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ERRATA: Proceedings Vol. 10 (1956): p. 364, l. 35, "Wet-strengthened" should read "Wet-strengthening"; p. 371, l. 41, "ratio" should read "rate"; p. 373, Curves 3, 4 and 5, "water" should read "acetic acid", and "acetic acid" should read "acetic anhydride"; p. 380, Curves 2 and 3, "temperature 100°C. curve 2" should read "temperature curve 2".

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**Cover Photo:** The central control room of Visy Board Company's new corrugating plant. See article on page 96.

**Editorial Committee:** D. F. Lampard (Chairman), G. W. Balstrup, K. C. Carolane, J. L. de Yong, K. G. Henson, C. N. Hunter, L. B. James, J. J. Knewstubb, A. W. McKenzie, A. J. Michell, R. D. Williamson.

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**Cover Photo:** With the coming of summer the forest industry again faces the possibility of disaster through forest fire. This tower in one of APM's eucalypt forests in Victoria is typical of the many fire spotting posts which will be manned throughout the summer.

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Section Editor—  
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**Cover Photo:** Mt. Pokaturua Recreation Zone, one of three major recreation zones in New Zealand Forest Products Ltd's forest areas. The trees at the top were planted in 1927 and are likely never to be harvested.

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D. F. Lampard  
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**Cover Photo:** Situated on Bennalong Point on Sydney Harbour the Sydney Opera House was the venue of the Conference Reception of the 32nd Appita Annual General Conference. For detailed report on the Conference see page 15.

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**Cover Photo:** This giant 98-metre eucalypt growing in Tasmania's Styx Valley about 94 kilometres from Hobart on land concessioned to Australian Newsprint Mills Ltd is claimed to be the tallest hardwood in the world. It is *Eucalyptus regnans* probably about 350 years old and nearly 16 metres around the base. The tree was photographed for a new book on forests and woodlands of Australia being prepared at the CSIRO Division of Forest Research, Canberra.

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**Cover Photo:** N.Z. Forest Products Limited using a helicopter to seed difficult terrain in their pine forests near Tokoroa.

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**Cover Photo:** Pinus radiata seedlings growing in N.Z. Forest Products Limited's Athol nursery prior to trans planting into the Company's future forests. What to do with New Zealand's future forests is a question considered by A. W. Mackney on page 256 of this issue.

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COVER PHOTO: Clean logs of *Pinus radiata* emerging from a rotating drum debarker

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**COVER PHOTO:** A first grade eucalypt stand in ANM's forest concession in Tasmania. In the foreground vigorous regrowth covers an area logged six years earlier.

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**Cover Photo:** Fire in the Australian bush; a photograph from the Forests Commission of Victoria. Although there were no serious fires in production forests in the summer of 1979/80, large fires in bush areas close to the three major cities in Australia destroyed natural flora and fauna and resulted in extensive loss of property.

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**Cover Photo:** No. 1 effluent clarifier at NZ Forest Product's Kinleith Mill. It is 69.5 metres in diameter, 4.6 metres deep at the centre and holds 12.5 megalitres of effluent. It removes 12.5 megalitres of settleable solids and 80 to 90 per cent of total suspended solids from up to 120 megalitres of water each day.

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**Cover photo:** The expanding pine forests of Australia and New Zealand are the subjects of feature articles in this issue. The 35th Annual General Conference to be held in Rotorua in 1981 will examine the options for utilization for them.

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Lorraine Geal  
Advertising Manager

**COVER PHOTO:** This monitoring station at the effluent outfall of NZFP's Kinleith mill provides a continuous record of water quality.

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**Cover photo:** A Stahl folding machine operating at 8000 sheets per hour at the CSIRO Printing Unit in Melbourne. Photo by David McArthur, a second year student in photography at RMIT.

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Cover photo: Woodchips, manufactured from wood waste and forest residues, being loaded for export at Triabunna, Tasmania.

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**COVER PHOTO:** This photograph by Andrew Russ was taken in a 50 year old redwood (*Sequoia Sempervirens*) glade near Tokoroa, New Zealand. Owned by N.Z. Forest Products Limited, it is one of several recreation areas set aside by the Company for public use.

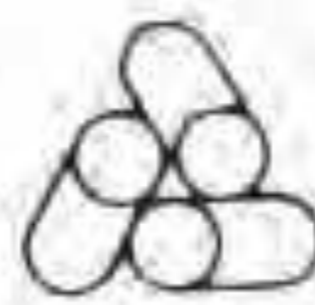
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**COVER PHOTO:** This pulp drier was inspected by delegates to the 35th Annual General Conference of Appita during their field day visit to Tasman Pulp and Paper Co Ltd. A full report of the Conference will be published in the next issue of Appita.

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**COVER PHOTO:** Mr. B. P. McLaughlin, President of Appita, escorts His Royal Highness The Prince of Wales into the Opening Ceremony of the 35th Annual General Conference held in Rotorua in April 1981. Photograph by courtesy of *Daily Post*—Rotorua.

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**COVER PHOTO:** An aerial view of Australian Newsprint Mills newsprint production complex on the northern outskirts of Albury, N.S.W. (See article page 98). Photograph by courtesy of ANM Ltd.

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**COVER PHOTO:** A typical stand of Mountain Ash in the Board of Works' Wallaby Creek Catchment. Photograph by courtesy of Melbourne and Metropolitan Board of Works.

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**COVER PHOTO:** A 25 tonne roll of paper is rotated off the No. 6 machine at the Kinleith mills of N.Z. Forest Products Limited.

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**COVER PHOTO:** A Bell Kaplan turbine during installation at a hydro electric power station in Switzerland. The 1060 kW station was designed and built specifically to power a paper mill at Perlon.

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**COVER PHOTO:** The Millicent, South Australia, mill of Apcel Pty. Ltd. Kimberly Clark Australia, which owns Apcel Pty. Ltd. in partnership with APM Ltd, will be the Host Company for the 37th Annual General Conference of Appita to be held in Mt. Gambier, S.A., from 10th to 15th April, 1983.

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Sectional Editor—  
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**COVER PHOTO:** An aerial view of the Petrie mill of APM Ltd, host company for the 38th Appita Conference.

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Ann Sykes  
Commercial Manager

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**COVER PHOTO:** A view of the cooling bed at Smorgon Consolidated Industries' new steel mill. This mill will be the site of the Field Day for the 39th Appita Annual Conference.

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Section Editor—  
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**COVER PHOTO:** Dr G. H. Covey receiving the Appita-L. R. Benjamin Medal from Dr N. Wiseman at the Opening Ceremony of the 39th Appita Annual General Conference.

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**COVER PHOTO:** An aerial view of Auckland, the site of the 40th Appita Annual General Conference.

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**COVER PHOTO:** The installation of a new 25 tonne overhead crane in ANM Boyer's No 1 and No 2 Machine Room caused a few anxious moments for Mechanical Engineering and Design Departments recently. The delicate task of threading the two massive main girders through the Machine Room window was carried out without a hitch with the help of a 45 tonne crane.

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Mr R. C. Klye  
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**COVER PHOTO:** Winstone-Samsung's Karioi pulp mill; view of the additional chip wash line constructed outside the existing mill building (see page 411).

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**COVER PHOTO:** Pine logs stored in Lake Bonney, Mount Gambier, after storage from the 1983 bushfires. Photo courtesy *The Age*, Melbourne. An article on water spray storage of fire damaged logs appears on page 8 of this issue.

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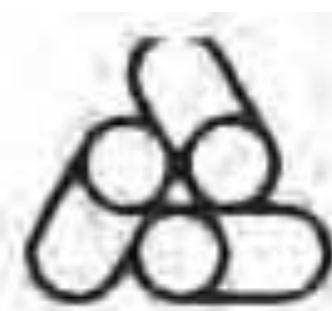
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**COVER PHOTO:** The Sheraton Hotel, Auckland — venue for the 40th Annual General Conference of Appita. An article featuring Appita '86 Conference highlights commences on page 94 of this issue.

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**COVER PHOTO:** The Kiriāith Mill of N.Z. Forest Products Limited. NZFP was the host company for the 40th Annual General Conference of Appita, held in Auckland from 14th-18th April. A post-conference feature will appear in the next issue.

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**COVER PHOTO:** Dr R. P. Kibblewhite receiving the Appita-L. R. Benjamin Medal from Mr A. J. Walters at the Opening Ceremony of the 40th Appita Annual General Conference.

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**COVER PHOTO:** The Karioi Pulp Mill of Winstone Pulp Industries Ltd. The mill commenced operation in October 1978 and produces bleached and unbleached CTMP from *Pinus radiata* and mixed pine species for export to South East Asia and the Far East.

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**COVER PHOTO:** Softwood Holdings' Mt Gambier nursery. The nursery produces in excess of 2 500 000 seedlings annually for its own use and for resale to other forest growers.

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**COVER PHOTO:** An aerial view of APPM's Burnie mill. A feature on APPM's Golden Jubilee appears on page 8 of this issue.

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**COVER PHOTO:** Manly Pacific International Hotel — venue of the 41st Annual General Conference of Appita. Refer to pages 91-103 of this issue.

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COVER PHOTO: Earthquake damage at Tasman's Kawerau mill — 20 tonne jumbo reels hit the floor at the No. 2 and 3 paper machines. Refer to article on page 163 of this issue.

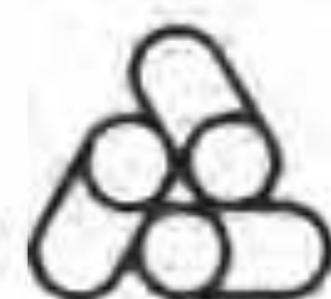
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**COVER PHOTO:** The official table at the opening ceremony of the 41st Appita Annual General Conference (from left), Dr K. N. Boardman, Chief Executive of CSIRO, His Excellency Air Marshall Sir James Rowland, A.C., K.B.E., D.F.C., A.F.C., Governor of New South Wales, Mr J. J. Sullivan, President of Appita, Alderman Gregory Smith, Mayor of Manly and Mr G. N. Gee, Vice President of Appita. A report on the Conference is given in an article commencing on page 255.

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**COVER PHOTO:** The Premier of Tasmania, Mr Robin Gray inspects the computerized control of ANM's TMP plant. Refer to article on page 324 of this issue.

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**COVER PHOTO:** The Premier of Victoria, The Hon. John Cain, M.P. officially opening APM's Maryvale No 3 paper machine. Refer to article on page 407 of this issue.

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Photo: Mr L. Wilson announced major development plans for Bowater (refer to page 5)

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Photo: The South Australia Section Committee with the 1987 Appita Visiting Speaker, Dr Nils Hartler (second from left). Refer to article on page 69.

**COVER PHOTO:** General view inside the PAPRO New Zealand pilot plant building. See article on page 9 of the issue. Photograph courtesy Kerry Grant, Rotorua

## Comment from the Editor . . .

Welcome to the new look Appita Journal. The following changes have been made to the format of the Journal:

**New Size** — we have moved to A4, the International Size. A4 provides economy in paper purchasing by our printer and also provides more print area per page. This move will assist in containing our publishing costs. Also the size of the Appita Journal will be the same as the majority of the other journals published.

**New coloured cover** — In addition to our 1988 theme colour of red, we have introduced a 4-colour reproduction on the front cover. To ensure optimum appearance, we have selected a two-sided coated stock for the cover. Printing on the inside of the cover will also be enhanced, allowing for better presentation for advertising.

**New layout** — 3 column layout has been selected for the front and back sections to permit easier reading.

**New presentation of technical papers** — Including outside of page justification of the title, use of screen to highlight the summary, and publication of photographs of the authors to bring a more personal touch.

**New and larger type face in Tables and Figures** — to improve clarity of presentation.

We believe these changes will increase the value of the Journal to you. Appita Journal is your Journal and we seek your comments and suggestions on these and other changes that you consider would enhance its content and presentation. We welcome your interest and invite you to either write or call on (03) 347 2377.



Peter J. Brown, Editor

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COVER PHOTO: Night view of Boyer Mill, Australian Newsprint Mills. Refer to article on page 100 of this issue.

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Photo: Mr J. J. C. Knewstubb, Section Editor — Technical Papers.



**COVER PHOTO:** View of a section of the new wastepaper processing line commissioned at Smorgon Consolidated Industries.

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*Appita President, Mr Greg Gee, presenting a Bicentennial Plate to Mr Eric Langdon, President of the British Paper Machinery Manufacturers Association during the Opening Ceremony of the 1988 Conference.*



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**COVER PHOTO:** APPM Burnie Mill 50 Years On. Refer to article on page 429 of this issue.



Dr R. H. Crotogino is presented with the Visiting Speaker's Plaque by Appita President, Malcolm McKenzie, at a meeting of the Southern Tasmania Section. For a report on Dr Crotogino's calendering seminar see p. 431.

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**COVER PHOTO:** Wet-end of APM Fairfield No 6 machine.  
Refer to article on page 8 of this issue.



**Photo: Mr R. C. Francis, Chairman, Engineering Group (left) chatting with Dr R. J. Hooper, Keynote Speaker at the Engineering Seminar held in Tokoroa in November 1988. Refer to page 63 of this issue.**

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Mr Malcolm McKenzie, President of Appita, presenting Mr Kingsley Churchill, Chairman, Technical Section CPPA with a gift to honour the 75th Annual Meeting of the Technical Section CPPA.

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**COVER PHOTO: Aerial view of APM Petrie Mill, the site of the Field Day trip during the 43rd Appita Annual General Conference.**

APM HOSTS FIRST EVER  
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**COVER PHOTO: Executive of Pulp and Paper Manufacturers Federation of Australia from left to right: Roger Flynn, Smorgon; Laurie Wilson, Bowater Corporation; Alan Hollibone, North Broken Hill (Hon.Sec.); Tom Plant, Kimberly-Clark Australia (Chairman, 1988); Imre Lele, APM; Brian Gibson, ANM (Director); Kevin White, APPM (General Manager — alternative for Bill Paisley); Barry La Fontain, (Executive Director of the Federation).**

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**COVER PHOTO: An 'aerial' view of the Exhibition area at Appita '89, held in May at the Hilton International Brisbane. Further details about the Conference and Exhibition will be found on various pages throughout this edition of Appita.**

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Mr D. J. Dumbrell, Managing Director of Huyck Australia Pty Ltd presenting The Huyck Australia Fellowship Award to Mr M. J. Ashburn of NZFP Pulp and Paper at the recent Appita Annual General Conference.

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**COVER PHOTO: View of NZFP Kinleith Mill — refer article on P. 330 of this issue.**

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**COVER PHOTO: Victorian Department of Conservation, Forests and Lands regeneration area; an example of the result of sound economic, sustainable wood harvesting.**

Photo courtesy of the Victorian Department of Conservation, Forests and Lands



SWEDISH ENVIRONMENTAL MATTERS



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Cover Photo: *P. radiata*  
TMP fibre × 600. See story  
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Mr Simon Crean (Federal Minister for Science & Technology) during a visit to Maryvale on January 9th said that value added industries such as pulp mills were critical in assisting Australia's balance of payments. An expansion at Maryvale, or the building of a new mill, would help reduce Australia's balance of payment figure. He added "The environmental standards achieved at Maryvale show that the processing of pulp can be done in an environmentally safe way. The company has actually bettered the standards set by the Federal Government which are the strictest in the world".

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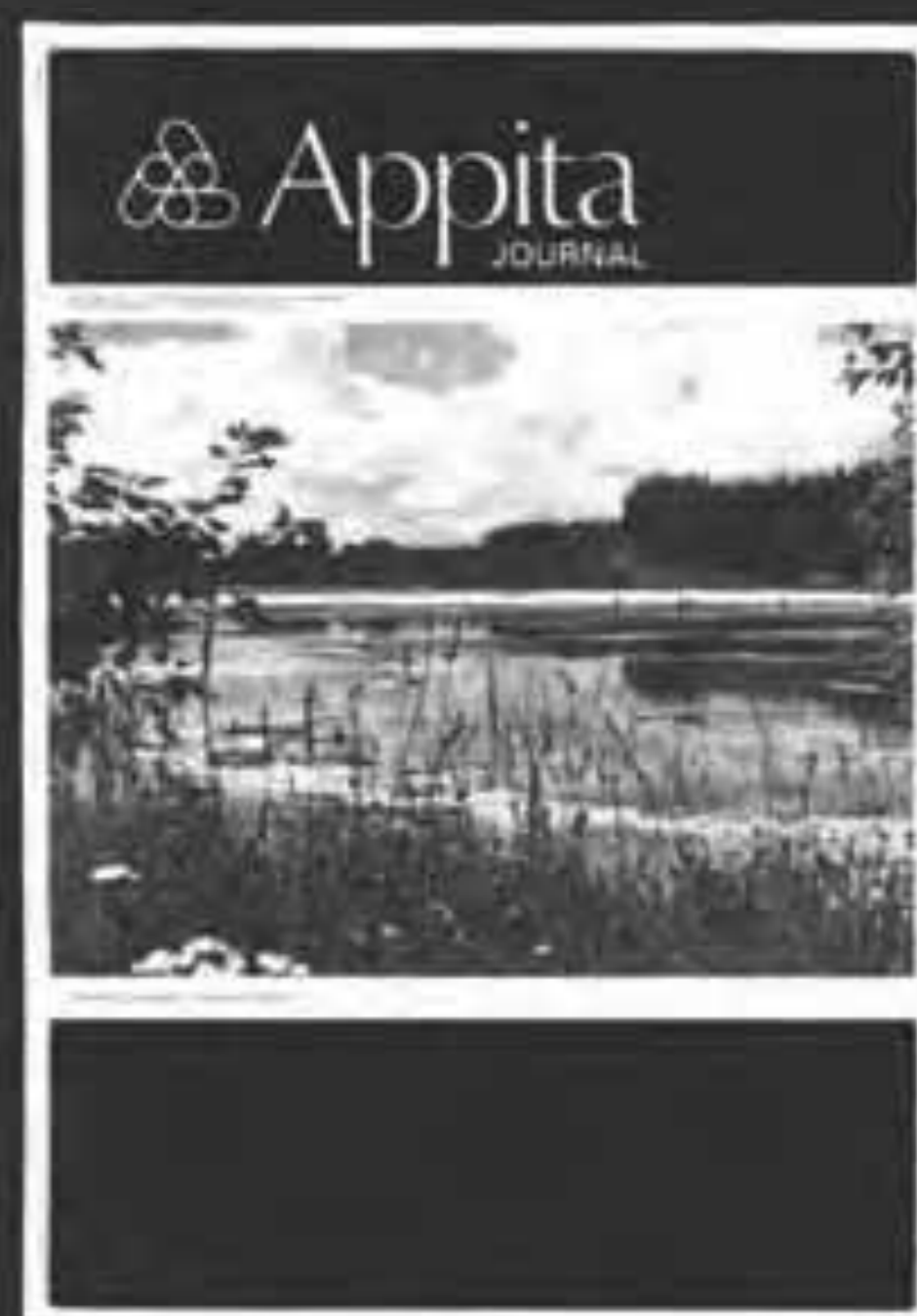
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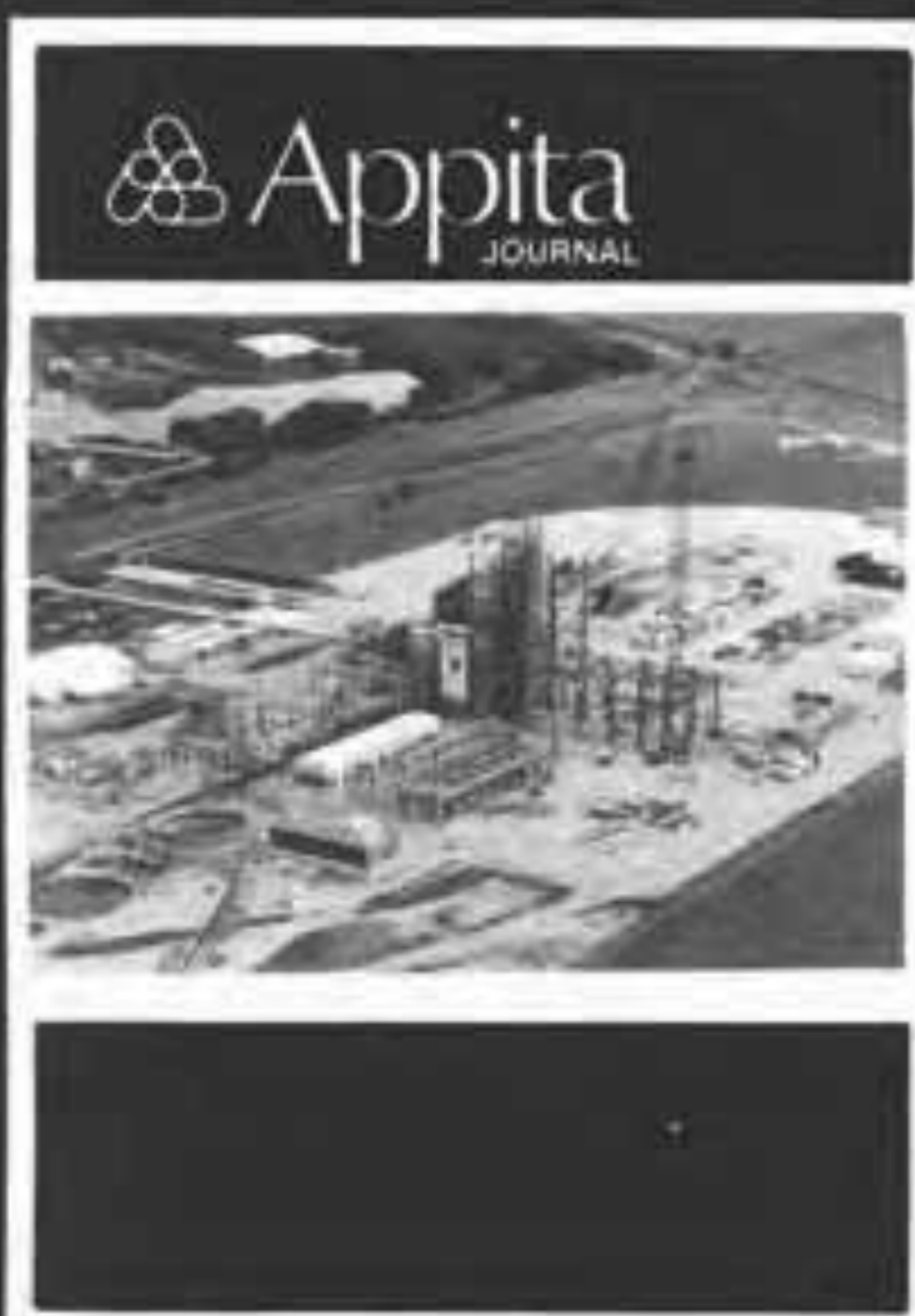
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Paul Potter, Managing Director Beca Simons congratulating Steve Soutar, APM Maryvale Mill on winning the Beca Simons Prize at the Appita Engineering Group Spring Seminar held at Traralgon on 26th and 27th October 1992, with his paper entitled 'Robotics Materials Handling'.

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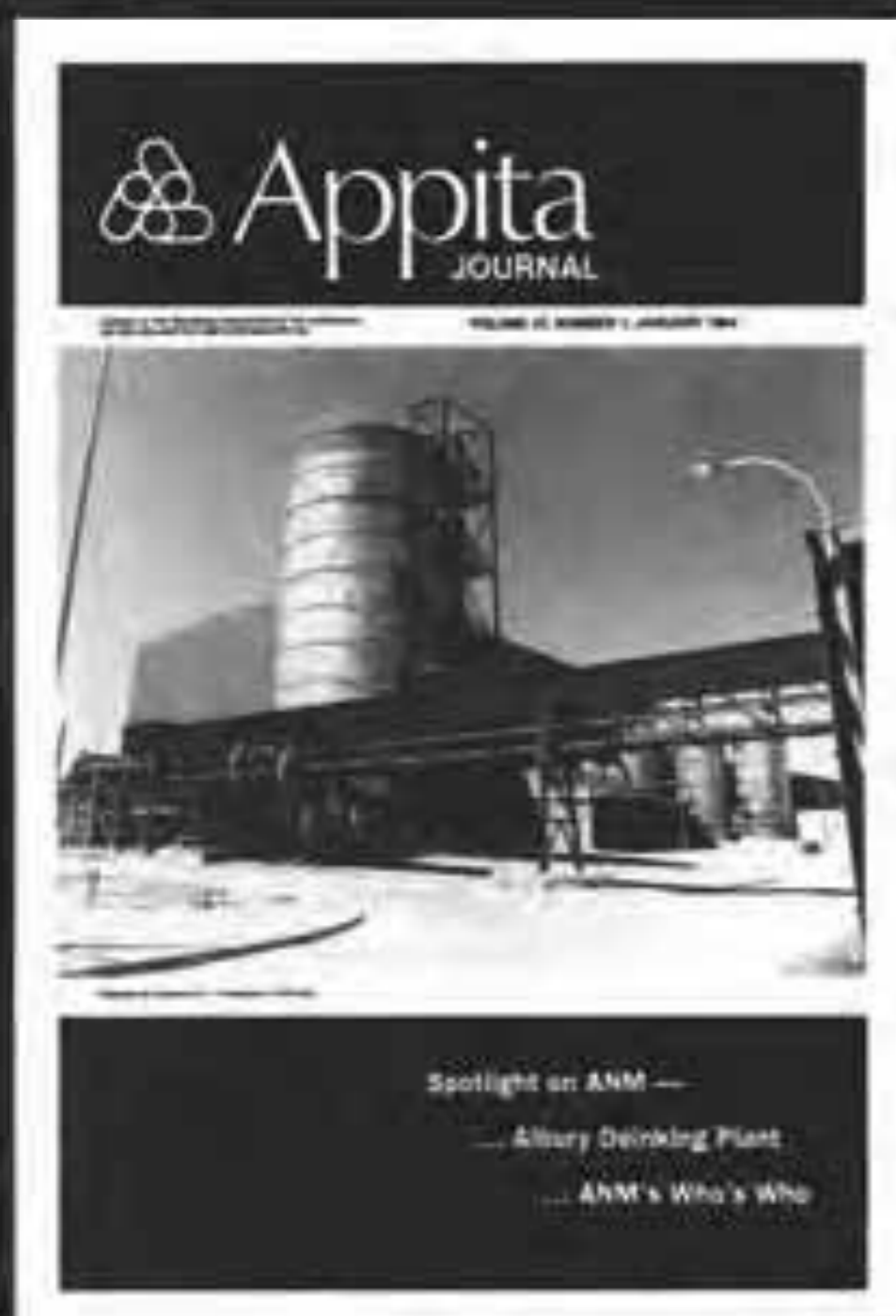
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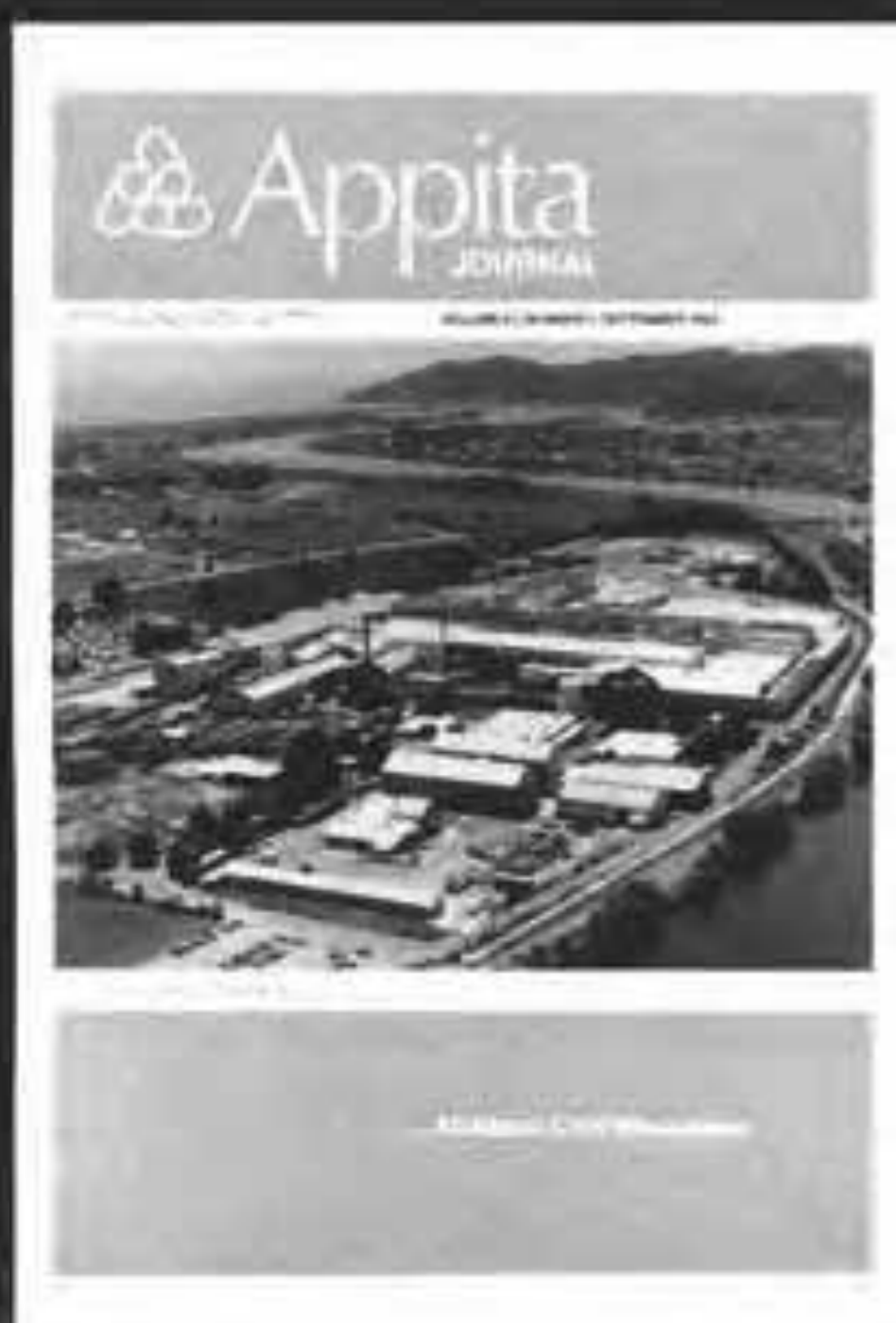
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Conference Update  
All about CHN

**Carter Holt Harvey  
Kinleith Mill — see  
feature on page 84**

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... All about Broadford

**AP Broadford**  
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**Australian Paper Recycling**  
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AP Maryvale pulp mills  
New kraft mills in Australia  
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– see page 402

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**Cover photo:**  
3D Render of Confocal Microscope images. Sample is a 20gsm handsheet made from bleached Eucalyptus Globulus pulp fibres (kraft).  
Dye: Acridine Orange.  
Size: 100µm by 100µm by 46µm.  
Image captured using a 60X Olympus oil-immersion objective lens using an Optiscan F900 Confocal Microscope system.  
From: Australian Pulp and Paper Institute.

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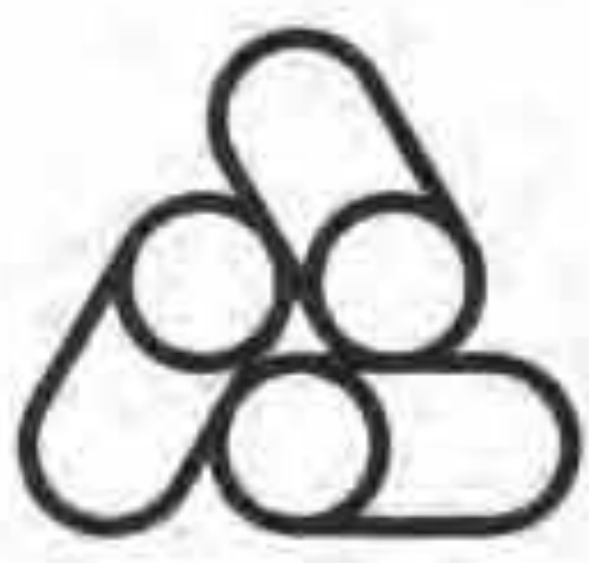
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**Cover photo:**  
Aerial view of Pan Pacific Forest Industries (NZ) Ltd Mill at Whirinaki, near Napier – one of the Conference Field Day visits.

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The Maori Cultural Group from Avondale College welcoming delegates and partners to Appita's 1996 conference in Auckland. See page 218 for conference details.

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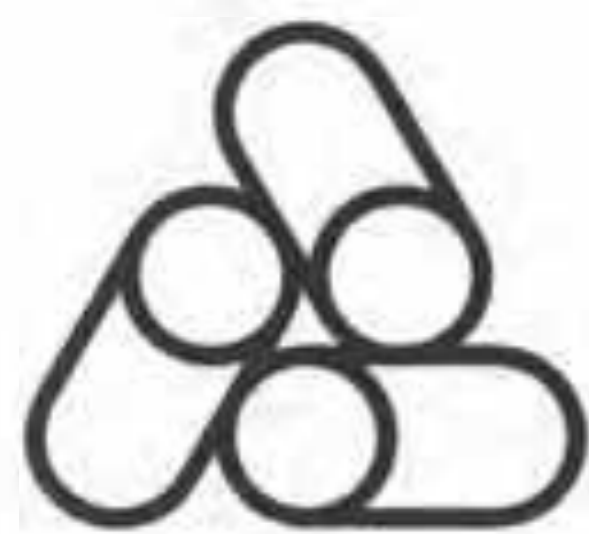
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Visy Paper's new plant, Gibson Island,  
Brisbane as reported in the last issue.

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# Appita

## JOURNAL

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Cover photo:  
Albany celebrates 30 years in Gosford,  
NSW. Story page 433.

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**Cover photo:** Official opening of the Kinelith Mill of N.Z. Forest Products Ltd., 1954. Story on the development of Appita in New Zealand on page 11.

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# Appita

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March 1997

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Cover photo: NZFP's first machine at Kinleith. The opening of Kinleith mill was shown on the cover of last month's issue. Photo supplied by Beloit.

