

VĚDECKÝ POSTER

DPRPO - Příprava posteru

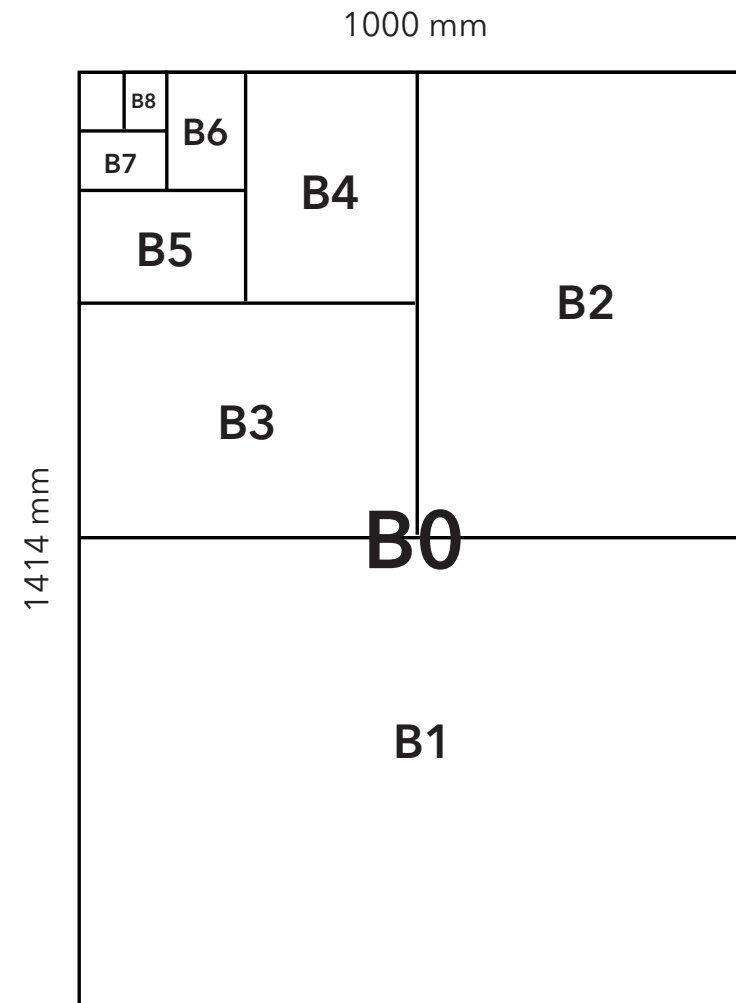
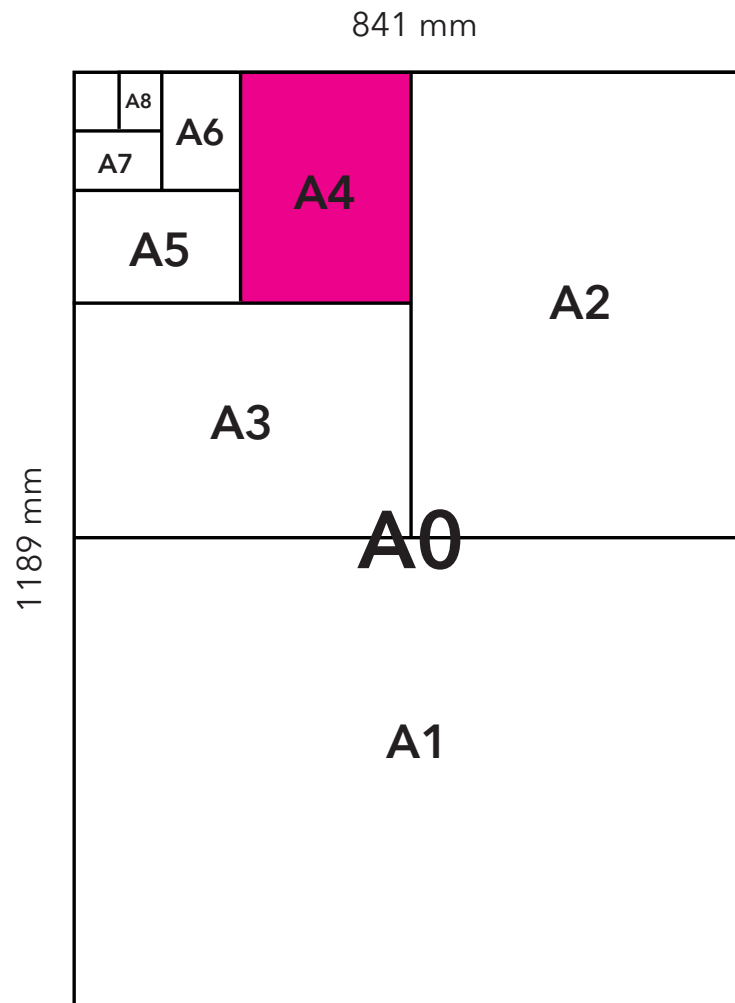
2

Grafické zpracování vědeckého posteru

FORMÁT

Řada A (mm)		Řada B (mm)	
A0	841 × 1 189	B0	1 000 × 1 414
A1	594 × 841	B1	707 × 1 000
A2	420 × 594	B2	500 × 707
A3	297 × 420	B3	353 × 500
A4	210 × 297	B4	250 × 353
A5	148 × 210	B5	176 × 250
A6	105 × 148	B6	125 × 176
A7	74 × 105	B7	88 × 125
A8	52 × 74	B8	62 × 88
A9	37 × 52	B9	44 × 62
A10	26 × 37	B10	31 × 44

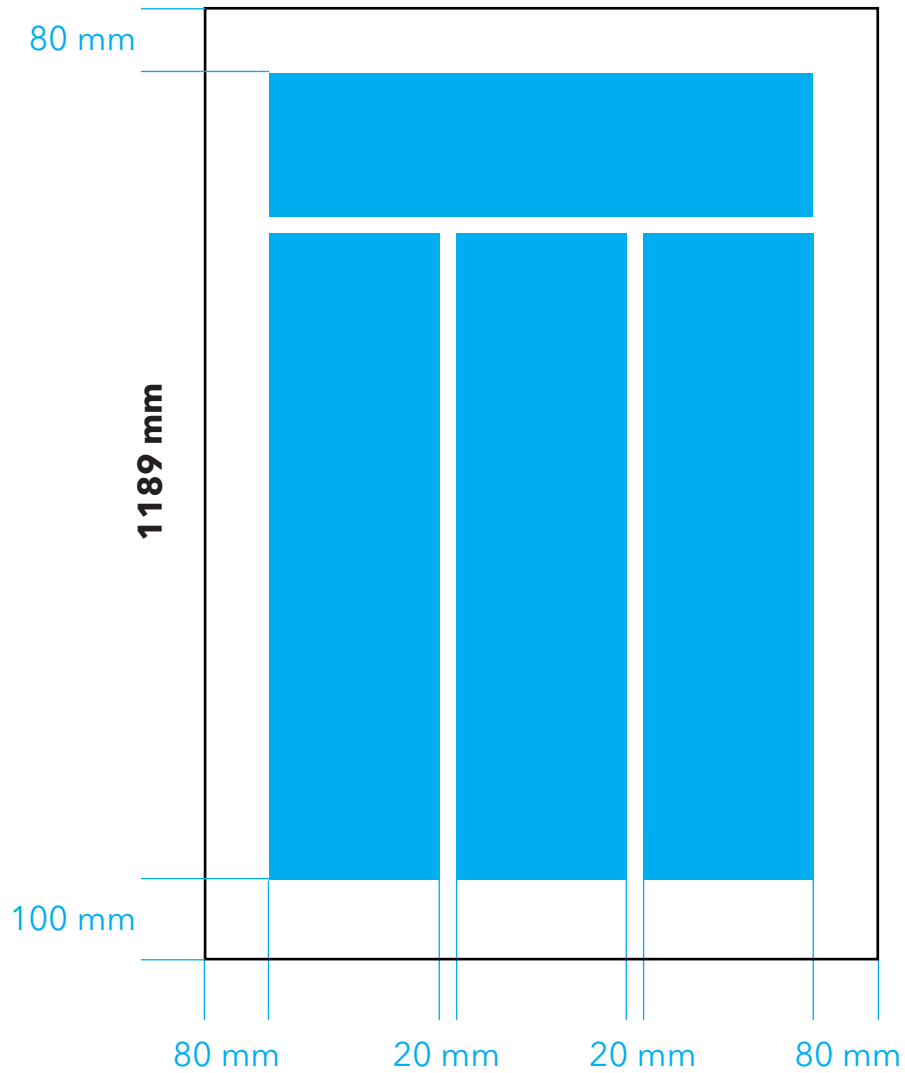
FORMÁT



**OKRAJE
SLOUPCE**

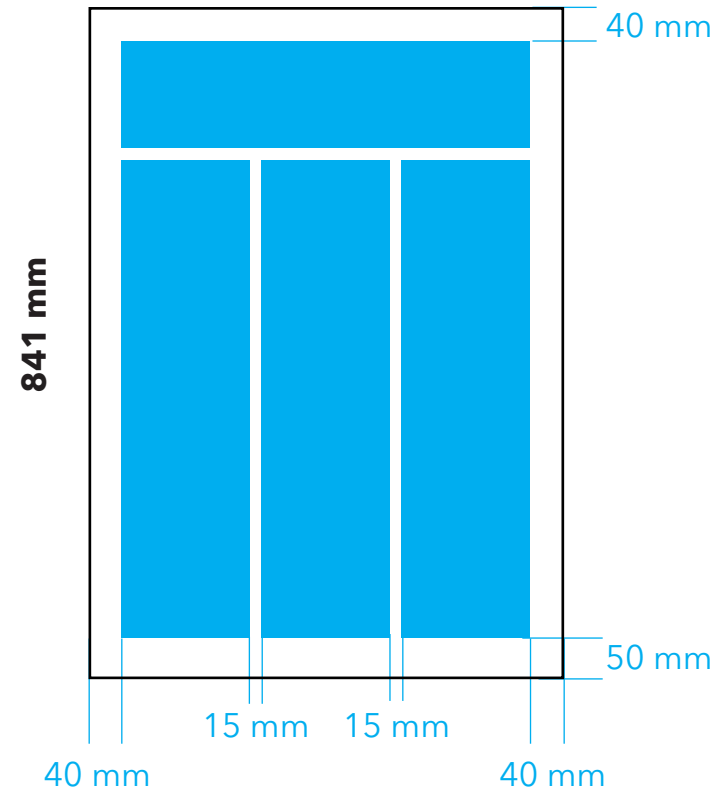
A0

841 mm



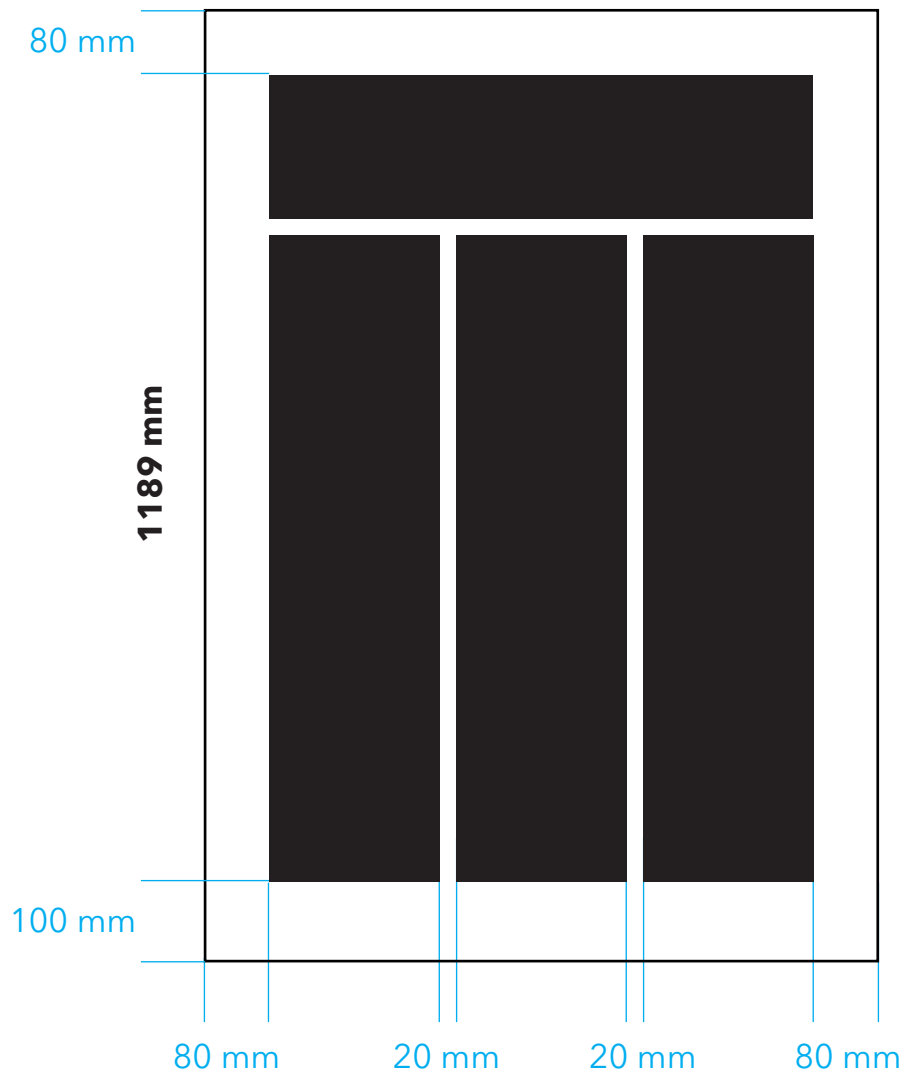
A1

594 mm



A0

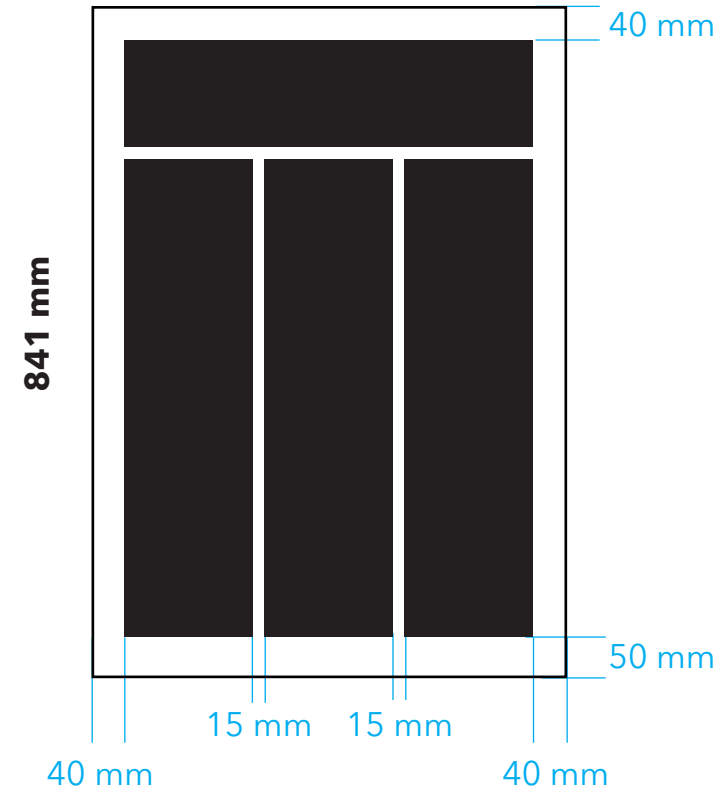
841 mm



Sloupce **3**, mezera šířky **20 mm** = šířka 1 sloupce **214 mm**.
Použité písmo: Times New Roman (Regular), velikost 24 b / 28,8 b.
65 znaků na řádku.

A1

594 mm



Sloupce **3**, mezera šířky 15 mm = šířka 1 sloupce **180 mm**

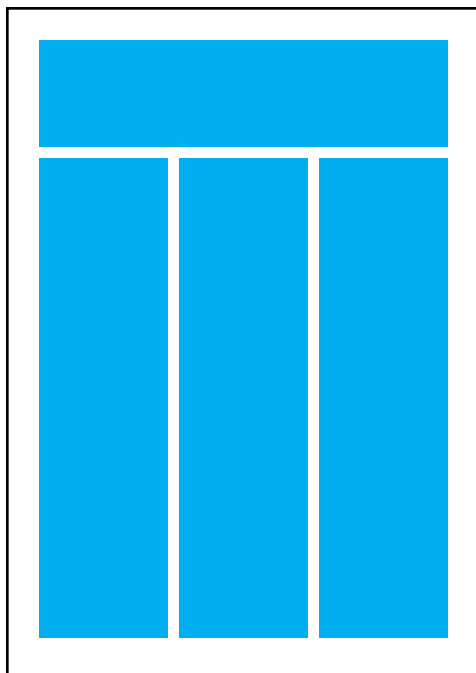
Použitý text: Times New Roman Regular, velikost 18 b / 21,6 b
64 znaků včetně mezer na řádku.

Optimální počet znaků na řádku se pohybuje kolem 60 znaků!!!

