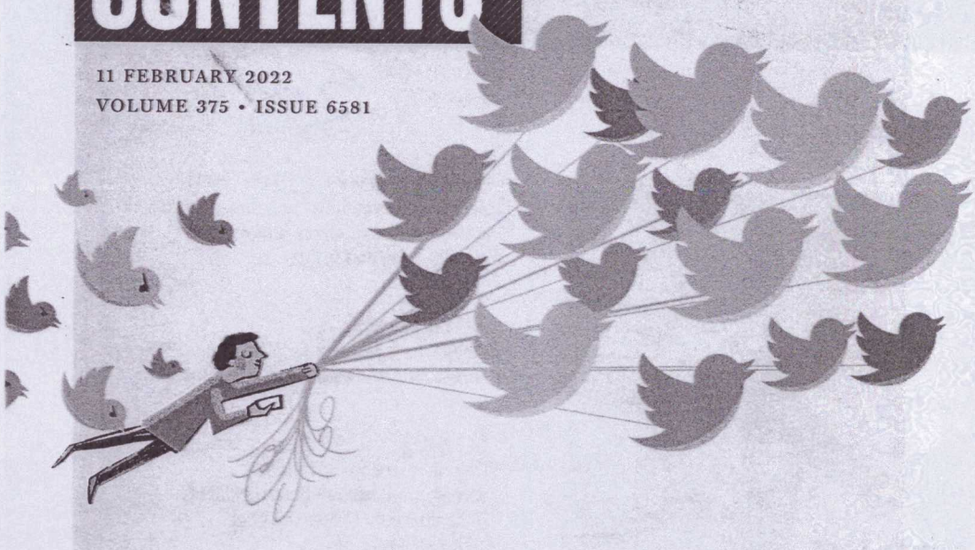

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Artificially colored scanning electron micrograph of a knobby starfish (*Protoreaster nodosus*) skeletal element with small calcite crystals grown on its surface. This overgrowth experiment demonstrates this biomineralized structure's two single-crystalline components—a micrometer-scale periodic lattice and the underlying atomic-scale calcite—that are aligned by their crystal symmetry. This lightweight dual-scale structure exhibits high mechanical efficiency and damage tolerance for enhanced protection. See pages 615 and 647. *Image: Ling Li/Virginia Tech*



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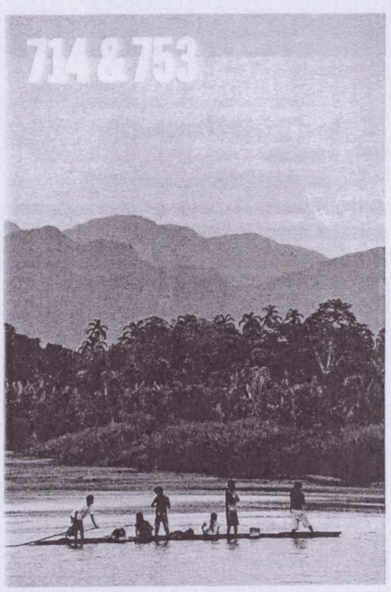

The Shawi, an indigenous group inhabiting the western Amazon, are intimately linked to free-flowing rivers in their lives and culture.

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Although its tail aids in fast and stable locomotion, a lizard species (*Hemidactylus flaviviridis*) from the Gekkonidae family will quickly detach this appendage when attacked by a predator. A biomimetic model elucidates the hierarchical micro- and nanoscale structures required to enable predetermined fracture planes that balance attachment and detachment, enabling the "just right" connection to maximize the animal's chance of survival. See pages 721 and 770. *Photo: Shiji Ulleri/Wise Monkeys Photography*