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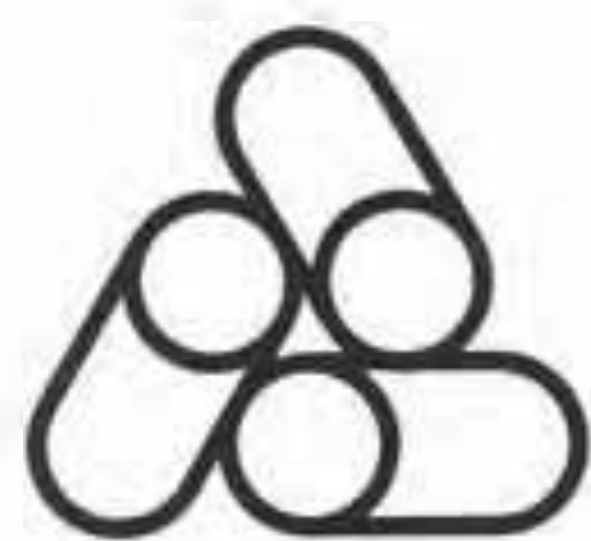
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**Cover Photo:** Visy Paper's latest Coolaroo machine – the VP5. The contrast with the March cover reflects the technological changes which provide the backdrop to Appita's 50 year history (see page 190).

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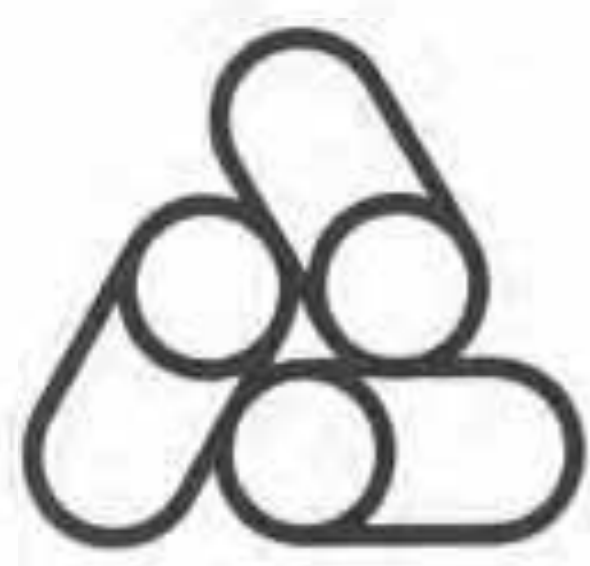
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Cover Photo: Yarraman Pulp Mill, Queensland 1913-1920, photo courtesy Queensland State Library. See story page 283.

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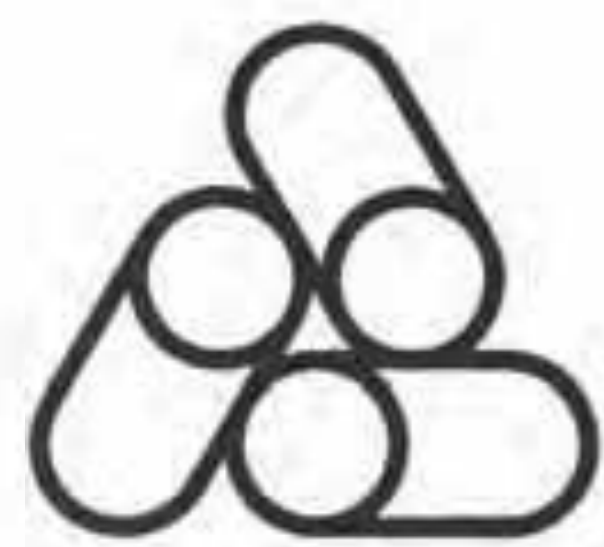
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**Cover Photo:** Confocal microscope image of pine compression wood under crossed polarization conditions. See technical paper page 377.

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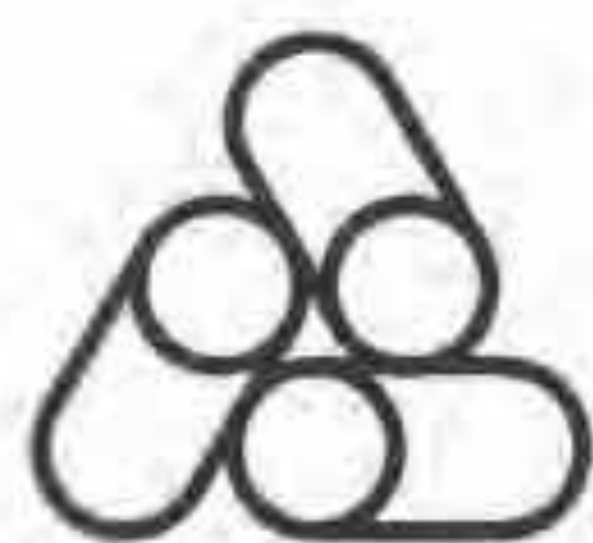
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Cover Photo: SilviScan-2: a breakthrough in wood fibre analysis, page 447.

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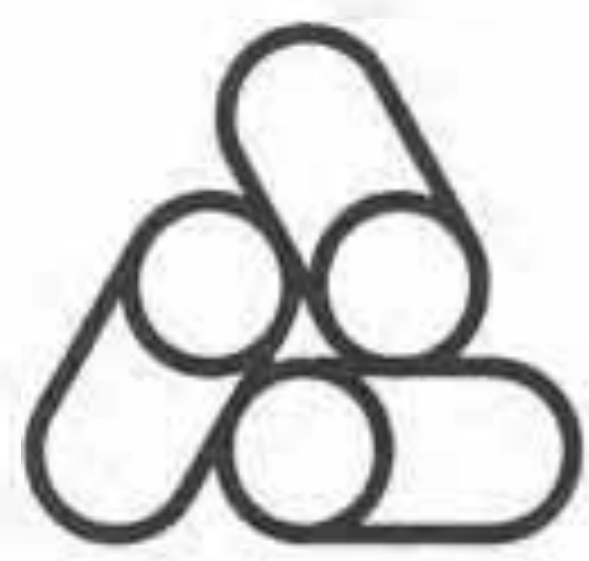
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January 1998

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# Appita

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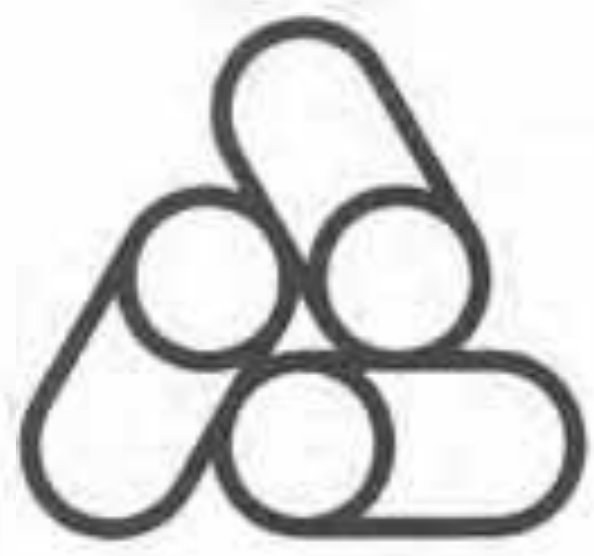
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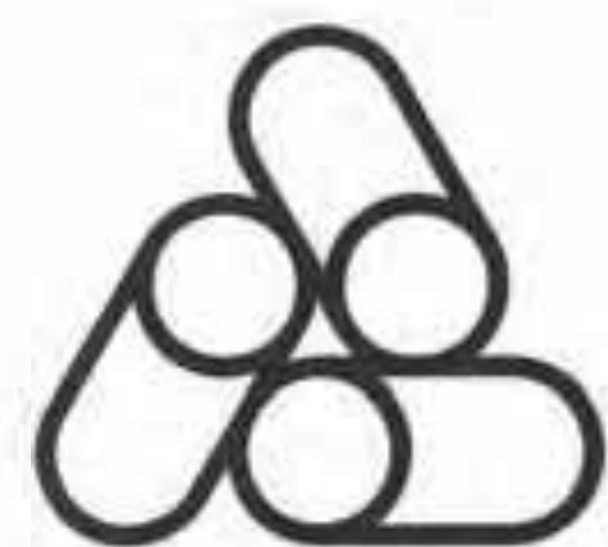
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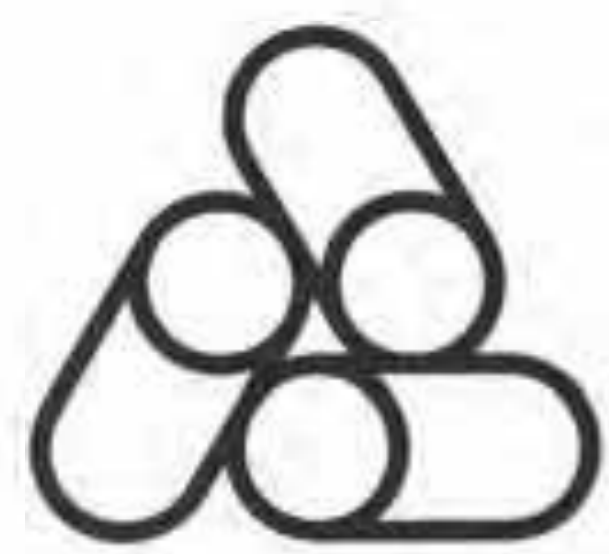
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# Appita

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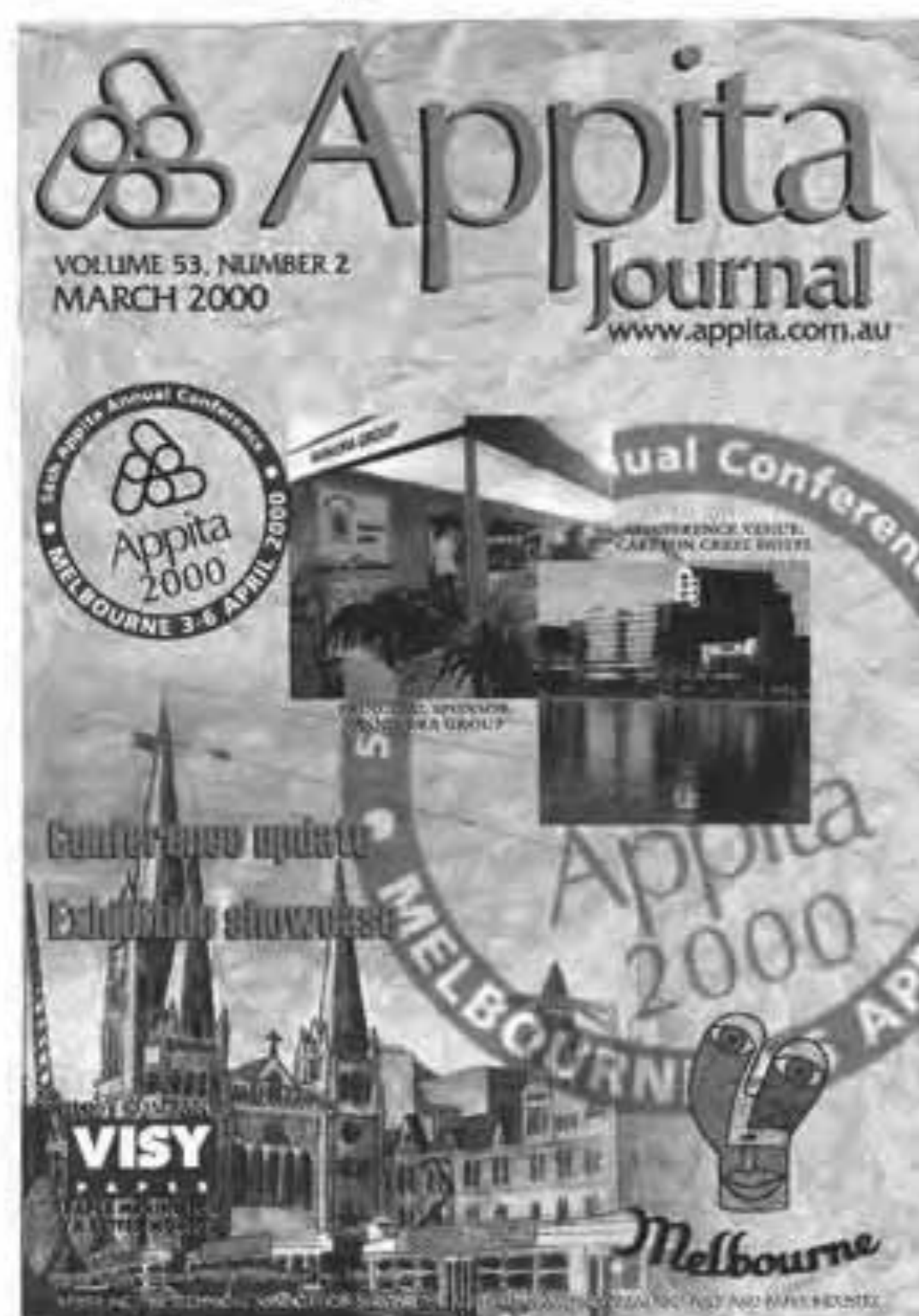
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First reel of product from Maryvale 1,  
7 August 1940. From left to right:  
W Thorpe, Resident District Manager, Maryvale;  
C S Booth, Managing Director, Australian Paper;  
P Holland, Managing Director, Walmsleys;  
J Thornborrow, Assistant Papermill Superintendent.

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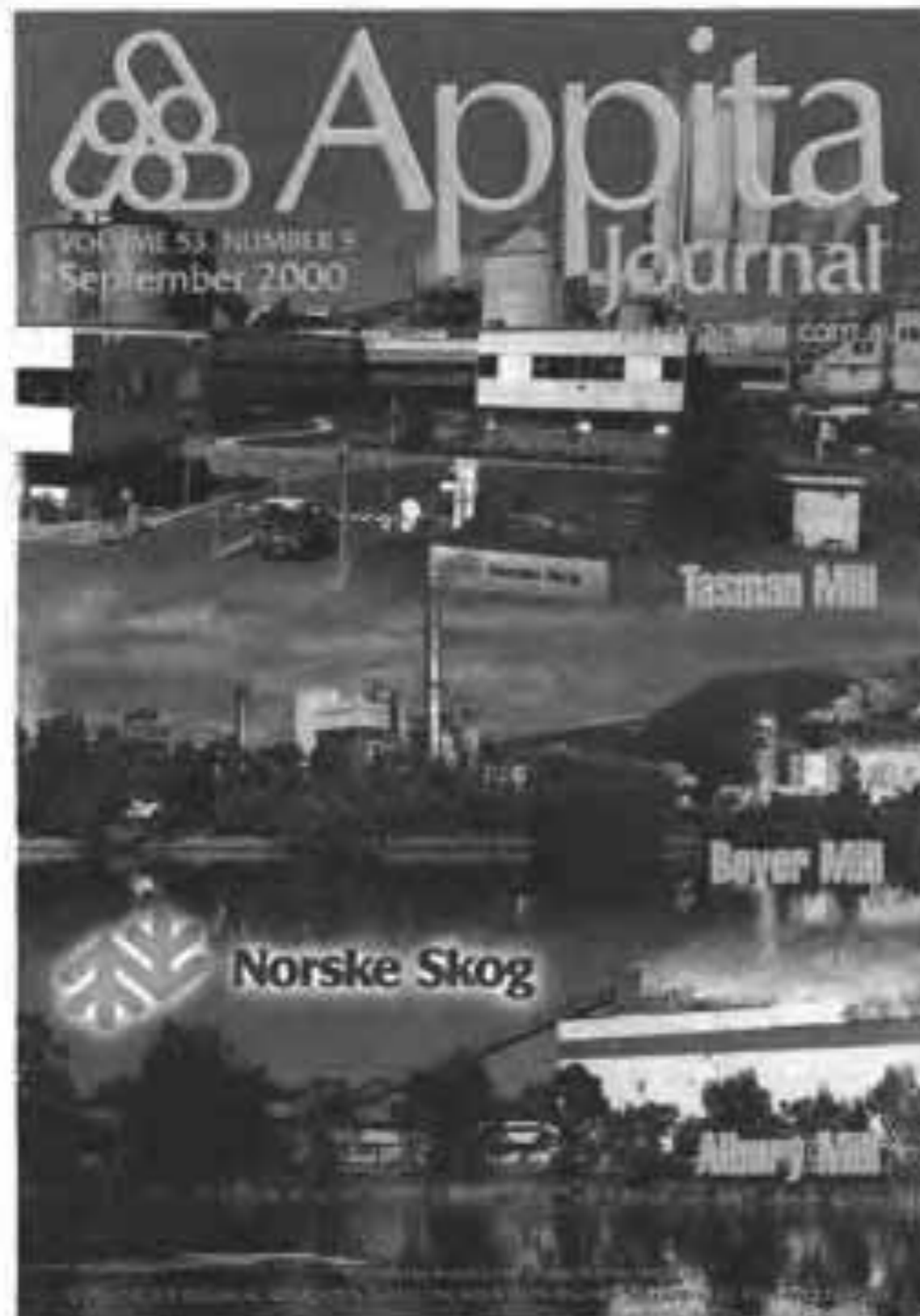
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Cover: Norske Skog Albury TMP plant, courtesy Norske Skog. Photograph © Peter Whyte/Creative Partners, 2001.

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Cover: Tasmania, home of the 55th Appita Annual Conference.

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**Cover:** Conference highlights  
 Top right: Ernie Hacker opens exhibition  
 Right: David Kirk's opening address  
 Centre: Presidential group from left Tony Johnson, Vice-President; Bob Johnston, President; Ken Price, Immediate Past President  
 Bottom left: Bob Allison, LR Benjamin Medallist  
 Bottom right: Tony Jensen, Oertel Nadebaum Award  
 Full report in July issue.

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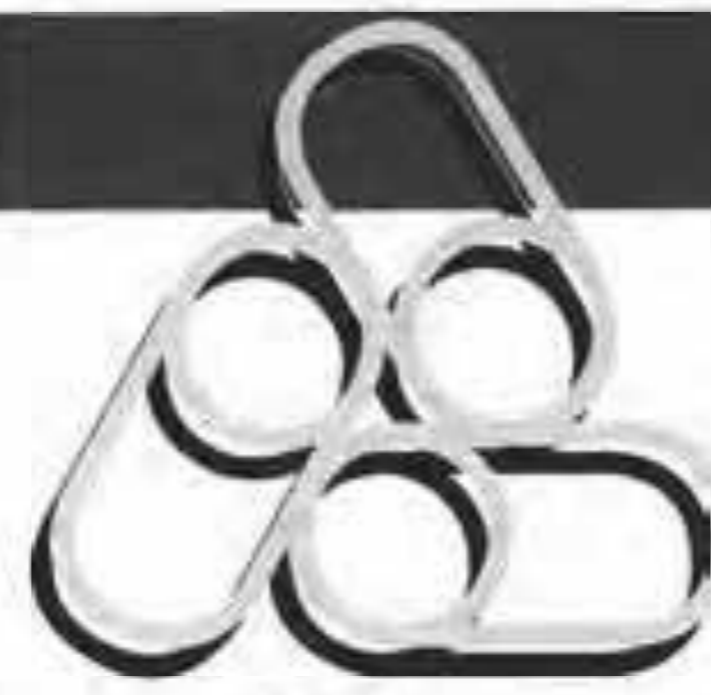
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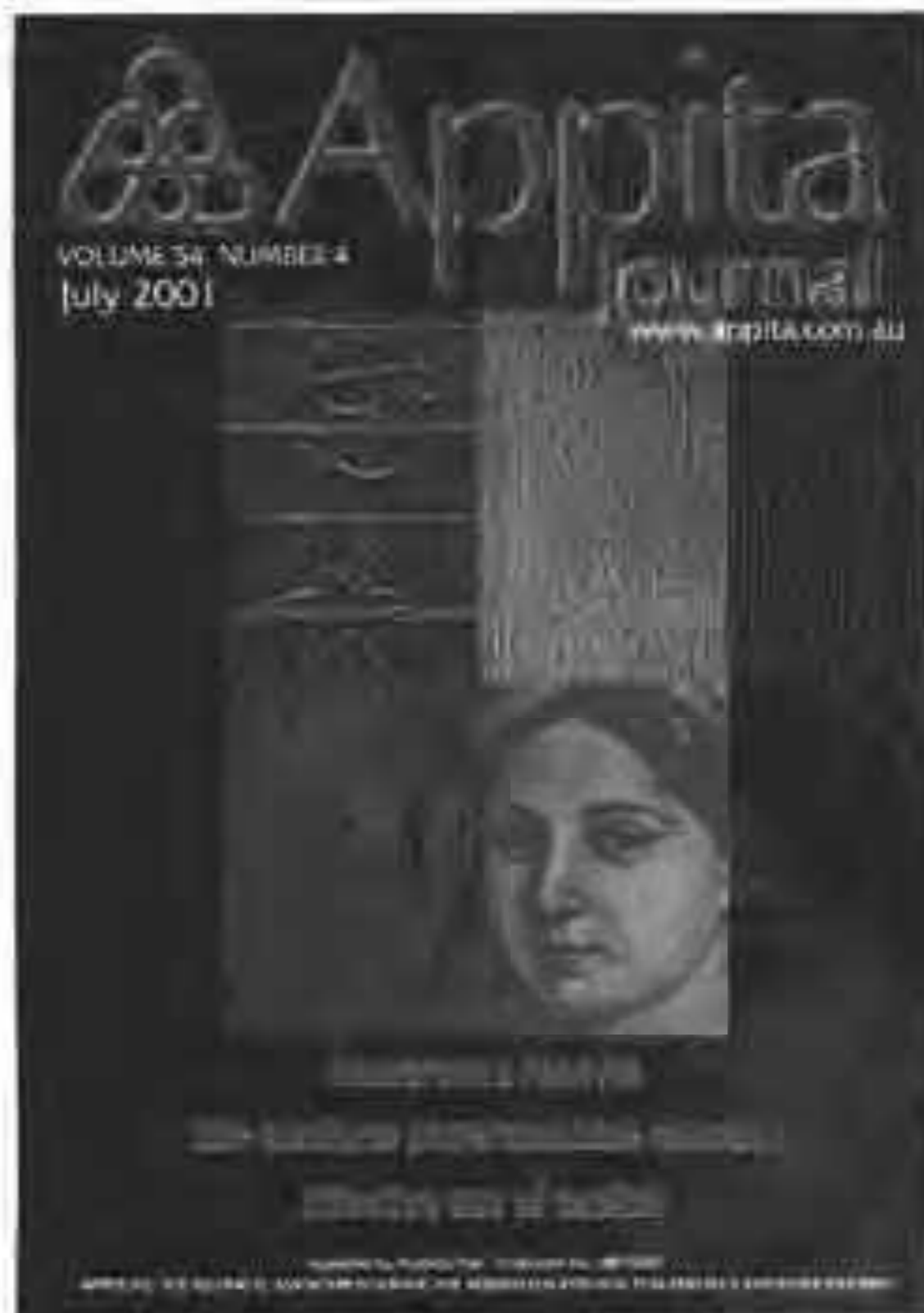
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Cover: Watermarked cotton paper and mould  
(13th Century)

Top: Fabriano watermark

Bottom: Detail of 'La velata' by Raphael  
From Museo della Carta della Filigrani,  
Fabriano, Italy

Displayed at 'New Possibilities for Paper'  
Conference, Sunshine Coast, Australia,  
13-15 July 2001

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Cover: Norske Skog's Boyer and Albury Mills both celebrate anniversaries this year. Story page 408.

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*Apology: In the July issue the name of one author, Wei Shen, of the paper 'A simplified approach to understanding the mechanism of AKD size' was incorrectly spelt in the contents, but was correct on the paper. We apologise for the error.*

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Cover: Surface fibres and filler at high magnification. Area shown is 45 microns wide by 65 microns high. Filler particles (pink) are contained in clusters by a fine transparent film which is anchored to the fibres by microfibrils. Image: Gerald Bristow.

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Cover: Conference theme. Images courtesy Tourism Rotorua. Montage by Rosella Angley. Cover design by Jamie Coghill.

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Cover: at 56th Conference. Clockwise from top right: Jim Colley receives Oertel Nadebaum Award from Bob Johnston; Chris Liddell opens the Conference; Mervyn Uprichard receives LR Benjamin Medal. Centre: Triple 'R' Engineering – Best Exhibitor. Full reports in next issue.

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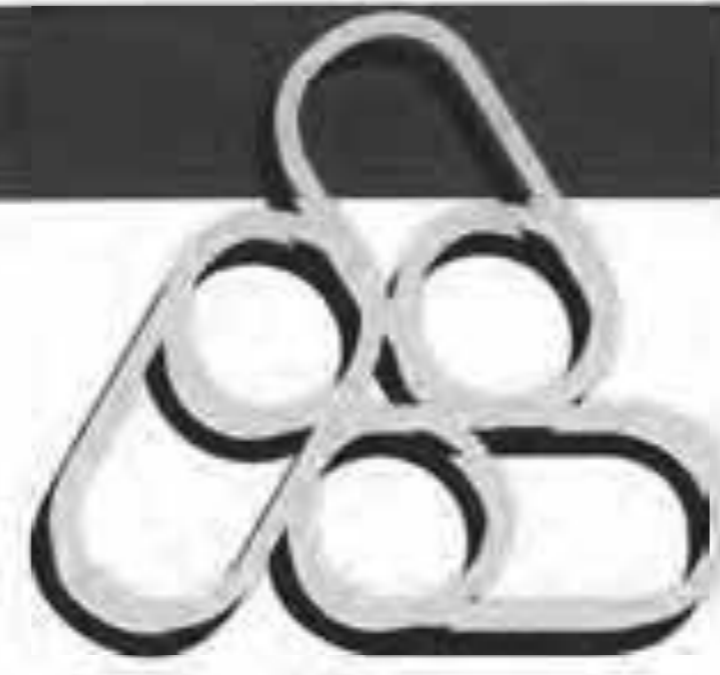
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Sponsors' exhibits at the 55th Conference and Exhibition, Rotorua. Reports begin on page 244.

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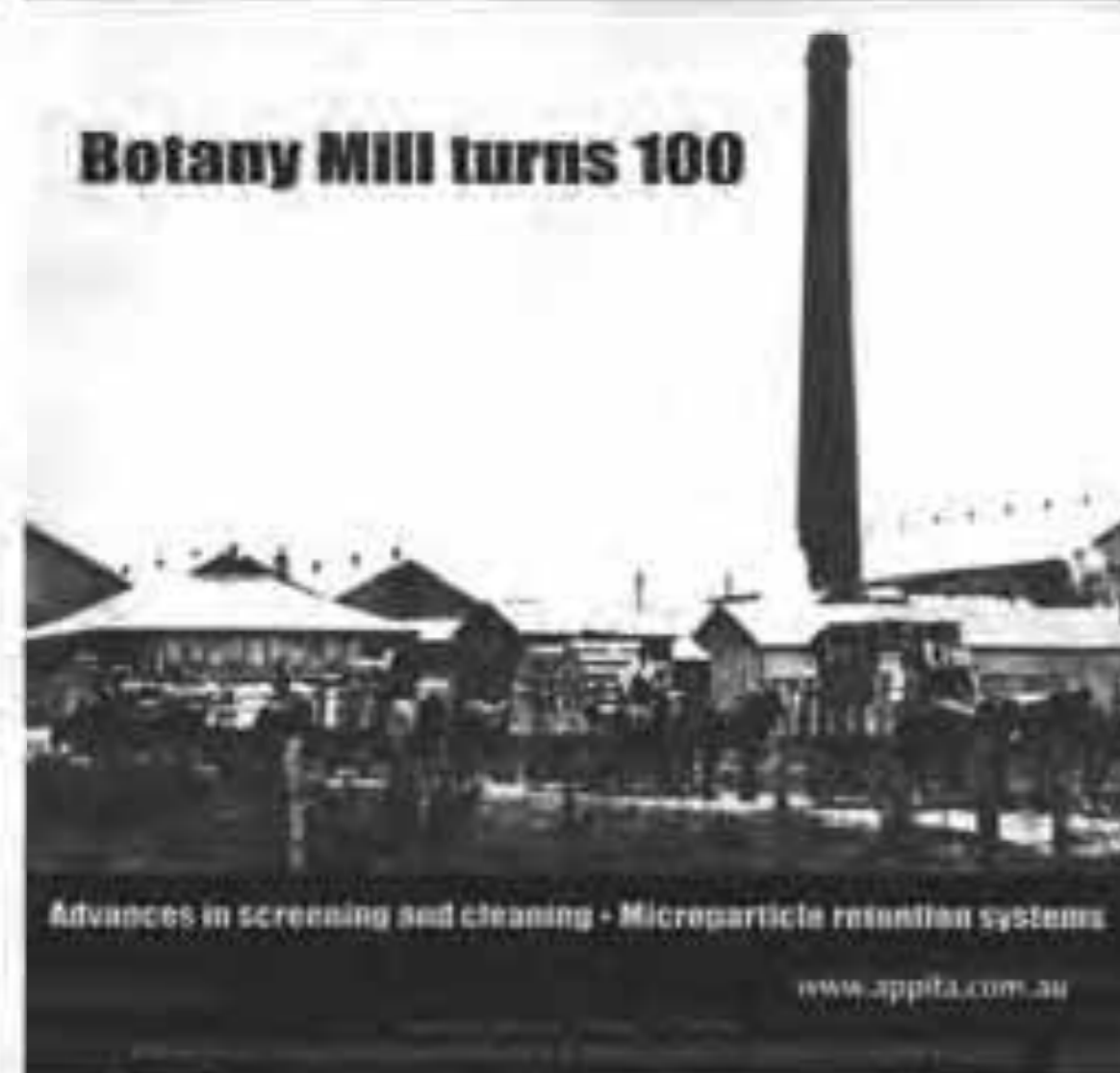
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### Botany Mill turns 100



Cover: Amcor Botany celebrates its Centenary this year. Story page 264. Photo shows product being despatched, circa 1908.

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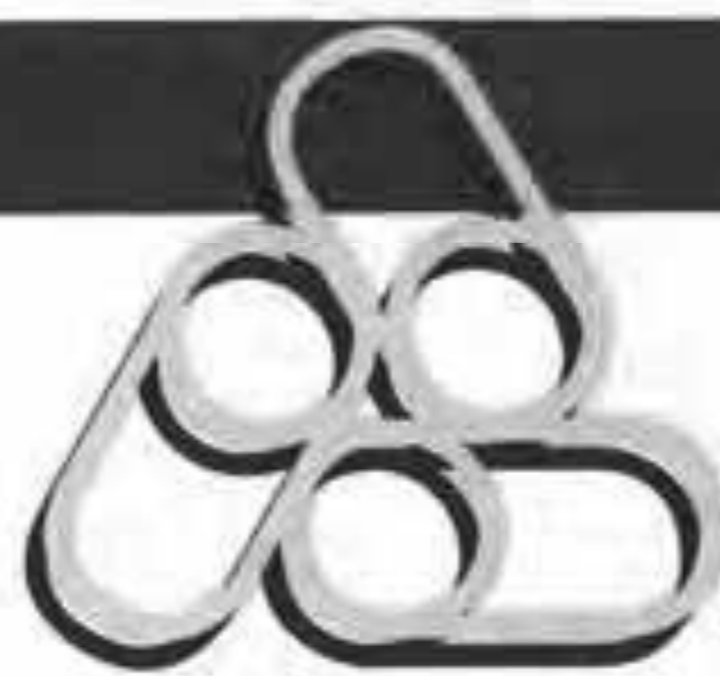


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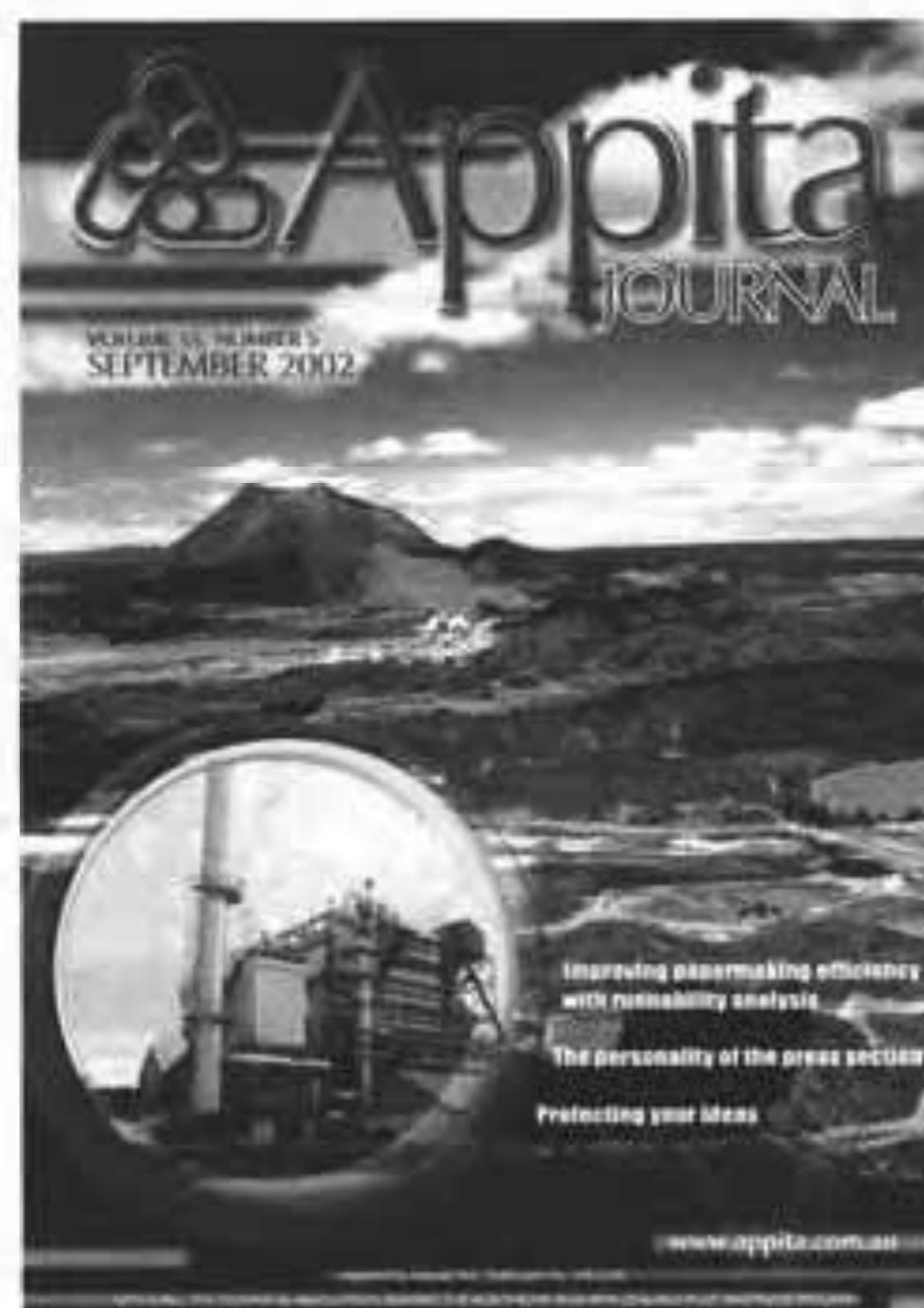
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Cover: Main picture: Tasman mills of CHH and Norske Skog. The mills have recently released a unique environmental report (page 341). Inset: the new boiler at Pan Pac Forest Products, Napier (page 342).