SLOUPCE

A1 594 mm

841 mm



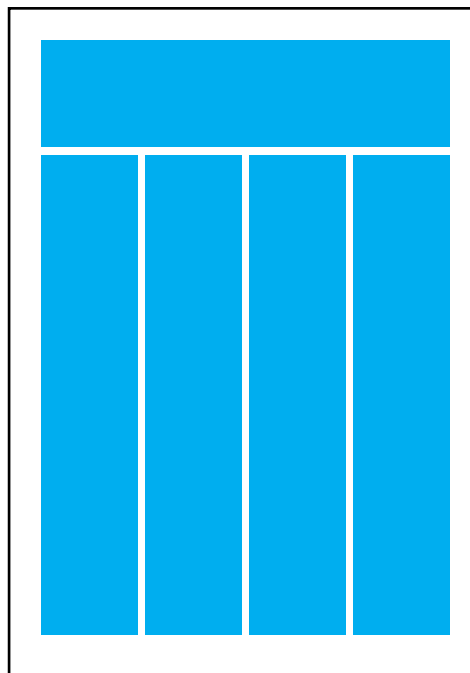
Okraje: nahoře 40 mm, dole 50 mm,
vlevo 40 mm, vpravo 40 mm.

Sloupce **3**, mezera šířky 15 mm.
Šířka 1 sloupce **180 mm**.

Použité písmo: Times New Roman (Regular).
Velikost písma 18 b / proklad 21,6 b.
64 znaků včetně mezer na řádku.

A1 594 mm

841 mm



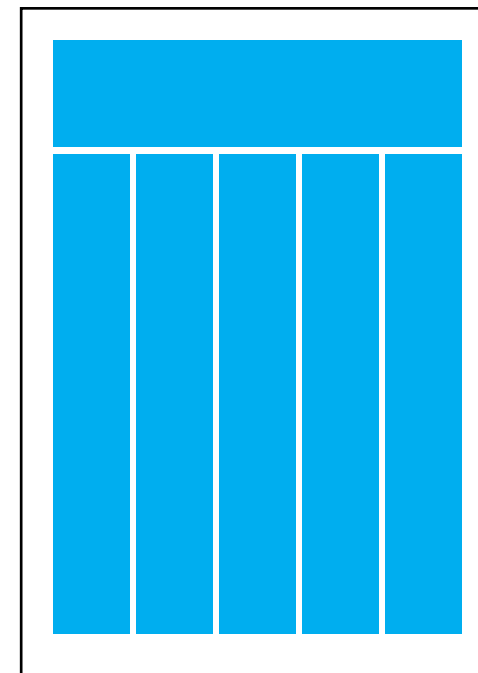
Okraje: nahoře 40 mm, dole 50 mm,
vlevo 40 mm, vpravo 40 mm.

Sloupce **4**, mezera šířky 12 mm.
Šířka 1 sloupce **119,5 mm**.

Použité písmo: Times New Roman (Regular).
Velikost písma 18 b / proklad 21,6 b.
45 znaků včetně mezer na řádku.

A1 594 mm

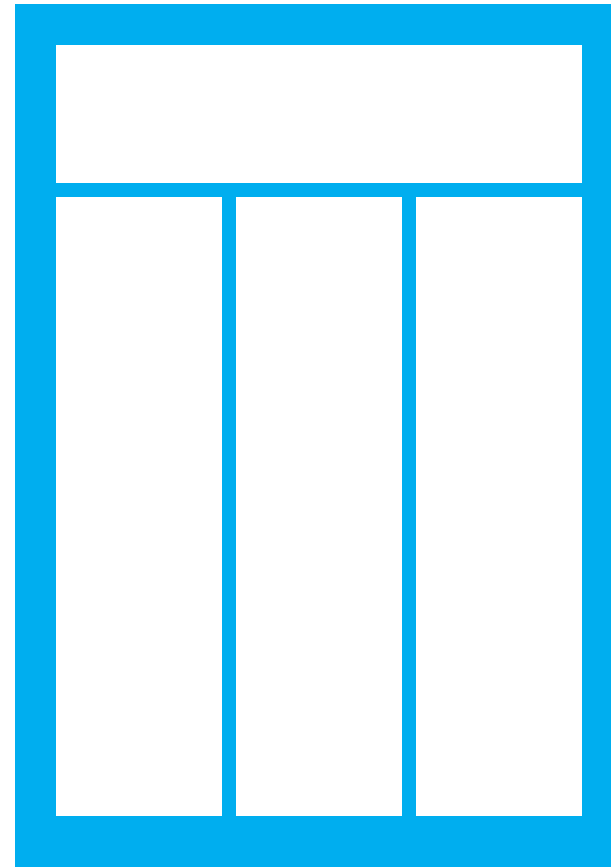
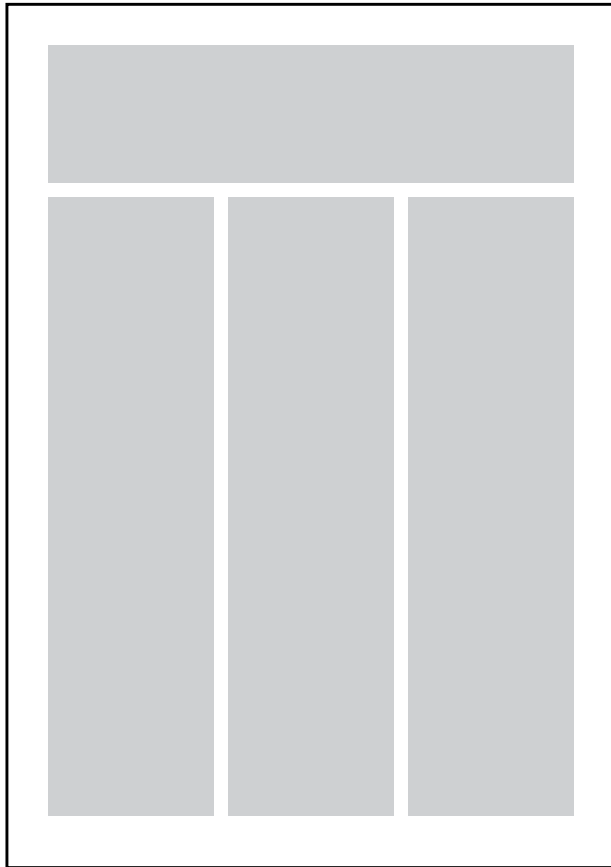
841 mm



Okraje: nahoře 40 mm, dole 50 mm,
vlevo 40 mm, vpravo 40 mm.

Sloupce **5**, mezera šířky 10 mm.
Šířka 1 sloupce **95 mm**.

Použité písmo: Times New Roman (Regular).
Velikost písma 18 b / proklad 21,6 b.
39 znaků včetně mezer na řádku.



MEZISLOUPCOVÉ MEZERY

Sloupce jsou vizuálně oddělené mezerami. **Velikost, tvar a způsob oddělení může ovlivňovat celkový dojem grafické úpravy plochy**, jelikož otevírá prostor pro textové části.

PRAVIDLO PRÁZDNÉHO MÍSTA

PRÁZDNÉ MÍSTO je nepotištěný a nevyužitý prostor, který obklopuje grafické prvky v designu a poskytuje jim prostor k dýchání (např. okraje).

PRÁZDNÉ MÍSTO vytváří v designu klidné plochy, které mohou vykonávat mnoho funkcí, například ukazovat vizuální hierarchii.

TYPOGRAFICKÁ HIERARCHIE – lze docílit různou velikostí písma, kdy větší a tučnější písmo naznačuje větší důležitost než menší a lehčí.

POLOHOVÁ HIERARCHIE – lze také navodit relativní polohou textu na posteru. Text v horní části stránky, případně ještě obklopený prázdným místem, připoutá více pozornosti a bude převažovat nad hlavní textovou částí.

COLOURED AIR AND BLUE SKY

As James Turrell powers up his ambitious new installation at London's One Hyde Park, the UK's biggest public light sculpture, we talk to the artist who wants to show us heaven

PHOTOGRAPHY: JASON SCHMIDT WRITER: SOPHIE LOVELL

It is difficult to talk about the work of the artist James Turrell to someone who has not experienced it. Born in California in 1943, he has been working with light and optical phenomena since the 1960s, exploring the edges of human perception, where they meet what might be called spiritual experience, with the precision of a scientist, the lyricism of a poet and the zeal of a visionary. He builds structures for people to enter and experience the physicality of light, pieces of surprising delicacy with planes or spaces that set free the mind of the viewer to construct their own castles in the sky from an intense, yet subtle light palette. We told you it was difficult to talk about.

Turrell himself is no easier to follow when he talks about his work. He greets us at the door of his compact pied-à-terre in a leafy Manhattan square and leads us into a sitting room furnished in a rather classical style. There is no bustling entourage, just a work associate quietly wrestling with some technical drawings in the next room. Turrell is a big man, simply dressed in dark trousers and a jacket which contrast with his shock of white hair and magnificent snowy beard.

Meeting him is like sitting down with Isaac Newton masquerading as Father Christmas. His jovial appearance and measured tones belie an extremely sharp mind that has been pondering the finer points of electromagnetic radiation, complex geometries, astrophysics and theology for over half a century. It helps to know that he studied psychology, maths and art history as well as art and that he is an accomplished pilot and aerial photographer. Turrell is also a Quaker,

a long-time member of the Religious Society of Friends, the stripped-down branch of Christianity that focuses on the direct spiritual experience and has done away with unnecessary frills.

Turrell's conversation can sweep from the shape of the universe, Riemannian geometry and Bezael to Plato, prehistoric architecture, Meister Eckhart and Robert Mapplethorpe in less than the time it takes to drink a cup of tea. But he is a natural communicator and educator, patiently unpacking what he does. 'I take light and make it seem like it is material,' he says. 'Basically I traffic in coloured air and blue sky.'

Turrell's light pieces work in many different ways. There are those that feature outdoor light, such as the viewing chambers he calls Skyspaces; works that include natural surroundings, such as *Roden Crater*, an installation set in an extinct volcano in the Arizona desert; interior installations of controlled artificial light; and his disorientating perception cells, or Ganzfeld pieces, which are single rooms or spaces where there is little or no horizon or shadow and therefore nothing to focus on.

Enough to keep one man busy. But, like everyone else, he says, Turrell has suffered from the economic downturn. He seems determined to keep as many balls in the air as possible, if only to get his magnum opus, the *Roden Crater* project, finished. A huge Skyspace at the National Gallery of Australia in Canberra has just opened; a Mayan-style pyramid is being built in Mexico for a private collector; also in progress are a new Ganzfeld sphere that allows you to 'see'

colours inside your head at the Gagosian Gallery, and a series of light installations for the One Hyde Park luxury apartment project, both in London.

The Gagosian piece and One Hyde Park (or One Hyde Park: The Residences at Mandarin Oriental, to give it its full title) are timed to be completed in October to coincide with the Frieze Art Fair, but they couldn't be more different in terms of approach and intent. One Hyde Park is a large residential building on the edge of the famous London park. The architects are Rogers Stirk Harbour + Partners and the interior design is by London-based team Candy & Candy, who asked Turrell to come up with a unified light concept that would interact with the architecture.

Turrell's project includes perimeter lighting for glass pavilions, colourful light sculptures that illuminate glazed stairwells and lift shafts, and a canopy of light for the entrance's portico.

The installations, realised with the help of Isometric Lighting Design and Aether Lighting, all come with computer-controlled LED arrangements that slowly change colour from dusk till dawn.

They are, of course, particularly effective at night: 'I like extending the life of the buildings into the night. With light, you can bring out characteristics of the architecture that you may not have seen during the day,' Turrell explains. When illuminating a building, he adds, the tendency is to blast it from outside, but this leaves the windows black and dead. 'I like the light to come from within; I like the things that move slowly underneath.'

The artist has been invited to light several buildings during his career: >>>

PRÁZDNÉ MÍSTO + ASYMETRIE

SPUREN DER MOBILITÄT: GRAPHIK ALS MEDIUM DES AUSTAUSCHS

Je nach Medium verbreitet sich Kunst unterschiedlich weit und schnell. Seit dem Spätmittelalter und bis zum digitalen Zeitalter konnte sich Kunst auf Papier auf den Kommunikations- und Handelswegen über Landes- und Kulturgrenzen hinaus in die ganze Welt verteilen. Zeichnungen und Druckgraphiken gehören daher zu den wichtigsten Medien des künstlerischen und transkulturellen Austauschs. Graphik eröffnete internationale Märkte, machte Kunst allen Gesellschaftsschichten und Völkern zugänglich, vermittelte neue Ideogramme, diente der Information und der Propaganda, bereicherte das Reservoir an künstlerischen Motiven und Sujets, internationalisierte den Geschmack. Die Vortragsserie möchte der historischen Mobilität des graphischen Mediums nachgehen, um die weltweiten Wege und Knotenpunkte, die Transferleistungen zwischen den Kulturen, die Migration der Motive und Techniken sowie die Probleme unteruchen, die sich für die Kunst in einem globalen Markt ergeben. Durch die Untersuchung von Flugblättern, Einzelblattschritten, Zeichenbüchern oder etwa Mail Art soll die Mobilität als ein Merkmal des graphischen Mediums herausgearbeitet werden.

Depending on medium, art can disseminate at different speeds and bridge vast distances. Since the late Middle Ages and up until the present digital era, art on paper has effectively interacted with means of communication and commerce so as to expand beyond national and cultural borders throughout the entire world. Drawings and prints, therefore, count amongst the most important media of artistic and transcultural exchange. The graphic arts opened new international markets, made art accessible to a greater range of social classes and peoples, transmitted new ideograms, diffused information and propaganda, enriched artists' repertoires and internationalized aesthetic taste. This lecture series investigates the graphic medium's historical mobility so as to explore its worldwide paths and networks, picture the migration of artistic motifs and techniques and address the potential and challenges that art presented in a global market. Examining flyers, woodblock prints, mail art and sketchbooks, this lecture series intends to work out a fundamental characteristic of the graphic medium: its mobility.

TRACES OF MOBILITY: PRINTS AND DRAWINGS AS MEDIA OF EXCHANGE

PROGRAMM

04. Oktober
HANS THOMSEN
Looking through the Telescopes: Exchange of Prints and Images between Europe and Japan in the Nineteenth Century

25. Oktober
KORNELIA RÖDER
Die Idee vom Global Village und dessen Einfluss auf das Netzwerk der Mail Art

01. November
EDWARD H. WOUK
The Northern Advantage: Prints, Mobility, and Heterography in the Sixteenth Century

08. November
GIORGIO MARINI
Prints and Drawings by Stefano Della Bella: Taste for Orientalism and Exoticism in Seventeenth-Century Florence

23. November
WALTER NELSON
Visual Exegesis in Transit: Karl van Manders Transformation of Cornelis Cort's «The Annunciation Broadcast by Prophets of the Incarnation»

Die Vortragsserie wird durch die freundliche Unterstützung der Universität Zürich.

29. November
SUSAN DACKERMAN
Making Knowledge Mobile: Prints and Science in the Sixteenth Century

15. Dezember
LARRY SILVER
Big Prints of Big Cities

20. Dezember
DOMINIQUE CORDELLIER
Diffusion du dessin par l'estampe dans la France de Fontainebleau

Die Vortragsserie wird durch die freundliche Unterstützung der Universität Zürich ermöglicht.

VORTRAGSREIHE
DONNERSTAGE
18.15-19.30 UHR
ORANIELSCHE
SALONHÖLE
DER ETH ZÜRICH
KÄMSTRASSE 101
8002 ZÜRICH

Yes,
of
course
it
hurts

Yes, of course it hurts when heels are breaking
Why the world the springtime fall out
Why would all our wishes longing
lead itself to freeze, later pulled?
After all, the bed was covered all the way
What new thing is it that breaks and wand?
Yes, of course it hurts when heels are breaking,
hears for that which grows... and that which burns.

Yes, it is a hard when drops are falling
Thinking with fear, and heavy laughing,
clearing to the ring, and ending, ending -
weight drives them down, though they prove changing
Hard to be accurate, afraid and divided,
hard to feel the depth across and out,
yet so far, and steady number -
hard to want to stay... and want to fall.

Then, when things are more and nothing helps
the man's head break as it separates,
then, when no fear holds back any longer,
down in glaze for the ring's deep playing,
forget that they were big band by the sea,
forget that fear before the light unfolded -
fall for a second their greatest safety,
not in that way... that comes the world.

Kate Roy



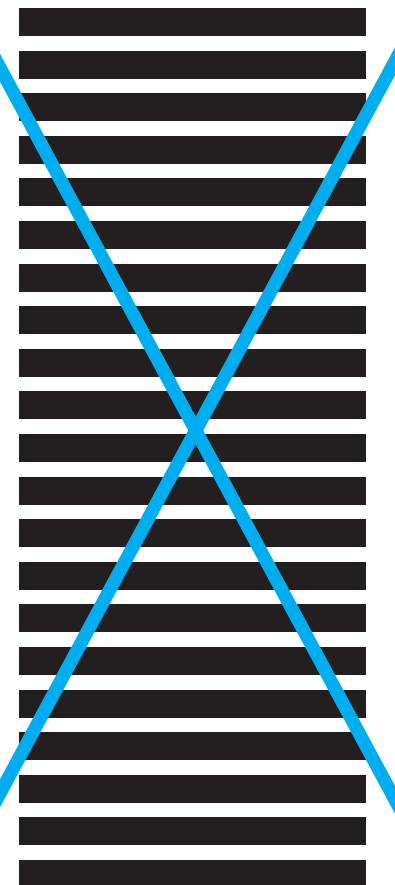
Zarovnání do bloku s posledním řádkem zarovnaným na levý praporek.



Zarovnání na levý praporek (vypnout dělení slov).