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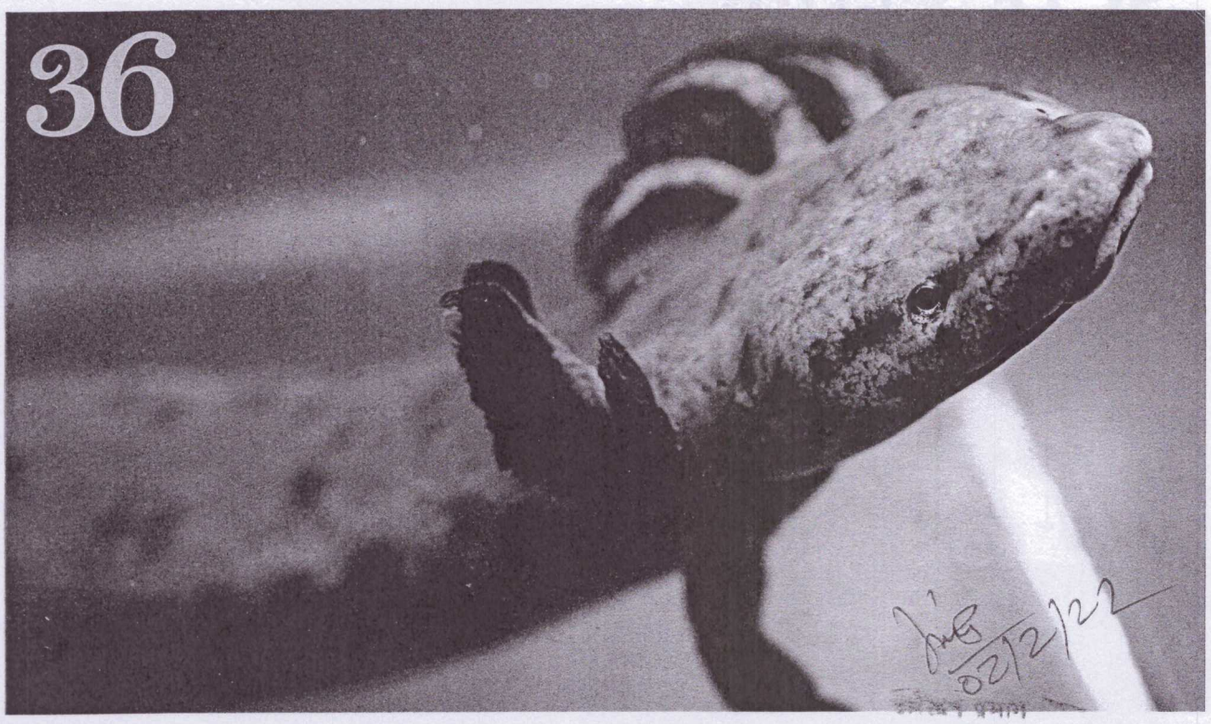

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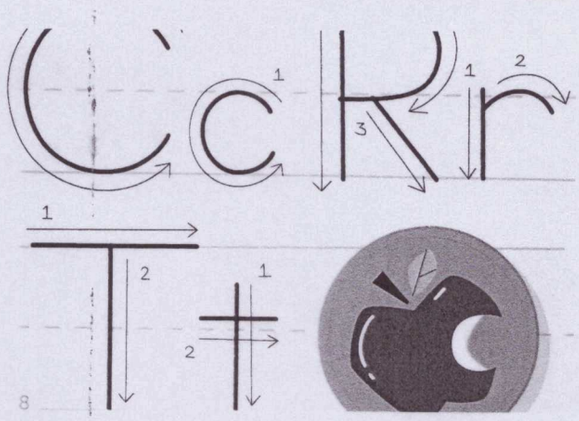