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**Author's Apology:** Dr Ajit Ghosh, author of the paper 'Use of a pilot refiner and screening system to improve stock quality', which appeared in *Appita J* 55(2), 112 (2002) has advised that Dr N Vanderhoek was a co-author of the paper and apologises for any inconvenience caused.

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Cover: The National Printing Laboratory at Monash University, Melbourne, is equipped to handle a wide range of printing and coating investigations.

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Cover: 3-D simulation and final product of Norske Skog's PM 3 Saveall project at Kawerau. See story page 5.

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Melbourne, Australia Location of the 57th Appita Annual Conference and Exhibition, 5-7 May 2003. Image: Jamie Coghill.

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Cover: Award Winners at the 57th Annual Conferences and Exhibition. Clockwise from top left: Ken Maddern receives LR Benjamin Medal from Appita President Tony Johnson; Kevin Ryan and Shashank Bharati, winners of the Jasper Mardon Memorial Prize with Vice President Noel Clark; Ron Dawson receiving Honorary Life membership from Bob Johnston, Immediate Past President; and Tony Johnson presents Karen Stack with the Oertel Nadebaum Distinguished Service Award. Centre: Honeywell, winner of the Best Stand Award in the Exhibition.

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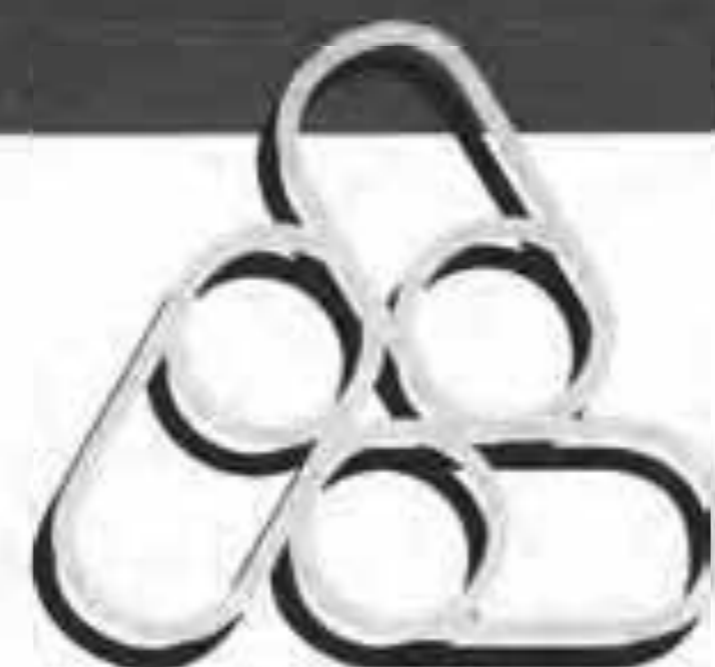
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Cover: Artists's impression of the proposed Swanbank Paper Mill in Queensland. See story page 256

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The sizing chemical AKD can hydrolyse into ketone, a solid wax with a much higher melting point than AKD. Research in APPI led by Dr. Wei Shen has addressed the fundamental link between the melting point, the spreading and sizing ability of AKD and ketone. The large ketone crystals reduces its ability to spread and take a proper molecular orientation on the surface of cellulose fibres. These micrographs show crystalline ketone micro-aggregates.

Photographs courtesy Wei Shen  
Design by Jamie Coghill

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Schematic and photographs of the pilot coating rig for the CRC for Functional Communication Surfaces. Images courtesy of Brenda Hutton. Cover design by Jamie Coghill.

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Cover: Then and now – The development of the paper industry in New Zealand. Main Photo: CHH Kinleith. Inserts: Left - MG machine, Otago Paper Mills, Woodhaugh, 1892. Right - Papermachine at CHH Kinleith, 2003. Design by Jamie Coghill. Kinleith images courtesy Beca Simons.

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Cover: Canberra, Australia's National Capital, location of the 59th Appita Annual Conference and Exhibition 19-21 April 2004. Design by Jamie Coghill. Images courtesy Canberra Convention Bureau.

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Second Row: Left, David Dong-Lung Hsieh, Taiwan TAPPI, Right, Hak Lee, Korea TAPPI  
Third Row: Kunitaka Toyofuku, Japan TAPPI  
Bottom Row: Rob Wood, PAPTAC (Canada)

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Full Conference report in July Issue.

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Cover: A cryo-SEM image of an unsized sheet at 1000 magnification, showing wetting fluid present solely in the form of films (blue) along channels formed by overlapping fibres and as films wetting corners of the pores (red). Image courtesy Dr. Ray Roberts, Smart Print CRC and Department of Applied Mathematics in the Research School of Physical Sciences and Engineering, Australian National University, Canberra. Cover design by Jamie Coghill.

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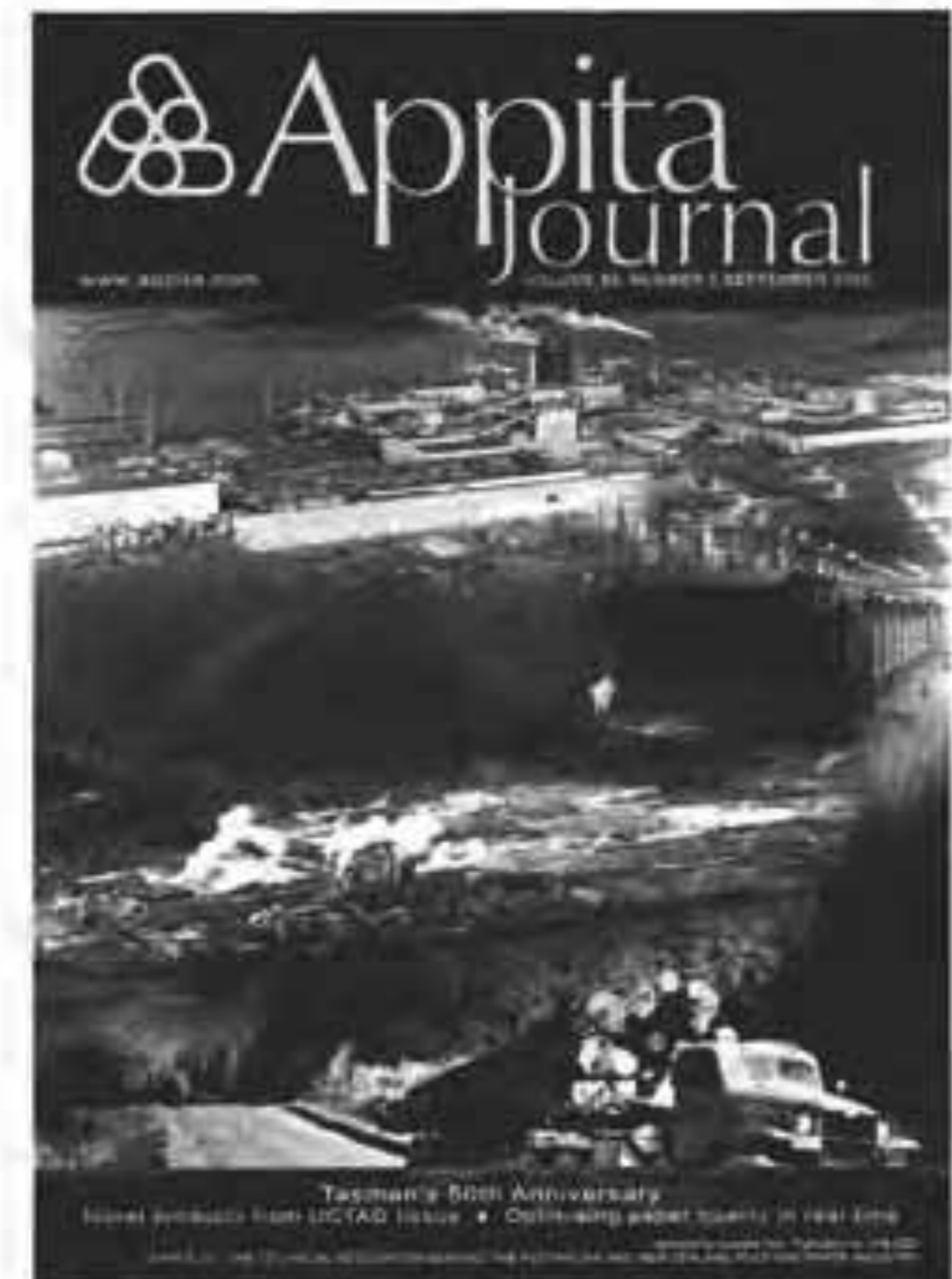
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Cover: Melbourne, Australia, host city of the 60th Appita Annual Conference and Exhibition 3-6 April 2006. Montage by Jamie Coghill.

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Cover: What corrugated board looks like close up. Images from Amcor R&T. Design by Jamie Coghill.

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**Cover: 3-D depiction of screening and TCF bleaching in a pulp mill, using wheat straw and based on the novel Chempolls process. The authors of the paper on page 268 designed the process and have been heavily involved in the plant design. Engineering company SWECO PIC carried out the actual 3D plant design. 3-D Picture supplied by Juha Anttila, cover design by Jamie Coghill.**

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Cover: Key people in the formation of Appita. Clockwise from top left: Ian Boas, Lou Benjamin, John Somerville, the first executive committee, Oertel Nadebaum, Godfrey Ellis.

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Cover: 3D Modelling and final pictures of the Whakatane papermachine rebuild. Images courtesy Beca AMEC. Cover design by Jamie Coghill.

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**Cover:** Before and after: NASA Satellite photos taken on 22 October 2006 (left), and 14 January, 2007 starkly illustrate the impact of the Victorian bushfires. The major river at the centre of each picture is the Murray and the city of Albury is at the edge of the forested area. Fire photograph courtesy Ensis. Satellite images courtesy of MODIS Rapid Response Project at NASA/GSFC.

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**Cover:** The Gold Coast Convention & Exhibition Centre - location of the 61st Appita Annual Conference and Exhibition, 6-10 May 2007.

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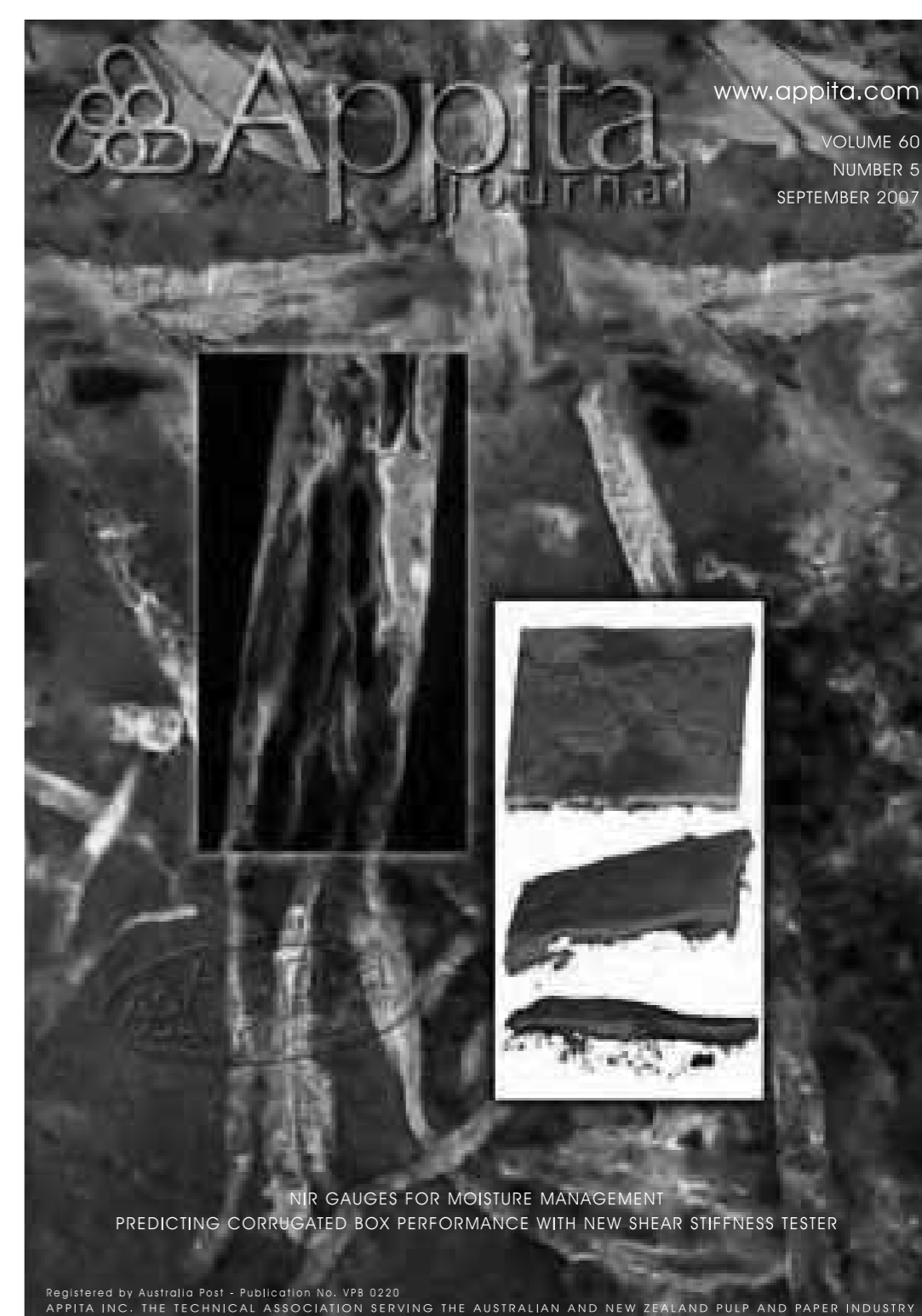
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**Cover:** Electron micrographs of coated paper surfaces and cross sections. Fibres are green, coating binder is red and clay particles show as black spots.

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**Cover:** Amcor's Petrie cartonboard mill celebrates 50 years of operation. See page 432.  
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**Cover:** 3-D maps of ring crush variation for a 60 metre length of 120gsm corrugating medium. Left: Z-direction variation; Right: CD variation. Scales show % variation from the mean. Images from Russell Allan, design by Jamie Coghill.

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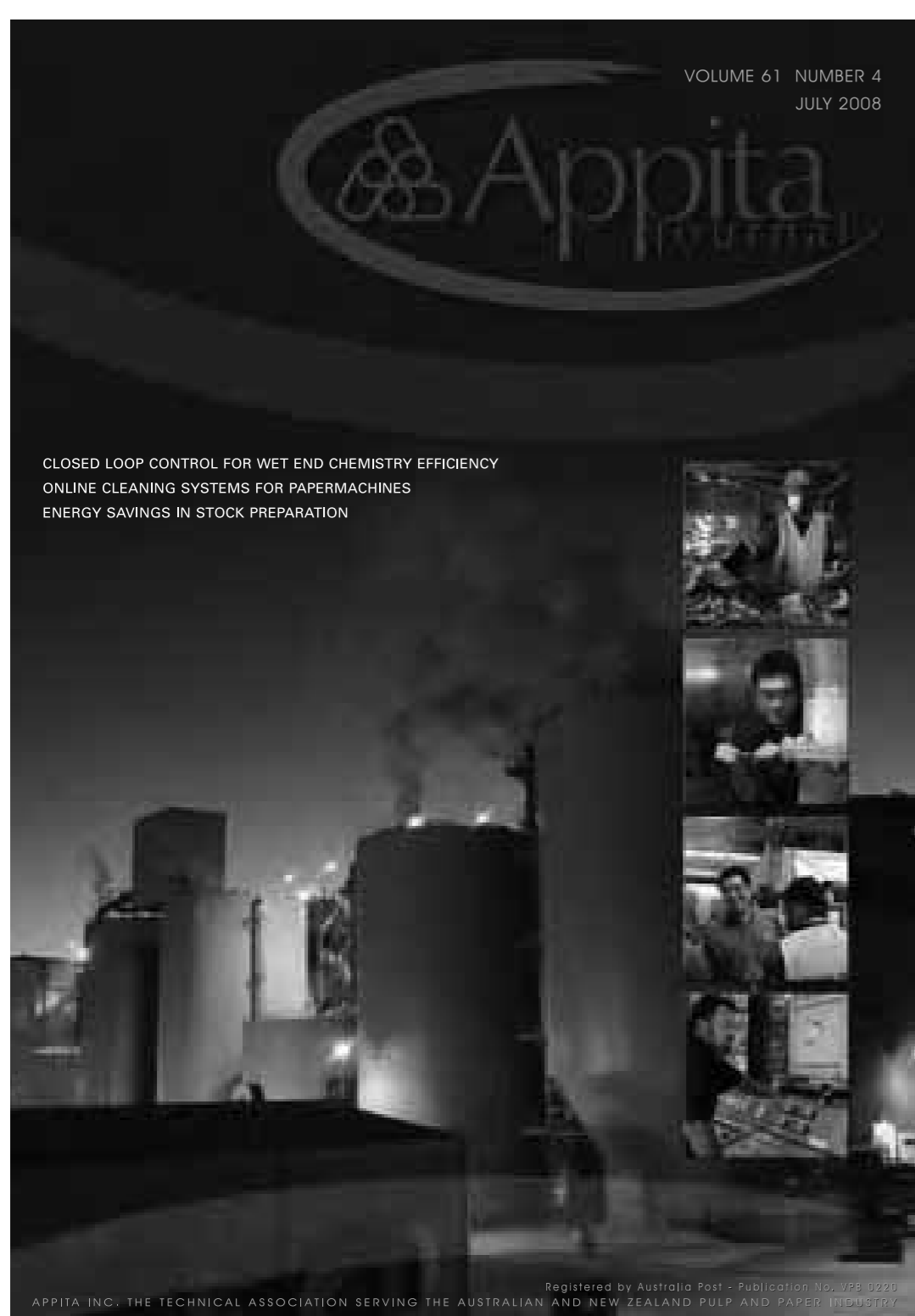


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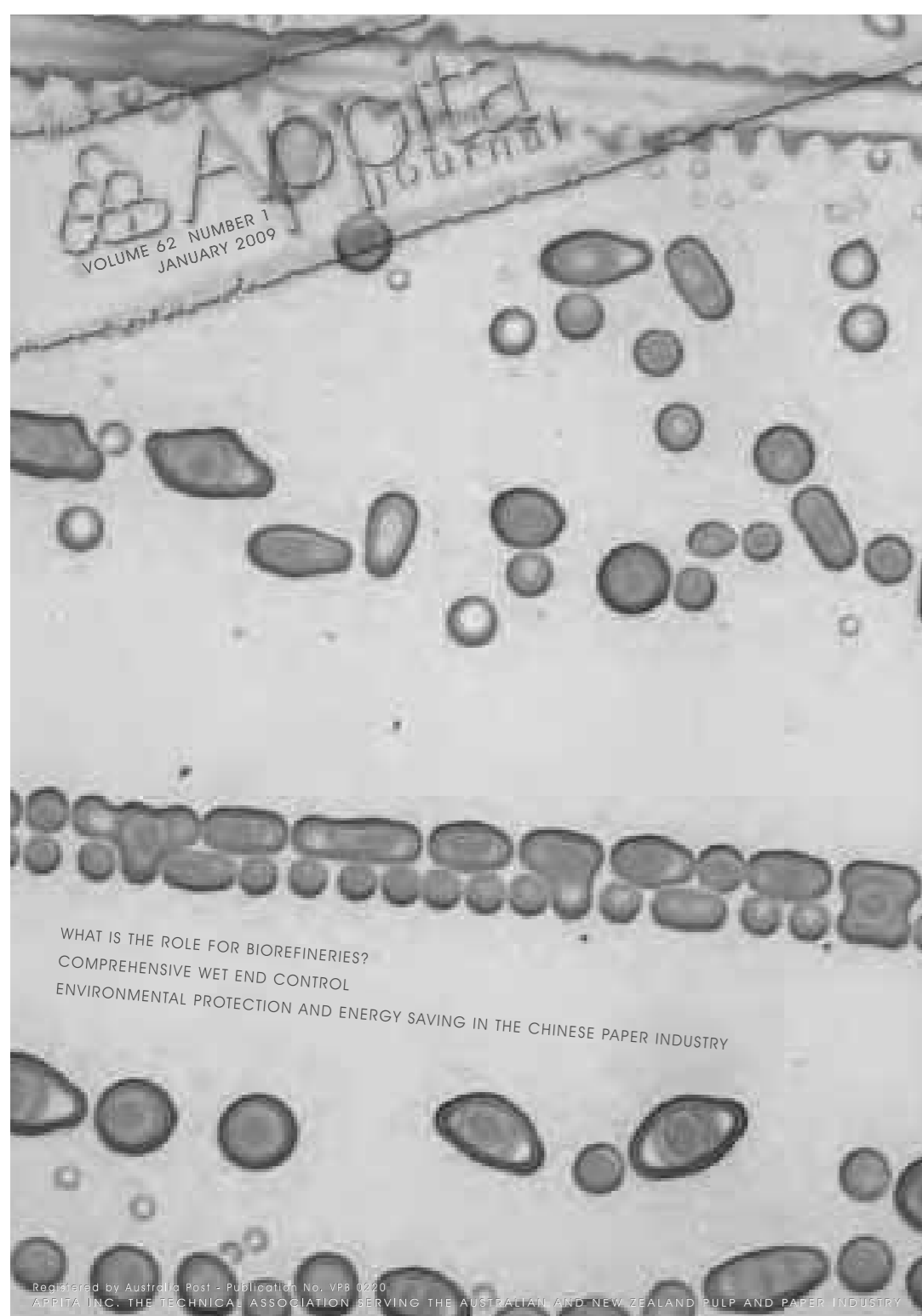


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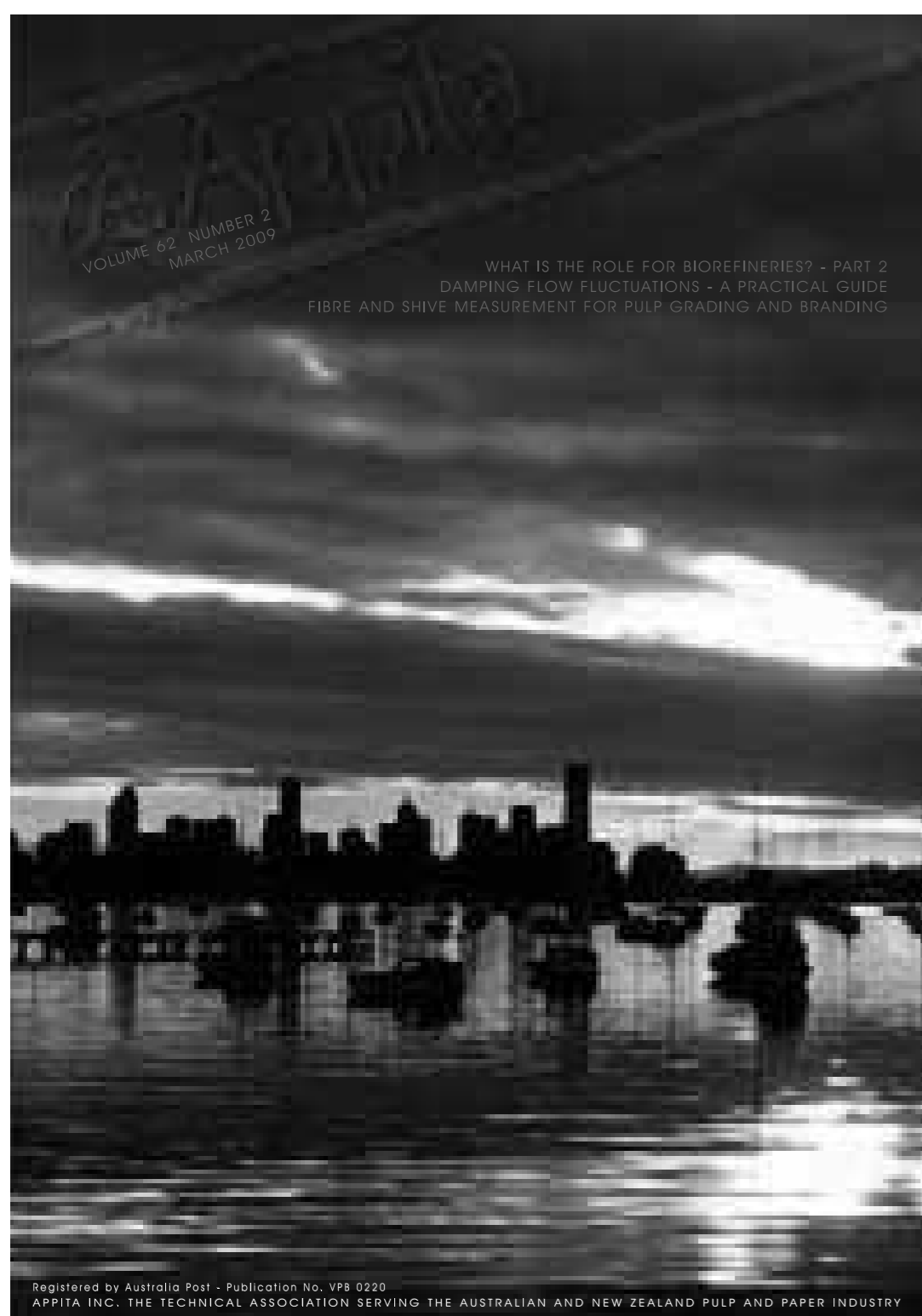


# Appita

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# Journal

VOLUME 62, No 2 March 2009



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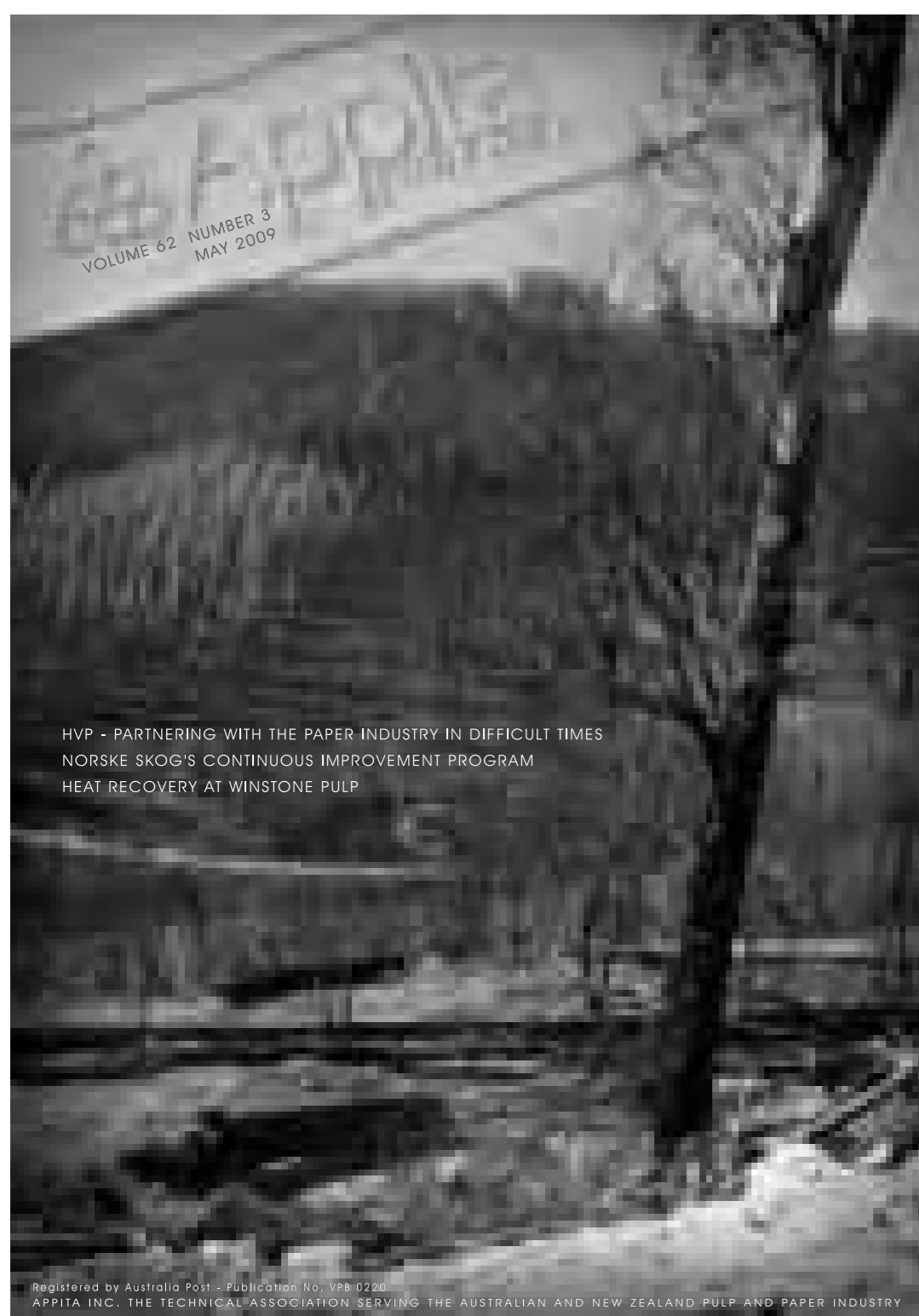


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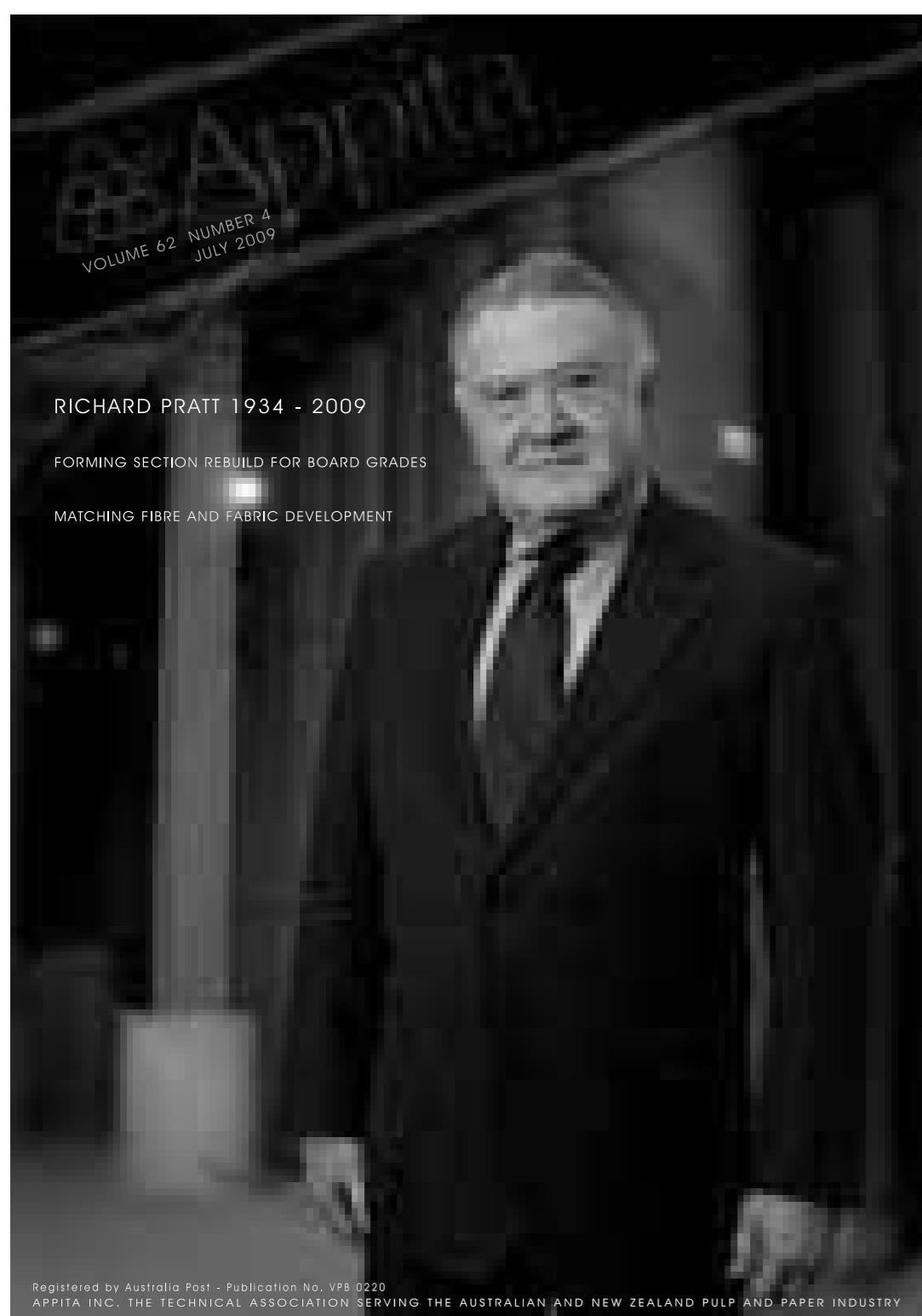


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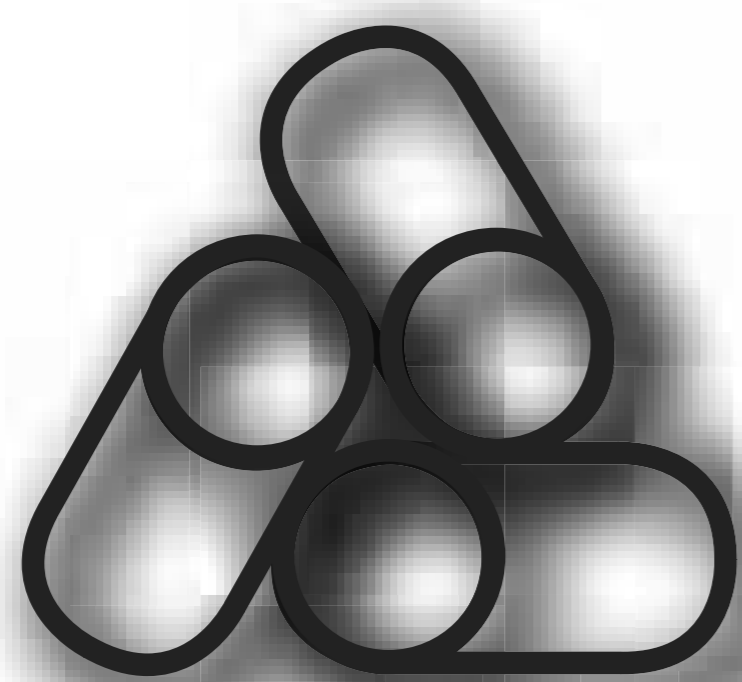
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# Appita Journal

VOLUME 62, No 5 October — December 2009



**Cover Image:** Australia recovered 2.98 million tonnes of wastepaper in 2008, of this, 1.68 million tonnes was recycled into new paper products and 1.29 million tonnes was exported. Images courtesy Norske Skog Albury and Australian Paper Recovery Pty. Ltd. Cover design by Jamie Coghill.