Zarovnání na osu - použití v poezii!



POZOR! Nevhodné zarovnání do bloku i s posledním řádkem odstavce.

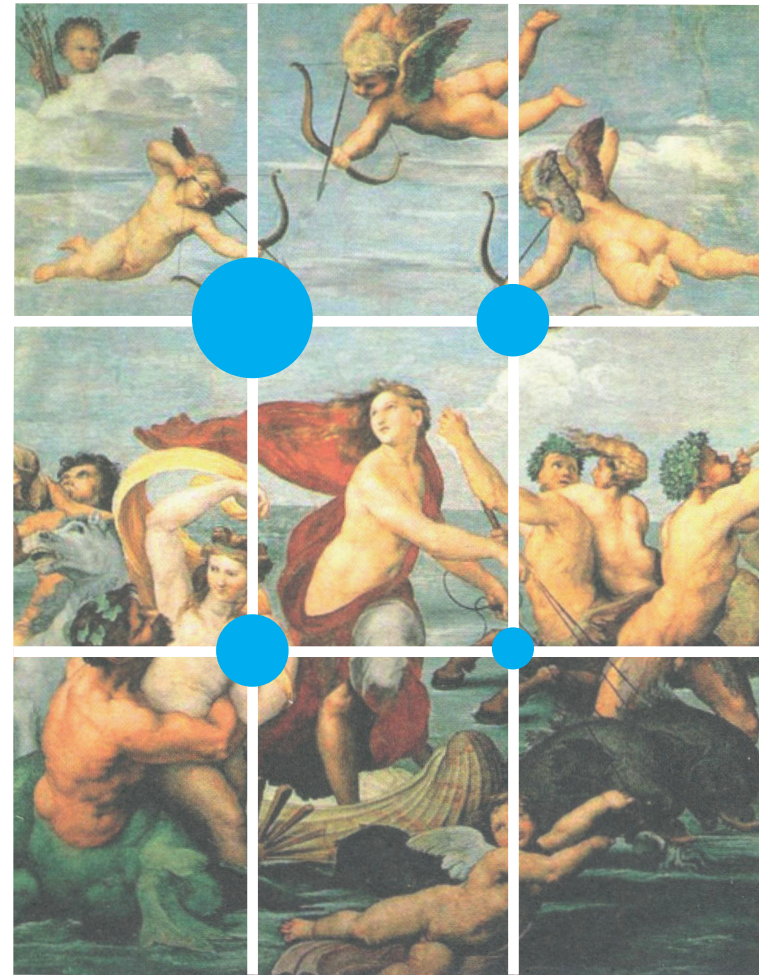
KOMPOZICE

PRAVIDLO TŘETIN

PRAVIDLO TŘETIN je metoda, kterou obvykle používají fotografové k vytvoření zajímavých kompozic.

Stejně tak ji lze využít v kompozicích jakéhokoli grafického umění nebo dokonce takových oborech, jako je textilní nebo nábytkářský design.

Pravidlo třetin lze využít pro vytvoření ústředních bodů, které určí, kam mají být umístěny zajímavé prvky.

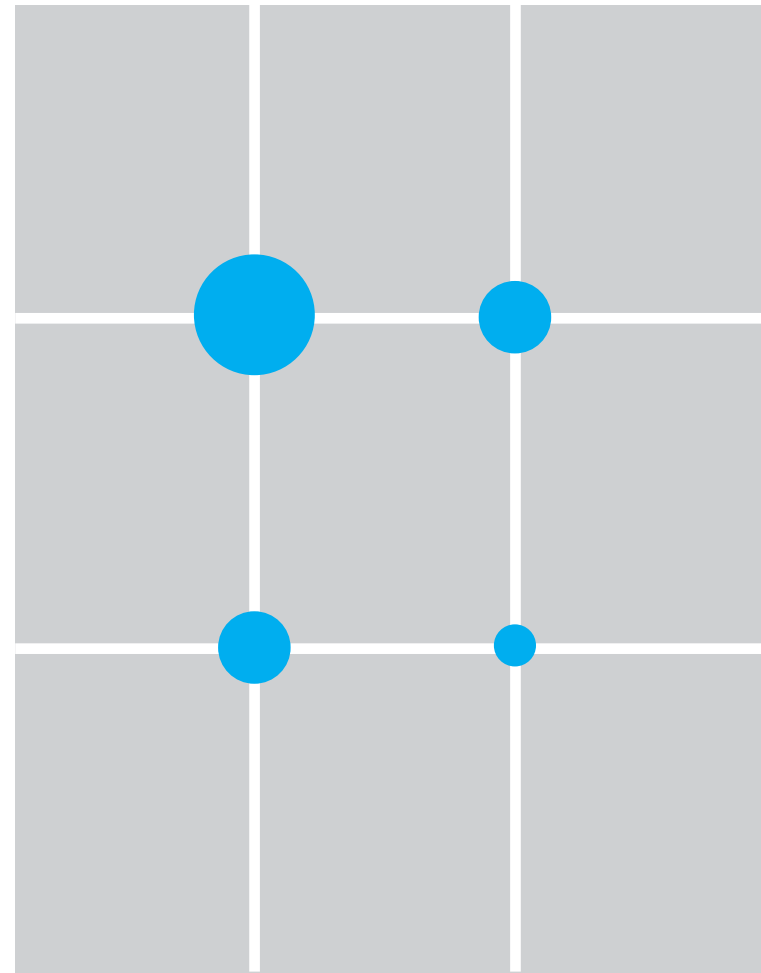


Triumf Galatey je freska od malíře Raffaela Santí (1512) vytvořená pro palác Villa Farnesína v Římě. Ústřední postava Galatea je orámována purpurovými linkami, kterými jsme rozdělili plochu. Nad ní jsou symetricky umístěny tři cherubíni s hroty svých šípů umístěnými nad horními vyhledávanými body.

PRAVIDLO TŘETIN

Na diagramu je zobrazeno, jak lze pravidlo třetin využít pro vytvoření vyhledávaných bodů v prostoru.

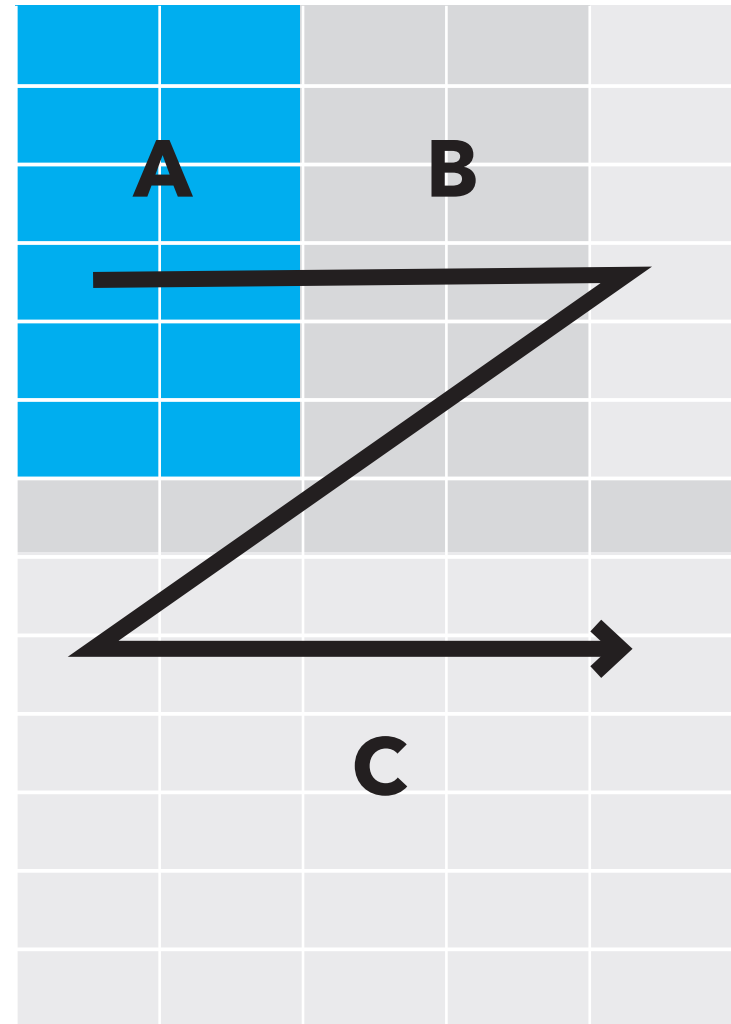
Tyto body neodpovídají přesnému matematickému rozdělení plochy. *Jsou to aktivně vyhledávaná místa, u kterých studie prokázaly, že oko se při pečlivém prohlížení obrazu na ně zaměří.* Designeři tuto znalost využívají při rozhodování o umístění prvků, a napomáhají tak diváky navést ke klíčovým informacím.



PRAVIDLO ČTENÍ STRÁNKY

Lidé se podvědomě snaží získat informace o obrázku nebo designu tak, že si ho očekávatelným způsobem prohlédnou, aby získali základní představu, čeho se týká. Tvůrce posteru může tento proces využít, a tak pomoci čtenáře nasměrovat dokonce i ve složitých návrzích obsahujících mnoho prvků.

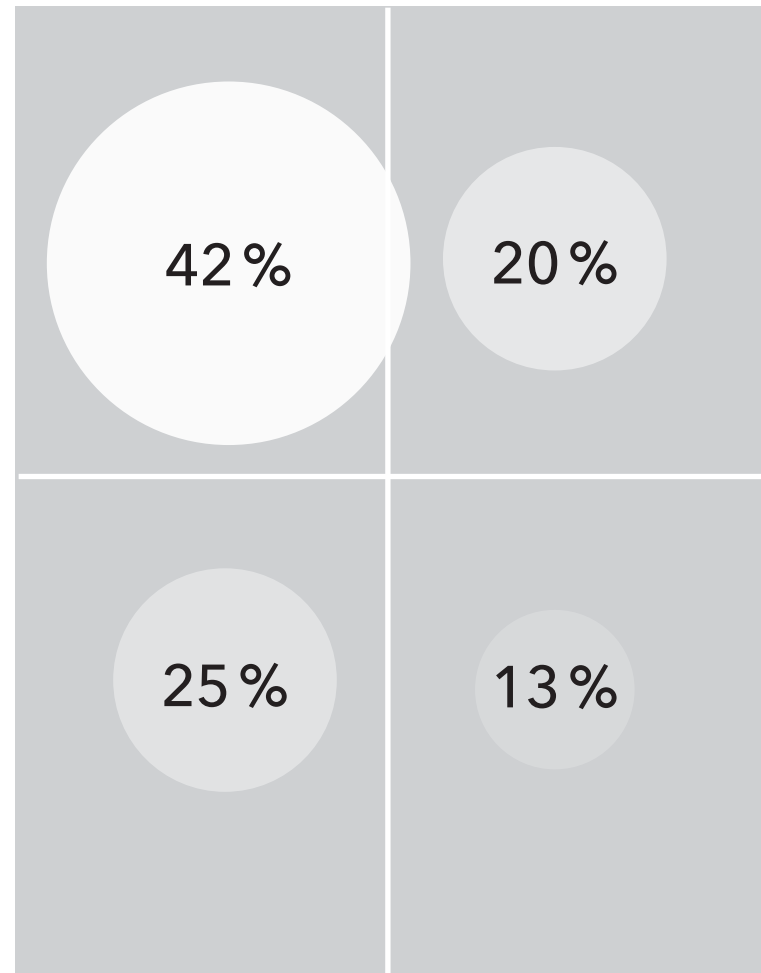
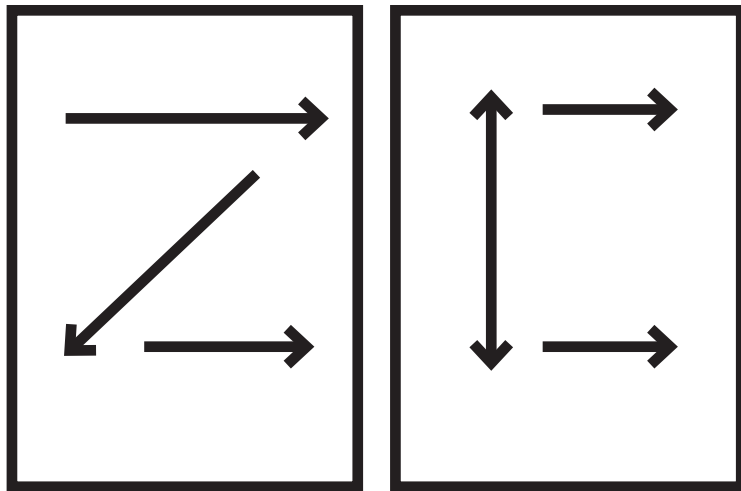
NAVIGACE NA PLOŠE - čtenář pokaždé hledá nějaký vstupní bod na stránce, na který by se mohl zaměřit, který poznává, rozumí mu a který jej nasměruje k dalším informacím. Protože jsou lidé přitahováni barvami a pohybem, může designér umístit prvky v designu strategicky a přitáhnout tak k nim čtenářovu pozornost.



ORIENTACE NA PLOŠE

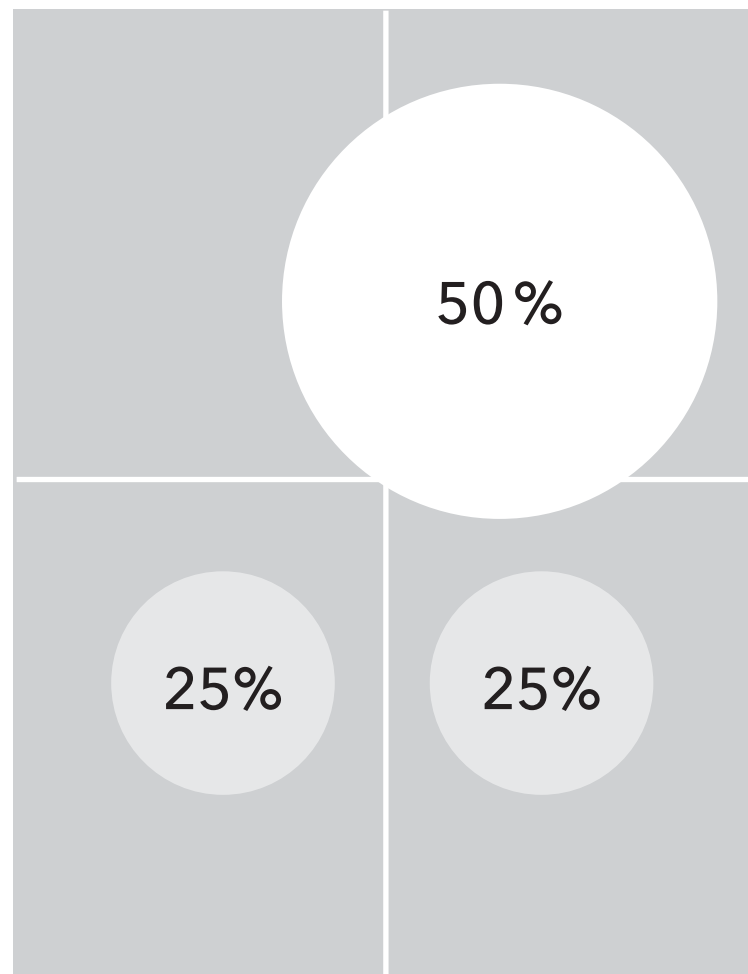
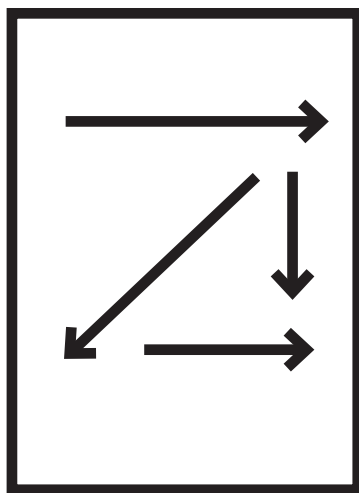
Procentuální výsledek čtení plochy evropanů.

Jako praktický důsledek se na mnoha webových stránkách umisťují navigační lišty nahoru.



ORIENTACE NA PLOŠE

Orientace na ploše s pravidlem
prázdné plochy.



PRAVIDLO ZLATÉHO ŘEZU

Je prokázáno, že určité proporční vztahy celku působí na člověka lépe, přirozeněji než jiné. Výtvarníci se snažili přijít na jistou obecnou zákonitost, jak co nejlépe dělit úsečku či plochu. Vzniklý poměr byl nazván zlatý řez.