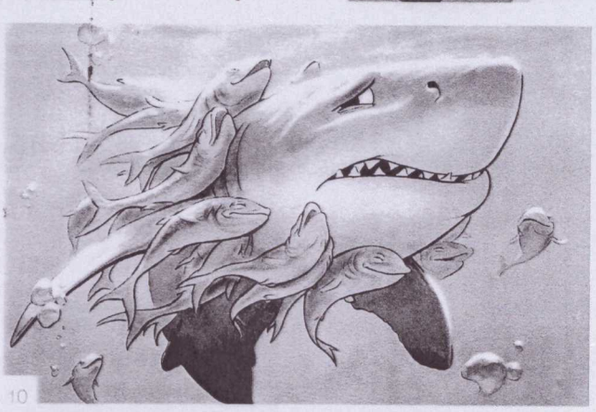



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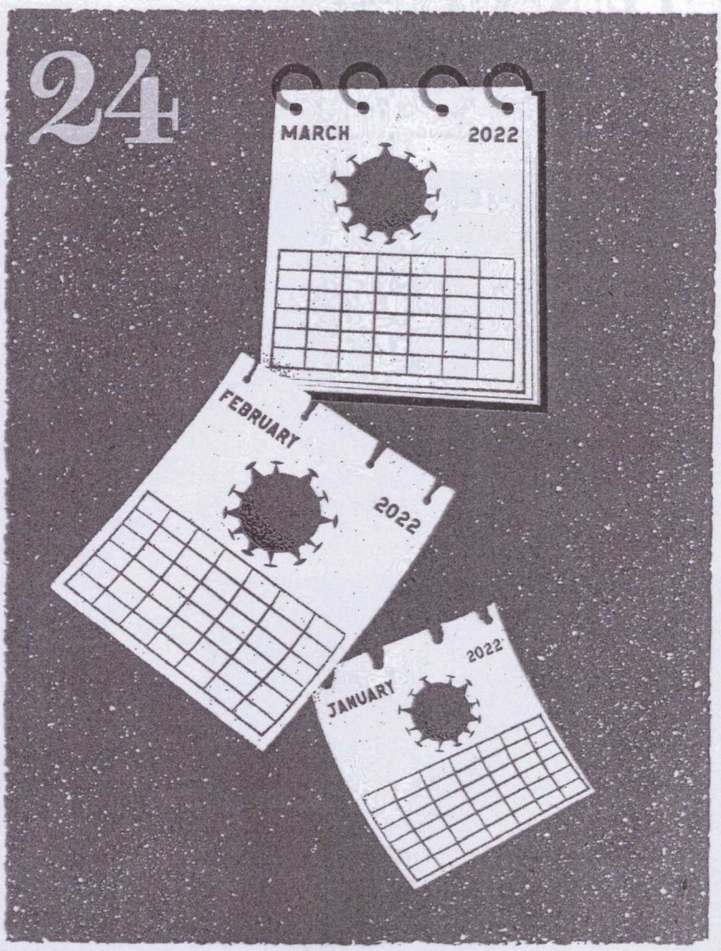

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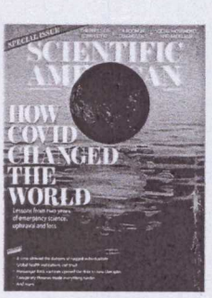

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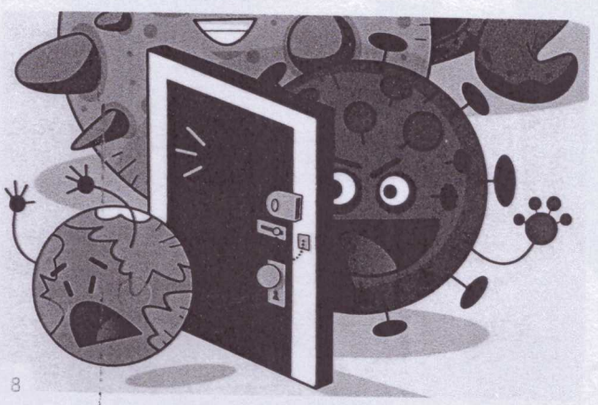