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**Cover Image:** Interior of a dryer cylinder showing installation of turbulator bars. The condensate syphon is also visible. Image courtesy Kadant Johnson. Cover design by Jamie Coghill.

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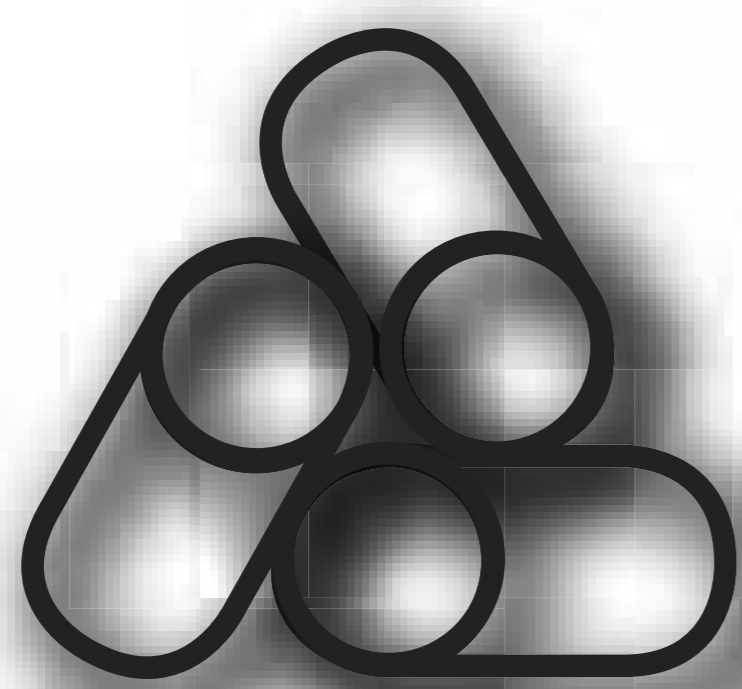
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**Cover Image:** Woodchips discharging into the storage bin at Norske Skog Boyer. A new woodyard was installed as part of their Softwood Conversion Project. Picture: Norske Skog Boyer. Cover design by Jamie Coghill.

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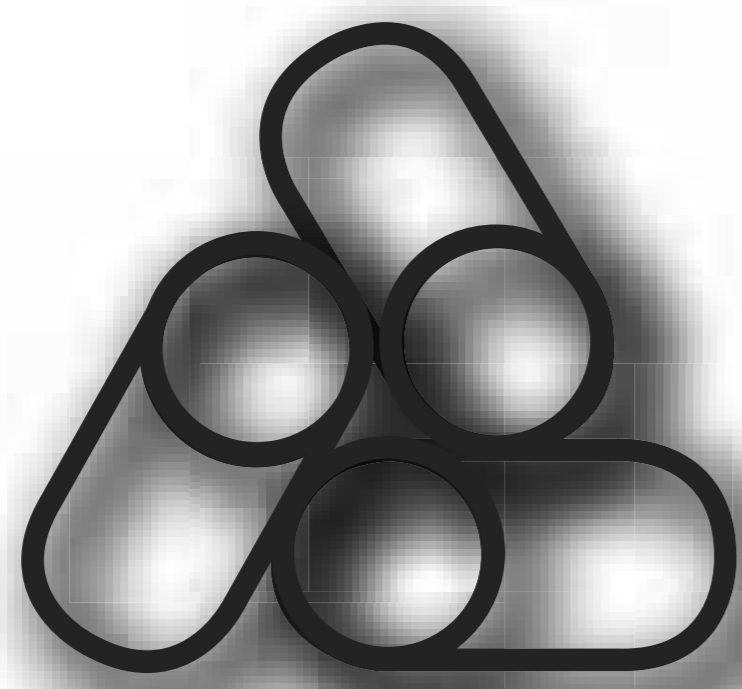
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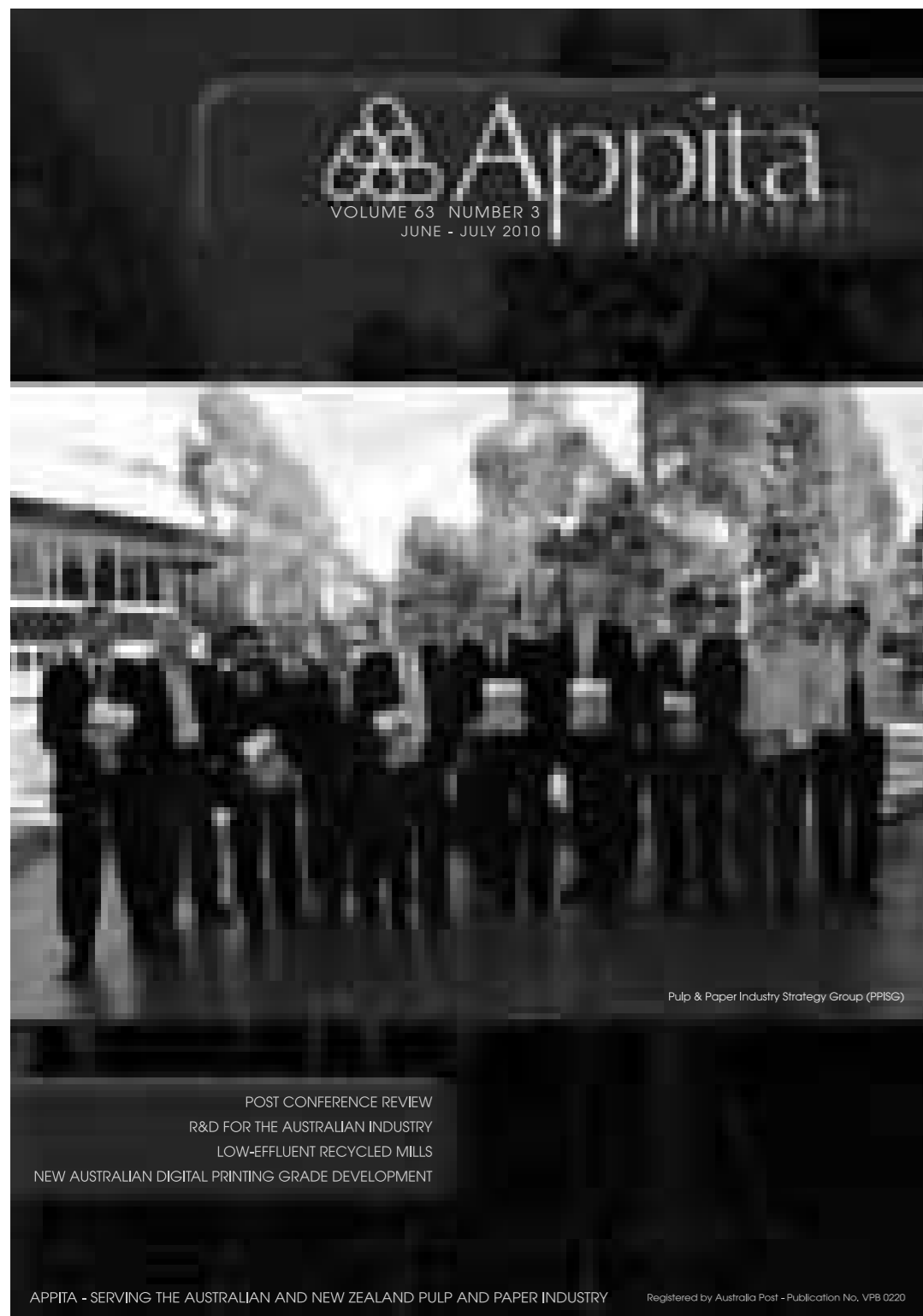
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**Cover Image:** Launch of the Pulp and Paper Industry Report at the 64th Appita Annual Conference and Exhibition. Left to right: Peter Chrisp (Norske Skog); Nafty Vanderhoek (CSIRO); Sonny Coleiro (Amcor); Mark Addis (Department of Infrastructure, Energy and Resources, Tasmania); John Gay (Gunns); Jim Henneberry (Australian Paper); Paul Thompson (SCA Hygiene Australasia), Senator Kim Carr (Minister for Innovation, Industry, Science and Research); Stephen Payne (Department of Innovation, Industry, Science and Research); Dean Anderson (NSW Department of State and Regional Development); Jon Ryder (PaperlinX); Bill Hurditch (The Fifth Estate); Bob Smith (Vic Forests); Brian Walsh (Regional Development Victoria).  
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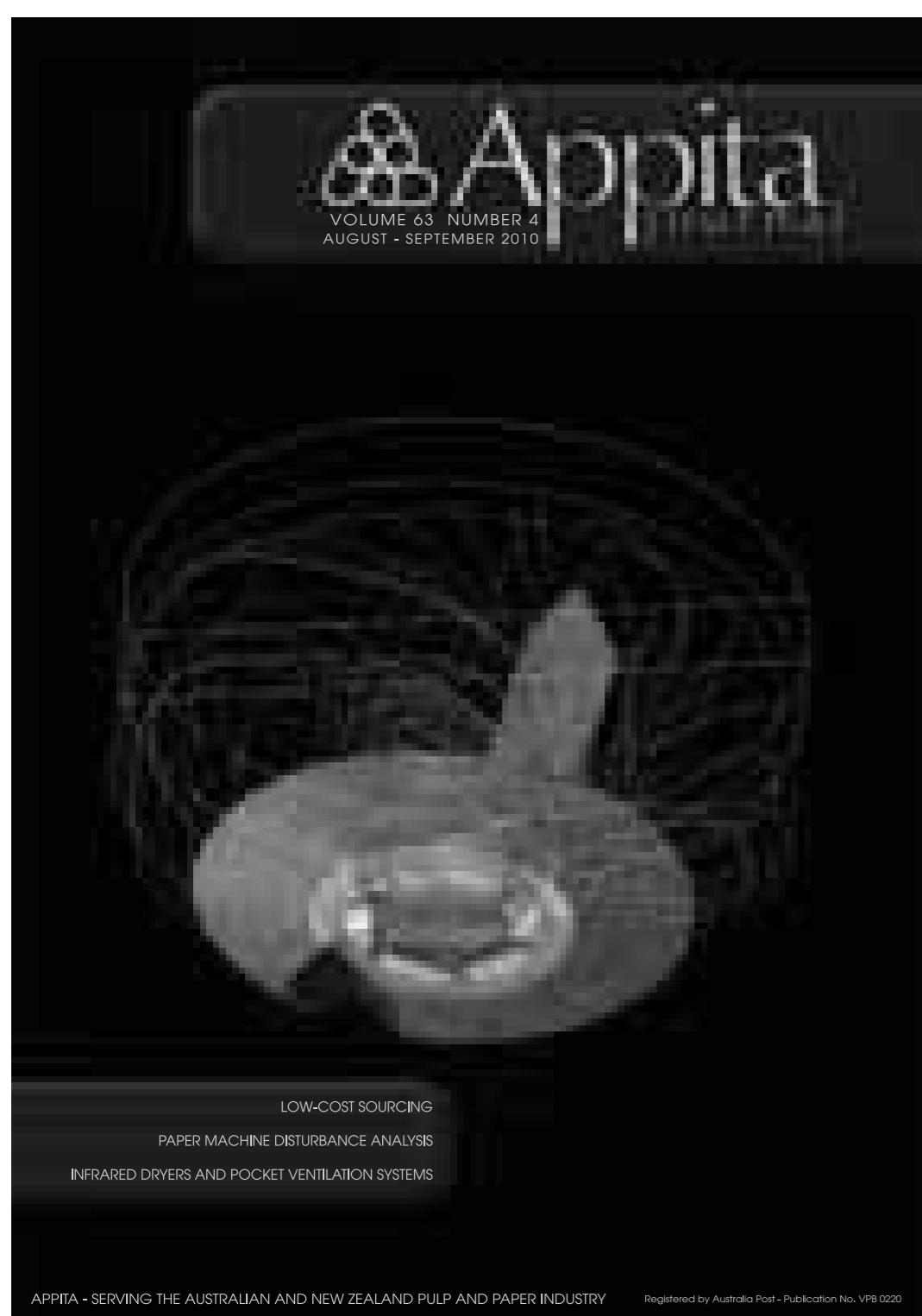


# Appita

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**Cover Image:** Fibre suspension trajectories inside a bale pulper mapped using computerised fluid dynamic simulation. Image courtesy of GL&V.  
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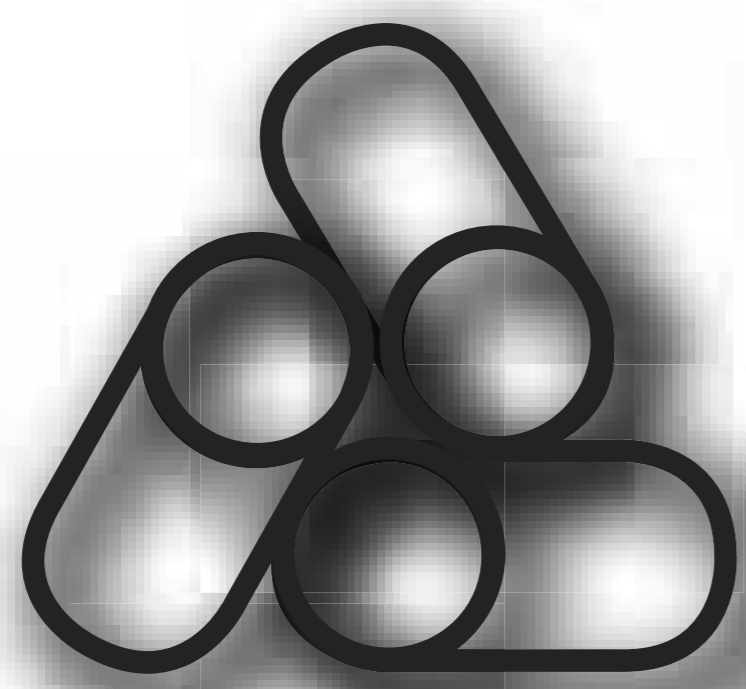
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# Appita Journal

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**Cover Image:** Damage to inkjet printer jets from printing conducting polymers for smart packaging applications. Inset: The Dimatrix Materials Printer. Images courtesy Dr Noel Clark, CSIRO. Design by Jamie Coghill.

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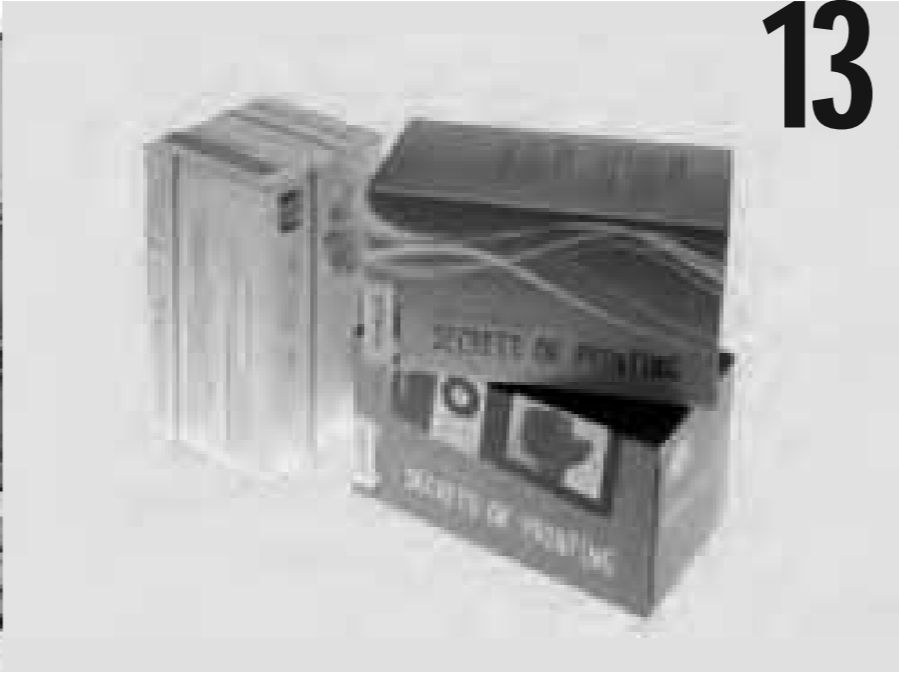
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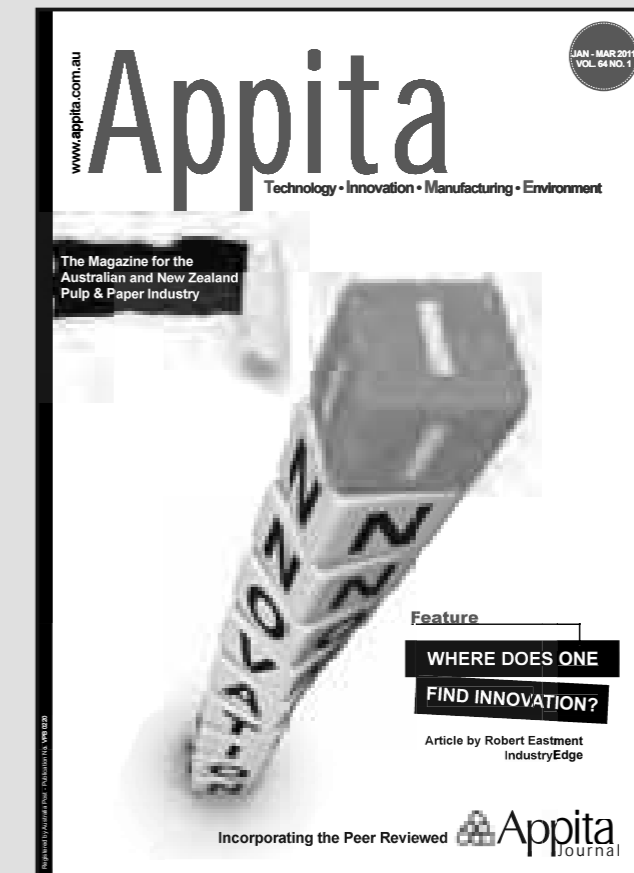
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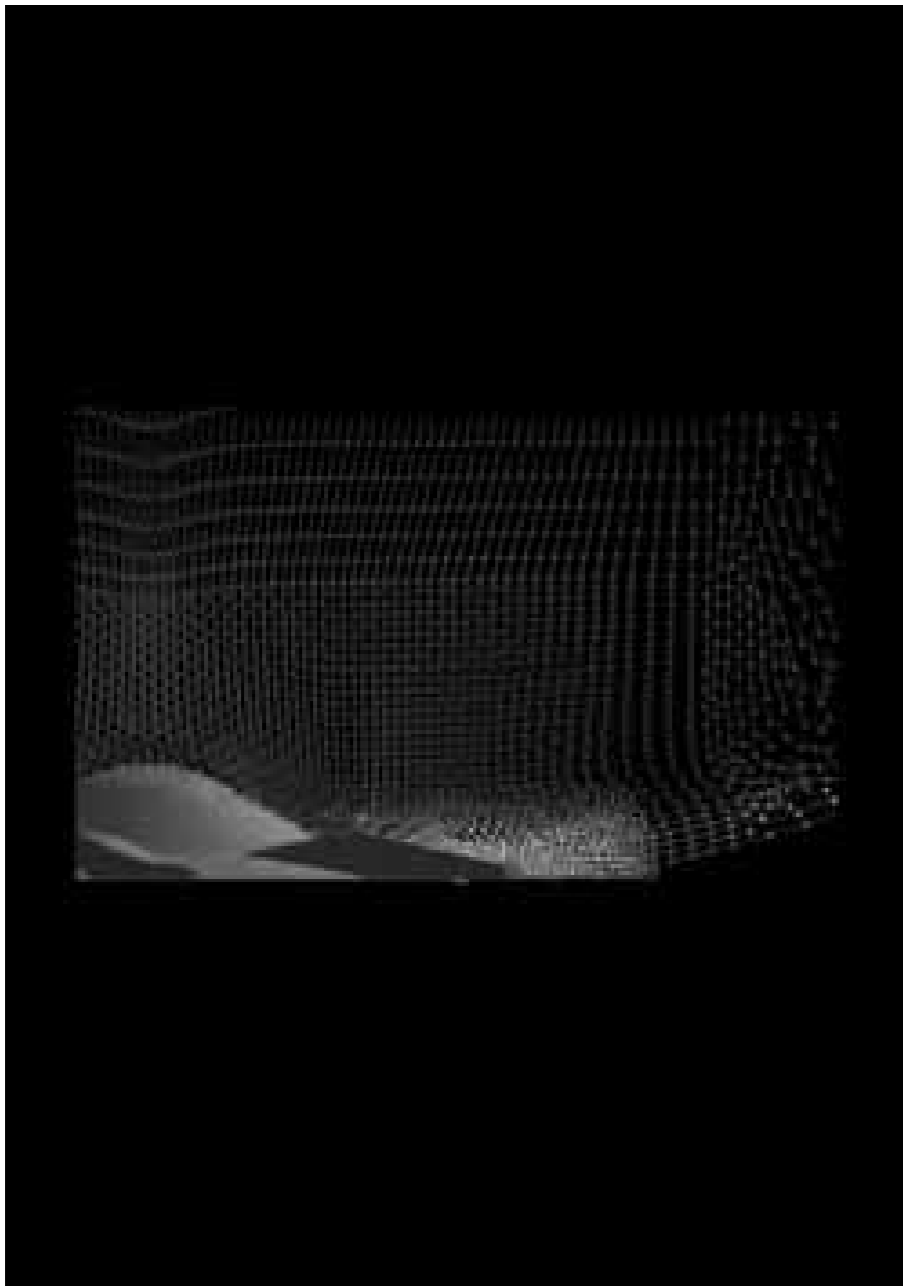
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Our flagship publication, Appita Journal, is a widely acclaimed peer-reviewed technical Journal published five times a year in January, March, May, July, and October.

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- n Pressure screen design
- n Pulp and bleaching OCC
- n Residual ink measurement
- n Influences on free sheet shrinkage
- n Peroxide bleaching in ECF
- n Softwood kraft pulp strength



**Cover Image:** Simulation of the flow pattern from the impeller of a pressure screen. Image courtesy GL&V.

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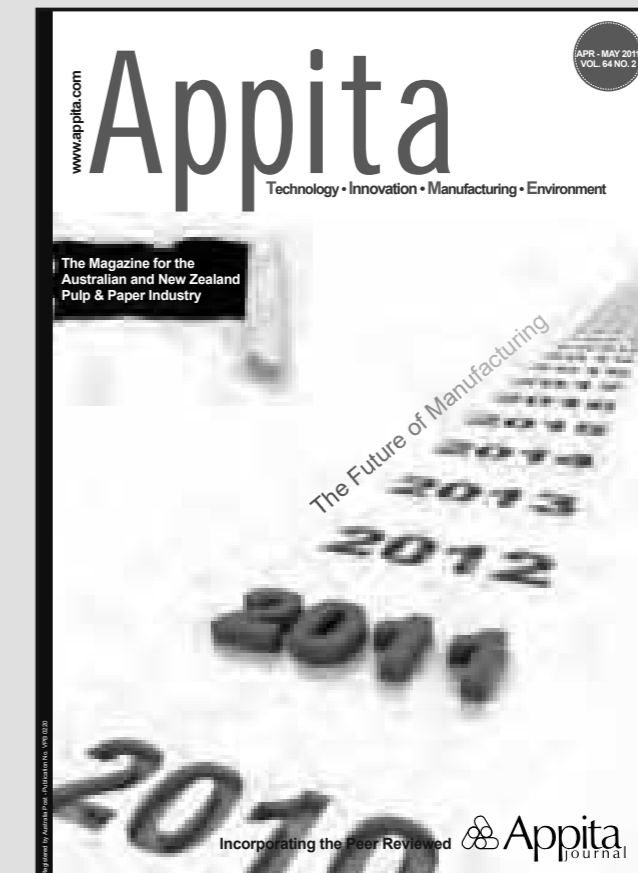
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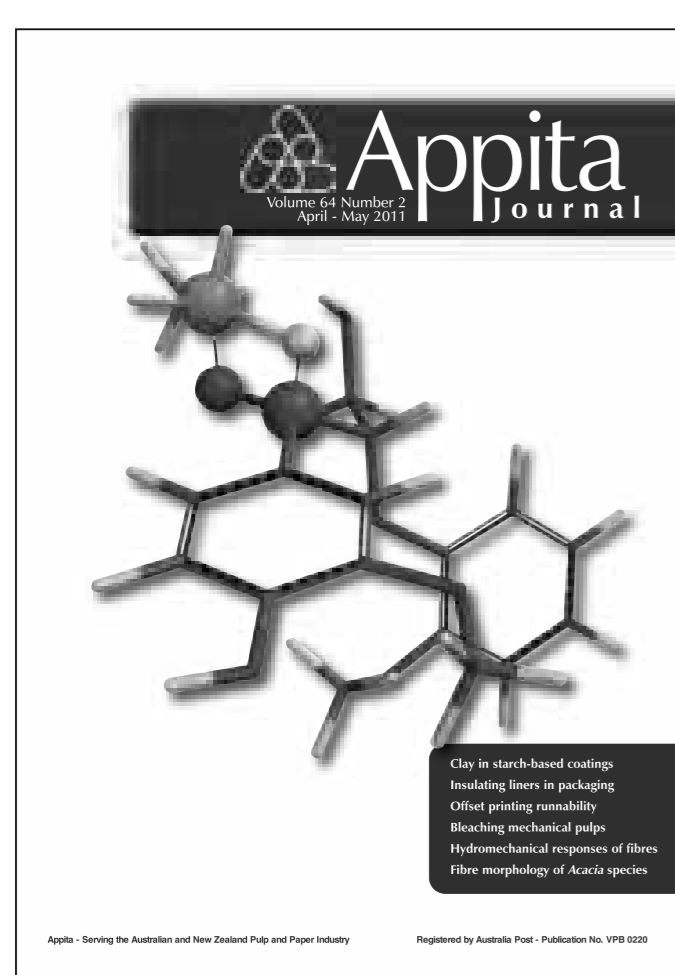
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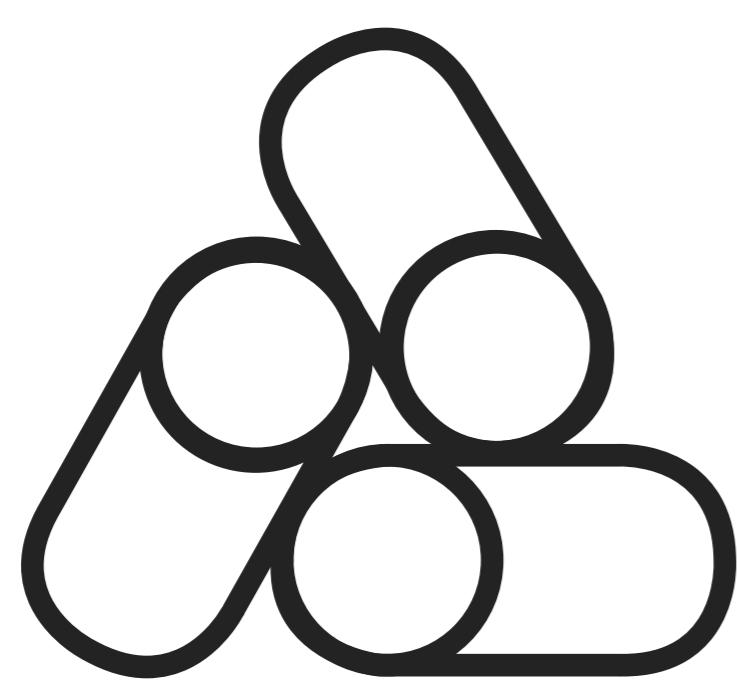
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### Featured in this issue

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- Insulating liners in packaging
- Offset printing runnability
- Bleaching mechanical pulps
- Hydromechanical responses of fibres
- Fibre morphology of *Acacia* species





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**Cover Image:** Molecular model of the transition state (spheres) between CY1 and boraneammonia (both tubes). See the paper by Sylvain Robert (page 165)

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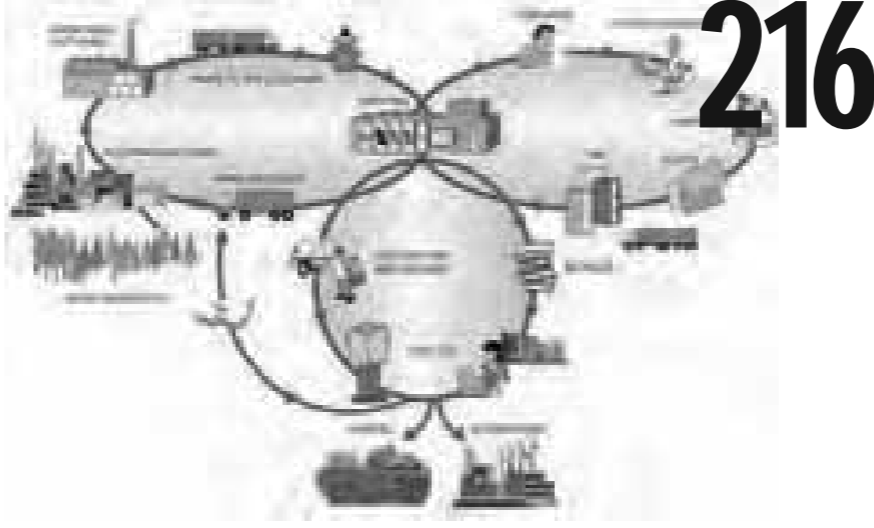
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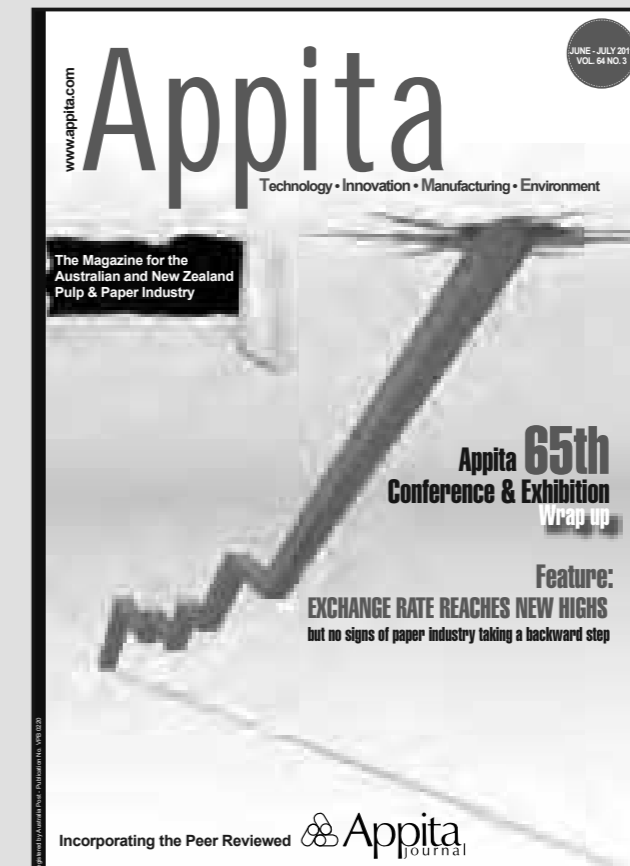
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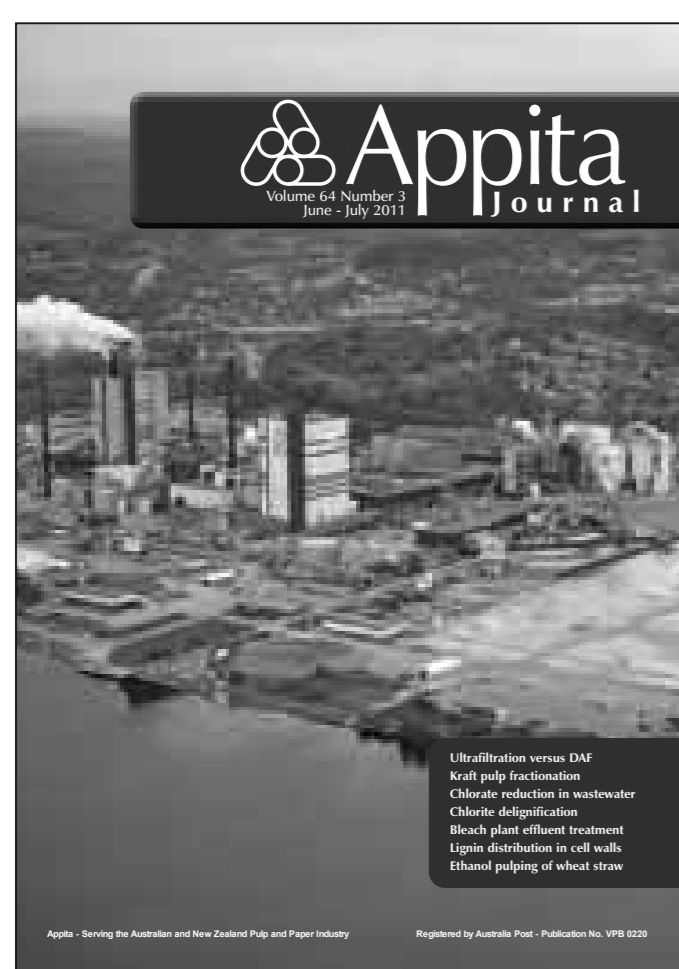
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# Appita Journal

# 243

Our flagship publication, Appita Journal, is a widely acclaimed peer-reviewed technical Journal published five times a year in January, April, June, August and October.