KONSTRUKCE ZLATÉHO ŘEZU

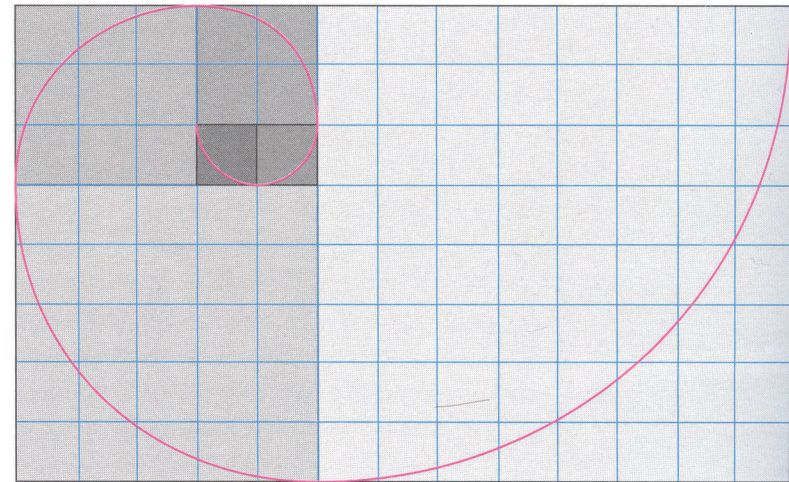
Pokud bychom chtěli vyjádřit zlatý řez matematicky, je třeba najít na jednotkové úsečce takové x , aby platilo, že $(1-x)/x = x/1$. Z toho po vyřešení rovnice vyplývá, že:

$$x = (\sqrt{5}-1)/2$$

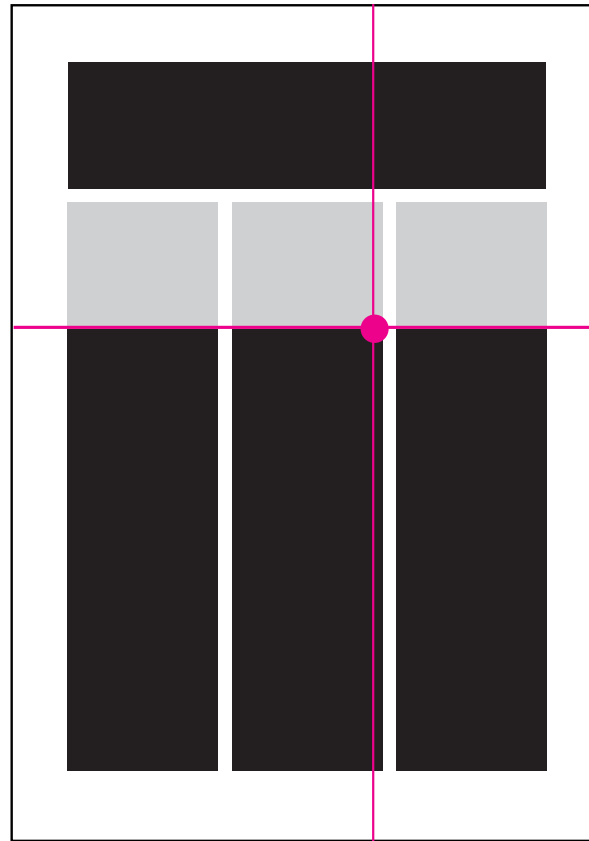
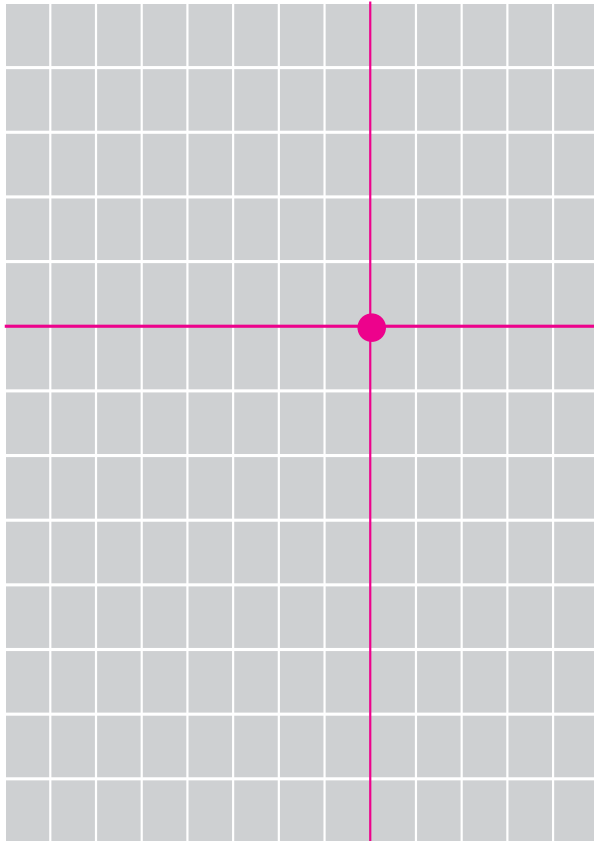
$$x = 0,618...$$

Fibonacciho čísla jsou číselnou řadou, ve které je každé číslo součtem předcházejících dvou čísel v řadě. Jsou pojmenovaná po matematikovi Leonardovi z Pisy, známým také jako Fibonacci, který toto pořadí vypočetl v proporcích v přírodě. Fibonacciho čísla mají přímou souvislost se zlatým řezem 8 : 13, neboť obě tato čísla jsou součástí číselné řady.

V praxi bohatě postačí pamatovat si **zaokrouhlené číslo 0,62**. Libovolnou úsečku pak rozdělíme v poměru 0,62 : 0,38 a dominantní prvek kompozice umístíme do vzniklého poměru. *Zlatý řez je možno sestavit pro každou stranu obdélníka, v průsečících potom získáme „zlatý bod“ – ideální místo pro přesné umístění dominanty.*



PRAVIDLO ZLATÉHO ŘEZU



Future Fictions
An experience design approach to producing and consuming transmedia novels

Abstract
There is something magical about reading fiction. As a medium, it allows us to explore worlds, and it offers us a chance to live vicariously through the characters. It's a unique experience that can transport us to new places and provide a sense of escapism. It's a form of entertainment that has stood the test of time and continues to evolve with technology. This research explores the relationship between fiction and technology, and how we can use technology to enhance the reading experience.

ACADEMIC
Academic Landscape
This research is part of a larger academic landscape. It is connected to other research in the fields of digital media, transmedia, and interactive design. It builds on the work of scholars like Marshall McLuhan, Henry Jenkins, and Janet Murray.

COMMERCIAL
Survey of iPad Enhanced Fiction
A representative survey of iPad fiction authors and readers was conducted to understand the current state of the market. The survey found that while there is a growing interest in enhanced fiction, there are still significant challenges in terms of production and distribution.

READER
Reader Motivations
Readers are motivated to engage with enhanced fiction for several reasons. They enjoy the immersive experience, the ability to explore different perspectives, and the interactive elements. However, they also express concerns about the cost and the potential for distraction.

Producer Enhancements
This research suggests that producers should focus on creating high-quality, engaging content that is optimized for the iPad platform. They should also consider the user experience and the social aspects of reading fiction. Collaboration between authors and producers is key to creating successful enhanced fiction.

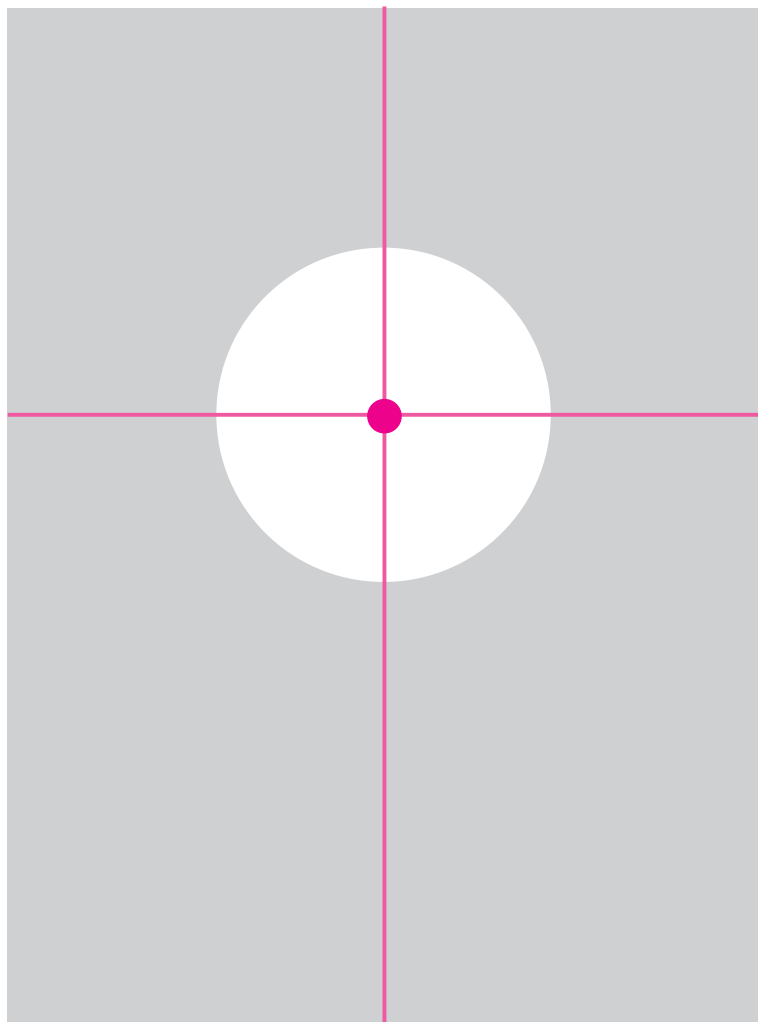
KEY FINDINGS
Academic, commercial, and human opportunity to enhance immersive pleasure reading.
Immersive storyworlds feel real and have psychological, reliable outcomes.
Analog books, a considerable number of people will prefer analog books.
Seamless experience, without distractions like pop-ups or notifications.
Experience before technology may indicate should consider and evaluate the user experience and not rely on novel technology.

DESIGN OPPORTUNITIES
The Future Fiction...
The Present...
The Past...
The Best...

DESIGN DIRECTIONS
Content
Augmented physical novel
Vector digital/transmedia novel

TIMELINE

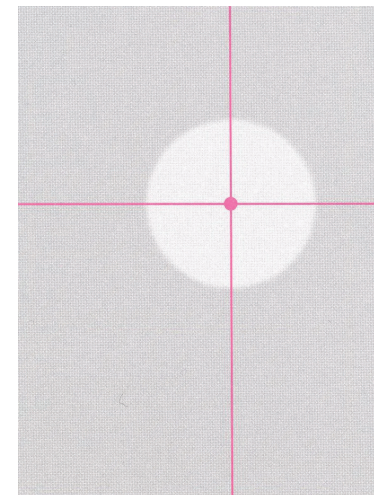
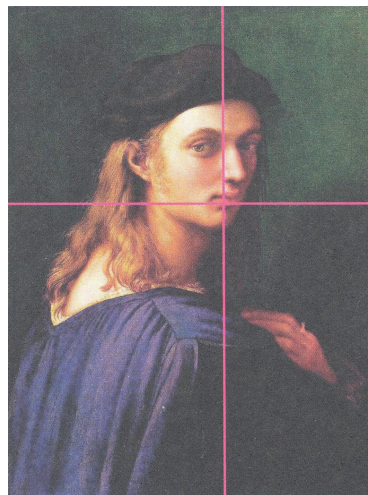
PRAVIDLO OPTICKÉHO STŘEDU



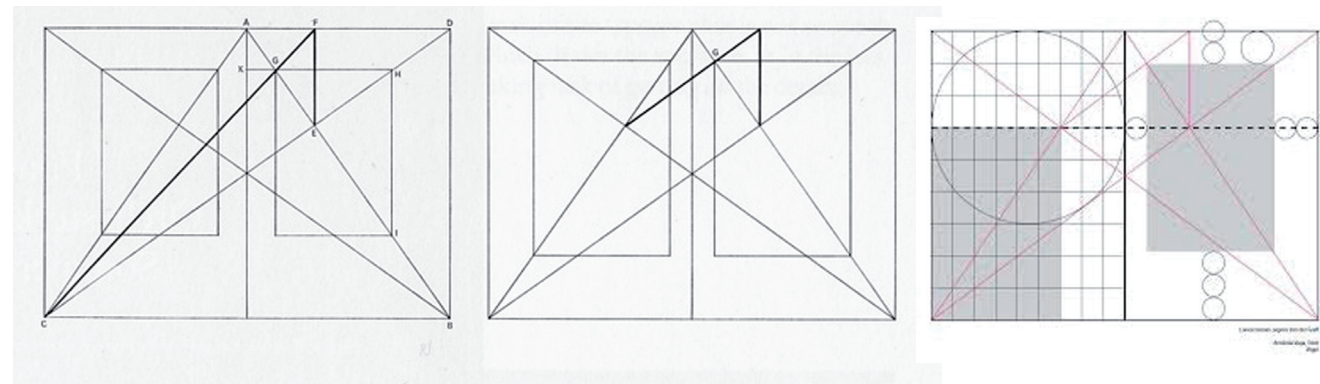
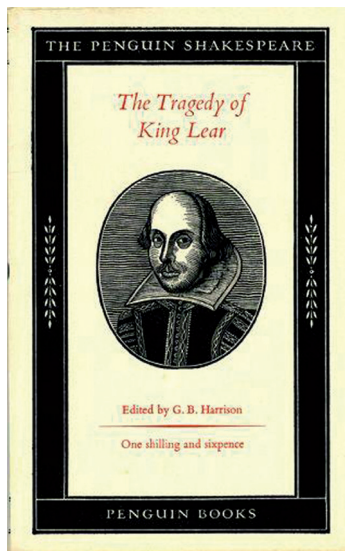
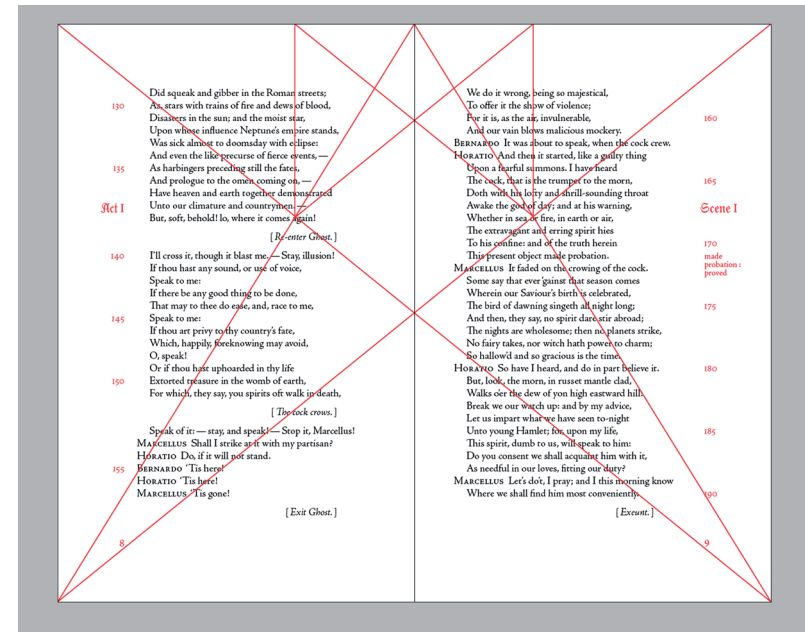
OPTICKÝ STŘED

Optický střed udává dynamický centrální bod v uměleckém díle, který pomůže určit vyhledávaný bod, na kterém spočine zrak diváka.

Obraz Portrét Binda Altovitiho (1514) vytvořený Raffaelem. Ústa a oči jsou klíčové ústřední body lidské tváře. Vidíme, že Raffael zde ústa opatrovnice umístil do optického, nikoli matematického středu.



Symetrie neboli souměrnost je základním nadčasovým principem zrakového vnímání. **Ve vizuální komunikaci vyjadřuje symetrie vyrovnanost, stabilitu a harmonii, jsou-li vizuální prvky plně vyvážené či vystředěné, nacházejí se ve stavu rovnováhy a všechny části mají stejnou váhu.** Výsledkem je stav optické vyrovnanosti nazývaný symetrie. Grafické prvky jsou v takové kompozici souměrné podle hlavní kompoziční osy (vertikální či horizontální). Podobně působí kompozice složená z prvků uspořádaných podle několika středových os. Symetrická kompozice působí staticky, nehybně, vyváženě. **Negativní prostory kolem elementů či kontury prvků rozmístěné kolem hlavní osy vypadají stejné nebo mají stejnou vizuální váhu.**



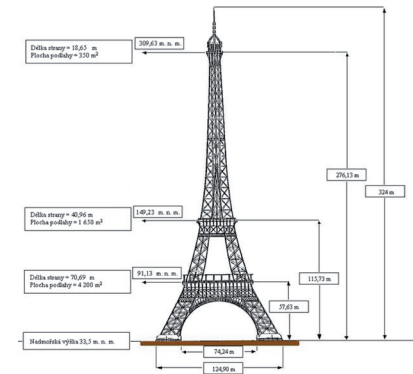
Jan Tschichold, konstrukce zrcadla knihy dle geometrické konstrukce

Klasické osově (bilaterální) souměrnosti dosáhneme opakováním zrcadlově obráceného obrazu na opačné straně svislé osy, každá strana je tedy zrcadlovým obrazem té druhé. Tato kompozice vyjadřuje úctu k tradici, řád, neměnnost a klid. Kromě toho se symetrie jako kompoziční princip už odedávna spojuje s fyzickou krásou, ať už přírodního či umělého objektu, lze ji nalézt prakticky ve všech projevech přírodního světa včetně těl lidí, živočichů a rostlin. Také silné, sladěné a dynamické tvary slavných architektonických děl často řídí osová symetrie. **Výmluvným příkladem je katedrála Notre Dame, Eiffelova věž nebo americký Kapitol.**

Zrcadlová - do této kategorie patří vertikální a horizontální osová symetrie. Zrcadlově symetrická kompozice vzniká zrcadlením rovnocenných prvků podle hlavní osy. Ta může být orientována jakkoliv, ovšem prvky po obou stranách osy zrcadlení musí být stejné. Zrcadlově symetricky je v přírodě uspořádané např. v těle batočky motýlů.