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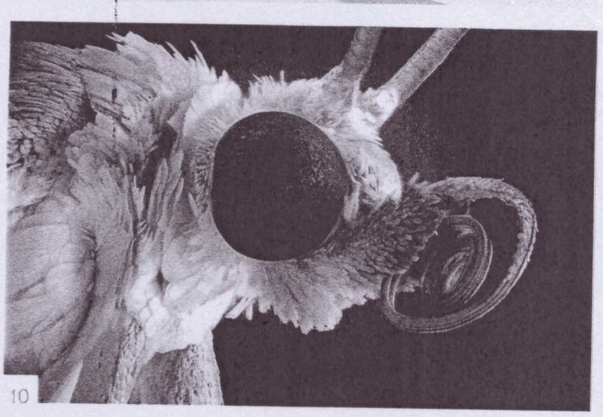

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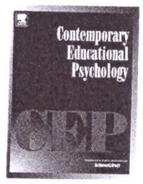

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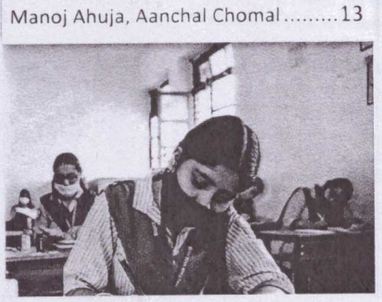

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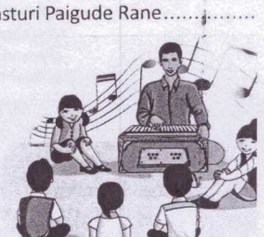

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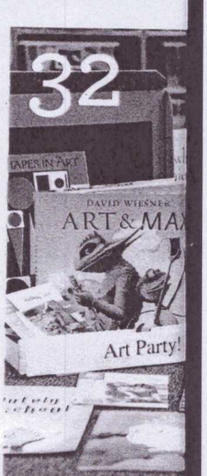

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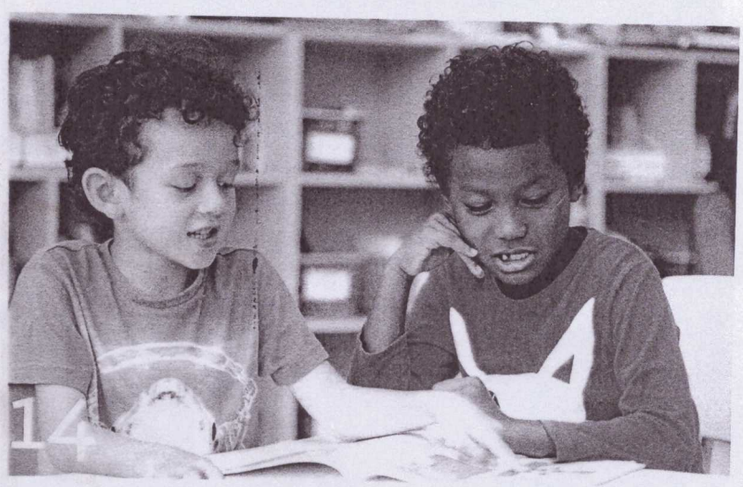



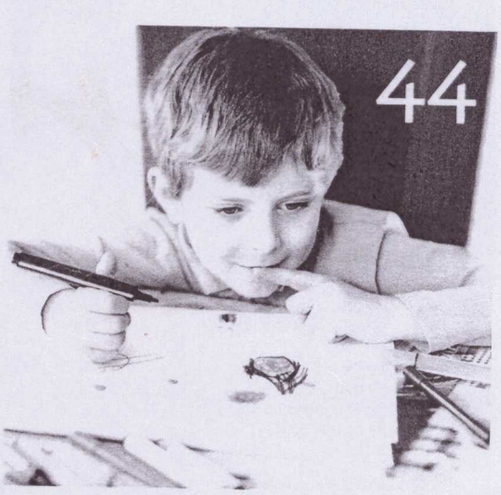

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