### Featured in this issue

- Ultrafiltration versus DAF
- Kraft pulp fractionation
- Chlorate reduction in wastewater
- Chlorite delignification
- Bleach plant effluent treatment
- Lignin distribution in cell walls
- Ethanol pulping of wheat straw



**Cover Image:** SCA's Ostrand kraft pulp mill, Sweden. This issue focuses on kraft pulping

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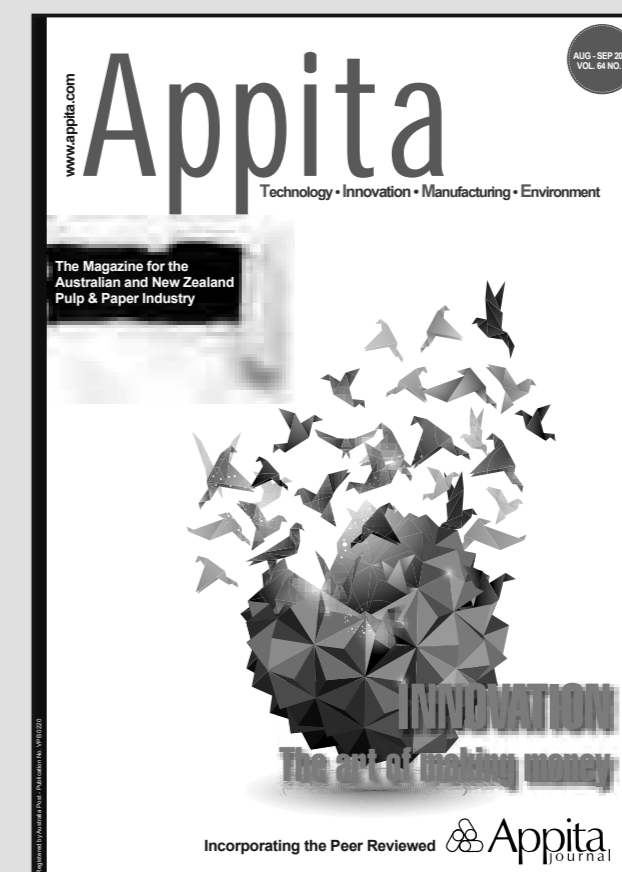
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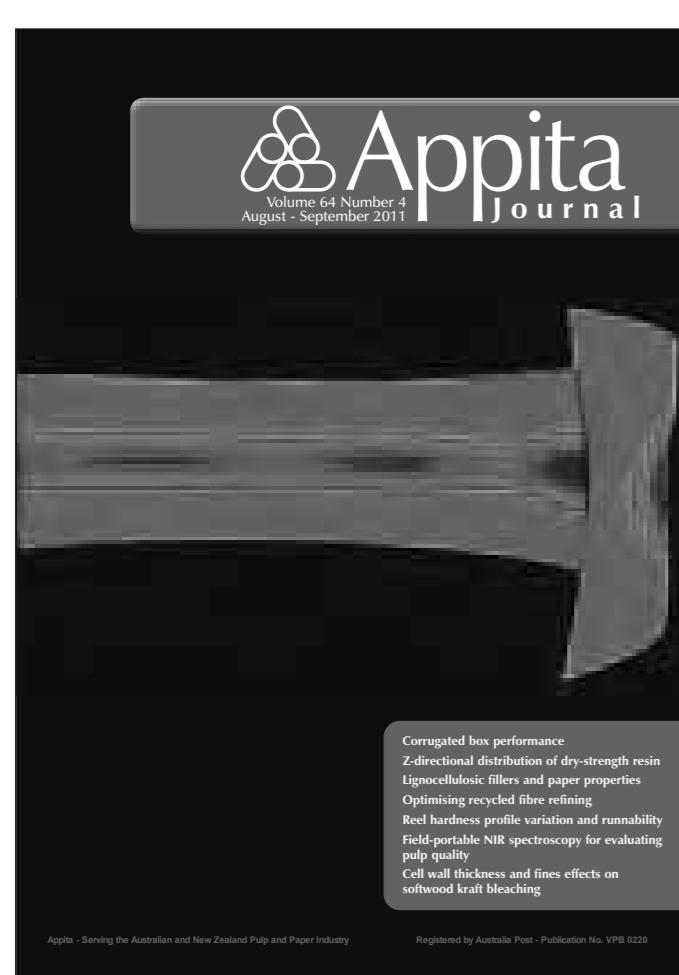
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# Appita Journal

# 323

Our flagship publication, Appita Journal, is a widely acclaimed peer-reviewed technical Journal published five times a year in January, April, June, August and October.

### Featured in this issue

- Corrugated box performance
- Z-directional distribution of dry-strength resin
- Lignocellulosic fillers and paper properties
- Optimising recycled fibre refining
- Reel hardness profile variation and runnability
- Field-portable NIR spectroscopy for evaluating pulp quality
- Cell wall thickness and fines effects on softwood kraft bleaching



**Cover Image:** FEA model showing the build-up of micro panels around a section of the ring crush test ring. Hot colours represent higher stresses. See the paper by Peter Bennett (page 325).

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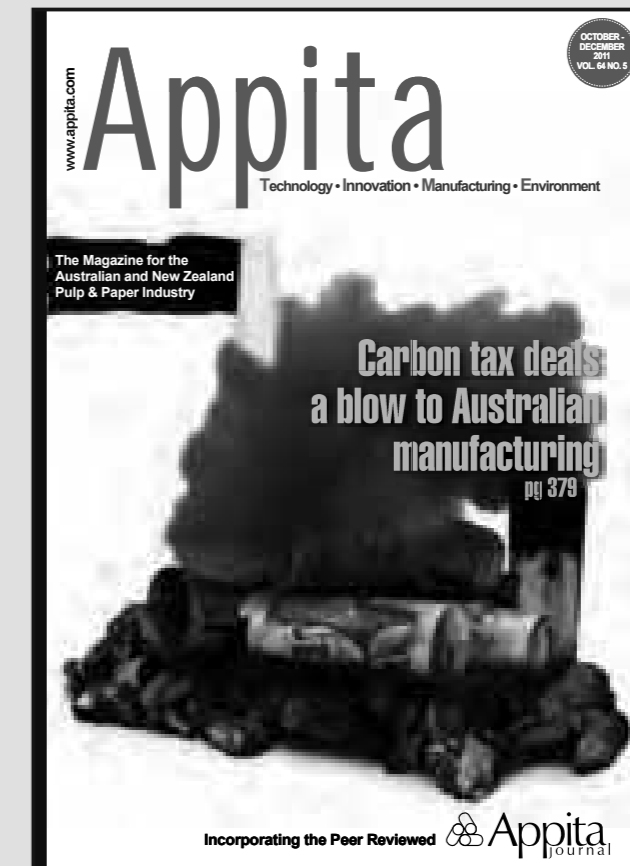
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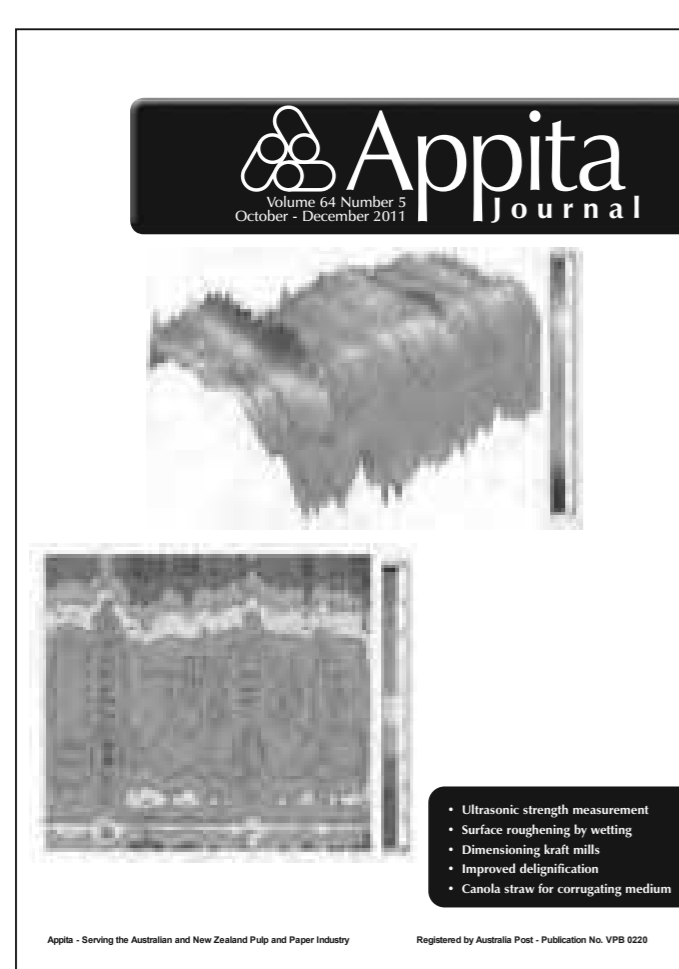
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- Ultrasonic strength measurement
- Surface roughening by wetting
- Dimensioning kraft mills
- Improved delignification
- Canola straw for corrugating medium



**Cover Image:** 2-D and 3-D contour maps of variation in Ring Crush creep. See paper by R J Allan, page 422.

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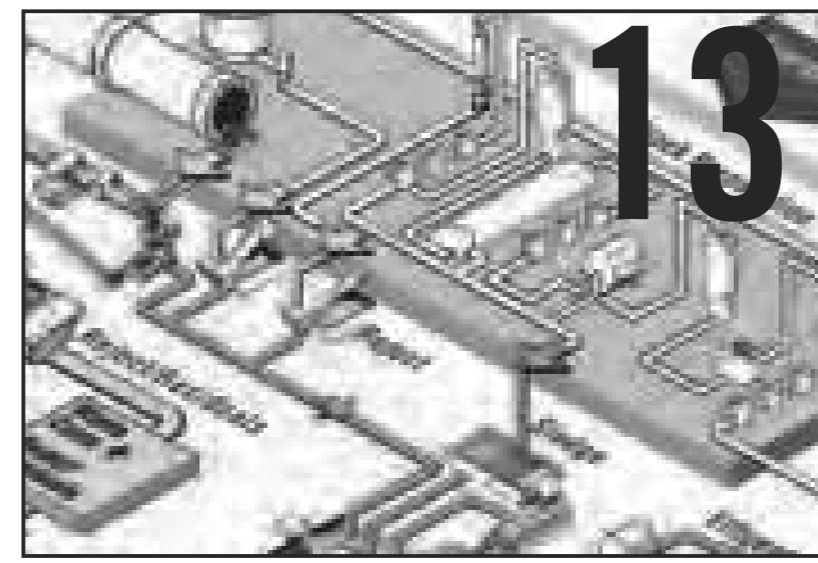
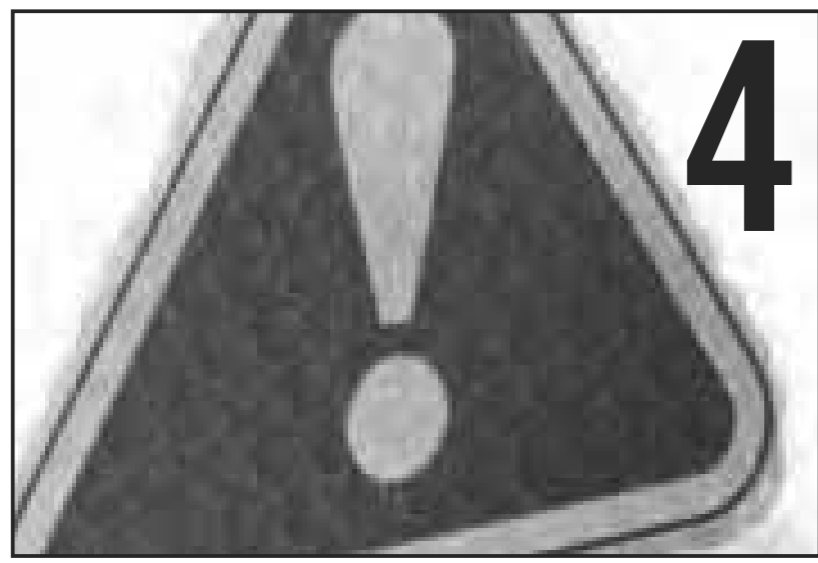
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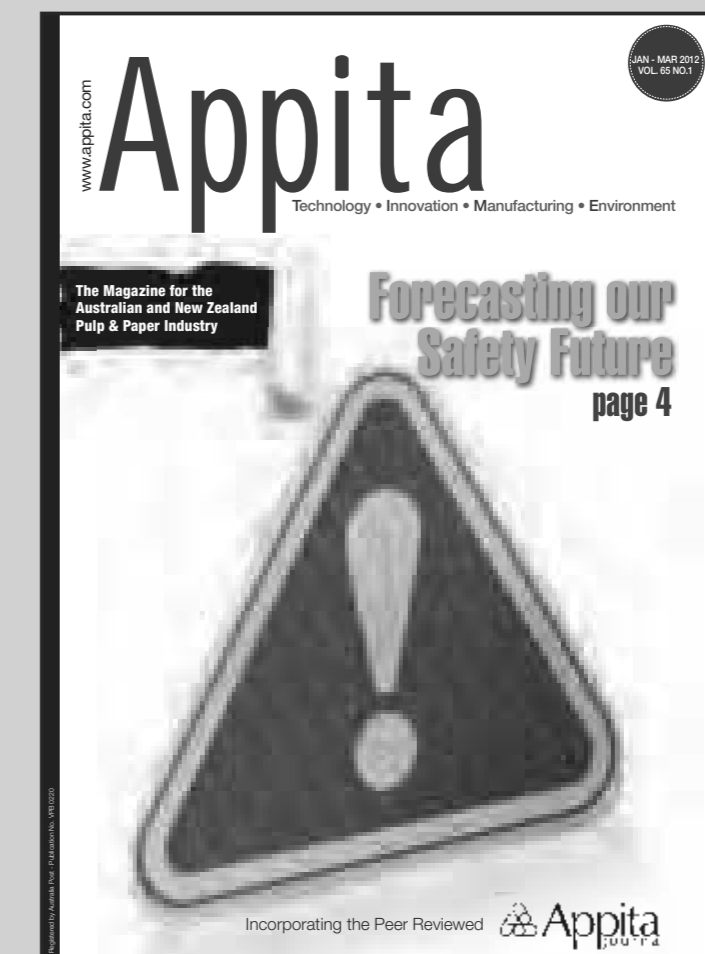
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## Appita Journal 49

Our flagship publication, Appita Journal, is a widely acclaimed peer-reviewed technical Journal published four times a year in January, April, July and October

### Featured in this issue:

- Flame-retardant paper
- Polyvinyl alcohol and OBAs
- Two stage hc single disc' versus 'hc double disc plus lc single disc' refiner pulps
- Non-newtonian behaviour of black liquors
- True-neutral fractional deinking
- Detecting an abnormality in a recovery boiler







# Appita Journal

Publishing Peer-Reviewed papers in the science and technology of pulp, paper printing and packaging

**Cover Image.** Main pic: Microscopic image of fibre fraction after 2 minutes pulping of flexographic newsprint. See paper by Mika Körkkö, Daniele Bussini, Ossi Laitinen, Graziano Elegir and Jouko Niinimäki, page 71.

**Inset pics:** Top pic: T-FWA distribution of paper with T-FWA applied externally. Centre and lower pics: Distribution of T-FWA in the cross-section of surface-sized paper (A) without (top) and (B) with (bottom) PVOH. See paper by Chul-Hwan Kim and Ji Young Lee, page 51

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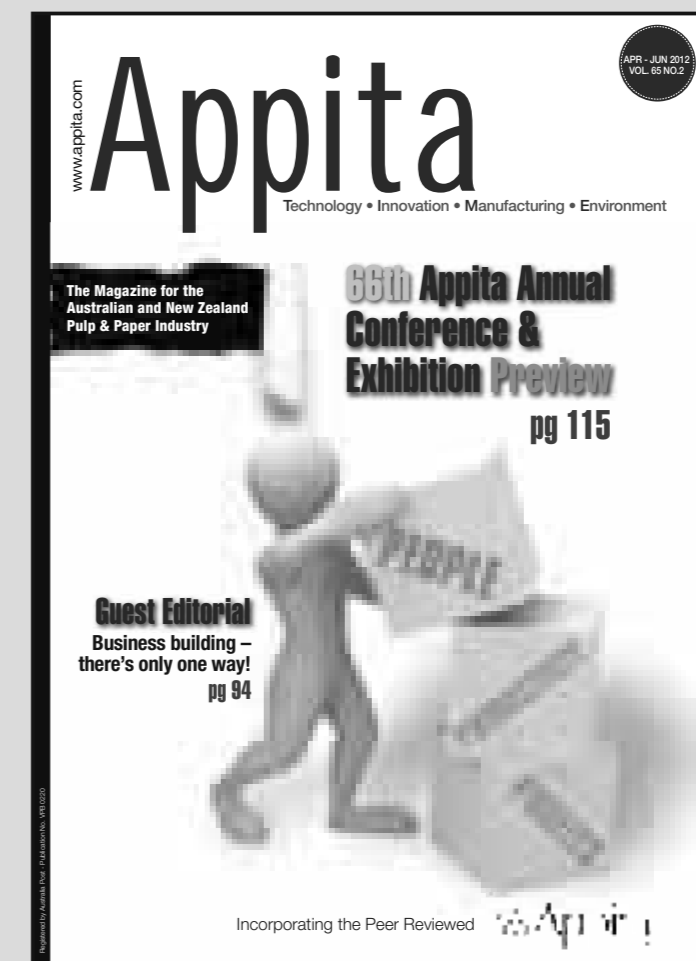
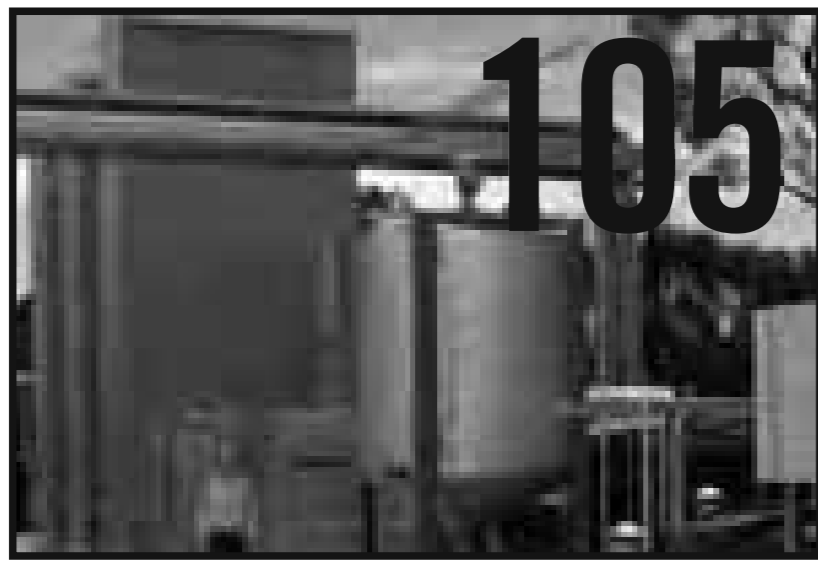
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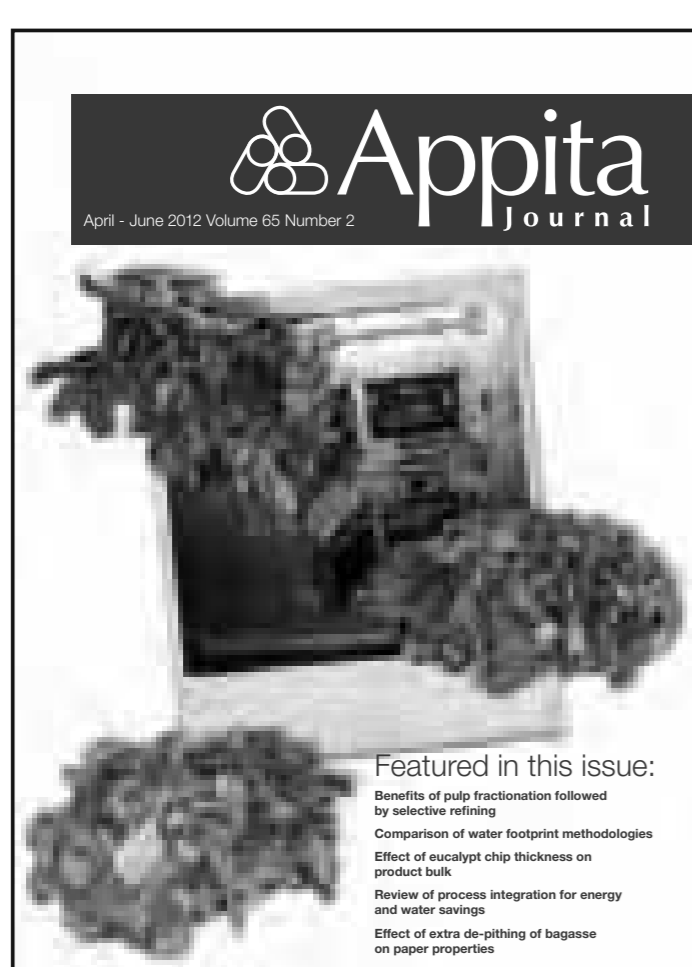
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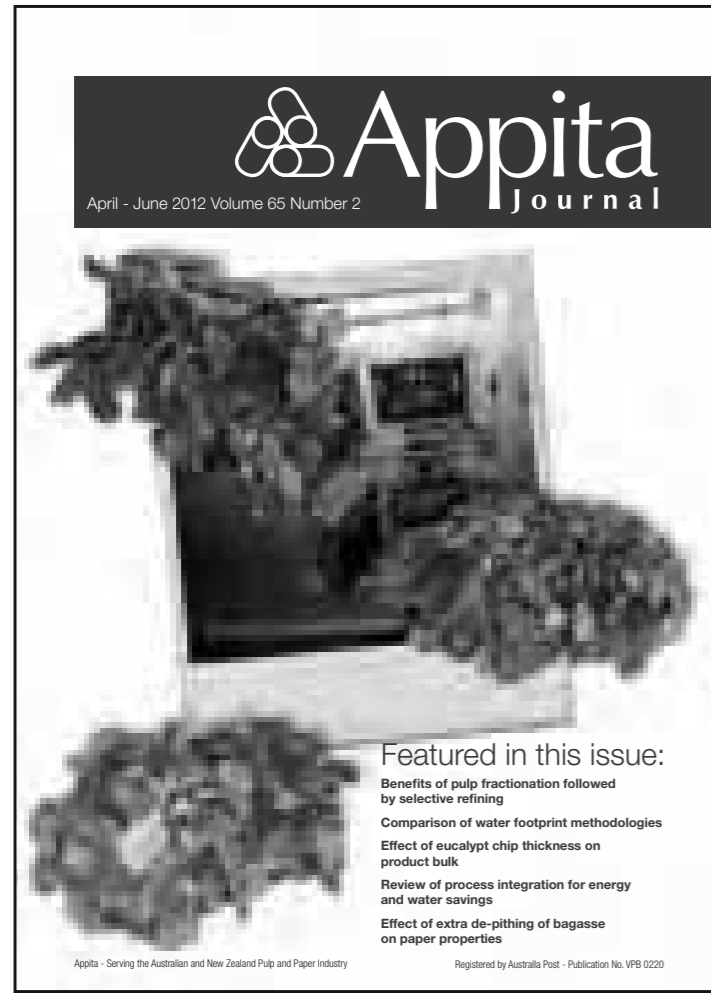
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### Featured in this issue:

- Benefits of pulp fractionation followed by selective refining
- Comparison of water footprint methodologies
- Effect of eucalypt chip thickness on product bulk
- Review of process integration for energy and water savings
- Effect of extra de-pithing of bagasse on paper properties

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**Cover Image.** Main pic: Picture of the multiple digester. Inset pic: Different chip thickness fractions used in this study. See paper by Peter de Morton, Mary Philipp, Nafty Vanderhoek and Keith White page 00.

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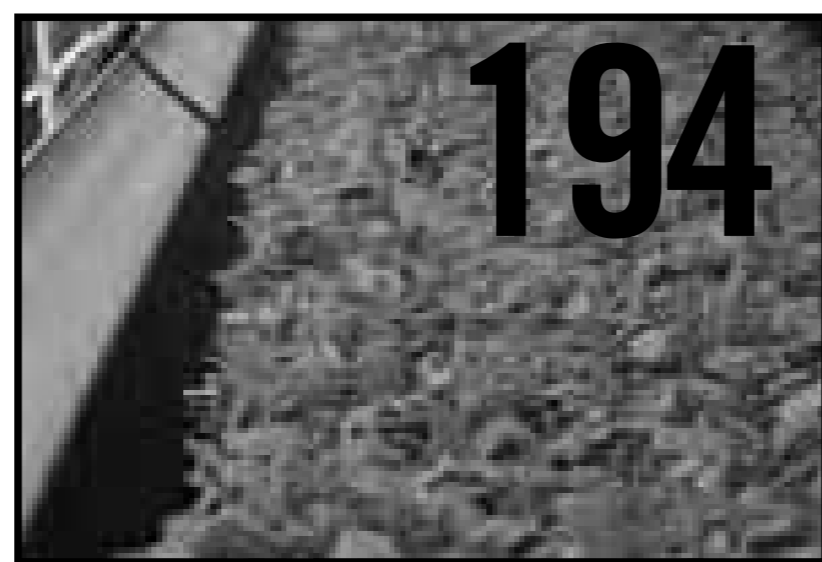
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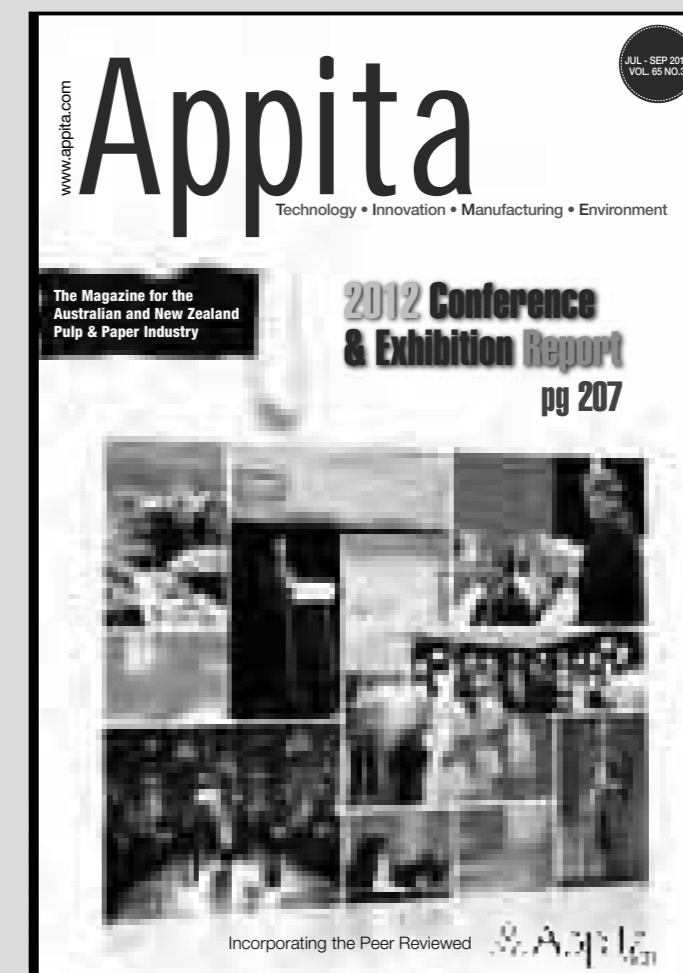
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## Appita Journal

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- Print mottle measurement – an alternative to subjective assessment
- Improving wet web strength and runnability
- Surface properties and print quality in coated papers
- Thermal paper image durability affected by coating formulation



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**Cover Image.** Composite picture of Graphs showing Mean % COD removal for trace element and added vitamins. See paper by Jason Barnett, Des Richardson, Karen Stack, Trevor Lewis page 237. Images of Fractures in wet web on pick-up fabric due to an excessive draw after press section. See paper by Elias Retulainen, Kristian Salminen, Hanna Lindqvist, Antti Oksanen, Anna Sundberg page 255.

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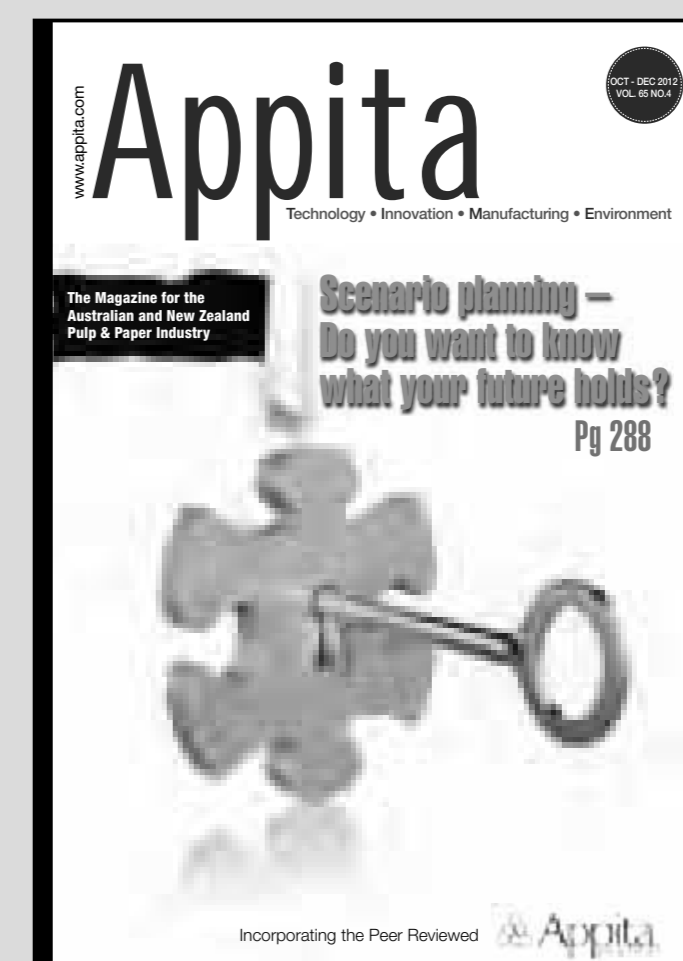
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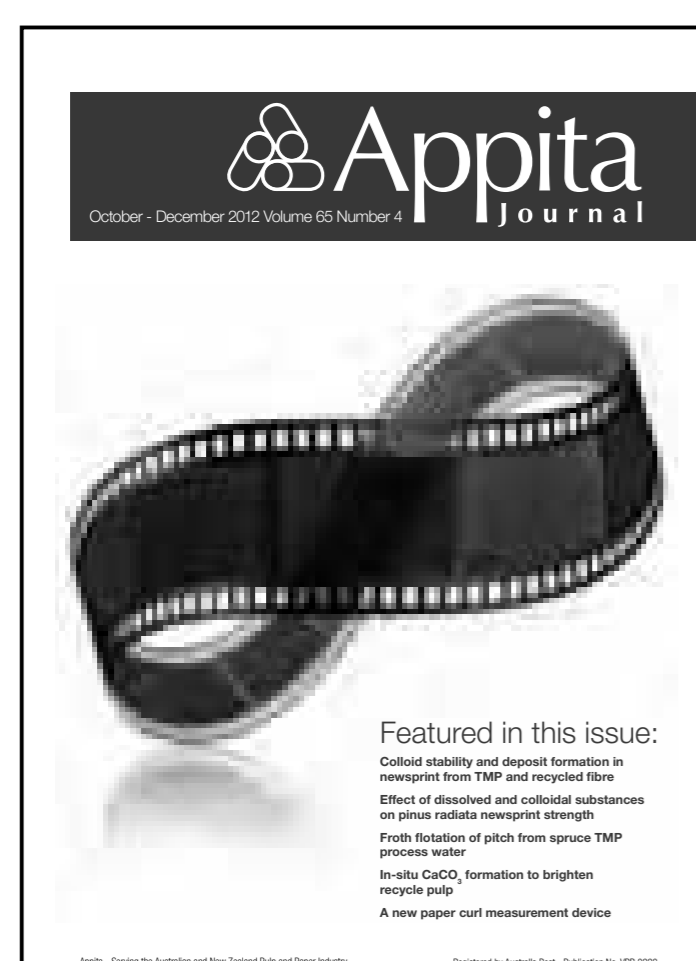
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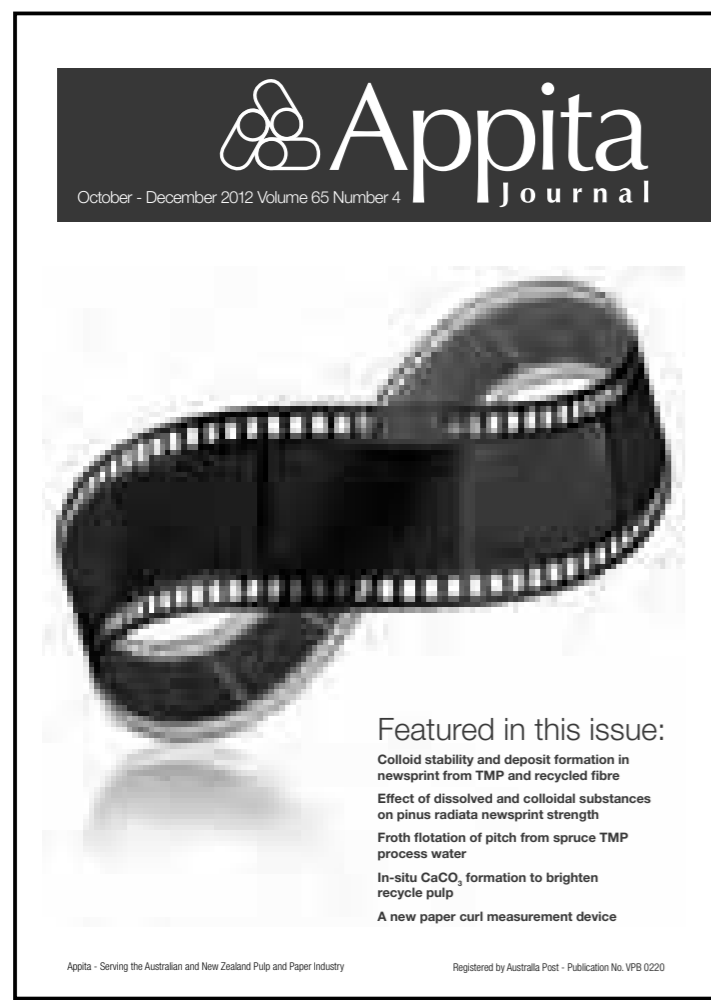
## Appita Journal

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Our flagship publication, Appita Journal, is a widely acclaimed peer-reviewed technical Journal published four times a year in January, April, July and October

### Featured in this issue:

- Colloid stability and deposit formation in newsprint from TMP and recycled fibre.
- Effect of dissolved and colloidal substances on pinus radiata newsprint strength.
- Froth flotation of pitch from spruce TMP process water
- In-situ CaCO<sub>3</sub> formation to brighten recycle pulp.
- A new paper curl measurement device.