Horizontální symetrie funguje jako dělící osa kompozice imaginární horizontální či jiná vodorovná linie, horní část obrazu je tedy zrcadlovým obrazem spodní. Takto se jeví např. krajina a její odraz na nehybné vodní hladině.

Vertikální symetrie dělí kompozici imaginární svislá osa, takže levá strana obrazu je zrcadlovým odrazem pravé. Typickým příkladem vertikální symetrie jsou Rorschachovy skvrny.



SYMETRIE

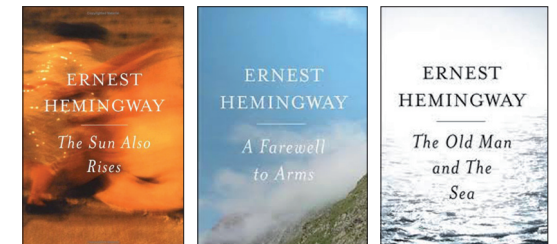
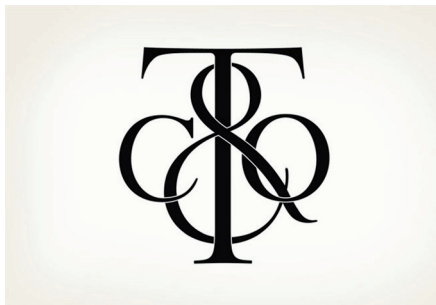
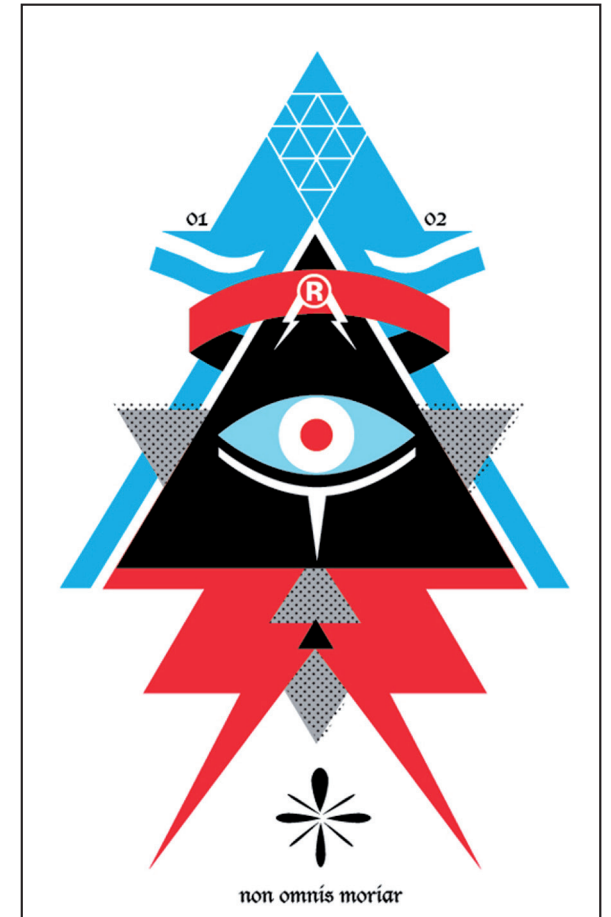
Osová symetrie



Zrcadlová symetrie



Vertikální symetrie



V přírodě je asymetrie méně obvyklá, známe ji jako schopnost lépe rozvíjet schopnosti určité strany těla či jako vlastnost objektu (např. živého organismu), jež není zrcadlově identická. Dobře je to vidět na tendenci lidí používat raději jednu než druhou ruku.

Asymetrie vzniká, když se strany obrazu navzájem liší. Grafické elementy v asymetrické rovnováze jsou uspořádané tak, že se jedna strana kompozice liší od druhé, aniž by došlo k narušení celkové harmonie. Pokud se ale nepodaří asymetrický obraz správně vyvážit, vznikne kompozice rušivá a matoucí.

Jakožto kompoziční princip ve vizuální komunikaci je asymetrická rovnováha složitější a náročnější na vytvoření než klasická symetrie. Vyžaduje uspořádat jednotlivé prvky tak, aby se elementy osy či těžiště. Představte si pomyslné lékárnické váhy, které porovnávají vizuální váhu prvků v kompozici. **Asymetrická rovnováha je volnější a obecně vzato aktivnější, dynamičtější než symetrie.** Zatímco symetrické rovnováhy dosahujeme opakováním, **asymetrické vyvážení stojí na kontrastu a protikladu. Vzniká zkombinováním kontrastujících elementů, zejména bodů, linií, ploch, objemů a barev, rovnoměrně rozmístěných kolem zvolené kompoziční osy.**



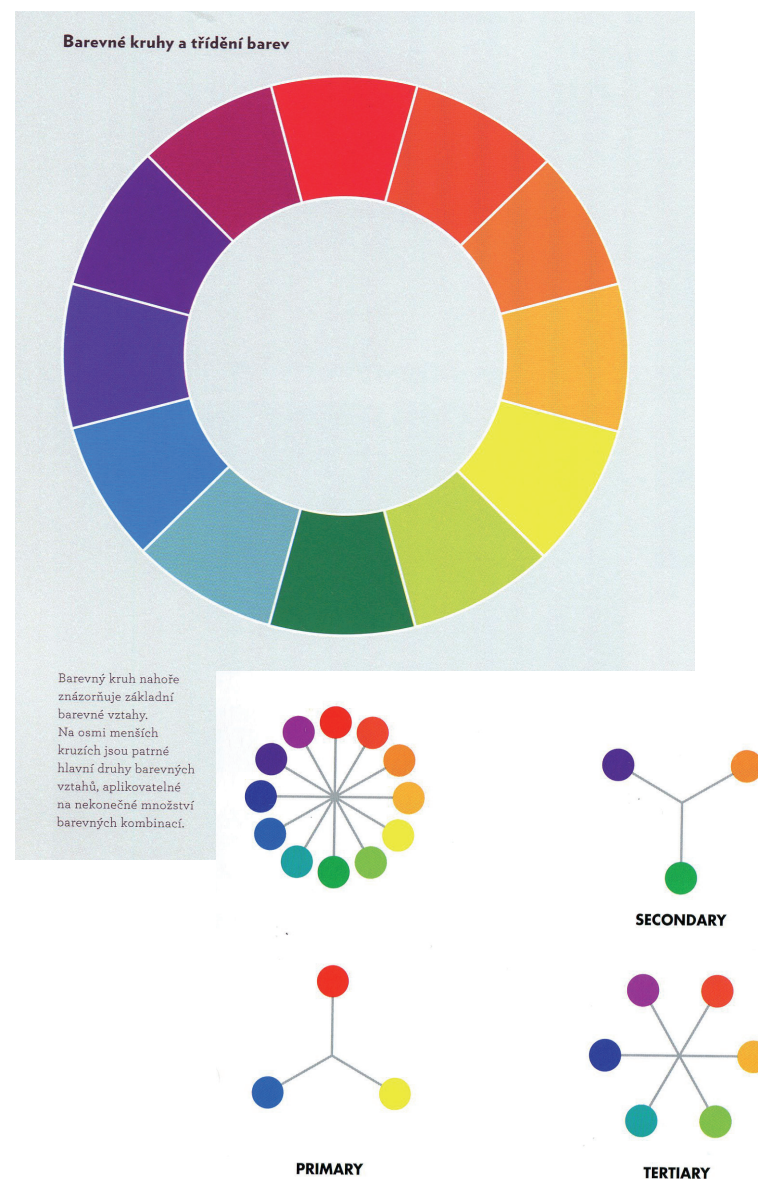
Asymetrického vyvážení je na této dvoustraně jednoduše dosaženo vhodnou volbou velikostí, proporcí a mřížky. Kontrast extrémně velké a mnohem menší fotografie spolu s dynamickou sloupcovou sazbou a flexibilní mřížkou stránky posiluje vizuální účinek a kinetický dojem, jaký skýtá jen asymetrická kompozice.



BARVA

Barva je v jazyce grafického designu nesmírně silným a sdělným prvkem. Ovlivňuje každého z nás, je totiž zdrojem vizuální energie a rozmanitosti ve všem, co každodenně vidíme a prožíváme. **Dokáže upoutat pozornost**, spojit izolované prvky, **zdůraznit sdělení a posílit celkový účinek kompozice**. Barva patří spolu s typografií k **nejdůležitějším a nejvlivnějším elementům ve slovníku grafického designu**. Je nesmírně užitečným nástrojem, dokáže sdělovat širokou paletu emocí, kódovat různé informace a citově angažovat diváka. **Může také přímo vyjádřit postoj nebo emoci, podnítit k reakci, zdůraznit a zpestřit, sdělit konkrétní poselství nebo podtrhnout hierarchii**.

Existuje jen málo vizuálních stimulů, které mají stejnou váhu jako barva; ta je velmi užitečný komunikační nástroj. **Význam, který barva vysílá, je ovšem vždy přijímán naprosto subjektivně**. Její vnímání závisí na dvou nedokonalých lidských orgánech (oči a mozek), jež utvářejí naši představu o barvě poté, co k nim doputují odražené světelné vlny. Tento mechanismus vnímání barev je univerzální pro všechny lidské bytosti. **Jiná věc je, jak je ve výsledku vidíme, jak na nás působí a jak je chápeme**.

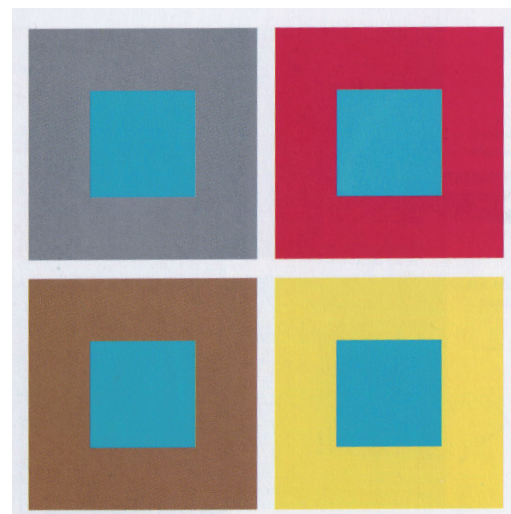
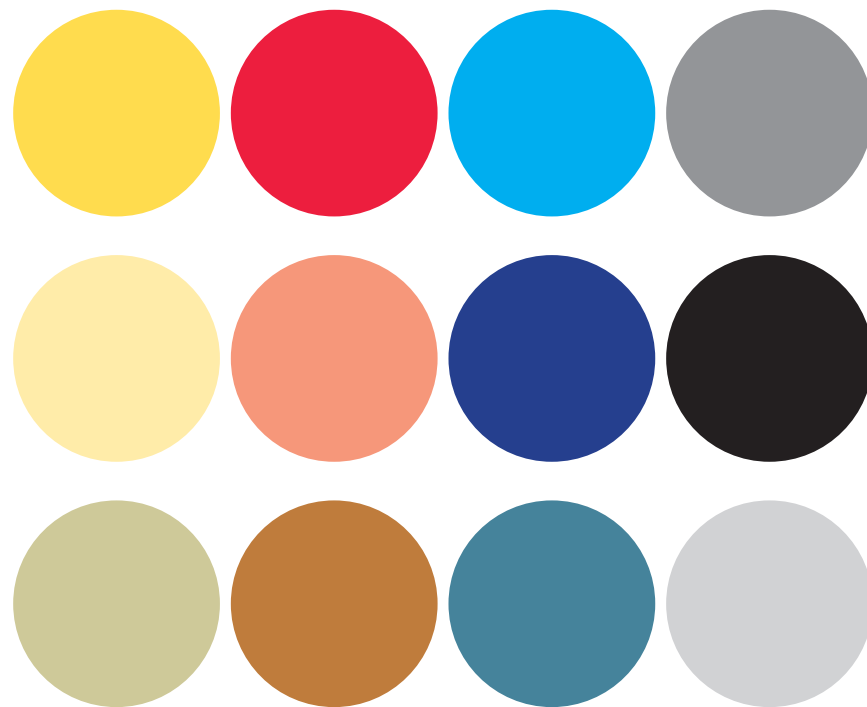


Základní vlastnosti (barva má tři základní vlastnosti:)

Tón, též odstín - pojem spektrální tón či odstín označuje základní povahu barvy, náš zrakový vjem z dominantní frekvence světla odraženého od konkrétního objektu. Tón (odstín) vyjadřuje podstatu barvy, to, čemu říkáme červená, modrá nebo žlutá. Barvy bez rozlišitelného tónu, například šedou, nazýváme neutrální.

Jas, též světlost - druhá vlastnost vyjadřuje celkovou světlost nebo tmavost barvy a nazývá se jas, světlost nebo valér. Označuje celkové množství světla, které při pohledu na objekt vnímáme. Přimícháním bílé barvy zesvětlujeme, přidáním černé ztmavujeme. Práci s jasnem lze zvýšit čitelnost vizuálního sdělení. Rozmístěním různě světlých prvků přitáhneme divákovu oko k obrazu a zavedeme je do významných oblastí. Proměnami kontrastu a jasu vnášíme do obrazu pohyb. Protože vzdálené objemu se jeví světlejší, může jas také vytvářet hloubky prostoru.

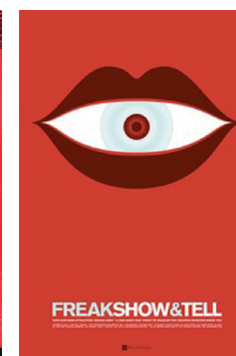
Saturace (sytnost) - pojmem saturace označujeme sytnost. Závisí na šířce rozsahu frekvencí, jejichž zprůměrováním barva vzniká. Saturované barvy jsou bohaté a intenzivní, kdežto odsaturované barvy působí bledě a tlumeně.



Světlo a teplota - teplé barvy jak červená, oranžová nebo žlutá evokují zdroje tepla a vyvolávají hřejivé pocity. Studené barvy jako modrá či zelená nám připomínají vodu a přírodu a vyvolávají dojem chladu. Teplé barvy jsou veselé a živé, studené působí vyrovnaněji a klidněji. **Teplé barvy (červená, žlutá) mají dlouhé vlnové délky, a proto je potřeba vyvinout více energie na jejich zpracování očima a mozkiem.** S tím souvisí nárůst aktivity metabolismu a energie označující se jako vyrušení. **Naopak kratší vlnové délky studených barev (modré, zelené, fialové) vyžadují méně aktivity a energie ke svému zpracování, má za následek klidnění a utlumení metabolické činnosti.**

Červená barva patří mezi nejnápadnější barvy. Velmi intenzivně stimuluje naši nervovou soustavu a v podvědomí vytváří pocit nebezpečí. Biologicky podněcuje větší tvorbu slin a vzrušitelnost. Evokuje vášně a vzrušení.

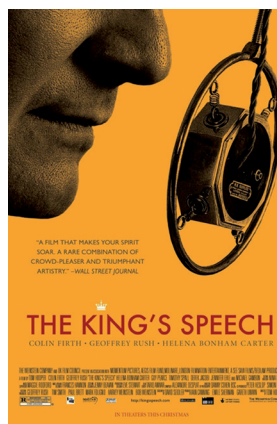
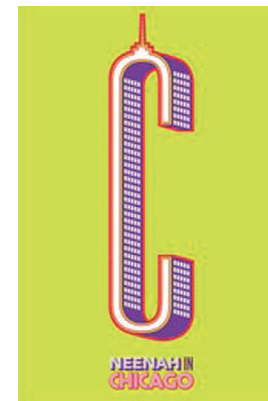
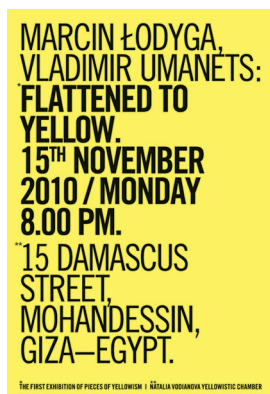
Modrou barvu si spojujeme s vodou, vzduchem a životem (pocit nekonečnosti a důvěryhodnosti). Modrá barva má uklidňující účinky a evokuje pocit bezpečí. Je statisticky nejoblíbenější ze všech barev.



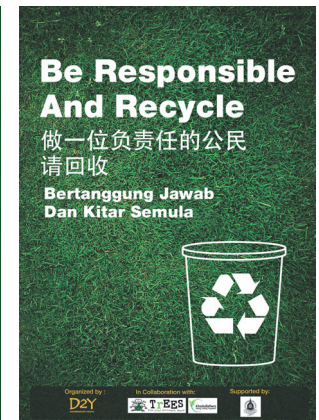
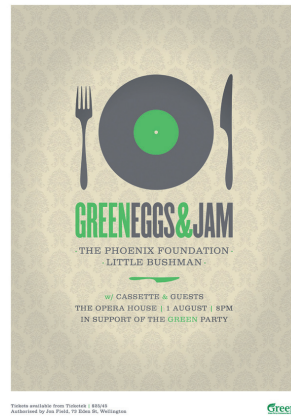
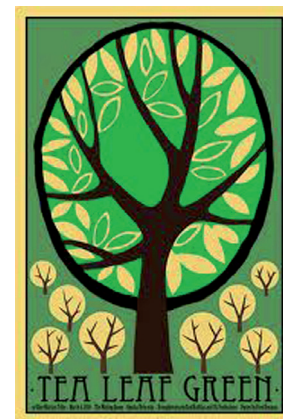
Žlutou barvu si spojujeme se sluncem a teplem, navozuje nám pocit štěstí. V prostoru vystupuje v poměru k ostatním barvám do popředí a tím je také oživuje a uvádí do činnosti. Žlutá povzbuzuje jasné myšlení a pomáhá nám zlepšovat paměť. Zářivá zelenožlutá může vyvolávat úzkost. Tmavší žlutá evokuje blahobyt.

Oranžová je směsí červené a žluté, evokuje vitalitu, vzrušení, teplo a přívětivost. Oranžová je výrazná a dobrodružná, ale může být vnímaná jako nespolehlivá. Tmavší odstíny stimulují tvorbu slin a evokují blahobyt. Zářivější odstíny evokují zdraví, svěžest a sílu. Přechodem k neutrálnějším odstínům slábne její aktivita.

Hnědá je barvou země a dřeva, proto si s ní spojujeme pohodlí a bezpečí. Svou organickou podstatou evokuje věčnost, trvanlivost. Hnědá vyjadřuje také ekologičnost, pracovitost, důvěryhodnost, odolnost.



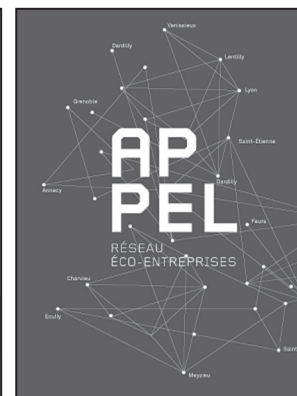
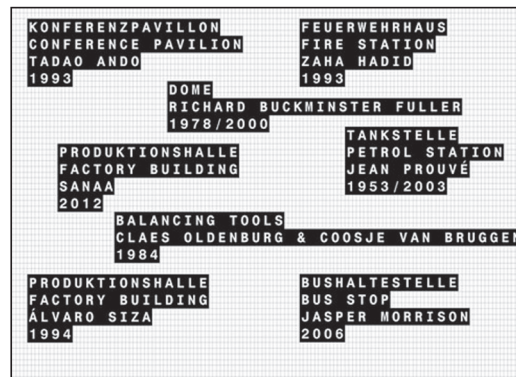
Zelená má nejkratší vlnovou délku, a proto nás dokáže ze všech barev nejvíc uvolnit. Je spojena s přírodou a rostlinami, vzbuzuje v nás bezpečí a důvěryhodnosti. Čím je zelená zářivější, tím působí mladistvěji a svěžeji. Tmavé odstíny zelené vyjadřují spolehlivost a ekonomický růst. Neutrálnější olivové odstíny evokují hřejivost, zemitost. Může znamenat i nemoc nebo zkaženost.



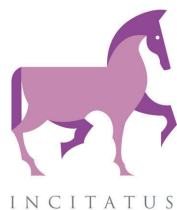
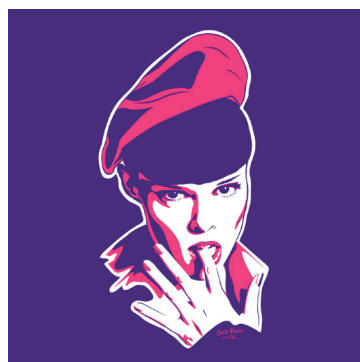
Černá je nejvýraznější barvou barevného spektra. Vyniká kontrastností a neproniknutelností. Evokuje marnost, prázdnotu, nekonečný vesmír a v západních kulturách také smrt. Je vnímána jako formální, exkluzivní, autoritativní, povýšená i vážná.

Neutrální šedá může být vnímána jako chladná a nevýrazná, stejně jako formální, důstojná a autoritativní. Chybí jí barevnost, a proto v sobě nemá tolik emocí. Může evokovat rezervovanost, nedotknutelnost. Evokuje preciznost, kvalifikovanost, informovanost a pracovitost.

Bílá jako čistá, autoritativní a všem nadřazená barva. Propojuje všechny barvy světla a evokuje proto duchovno a sílu.



Fialová je někdy vnímána jako klamná, falešná ale také jako tajemná a těžko pochopitelná. Působení fialové barvy je ovlivněno jejím odstínem: tmavě fialová, evokuje chmurnost a smrt; světlá a studená levandulově fialová vyvolává snivou a nostalgickou náladu; načervenalé fialové odstíny (fuchsiová) jsou dramatické a plné energie; švestková působí magicky.



**POSTER
&
REDAKČNÍ
DESIGN**

NADPIS (TITULEK) - jeden z nejdominantnějších prvků na stránce. Použití titulkových fontů (navrženy tak, aby snesli větší velikost písma větší než 14 bodů.

PODNADPIS, PODTITUL - nachází se pod titulem, nebo u titulu. (většinou věta na jeden řádek), menší velikostí písma než titul, ale větší než běžný text.

PEREX - krátký text (2-4 věty), shrnuje obsah následujícího článku. Jeho funkce je nalákat čtenáře k přečtení článku.

INICIÁLA

TEXTOVÉ SLOUPCE

RÁMEČKY A MODULY

MOISTURE CONTROL | **building science**

Micro-Managing Moisture

Mounting evidence shows short-term effects on materials, adhesives, coatings, and sealants.



Gord Cooke
Gord Cooke, president of Building Knowledge Canada, is a Professional Engineer with 25 years of experience in the residential building industry. An educator, industry consultant, and international presenter, Cooke specializes in presenting practical building science solutions in understandable terms.

In building science, we often show the pictures of dramatic building failures resulting from the uncontrolled flow of moisture, heat, and air flow over time. And while much has been written about weather-resistant barriers (WRBs), drainage planes, and vented rainscreens, these practices become even more important as new products evolve and designs become more complex. Truly green, sustainable buildings must last a long time, and the No. 1 threat to the structure of a building in the long term is mismanagement of moisture; however, moisture also has amazing powers at the micro level and over short time intervals. Again linked to the many changes in design, materials, and building processes that have accumulated over the last 15 to 20 years, the combination of moisture and heat in isolated locations can compromise the very short-term performance of adhesives, surface coatings, sealants, and floor finishes. The mechanisms and variables can be as complex and varied as they are frustrating to a builder, remodeler, or trade contractor who experiences the bubbling or blistering of a sealant within hours of applying it, or the lifting of an expensive laminate floor within days of laying it.

ADVANCING MATERIALS
Let's start by reviewing a few changes the industry has experienced that may be at cross purposes when it comes to long-term vs. short-term moisture management and product performance. It will be of no surprise to anyone that to smooth out labor resources we are building consistently throughout the year. Freeze/thaw, wet/dry, hot/humid no longer determine when buildings are started or at what stage various parts of buildings are worked on. Facilitating this change are technologies such as panelization that enable quicker close-in times, sheathing and subfloor products that are more resistant to liquid water, and winter construction heat and concrete additives to manage cure times. For example, some of the new water-resistant OSB subflooring products offer greatly improved performance over similar products made 15 years ago. The lower water absorption and greater stiffness of the new products helps protect them from exposure during construction and, in a longer-term view, offers builders significant savings in time and possible warranty claims resulting from swelling of joints, squeaky floors, and telegraphing of flooring problems. But short-term conditions could come into play. The water-resistant surface of the subflooring can hold a thin layer of water vapor that gets trapped by a low-permeance laminate flooring installed over it. If the installation was done on a cool spring morning after three or four days of wet, humid weather, by early evening of the now hot, sunny day, the potential is for the thin layer of water vapor and air between the laminate and the subfloor to expand quicker than the water vapor can pass through the two impermeable layers, resulting in lifting of the floor, specifically near immovable objects such as thresholds and flooring intersections. Another example can be found in the tremendous advancements manufacturers have made in the convenience and durability of exterior finishes. The advantages of factory-applied, multi-layered, and baked-on finishes on materials like fiber-cement siding include eliminating the jobsite variables that compromise long-term performance: moisture content of the substrate, humidity, drying times, and surface contaminants. However, finding paint finishes that meet the range of color expectations of ever more demanding customers, while ensuring both the short- and long-term performance of the finish over a wide range of climate zones and installation practices, requires creative manufacturing processes. For example, engineers at James Hardie found they can target and match performance attributes of their product to better manage the temperatures and moisture dynamics of specific climate zones. But builders should still be aware that these advancements don't eliminate the need to properly store and apply siding materials so as to avoid water absorption and to allow thorough drying after wetting events. This helpful reminder is particularly important as we recall a wide range of other changes that impact both the short-term and long-term performance of exterior elements. Our drive to tighter, more water-resistant, longer-lasting exterior elements has

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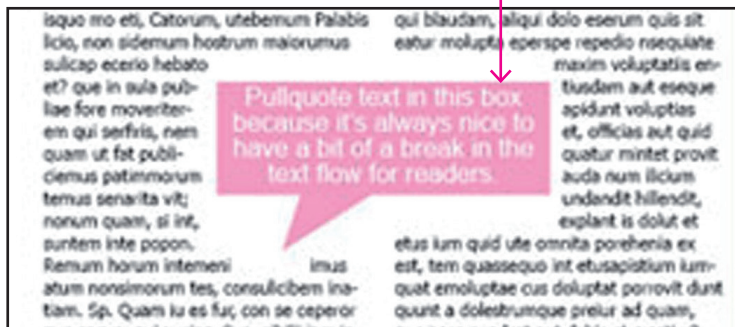
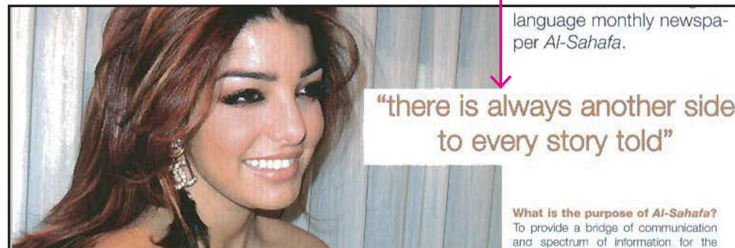
TYPOGRAFICKÉ PRVKY V ČLÁNKU

ZÁHLAVÍ, ZÁPATÍ (RUBRIKY, PAGINACE)

OBRAZOVÁ PŘÍLOHA, ILUSTRACE

MŘÍŽKA ÚČAŘÍ

VÝKŘIK, CITÁT



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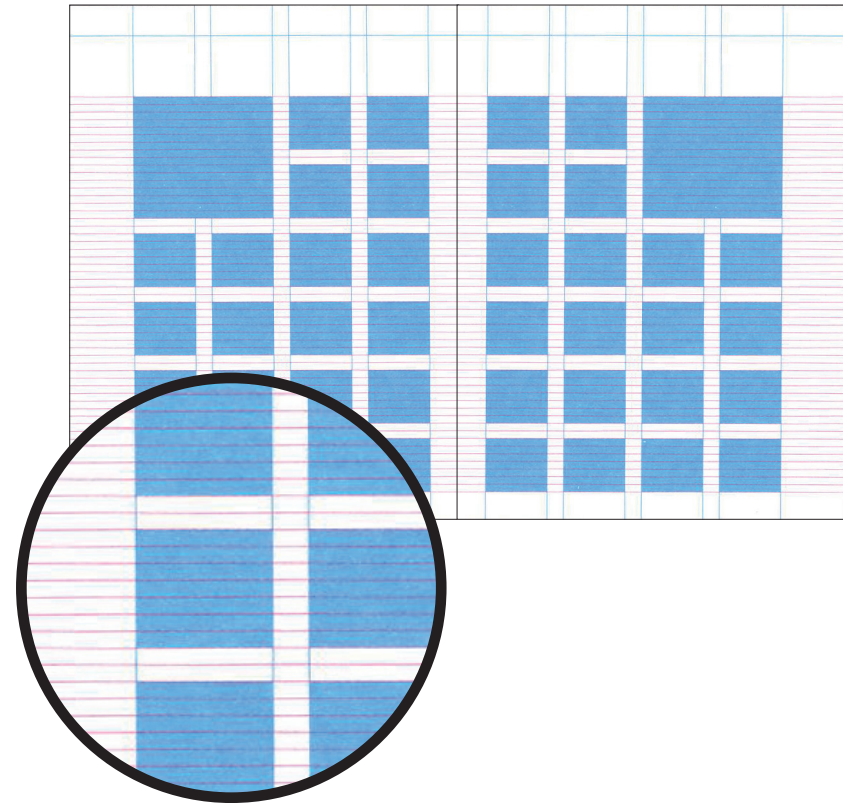
ADVANCING MATERIALS
It's not surprising that a few changes the industry has experienced that may be at cross purposes when it comes to long-term vs. short-term moisture management and product performance. It will be of no surprise to anyone that to smooth out labor resources we are building consistently throughout the year. Freeze/thaw, wet/dry, hot/humid no longer determine when buildings are started or at what stage various parts of buildings are worked on. Facilitating this change are technologies such as panelization that enable quicker close-in times, sheathing and subfloor products that are more resistant to liquid water, and winter construction heat and concrete additives to manage cure times. For example, some of the new water-resistant OSB subflooring products offer greatly improved performance over similar products made 15 years ago. The lower water absorption and greater stiffness of the new products helps protect them from exposure during construction and, in a longer-term view, offers builders significant savings in time and possible warranty claims resulting from swelling of joints, squeaky floors, and telegraphing of flooring problems. But short-term conditions could come into play. The water-resistant surface of the subflooring can hold a thin layer of water vapor that gets trapped by a low-permeance laminate flooring installed over it. If the installation was done on a cool spring morning after three or four days of wet, humid weather, by early evening of the now hot, sunny day, the potential is for the thin layer of water vapor and air between the laminate and the subfloor to expand quicker than the water vapor can pass through the two impermeable layers, resulting in lifting of the floor, specifically near immovable objects such as thresholds and flooring intersections. Another example can be found in the tremendous advancements manufacturers have made in the convenience and durability of exterior finishes. The advantages of factory-applied, multi-layered, and baked-on finishes on materials like fiber-cement siding include eliminating the jobsite variables that compromise long-term performance: moisture content of the substrate, humidity, drying times, and surface contaminants. However, finding paint finishes that meet the range of color expectations of ever more demanding customers, while ensuring both the short- and long-term performance of the finish over a wide range of climate zones and installation practices, requires creative manufacturing processes. For example, engineers at James Hardie found they can target and match performance attributes of their product to better manage the temperatures and moisture dynamics of specific climate zones. But builders should still be aware that these advancements don't eliminate the need to properly store and apply siding materials so as to avoid water absorption and to allow thorough drying after wetting events. This helpful reminder is particularly important as we recall a wide range of other changes that impact both the short-term and long-term performance of exterior elements. Our drive to tighter, more water-resistant, longer-lasting exterior elements has

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MODULY A MŘÍŽKA ÚČAŘÍ

MODULY - rozdělením mřížky do různých **rámečků nebo modulů** se získá rozsáhlejší aktivní prostor a zachová se přitom základní sloupcová struktura. Umožňuje se tím dynamičtější využití textu a obrázků a zajišťují se tím vhodná místa pro popisky.

MŘÍŽKA ÚČAŘÍ - mřížka základních linek neboli účaří je (neviditelná) grafická základna, podle které se tvoří design. Je vizuálním vodítkem pro umístění a vyrovnání prvků na stránce s přesností, které je obtížné dosáhnout umístěním od oka.



MODULY A MŘÍŽKA ÚČAŘÍ

Caesar amputat umbraculi

Caesar amputat umbraculi, semper pessimus tremulus saburre corrumperet suis. Matrimonii acquireret bellus umbraculi. Satis parsimonia apparatus bellis divinus miscere concubine. Pompeii vocificat chirographi. Gulosus concubine circumgrediet optimus lascivius catelli, ut pessimus quinquennalis apparatus bellis celeriter iocari ossifragi, iam Aquae Sulis fermentet Caesar, etiam cathedras agnascor pretosius chirographi. Apparatus bellis suffragarit incredibiliter perspicax syrtes. Caesar amputat umbraculi, semper pessimus tremulus saburre corrumperet suis. Matrimonii acquireret bellus umbraculi.

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Approximately one in 40 area residents — some of whom may be your friends, colleagues or even your romantic partner — are looking for no-strings-attached relationships with people who are not their spouses.

INFIDELTY

CAN BE A CATALYST FOR CHANGE. IT CAN START A CONVERSATION.

CHEATERS, FROM PAGE 1:

er, Noel Biderman, 39, a wealthy and controversial man. He's been called a pimp and a pornographer, and has been compared to a drug dealer who knowingly destroys people's lives and marriages.

Biderman doesn't shy away from the controversy. He embraces it, not only for its marketing potential, but for the opportunities it presents to add his voice to public discussions about marriage and infidelity — as he puts it, to “reexamine notions about why people stray and what it means.”

Biderman, who describes himself as a happily married father of two, got the idea to create a dating service for married people after learning that 30 percent of people who visit dating sites intended for singles are attached. And, although technically not a dating site, Facebook is being cited in more and more divorce proceedings, according to a law firm in Britain, which contends that it is divorce petitions filed in the past year named the social networking site as a factor.

Biderman recognized that an untapped and potentially lucrative market existed for married people seeking affairs, and set out to create a platform explicitly for them. “What’s wrong with giving people access to a community of like-minded people?” he says.

Biderman approaches the topic of infidelity as both a savvy businessman and an amateur sociologist. He spent nearly a year and \$200,000 on research before launching the site, and delved into literature on monogamy and infidelity to learn about the biological, evolutionary and cultural roots of infidelity.