**Cover Image.** Composite artwork of images taken from paper by Andrew Conn, Michael Reich, Rafik Faltas and Tristen Branson. See page 352.

# Appita Journal

Publishing Peer-Reviewed papers in the science and technology of pulp, paper, printing and packaging

October - December 2012 • Volume 65 Number 4

## FULL PAPERS

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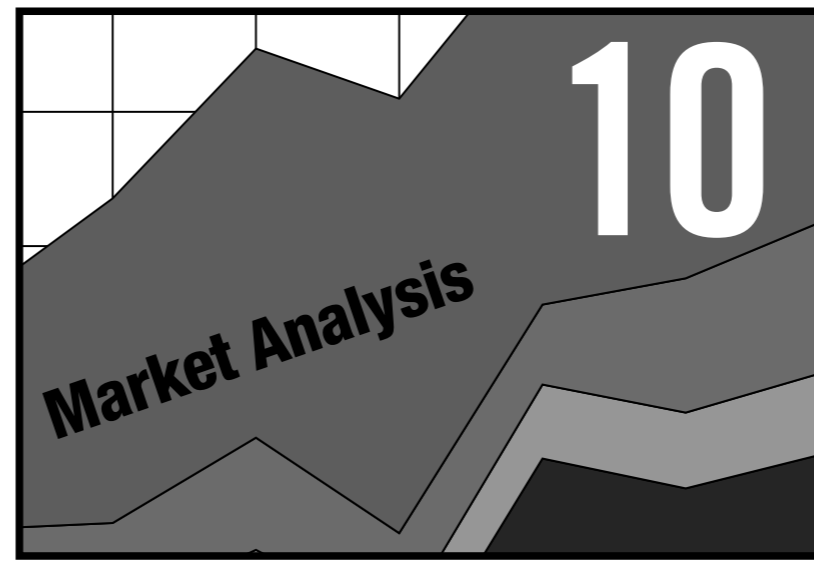
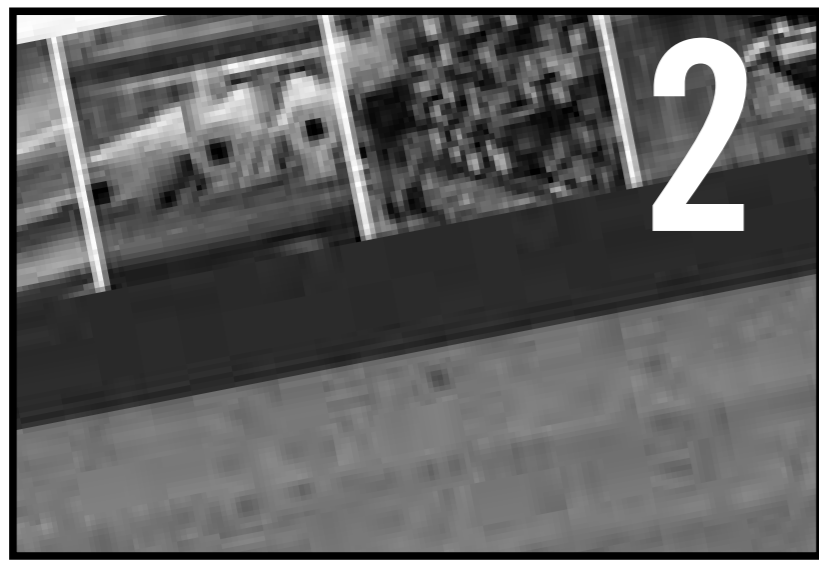
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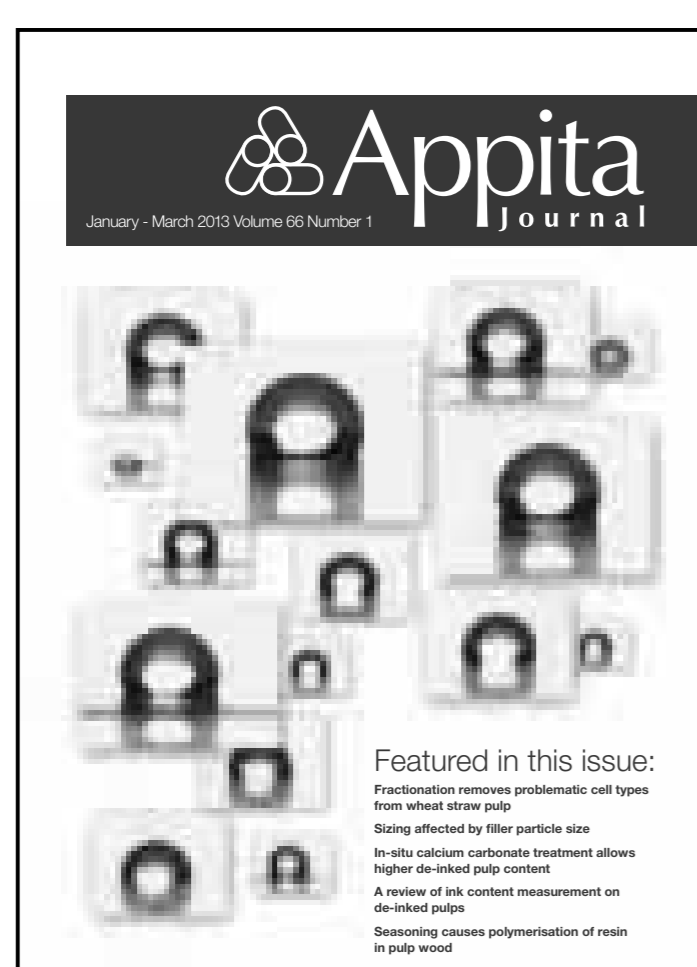
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- Fractionation removes problematic cell types from wheat straw pulp
- Sizing affected by filler particle size
- In-situ calcium carbonate treatment allows higher de-inked pulp content
- A review of ink content measurement on de-inked pulps
- Seasoning causes polymerisation of resin in pulp wood

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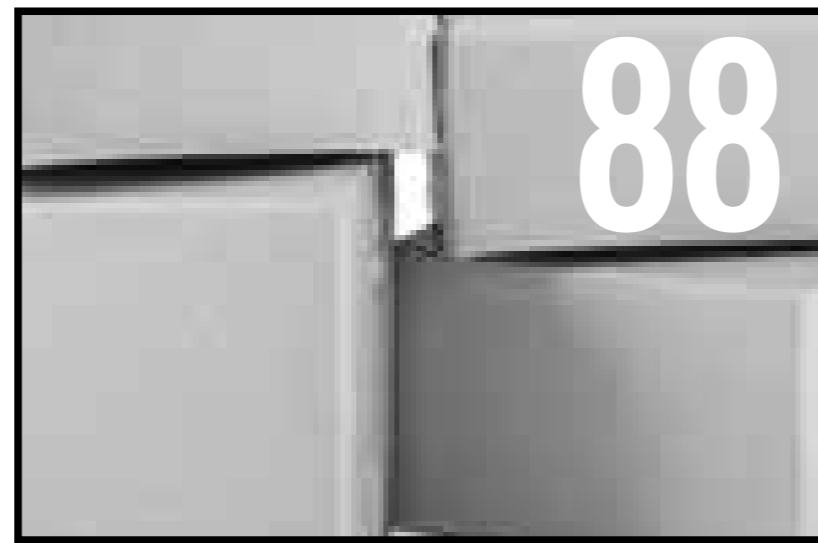
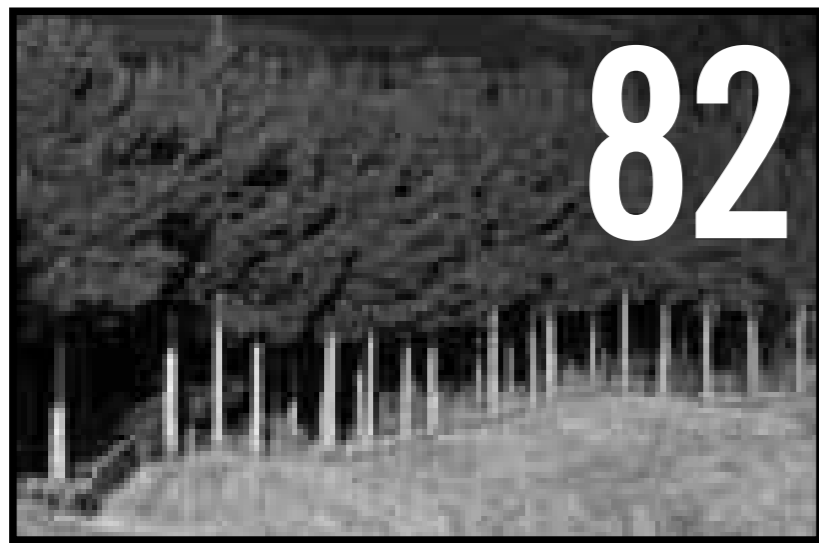
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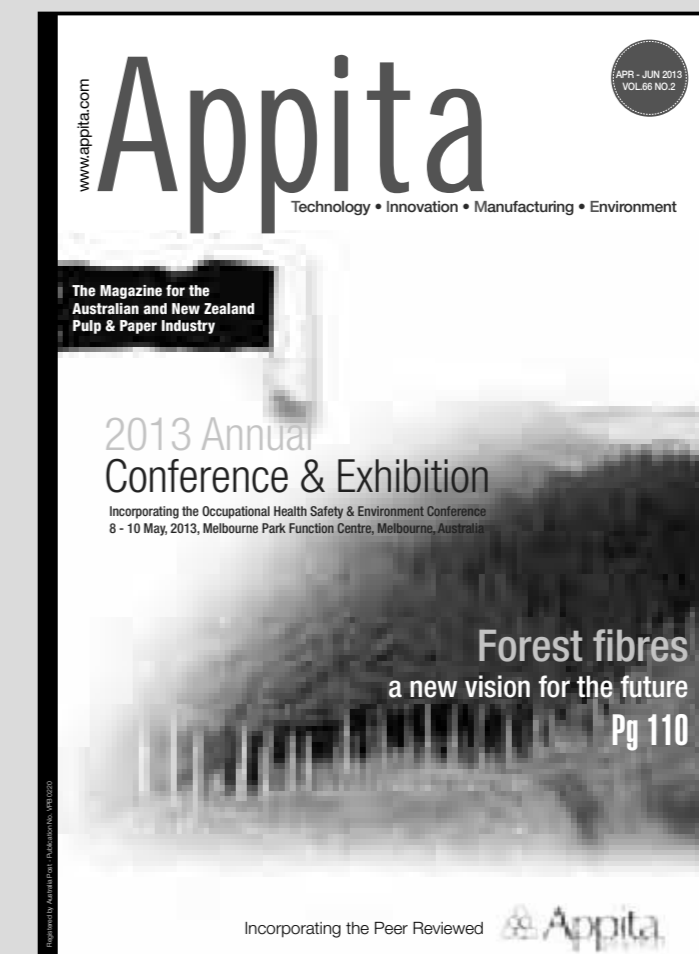
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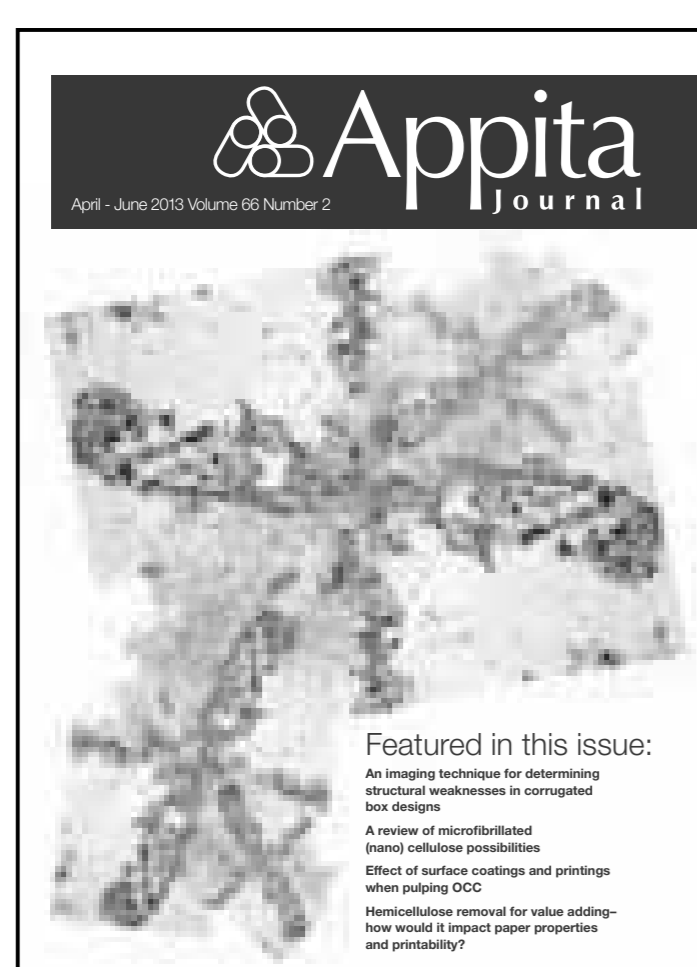
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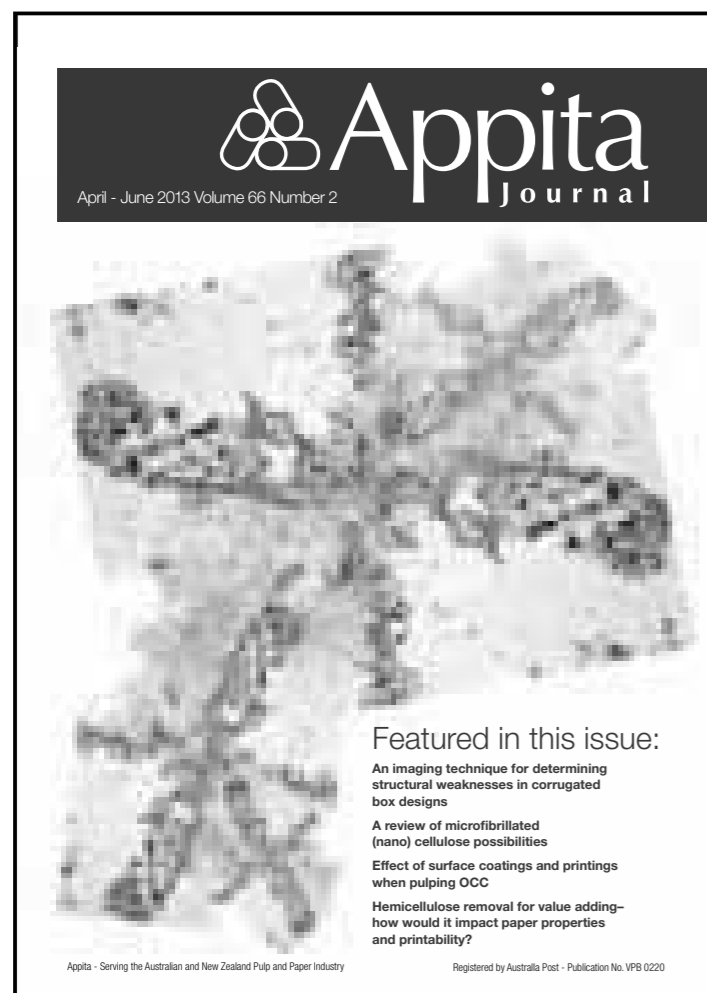
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- Hemicellulose removal for value adding—how would it impact paper properties and printability?
- Effect of surface coatings and printings when pulping OCC
- A review of microfibrillated (nano) cellulose possibilities
- An imaging technique for determining structural weaknesses in corrugated box designs





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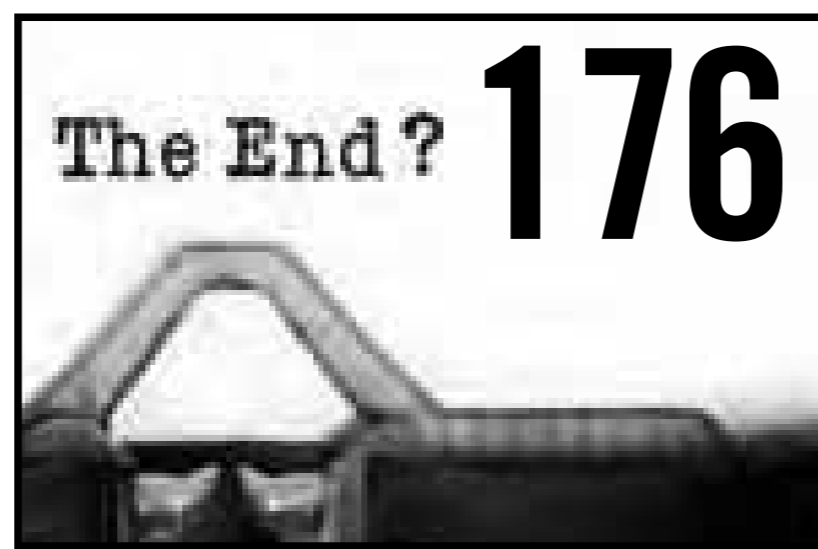
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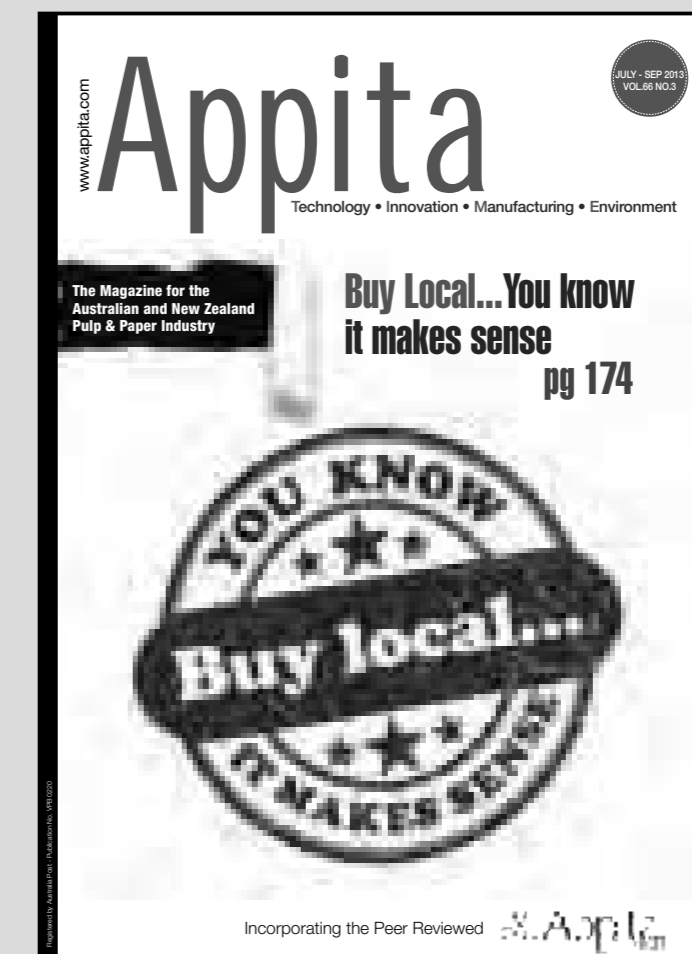
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- Improved papers with preflocculated talc
- Zeolite for papers – a review
- Effect of magnesium based bleaching on paper properties
- Extraction temperature effects on dissolving pulp



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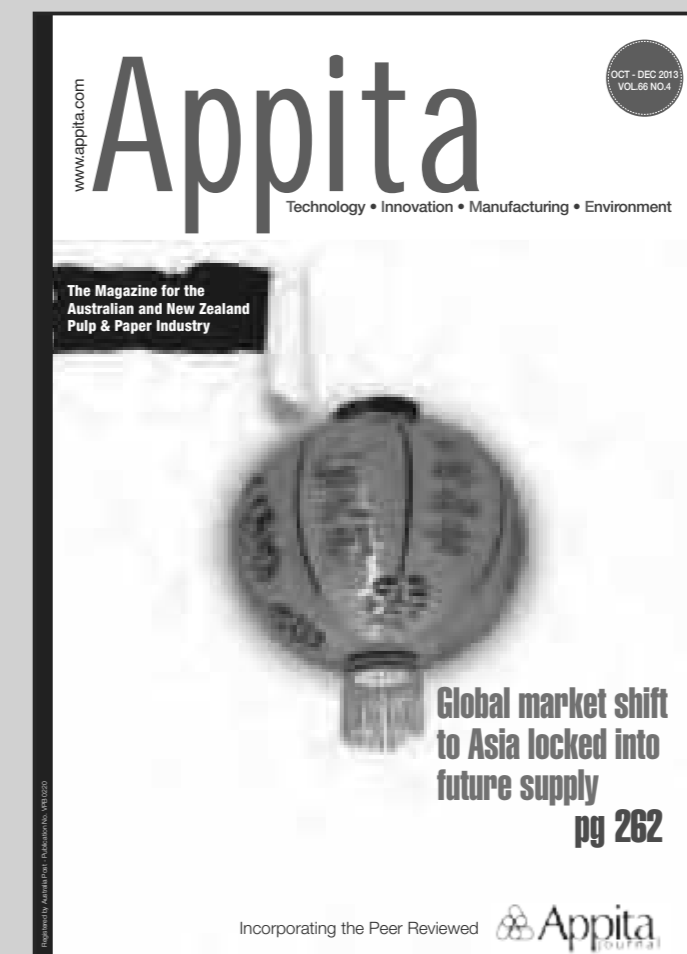
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## Appita Journal

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### Featured in this issue:

- Controlling impregnation of eucalypt chips
- Measuring lint on-line
- AOX formation in soda-AQ bagasse pulping
- Size and shape characterization of micro celluloses and wood powders
- Mild steam explosion as a pretreatment biorefinery process



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**Cover Image.** Artwork of Figs 5 and 8 taken from the paper by Rosiana Lestiani, Warren Batchelor, Paul Banham and Figs 6, 7, and 8 from the paper by Kerstin Jedvert, Anna Saltberg and Hans Theliander. See pages 299 and 322.

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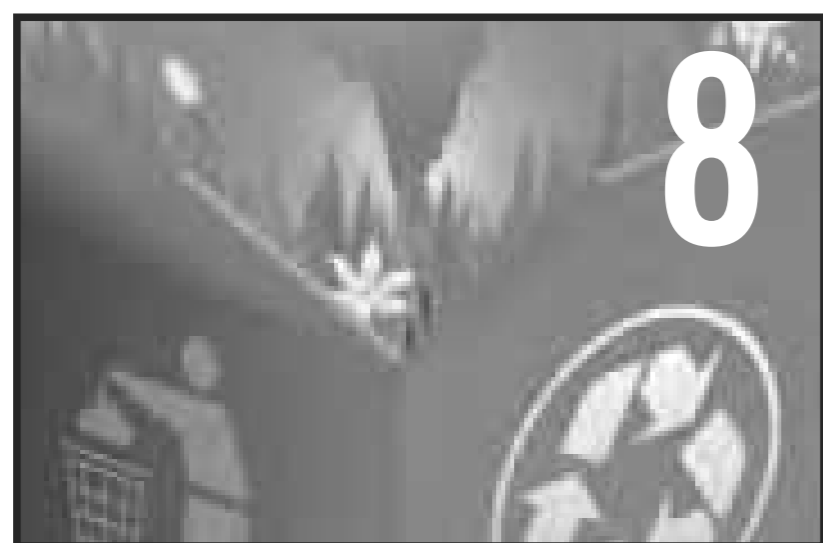
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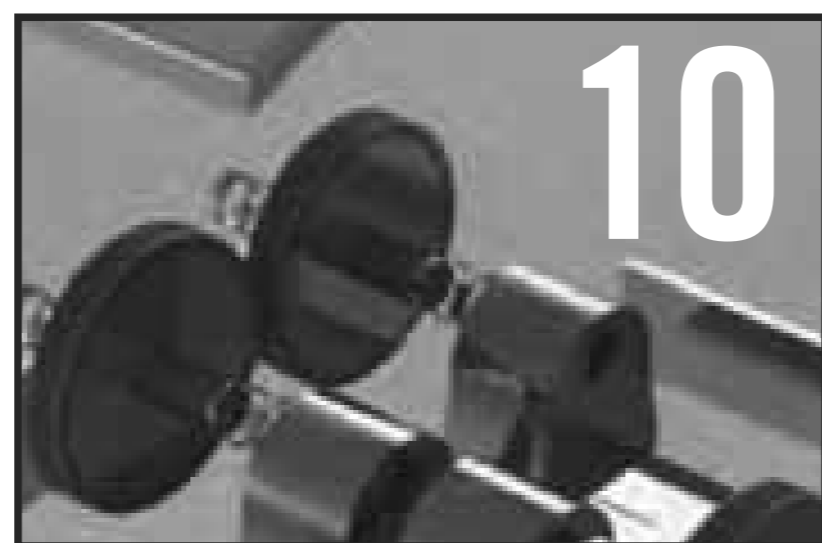
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- Factors controlling TRS emissions
- Reducing heat-induced darkening in bleached pulps
- Doubling the chromosomes in acacia for new pulp properties
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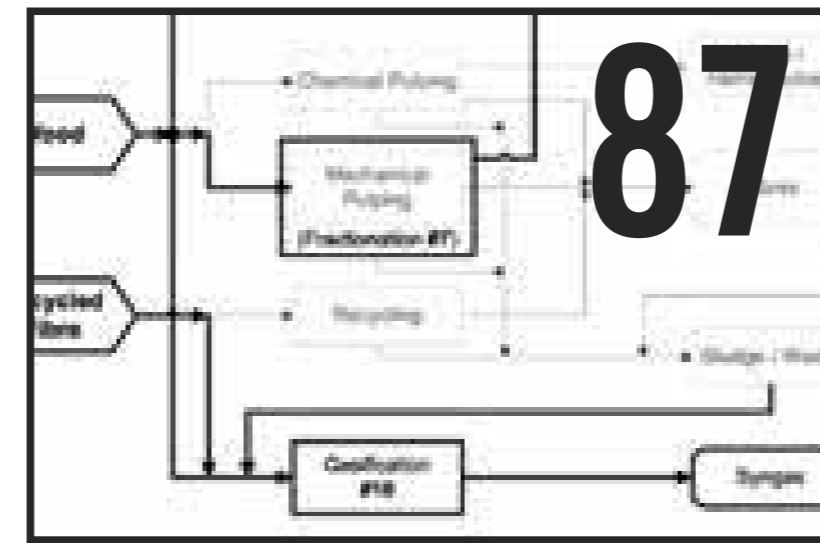
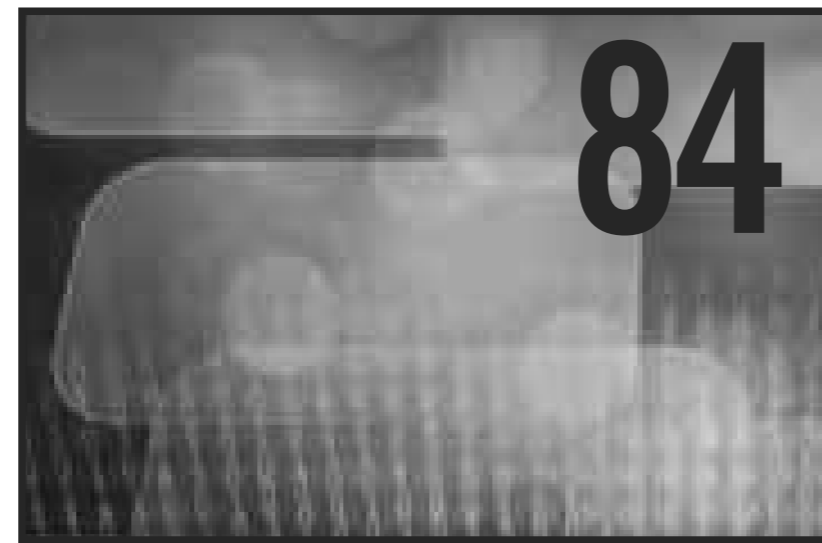
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- A cheap paper filler from spent brewing grain.
- A pulping comparison between sorghum, Arundo and bagasse.
- Reducing stickies - flow cytometry measures interactions between extractives and mineral adsorbents.
- A new non-contact method for measuring roughness.

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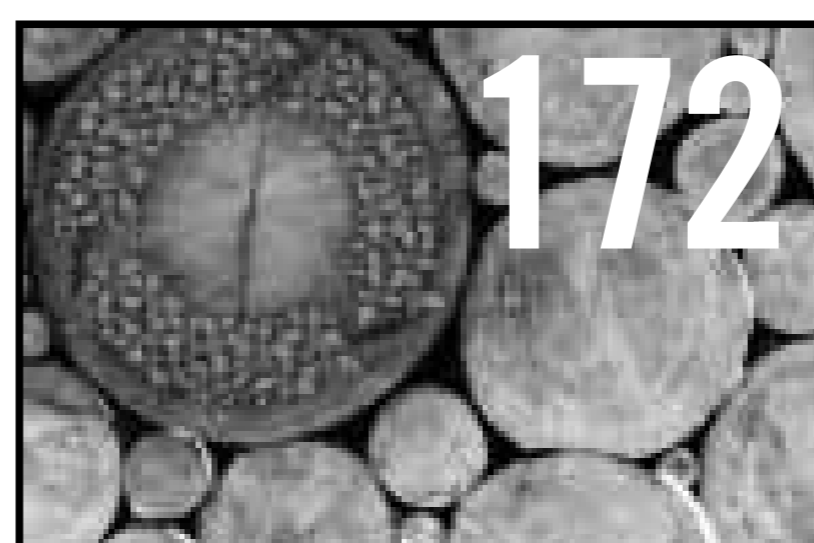
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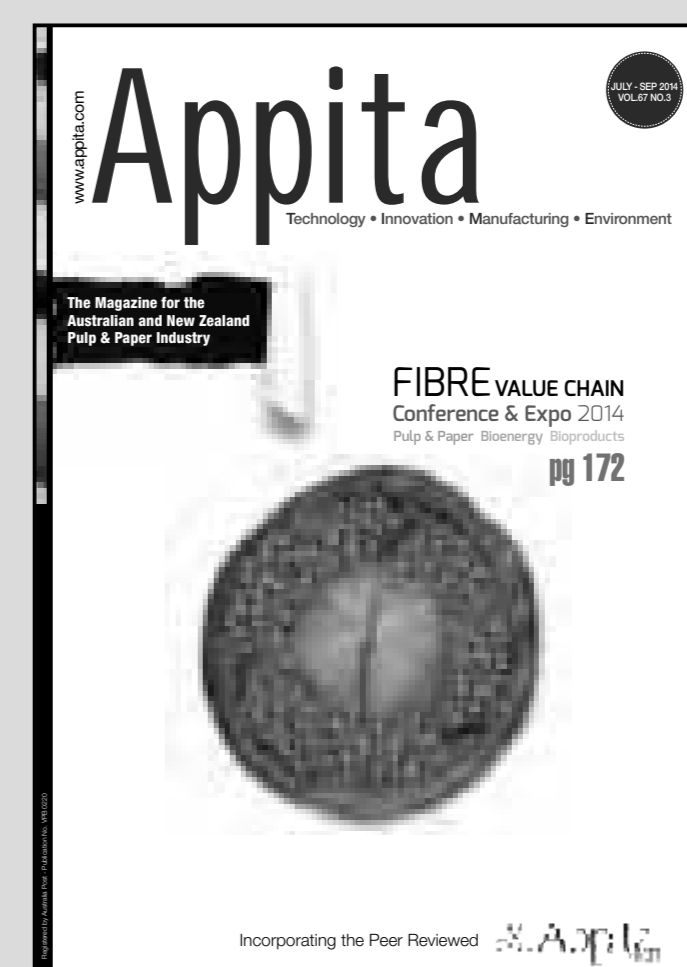
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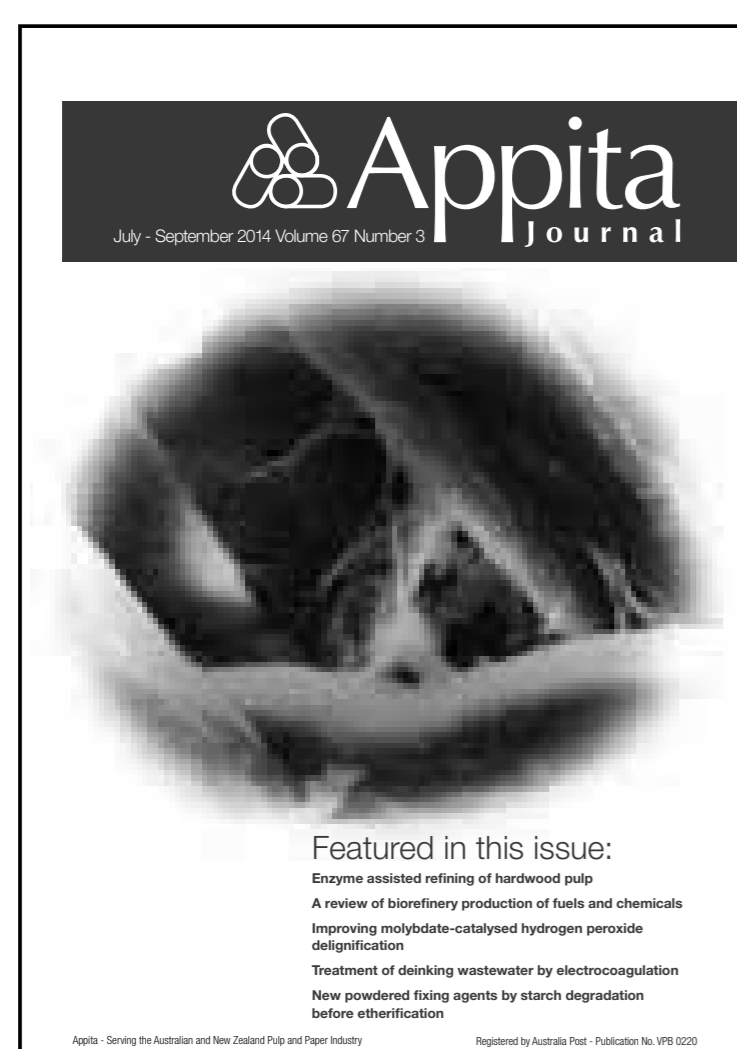
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- New powdered fixing agents by starch degradation before etherification
- Treatment of deinking wastewater by electrocoagulation
- A review of biorefinery production of fuels and chemicals
- Enzyme assisted refining of hardwood pulp
- Improving molybdate-catalysed hydrogen peroxide delignification

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**Cover Image.** Artwork of Fig 1 taken from the paper by Rashmi Singh, Nishi K. Bhardwaj and Bijan Choudhury. See page 226.