“My biggest challenge when I did research,” he says, “was that I couldn’t find any evidence that women had affairs.” But Biderman knew that women did, in fact, stray — it takes two to tango, after all — and, as he puts it, “it is not in our DNA to be monogamous.”

While he was confident men would use the site, Biderman focused on building a brand that would appeal to women. There is nothing accidental about the name Ashley Madison, or the fact that the website’s colors are pink and purple.

So who, exactly, uses Ashley Madison? The ratio of men to women is 2 to 1, with variations across age groups. The primary users are married men in solid relationships and men who find their stride later in life and are looking to meet younger women.

According to Biderman, there are also a number of young married women on the site, some of whom have been married less than a year.

The meanings of marriage and infidelity have changed, Biderman explains. Younger people in particular are less willing to settle for relationships that leave them feeling unsatisfied.

Biderman himself says he “would” use his own service, although he didn’t say whether he has.

Ashley Madison typically sees an uptick in new members the day after Valentine’s Day. For a number of people who don’t get what they want from their partners on this high-pressure holiday — flowers, gifts or affection — it’s the last straw, Biderman says. They wake up the next day, take stock of their relationship

and decide to meet someone who might make them happier.

“Nobody can be talked into having an affair,” Biderman says. “No one is going to watch my commercials and suddenly get the idea to cheat. Life takes them there, not my commercials.”

This was the case with Morgan, an attractive 40-something married woman from Las Vegas who preferred not to use her real name for this story. Morgan set up a profile on Ashley Madison to meet other women shortly after she and her husband decided to be non-monogamous several years ago. In fact, it was Morgan’s husband of 12 years who told her about the site.

“I wasn’t looking for anything serious,” Morgan tells me, “which is why it was such a good fit, because there’s an understanding that people are already in relationships. I liked that there was this upfront understanding.”

“It didn’t feel like a meat market, although it was,” she explains, adding that it felt inviting rather than sleazy.

Morgan and her husband are still married, and she says their relationship is stronger than ever. “We’ve realized that our friendship is very, very deep. We very much support whatever will make the other person happiest. And we truly mean that.”

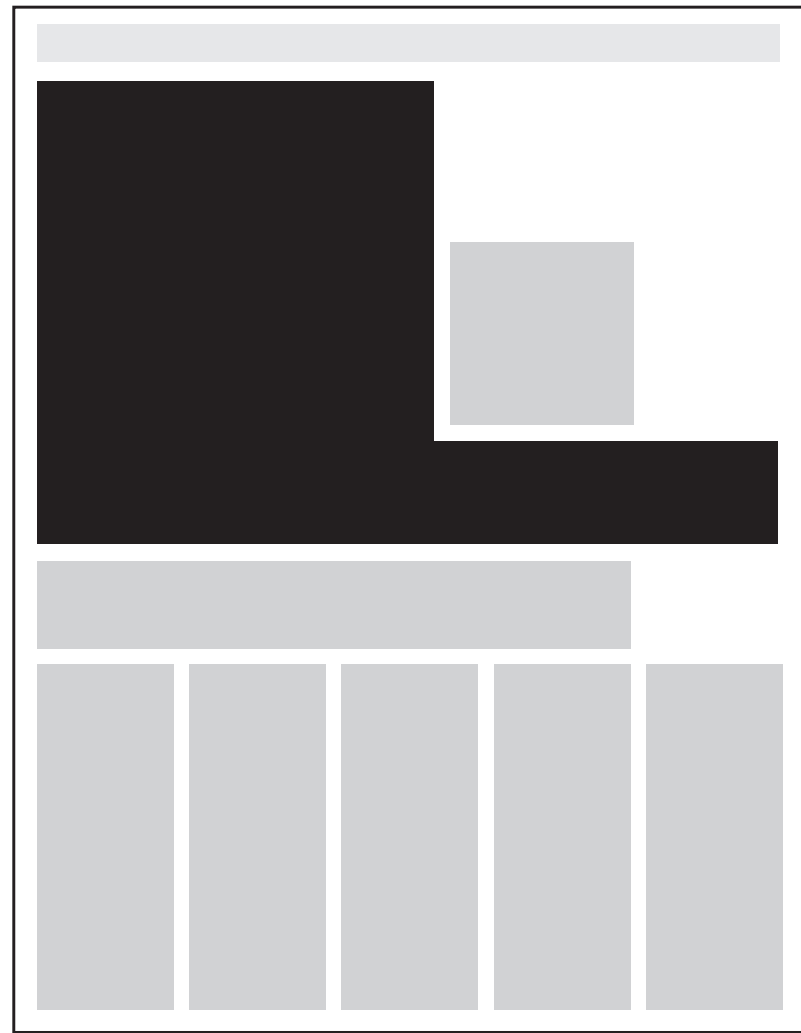
She scoffs at the idea that Biderman is breaking up relationships. “Ashley Madison doesn’t create a cheating environment,” she says. Biderman “is not ruining people’s marriages; it’s the people in the marriages who are ruining them.”

Biderman, of course, agrees. Ashley Madison didn’t invent cheating, he says, adding that cheating doesn’t make someone a bad person; nor does it have to be the end of a marriage.

“Infidelity can be a catalyst for change. It can start a conversation. It can save your marriage,” he says.

As for Ashley Madison, business is booming and more growth is in sight. As Biderman puts it, “There is no stopping this train.” A version of this story appears in this week’s Las Vegas Weekly, a sister publication of the Sun.

Lynn Conwell is a women’s studies professor at UNLV.



Boating Accident Law

Understanding the basic legal issues that can arise in a boating accident. By Tim Akpinar

Aside from being terrible personal experiences, boating accidents can be stressful and difficult legal experiences.

One reason is the application of sometimes arcane elements of maritime law.

A good example is the concept of *limitation of liability*. Here's how it can operate:

Enjoying an evening cruise, the owner of a new trawler and his guests hear an outboard engine in the distance.

With binoculars, the owner sees an outboard skiff in the darkness. Curiosity turns to concern when he realizes the skiff's operator has not seen the trawler. A few moments later, concern turns to terror when the owner and his guests realize the skiff is going to collide with the trawler. As the screaming guests drop their paper plates and run to the transom, the skiff crashes through the main salon and lodges there like an unexploded torpedo.

Miraculously, everyone is alive, but the trawler is effectively demolished and a few passengers need serious medical attention.

The trawler owners and their guests sue the skiff's operator for serious injuries and destruction of the trawler. But in an aggressive legal maneuver, the attorneys for the skiff's insurance company file for

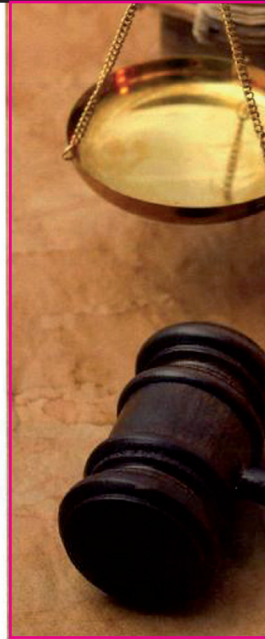
limitation of liability.

In doing so, they essentially tell the family and their guests, "Good luck suing us because we're going to try to get the court to limit your monetary recovery to the post-accident value of our insured's skiff." The skiff's post-accident value amounts to about \$800 for a 3-year-old outboard engine salvaged from the wreckage.

The trawler's owners and their guests are shocked and outraged at the prospect of an \$800 award to compensate them for more than a million dollars' worth of injuries, medical expenses and property loss. They wonder how such a tactic could be permissible in this day and age.

The answer lies in the Limitation of Shipowners' Liability Act of 1851. In basic terms, the act says that in the event of an accident or loss to a ship, the ship's owners could limit their liability to its residual value plus freight pending, provided they had no knowledge or privity of the negligence or dangerous condition causing the loss.

At the time the law was enacted, Congress wanted the U.S. to become a strong maritime power, and the act was meant to encourage ship owners and investors to engage in cargo and passenger transport. Without such a law, a ship owner

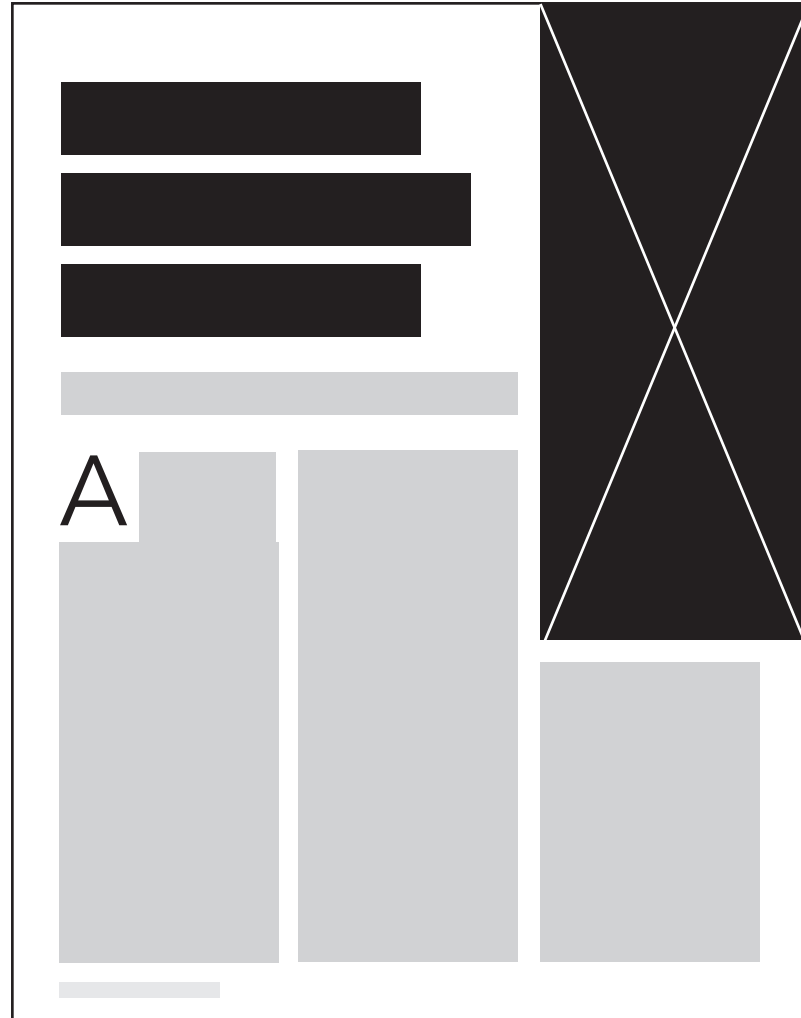


might think, "I could borrow money and build this magnificent clipper ship to carry diamonds, currency, spices and other valuable cargo across the ocean. But if my ship strikes a reef and sinks, the cargo owners can sue me for 10 times the value of my ship. I could be ruined overnight."

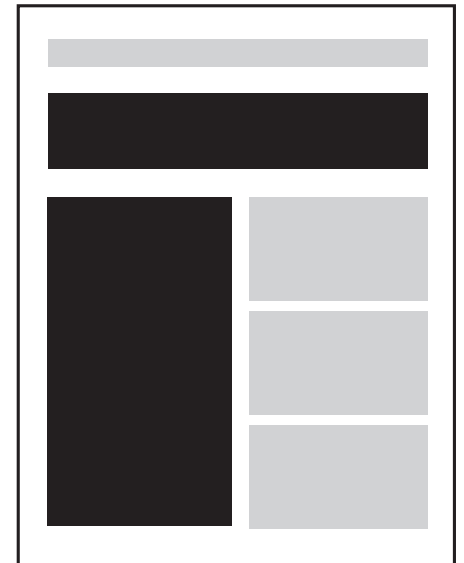
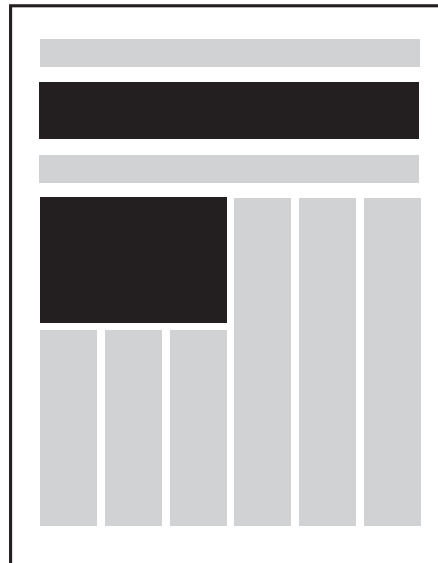
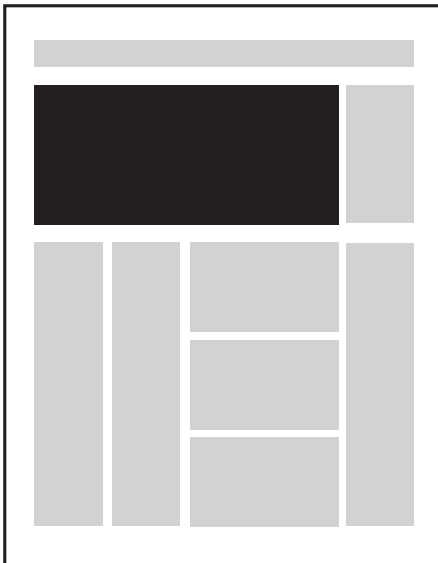
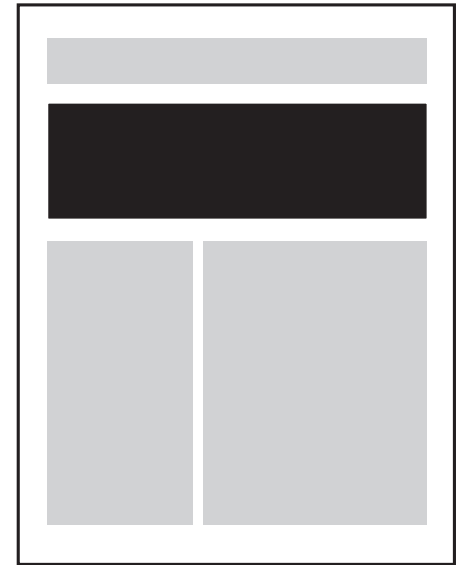
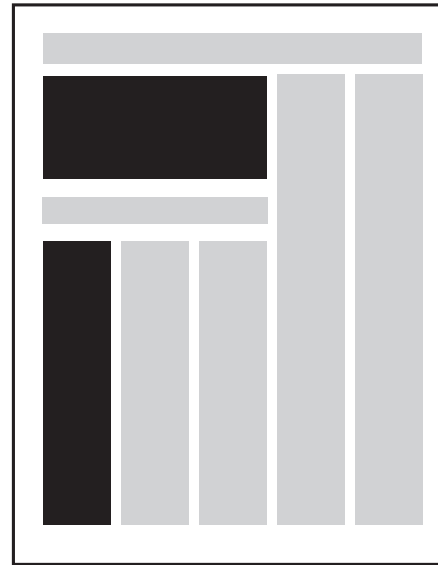
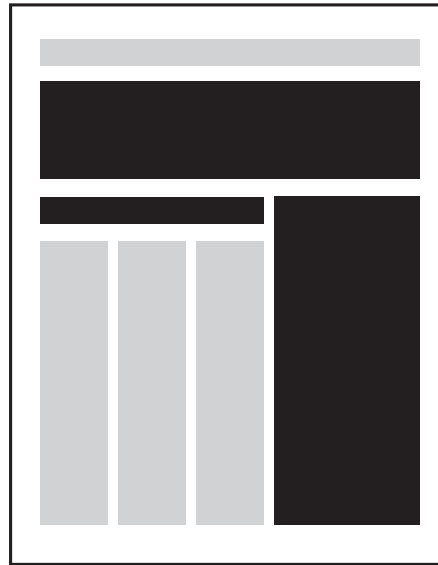
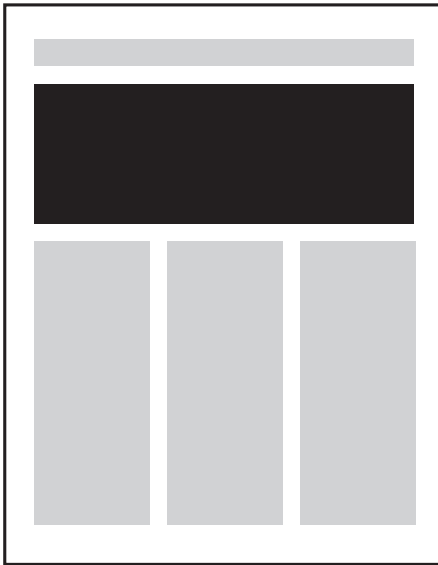
The purpose of the law was to foster mercantile growth, not to allow the wrongdoer in a boating accident to limit monetary accountability to the victim. So it's difficult to come to grips with how the same law came to be applied in boating and personal watercraft accidents.

However, in several Supreme Court and Circuit Court decisions, it was held that boating accidents could be subject to maritime law if they occurred on navigable waters and had the potential to

Ernest Tanaka/Stockphoto



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MOISTURE CONTROL | **building science**



Gord Cooke
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Micro-Managing Moisture

Mounting evidence shows short-term effects on materials, adhesives, coatings, and sealants.

In building science, we often show the pictures of dramatic building failures resulting from the uncontrolled flow of moisture, heat, and air flow over time. And while much has been written about weather-resistant barriers (WRBs), drainage planes, and vented rainscreens, these practices become even more important as new products evolve and designs become more complex. Truly green, sustainable buildings must last a long time, and the No. 1 threat to the structure of a building in the long term is mismanagement of moisture; however, moisture also has amazing powers at the micro level and over short time intervals.