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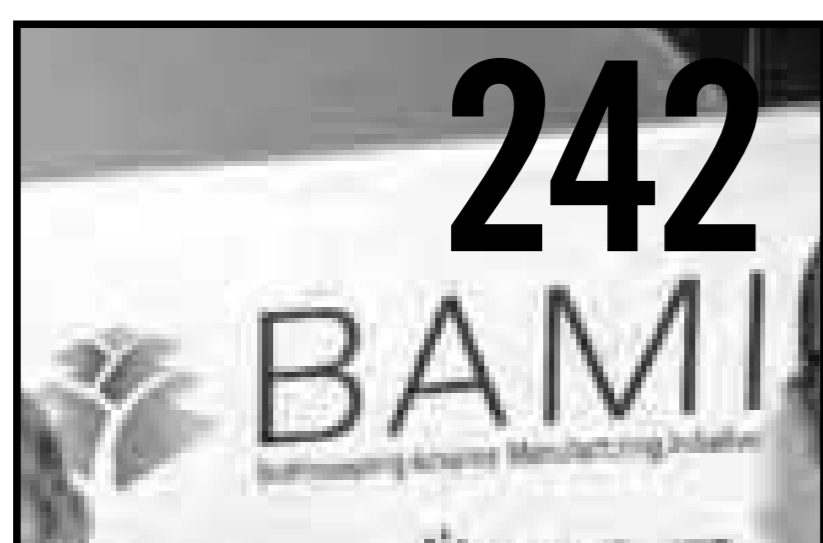
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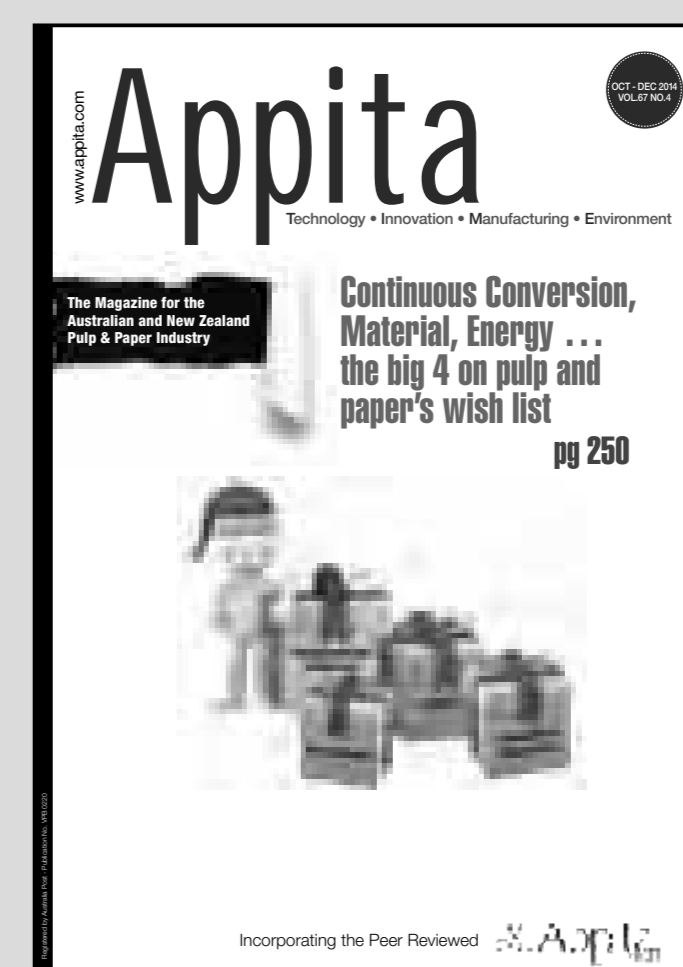
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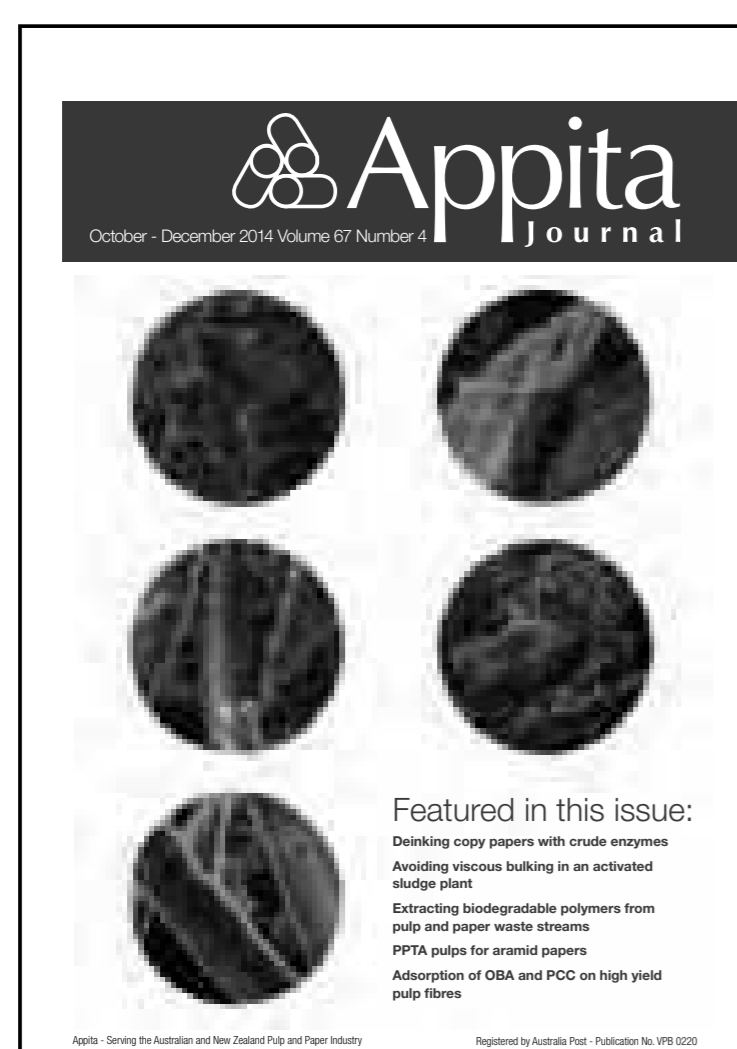
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- Deinking copy papers with crude enzymes
- Avoiding viscous bulking in an activated sludge plant
- Extracting biodegradable polymers from pulp and paper waste streams
- PPTA pulps for aramid papers
- Adsorption of OBA and PCC on high yield pulp fibres

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**Cover Image.** Artwork taken from the papers by Puneet Pathak, Nishi K. Bhardwaj and Ajay K. Singh (see page 291) and Zhaoqing Lu, Ming Jiang, Meiyun Zhang, Shunxi Song and Bin Yang (see page 316).

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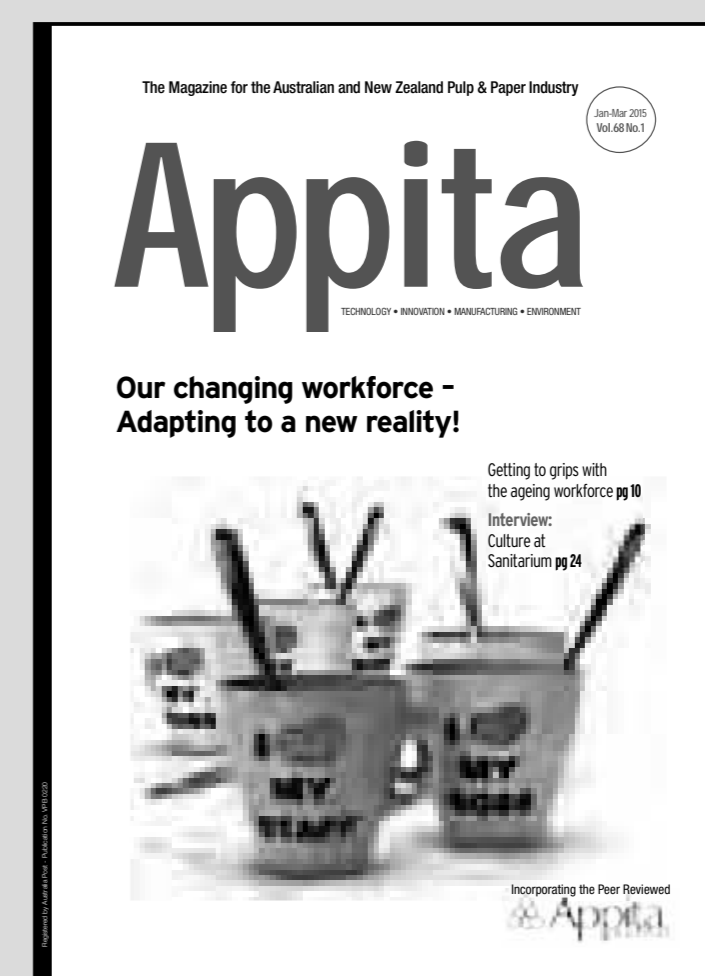
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- The development of stress and strength in paper during drying and rewetting
- Simulation of the in-built stress and strength development in a multiply board
- Benefits of inter-stage ozone and oxygen treatment in the TMP process
- Determining key factors in continuous pulping through neural network modelling
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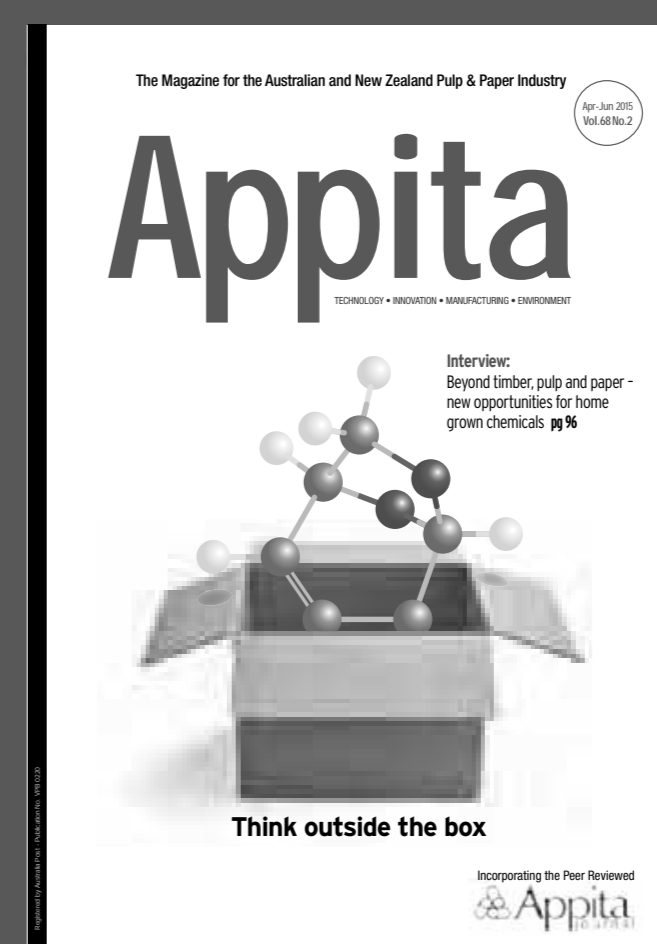
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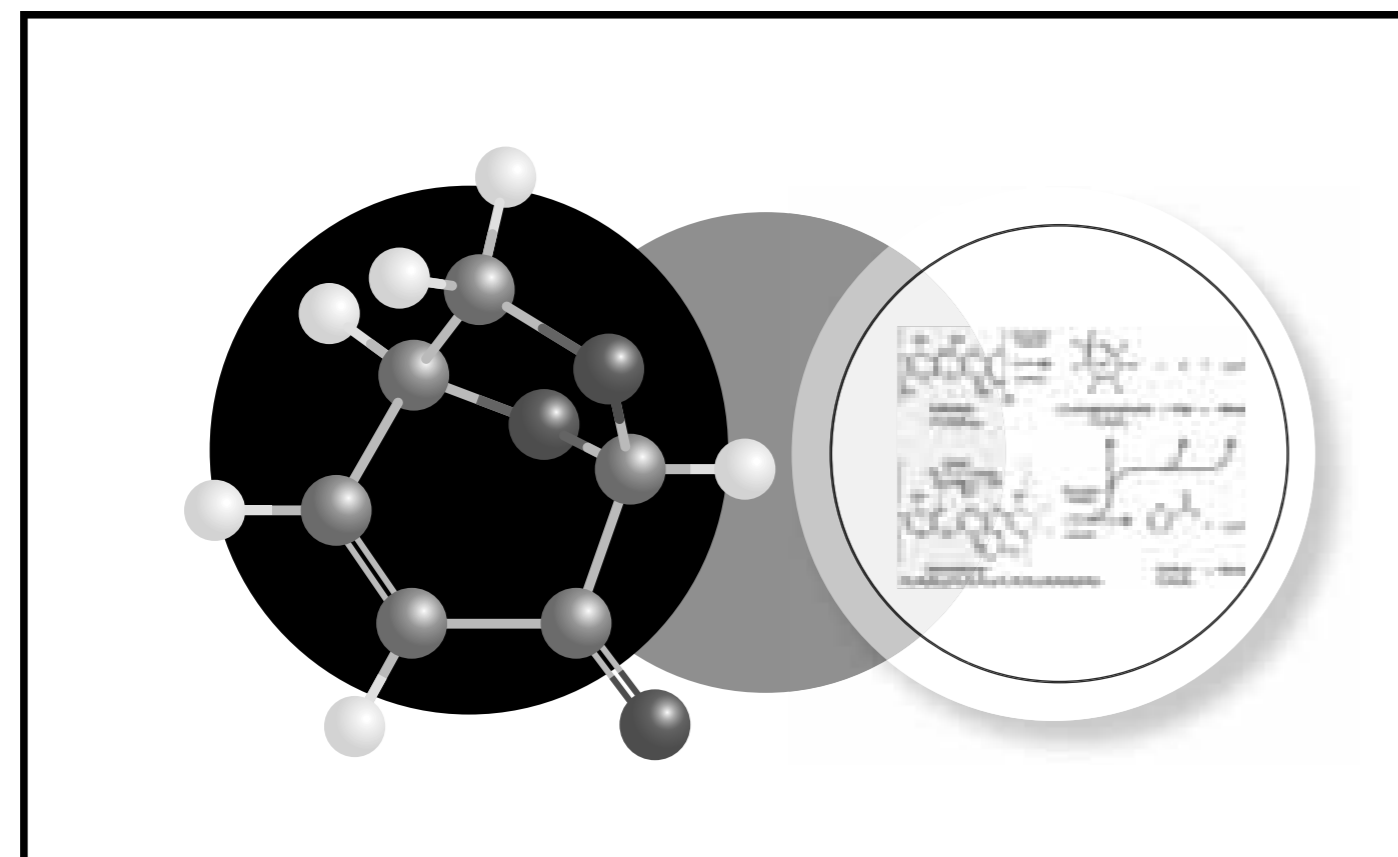
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Our flagship publication, *Appita Journal*, is a widely acclaimed peer-reviewed technical Journal published four times a year in January, April, July and October

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- Mapping and modelling of optical properties from pulp to super calendered paper
- Evaluation of recycling potential of ultrafiltered alkaline bleaching effluents
- Molecular mass distribution of sulfur-free lignin from alkaline pulping preceded by hot-water-extraction
- Online measurement of the bubble size distribution in medium-consistency oxygen delignification
- Relationship between fibre bonding structure and tensile strength for papers made from recycled and virgin kraft pulps



# Appita Journal



Publishing peer-reviewed papers in the science and technology of pulp, paper, printing and packaging

April - June 2015 • Volume 68 Number 2

## FULL PAPERS

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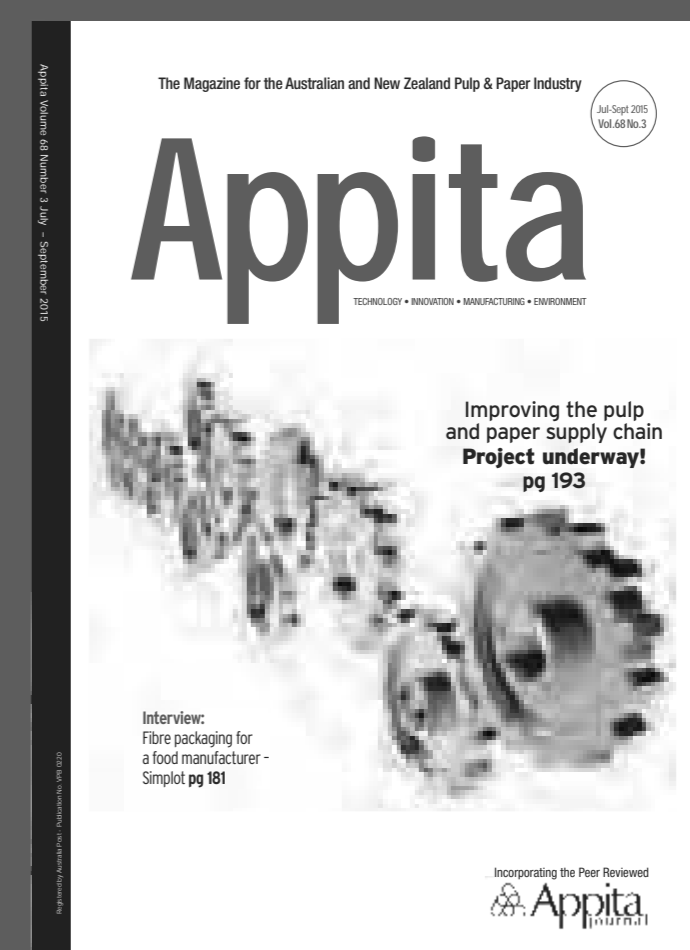
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- Technical evaluation of a new automated sizing tester
- Characterising agglomeration phenomena of calcium carbonate and fines
- Mill-based evaluation of a new tissue creping adhesive system
- Higher pollutant levels shown to have little impact on treatment efficiency
- Diverse pulp washing systems - how to compare efficiencies



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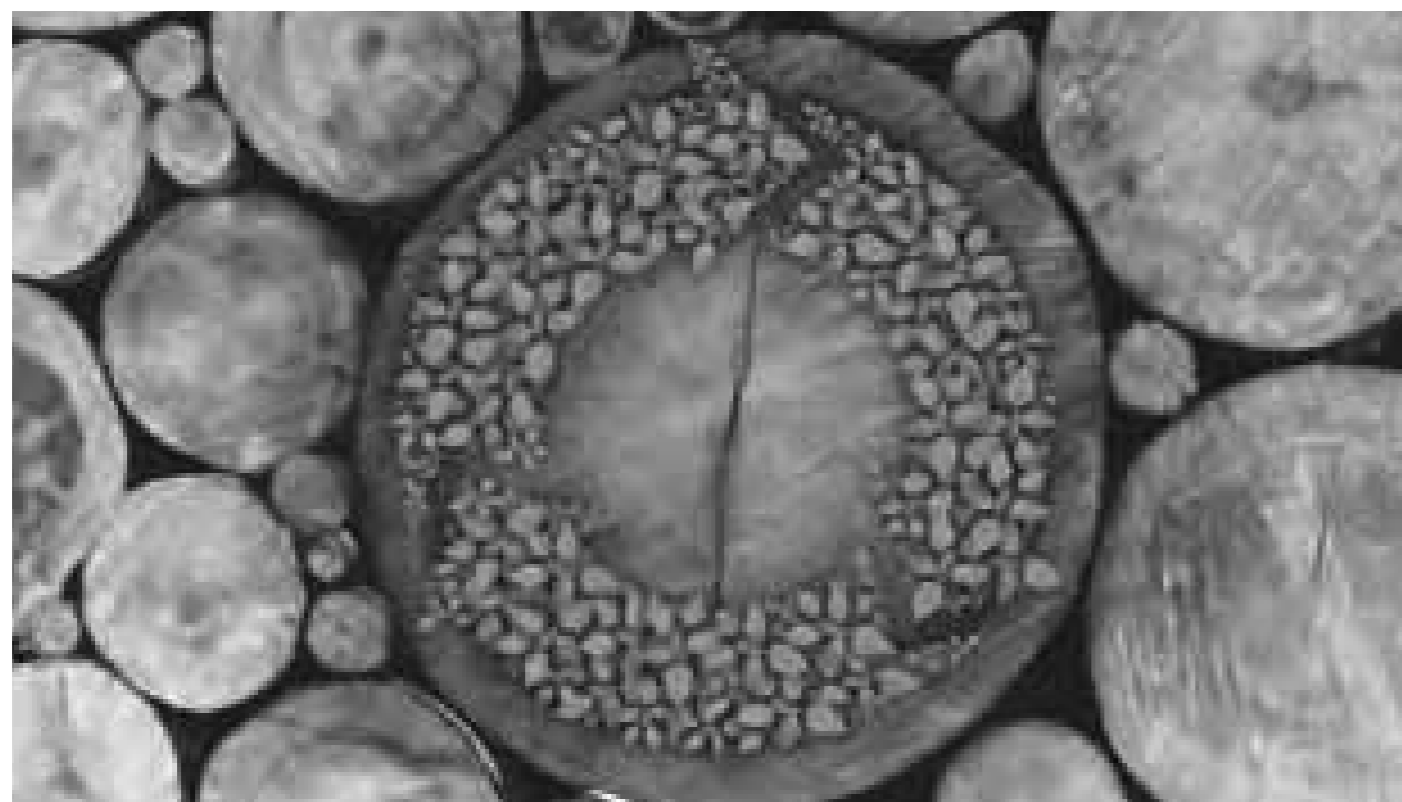
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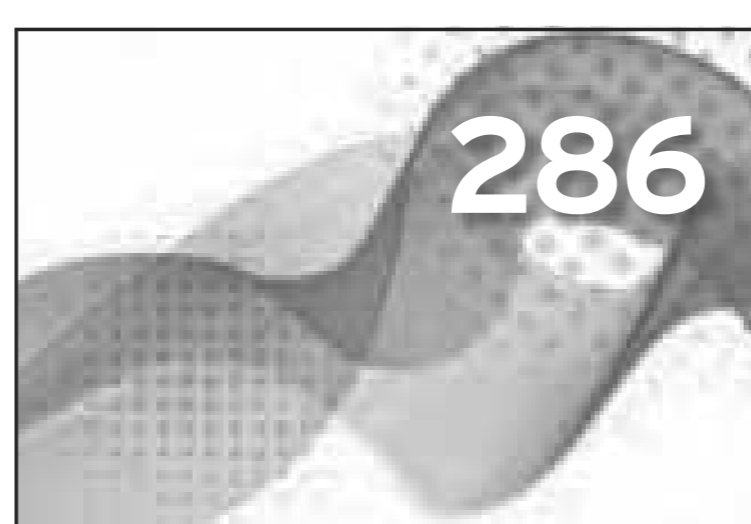
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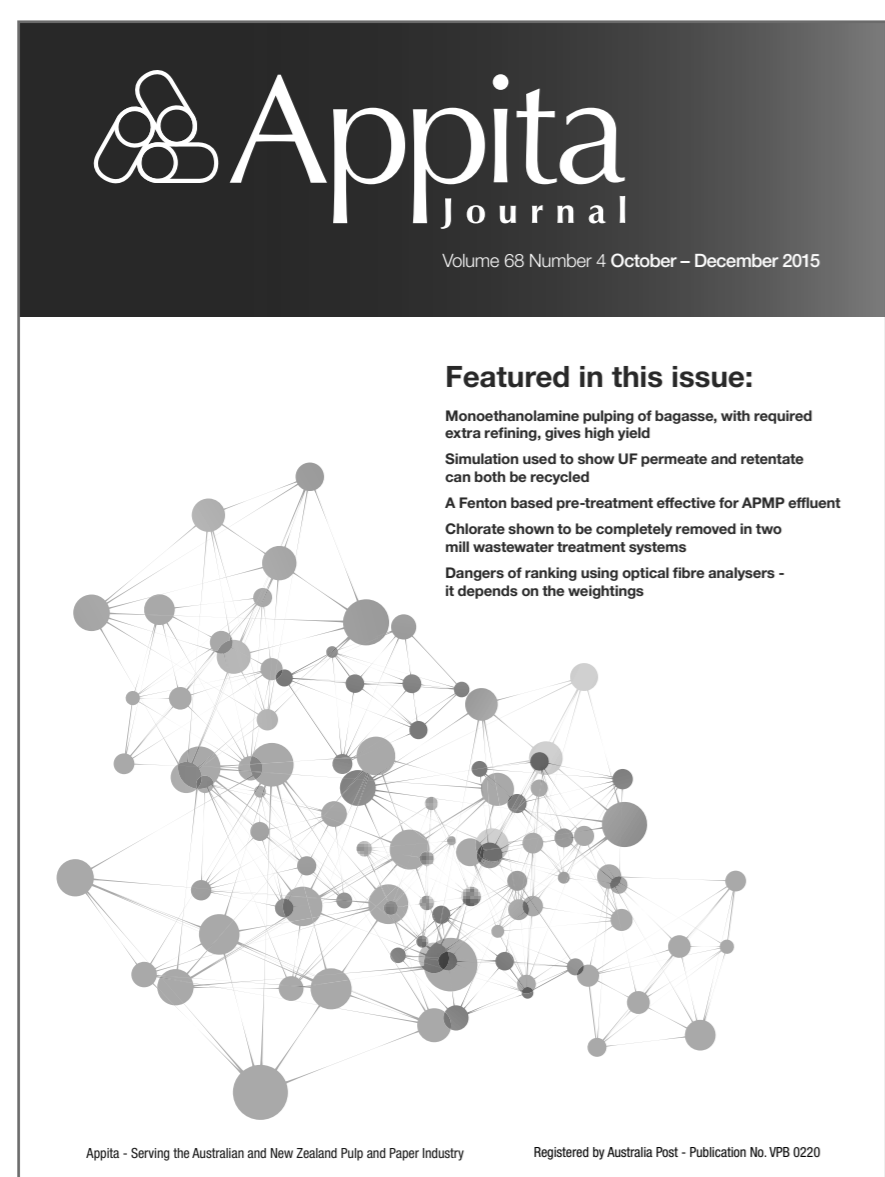
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  - Fate of chlorate during ECF-bleached-pulp wastewater treatment
  - Weighted averages and distributions of fibre characteristics of mechanical pulps
- Part I: Alternative methods of weighting data from an optical analyser produce averages that rank pulps differently



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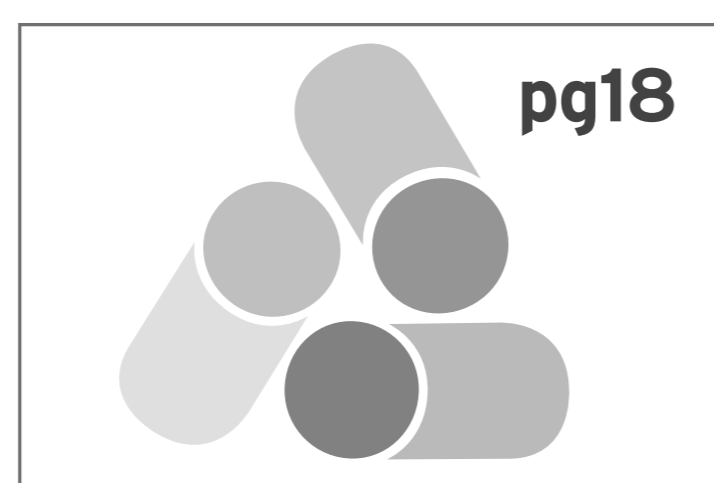
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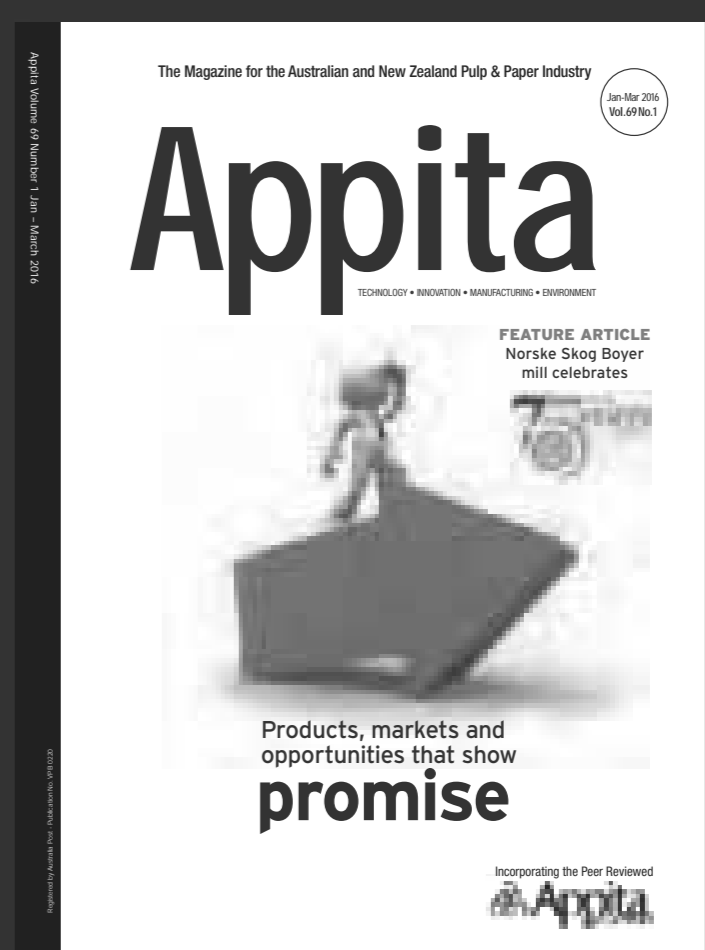
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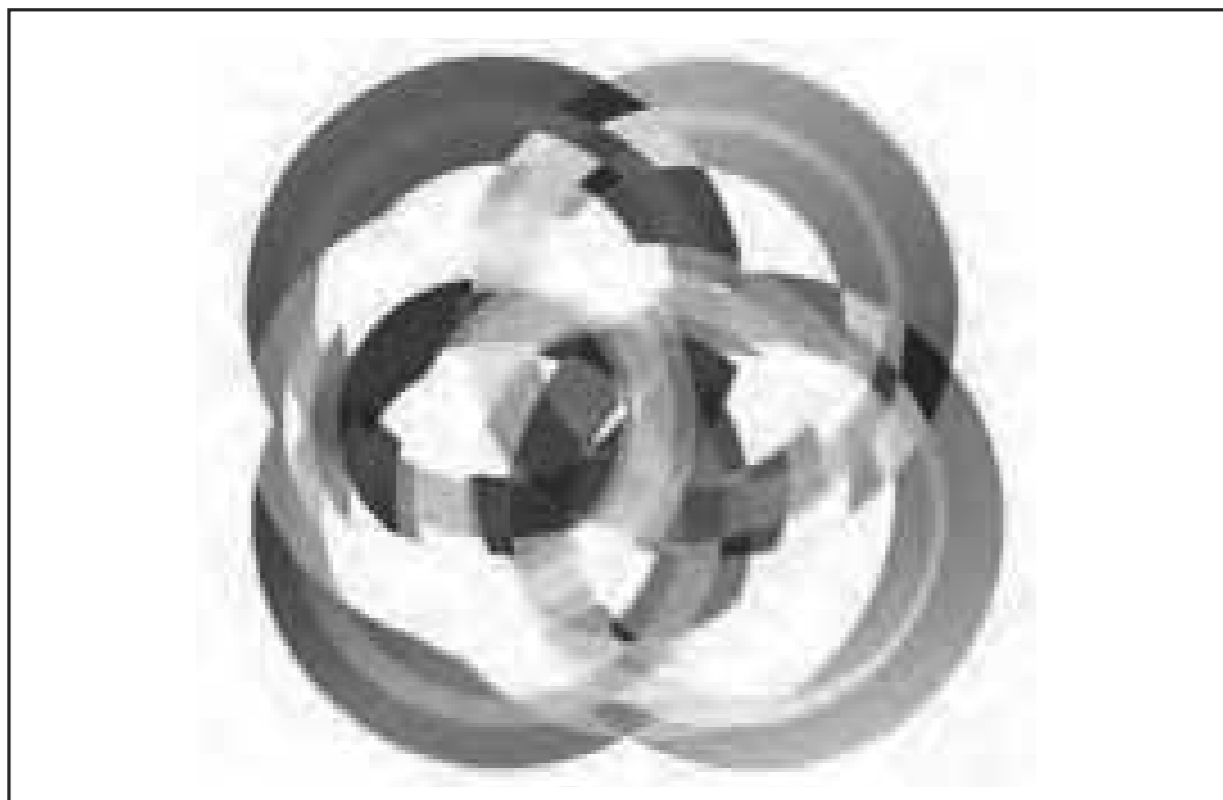
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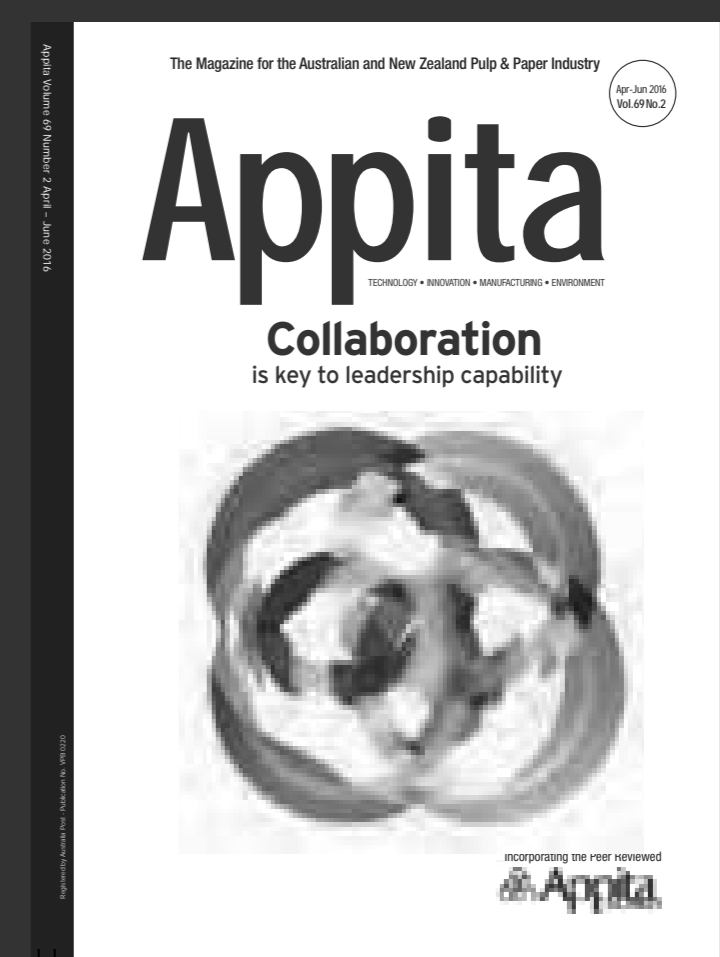
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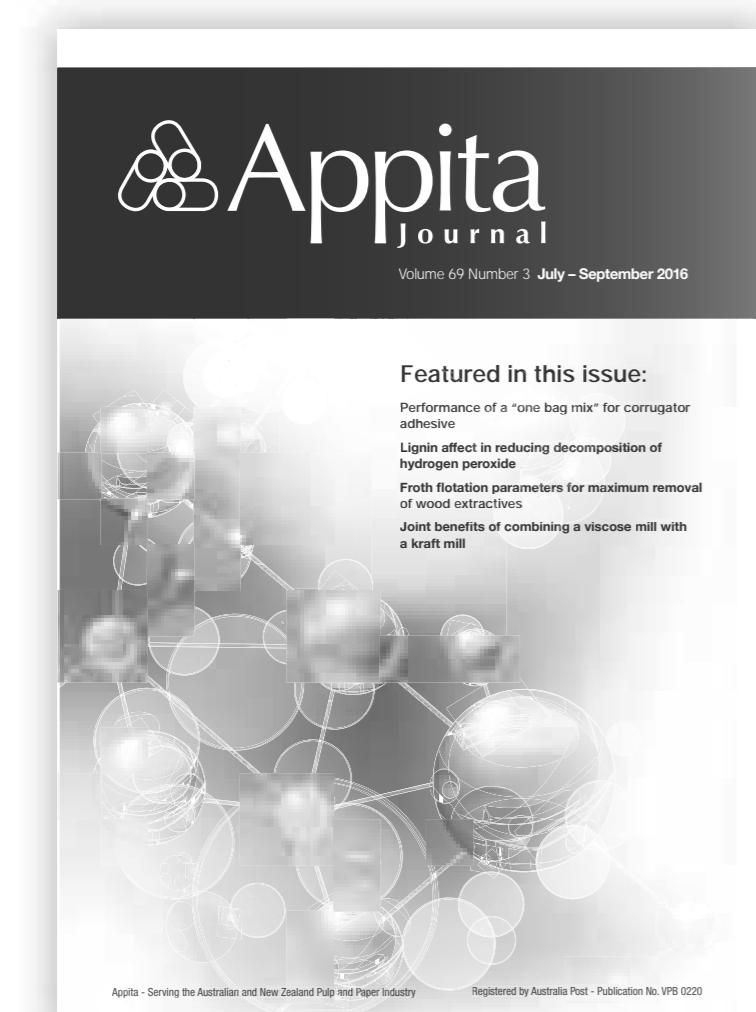
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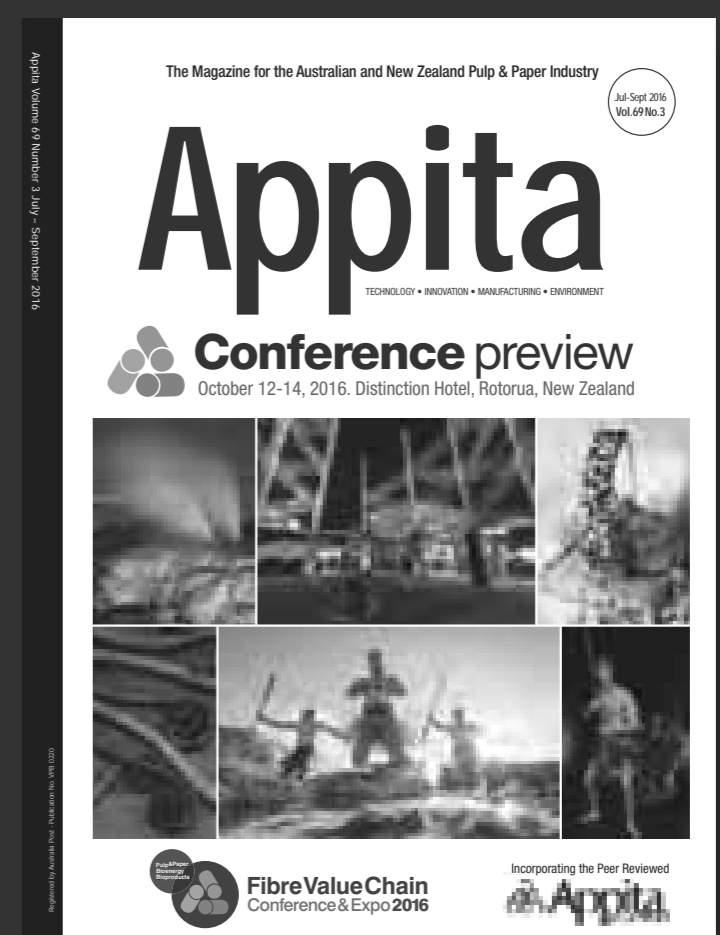
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- Performance of a "one bag mix" for corrugator adhesive
- Lignin affect in reducing decomposition of hydrogen peroxide
- Froth flotation parameters for maximum removal of wood extractives
- Joint benefits of combining a viscose mill with a kraft mill



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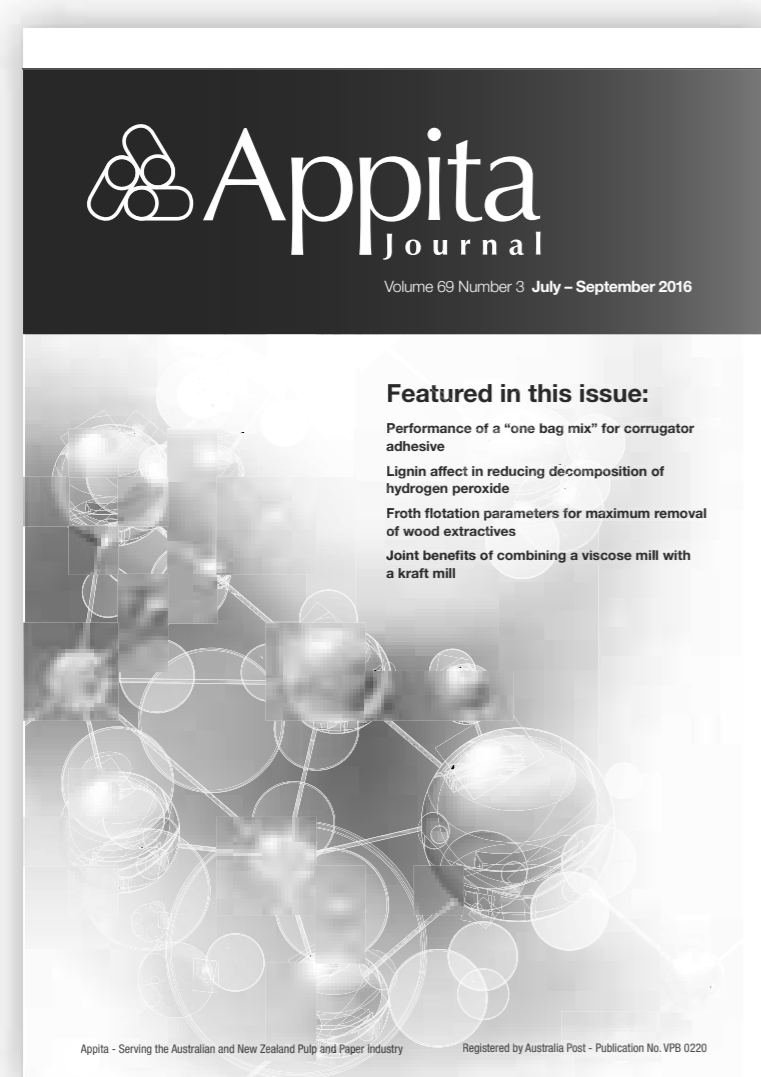
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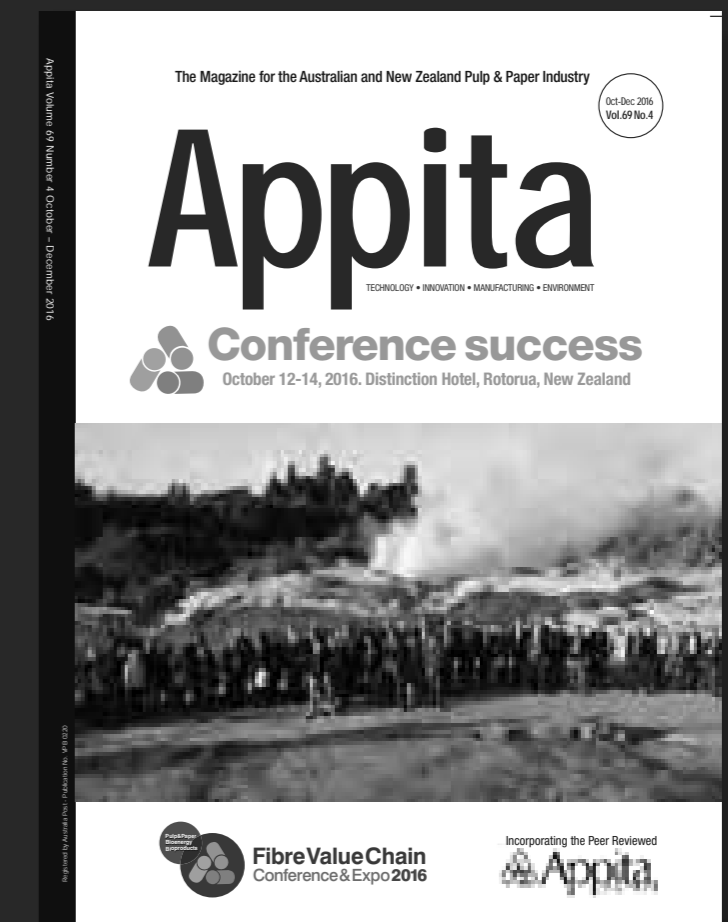
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Benefits of in-situ precipitation of calcium silicate filler.

Any precautions required for liquid emissions in the manufacture  
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Fillers and activating agents for wood plastic composites.



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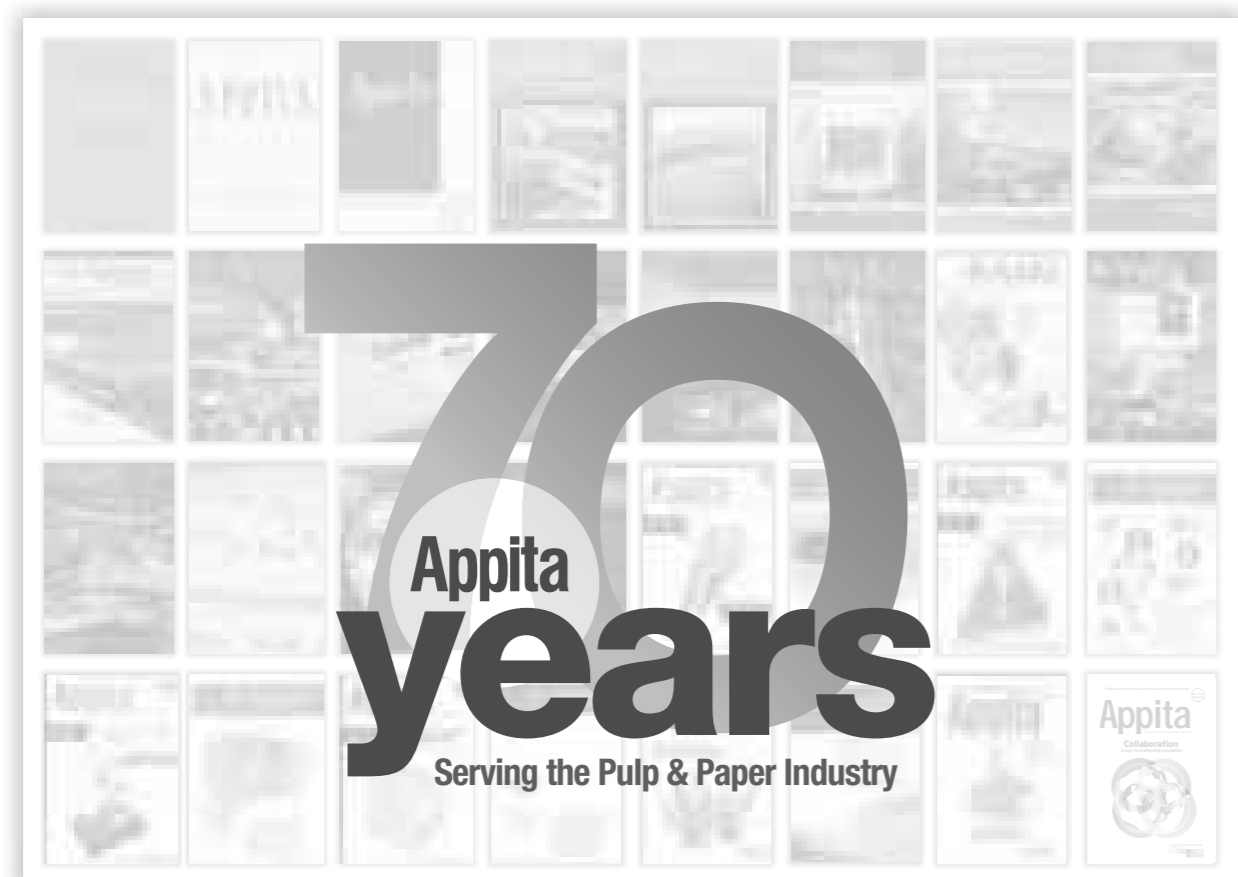
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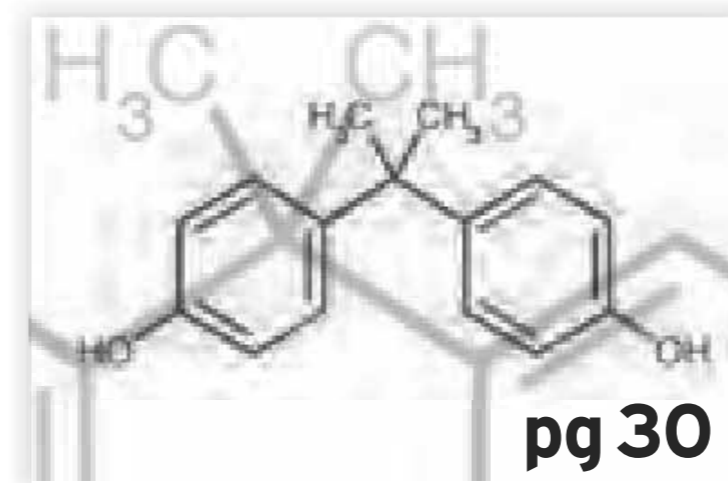
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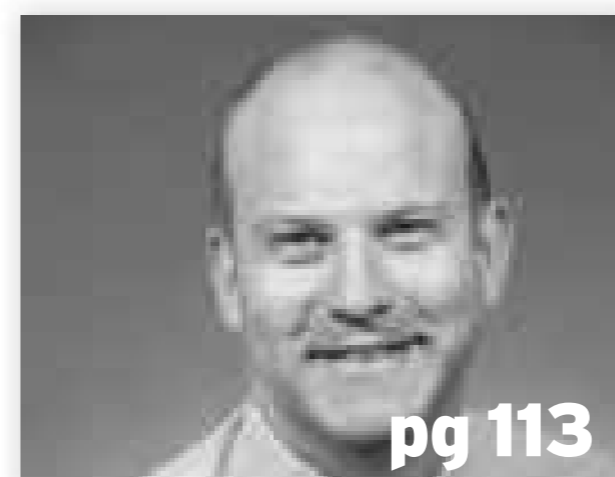
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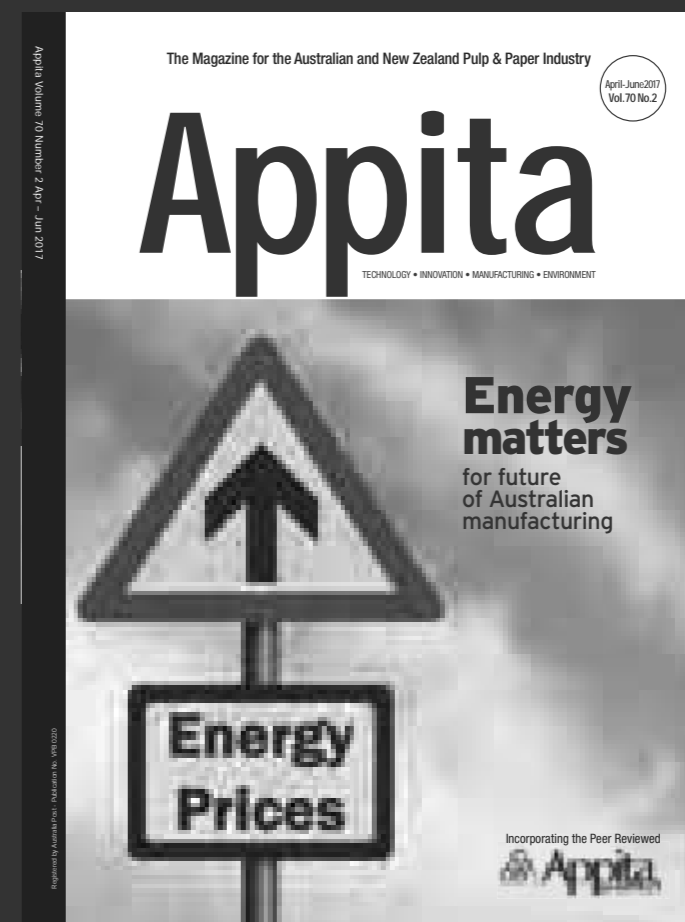
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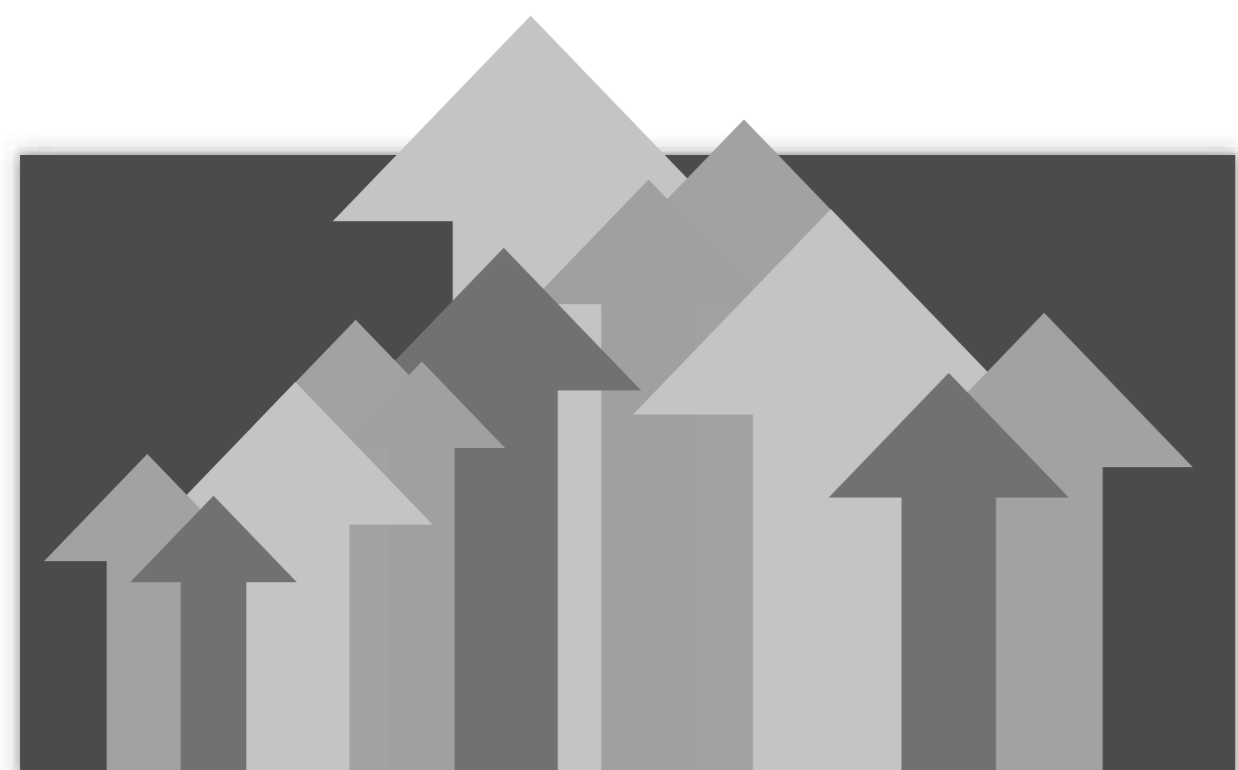
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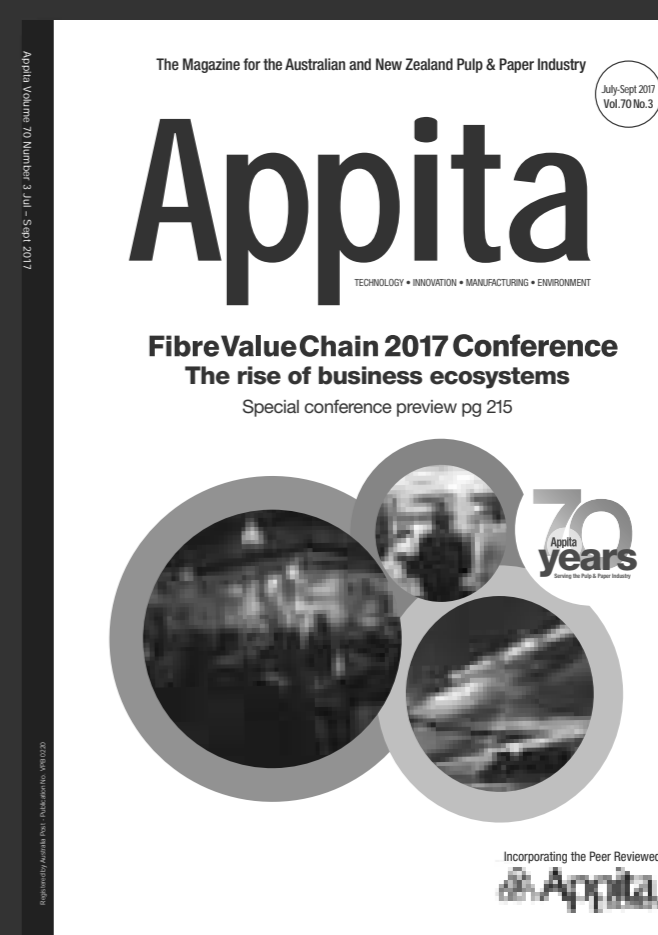
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- Characterization of biobased latex dispersions
- Improved reactivity of kraft pulp with cellulases
- Early studies into the influence of fibre morphology on paper properties
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# Appita JOURNAL

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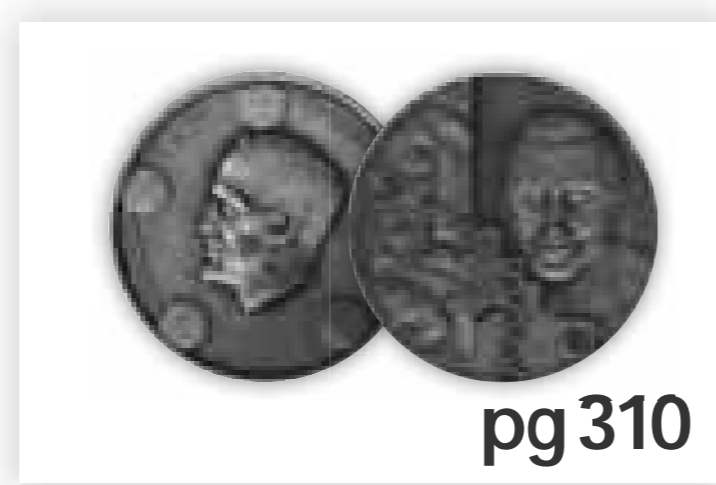
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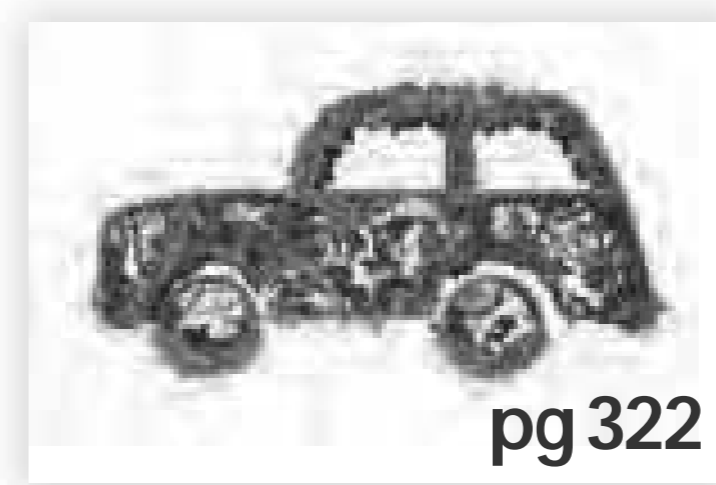
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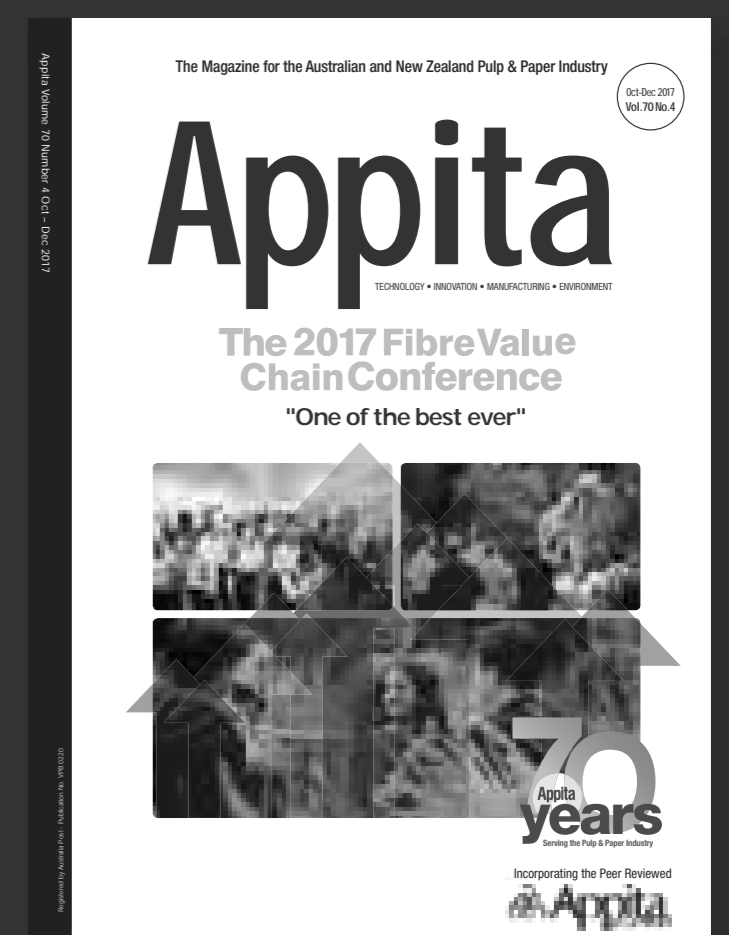
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### Featured in this issue:

- Bagasse soda pulp as strength enhancer
- Addition of banana stem to HW pulps
- Strong stiff papers with surface sizing
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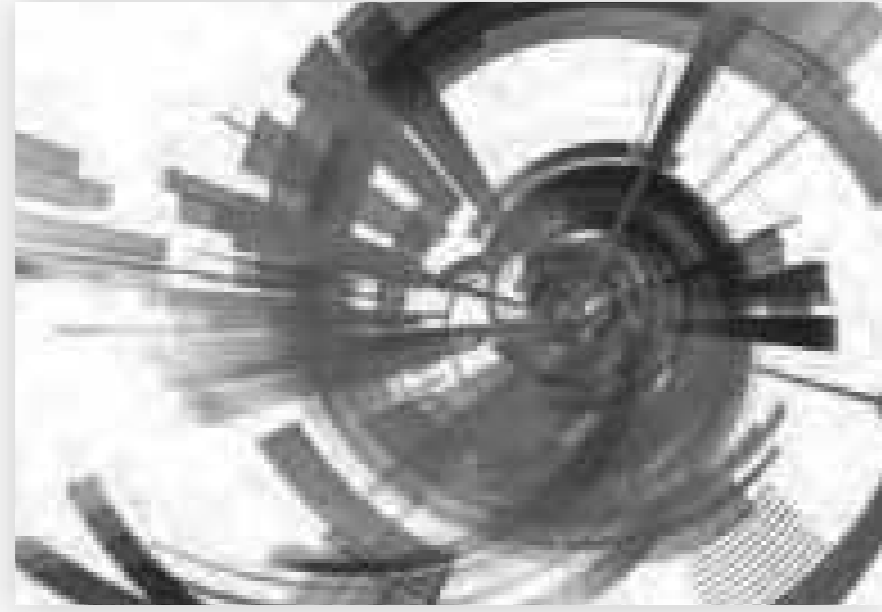
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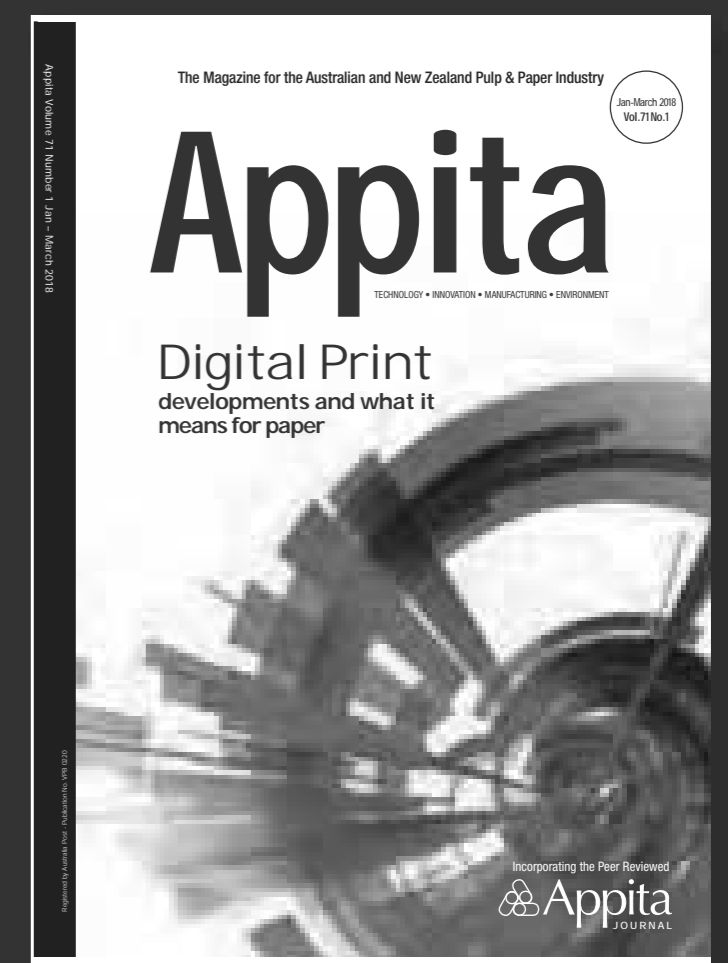
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- Improving strength of dry formed papers
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Zeljka Barbaric-Mikocevic	Geoff Covey	Ulf Germgard	Annaleena Kokko	Peter Nelson	Laurie Schimleck	Adrian Wallis
Warren Batchelor	Marek Cukier	Ajit Ghosh	Mark Kortschot	Yonghao Ni	Wei Shen	Michael Walmsley
Peter Bennett	Alan Dickson	Oyvind Gregersen	Kwei Nam Law	James Olson	Herbert Sixta	Nicholas Wiseman
Nishi Kant Bhardwaj	Geoff Duffy	Antti Haapala	Hak Lae Lee	Ian Parker	Karen Stack	Miguel Zanuttini
Angeles Blanco	Alan Eagle	David Harris	Fuping Liu	Robert Pelton	Per Stenius	
Jim Bonham	Khalil El-sharkawy	Tuomo Hjelt	John Lloyd	Piers Pettit	Ian Suckling	
David Bould	Andrew Emmanuel	Andrew Hoadley	Martin MacLeod	Przem Pruszyński	Hans Theliander	
Elisabet Brannvall	Toshiharu Enomae	Graham Hobbs	Thad Maloney	Tom Rainey	Ai Van Tran	

\*This list includes only those reviewers who have assisted in the past five years