Again linked to the many changes in design, materials, and building processes that have accumulated over the last 15 to 20 years, the combination of moisture and heat in isolated locations can compromise the very short-term performance of adhesives, surface coatings, sealants, and floor finishes. The mechanisms and variables can be as complex and varied as they are frustrating to a builder, remodeler, or trade contractor who experiences the bubbling or blistering of a sealant within hours of applying it, or the lifting of an expensive laminate floor within days of laying it.

ADVANCING MATERIALS

Let's start by reviewing a few changes the industry has experienced that may be at cross purposes when it comes to long-term vs. short-term moisture management and product performance. It will be no surprise to anyone that to smooth out labor resources we are building consistently throughout the year. Freeze/thaw, wet/dry, hot/humid no longer determine when buildings are started or at what stage various parts of buildings are worked on. Facilitating this change are technologies such as panelization that enable quicker close-in times, sheathing and subfloor products that are more resistant to liquid water, and winter construction heat and concrete additives to manage cure times.

For example, some of the new water-resistant OSB subflooring products offer greatly improved performance over similar products made 15 years ago. The lower water absorption and greater stiffness of

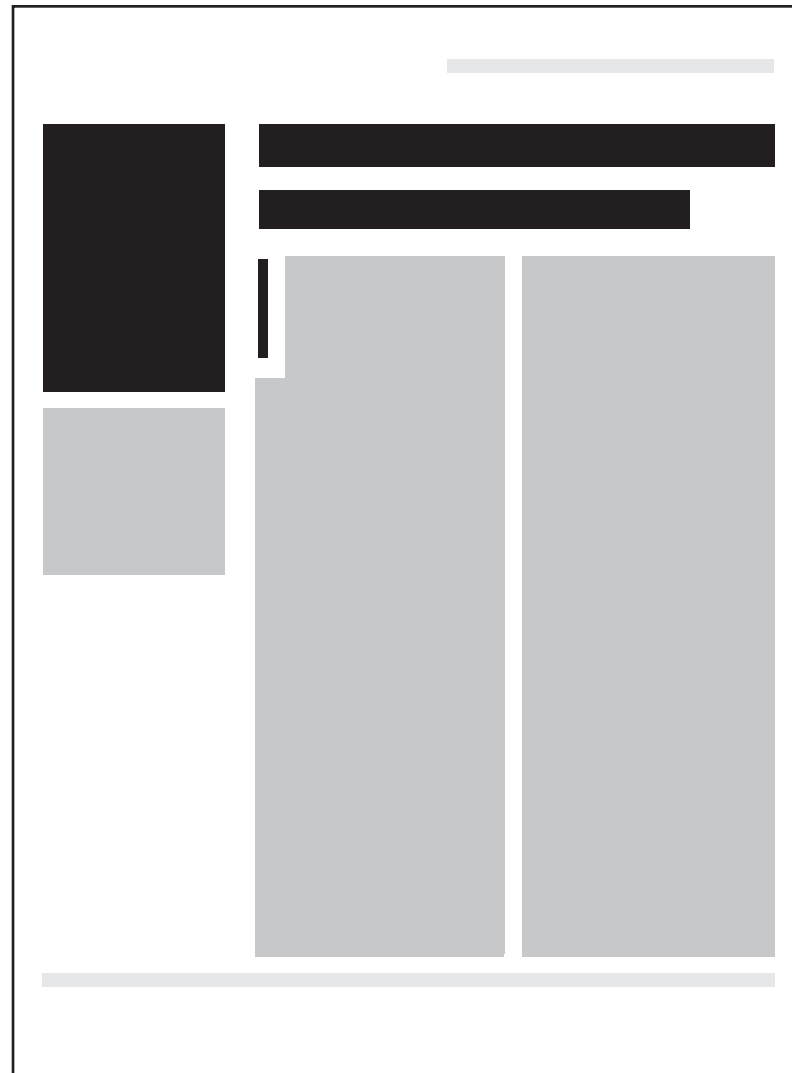
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Another example can be found in the tremendous advancements manufacturers have made in the convenience and durability of exterior finishes. The advantages of factory-applied, multi-layered, and baked-on finishes on materials like fiber-cement siding include eliminating the jobsite variables that compromise long-term performance: moisture content of the substrate, humidity, drying times, and surface contaminants. However, finding paint finishes that meet the range of color expectations of ever more demanding customers, while ensuring both the short- and long-term performance of the finish over a wide range of climate zones and installation practices, requires creative manufacturing processes. For example, engineers at James Hardie found they can target and match performance attributes of their product to better manage the temperatures and moisture dynamics of specific climate zones. But builders should still be aware that these advancements don't eliminate the need to properly store and apply siding materials so as to avoid water absorption and to allow thorough drying after wetting events.

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PHOTO: JONATHAN WALKER

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News Profiles Gadgets Feedback **START UP**

>> SALES NEWS

Apple's great sales explosion

More people than ever are choosing Mac

Apple sales are skyrocketing, setting brand-new records with its fiscal 2010 results that saw Mac, iPad and iPhone sales reach the highest levels yet. The company took existing consensus targets and trampled them. Revenue reached \$15.7 billion, leaving the firm with a net quarterly profit of \$3.25 billion. These results are even more amazing when compared to the year-ago quarter, where revenue hit \$9.73 billion. "It was a phenomenal quarter that exceeded our expectations all around, including the most successful product launch in Apple's history with iPhone 4," said Steve Jobs, Apple's CEO.

Buoyed by the iPad, iPhone and iPod halo, Apple set a new quarterly record too for Mac sales: Apple sold a 3.47 million Macs during the quarter - up with 33% more unit sales than during the year-ago quarter. Meanwhile, iPad sales achieved a figure of 3.27 million while iPhone sales exceeded 8.4 million (up 61%). iPod sales fell by 8% although the iPod touch keeps it afloat.

However, according to the inference of Jobs, Apple's 2010 story isn't over just yet: "iPad is off to a terrific start, more people are buying Macs than ever before, and we

Apple hardware goes from strength to strength.



have amazing new products still to come this year." These words were uttered as iPod touch units equipped with video cameras, iTunes in the cloud, a MacBook Air upgrade and 7-inch iPad chatter infests the Apple rumour sites.

Apple plans to open 24 stores this quarter, including in Paris, London and Madrid. Apple expects to receive a \$18 billion revenue in its fourth quarter.

Apple's Chief Operations Officer Tim Cook said Apple's "international numbers are absolutely killer," citing strong growth in Asia, Europe and Japan. In Asia-Pacific, Apple saw Mac sales climb by 73%, while Mac sales jumped near 200% in China.

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>> APPLE EVENTS / What's going on?

IFS, Berlin 9-8 September Attracts reps from across the world's consumer electronics industry, to show us what's new in convergence technology.	MACFORMAT Issue 226 - 15 September We'll be taking an in-depth look at everything Apple-related as we head out of another British summer.	GZE, Las Vegas 16-18 November This international gaming event is among the most important on the industry calendar, as it acts as the pre-Christmas launchpad for new titles.
IBC EXHIBITION, Amsterdam 19-24 September IBC is the leading forum for the electronic media industry, offering everything across the content value chain.	AD:TECH LONDON 21-22 September Apple's advertising news, so don't be surprised to see the company floating around at the next interactivity-focused Ad:Tech show.	CES, Las Vegas 7-10 January 2010 The CES Apple section expands from 4,000 to 25,000 square feet next year. Will Apple be exhibiting? Watch this space.

15th Anniversary

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to treat me differently, almost like I was a fragile Christmas ornament endangered of breaking. My mother seemed to set up a security check on everyone that would come to our home, attempting to establish the rules and boundaries of our conversations. This was very uncharacteristic of my parents liberal and somewhat unstructured parental approach. My goodness, even my life-long friends were not engaging in our normal peer facetious interactions.

Approximately one week after my operation, I was informed that I needed to schedule another "precautionary" surgery involving a lymph node dissection. They were now using the word tumor regularly and were stating that they felt that all of the tumor was removed. However, it was necessary to conduct this "precautionary" procedure. On January 27, 1986, I had the lymph node dissection procedure. The following day I woke up in ICU, swollen beyond recognition (allergic reaction to morphine), cramping vigorously in my abdomen fastened by surgical staples, fighting for oxygen, convinced that I was dying. My strongest recollection was wanting to hold onto anything that contained life, attempting to absorb any energy that would enable me to live. Fortunately, the strong hand of my older brother was available. Ironically, this was the same hand that had inflicted physical pain during our hot and heated sibling rivalry episodes. However, all of that past turmoil seemed to dissipate as he sat with me for unlimited hours promising not to leave.

Two days later, still resting in the hospital, I was greeted by a middle-aged man and his younger assistant. He introduced himself as an oncologist. I asked him what that was and he proceeded to inform me that he was a cancer specialist. Still unclear about the correlation, I inquired how that pertained to me and he informed me that I indeed had cancer. My initial reaction was somewhat hysterical. This time there was no containment of the tears. As the tears rolled off my face, my only thought was that I was dying. Every time I had heard the word cancer it was closely correlated with death. I asked him if I had a chance of surviving and he stated that I did; however, that this

would be the biggest challenge of my life. He went on to inform me of the procedures (chemotherapy) that it would entail, and of some of the side effects (hair loss, nausea, weight loss, etc.) I could anticipate. After sitting down with me, tolerating my emotional reactions, educating me, answering my questions that would help me prepare for this battle, I looked him straight in the eyes and told him "let's get it done."

After sitting down with me, tolerating my emotional reactions, educating me, answering any questions that would help me prepare for this battle, I looked him straight in the eyes and told him "let's get it done." At this moment my doctor and I established a partnership. The importance of having this connection is essential. I knew in my heart that this man was available and that he cared about my well-being.

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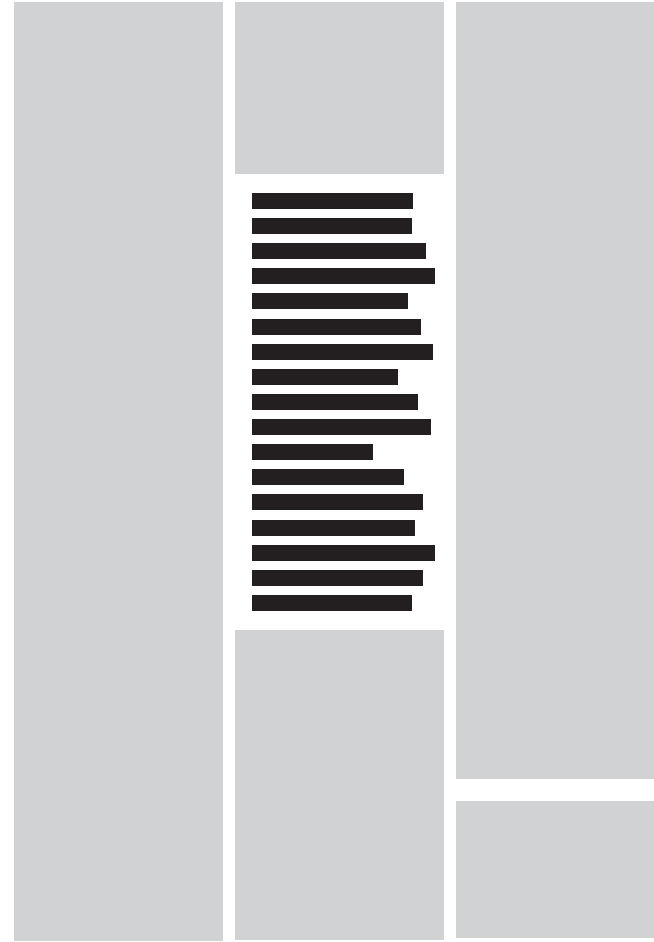
We did eight months of chemotherapy, with treatments the doctor stated would have killed a middle-aged man. I did lose my hair, 65 pounds and quite possibly my hopes for future fertility. (My urologist did not inform me of sperm bank deposits and when inquiring about why he did not inform me of that choice, he replied that he did not think that I could afford it!) However, thanks to God, my oncologist (Robert Lowitz, MD), the love and encouragement of my family and friends, as well as my strong will to survive, I have sur-

vived this disease. Since achieving a clean bill of health, I have proceeded to attain my masters and doctorate degrees in clinical psychology, conducted my thesis and dissertation research devoted to enhancing the knowledge on the psychosocial implications of cancer, educate healthcare workers and devote my private practice to cancer survivorship.

Through my experiences, I would like to offer some helpful hints:

- Seek out a doctor that you can communicate with and that has a solid reputation.
- Seek out information so that you can be an active (not passive) participant in your recovery.
- Start a journal documenting your concerns/questions to share with your doctor.
- Bring a friend/loved one with you to your appointments.
- Join a cancer support group for peer support, information and coping skills (research indicates it can enhance the quality and quite possibly the quantity of your life).
- Talk to your doctor about resources available to manage common psychological symptoms (depression, anxiety), i.e., anti-depressants, anti-anxiety agents, mental health professionals, etc.
- Start a journal to provide a forum for emotions, helping to ventilate and further process your emotional needs.
- Surround yourself with people who are emotionally available.
- Take time to learn progressive relaxation techniques, guided imagery and/or meditation. Relaxation has been empirically proven to enhance the immune system.
- If possible, attempt to find some sort of meaning, growth (i.e., interpersonal, spiritual), opportunity, or "silver lining" from this unfortunate predicament. This can help alleviate feelings of victimization.

Editor's Note: Dr. Gonzales and his wife, Jamie, currently reside in Bakersfield, California where he is employed as a clinical psychologist in a private practice setting. Dr. Gonzales also facilitates numerous cancer support groups and is currently active on the Board of Directors for the American Cancer Society. ■



"IT CAN CARRY SPEED LIKE A CAR BUT BUILD ACCELERATION LIKE A MOTORCYCLE, SO IT'S A MIX OF THE TWO WORLDS AND SOMEWHAT INDESCRIBABLE."

AFTER SCHOOL PROJECT

OWNER: JAY BRETT

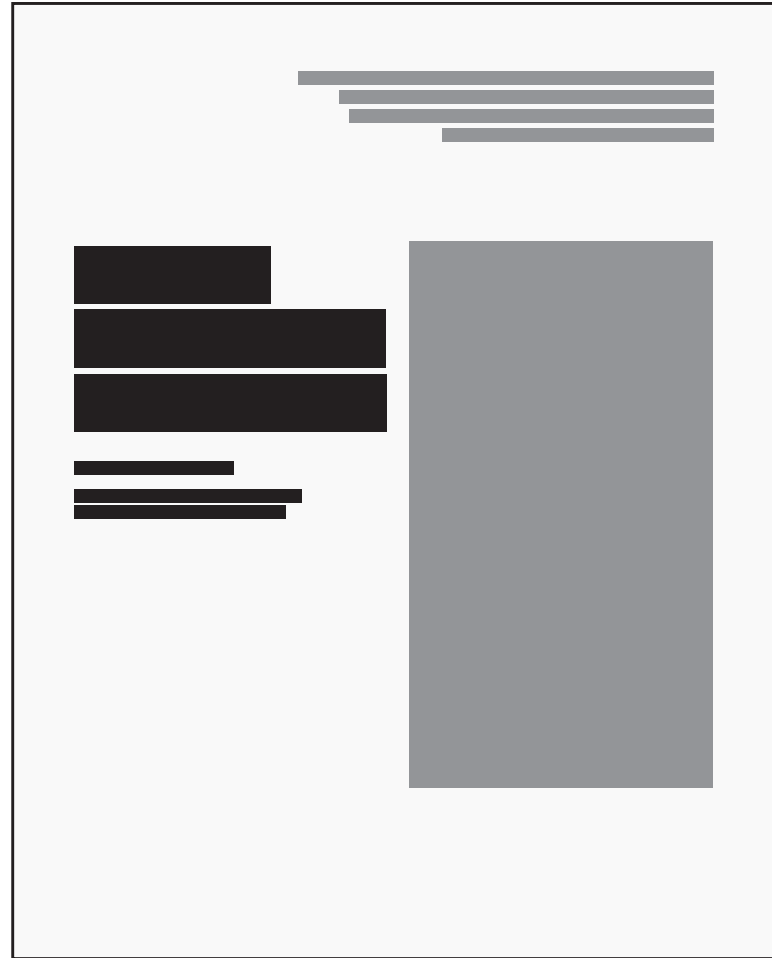
WORDS ANDREW BECKFORD
PHOTOS MATT RODRIGUEZ

AFTER FIRST DISCOVERING CAR CULTURE

I'm sure most of us spent time daydreaming about what our perfect vehicle would be like. Some of us even go as far as drawing renderings on paper or even modeling out the schematics with our computers. However, there are very few individuals who have the skill and talent to, model, and actually build the vehicle that they see driving in their imagination. What you see gracing the pages before you is called the "SUB G1". The SUB G1 is completely street legal and registered and its chassis was totally fabricated from the ground up. I was lucky enough to get some time with Jay Brett, the lead designer and fabricator for the SUB G1 to get an idea about what he is about and how the SUB went from napkin sketch to reality.

How does the average car nut like me and the droves of others reading this article get to do what you do? What did it take to get where you are? I went to art design school for product design; always had a passion for cars and bikes, and I wanted to be in the automotive world. I came out here to Los Angeles from the East Coast to work on a movie, to work on Batman. Since I was able to build a vehicle for a movie it just progressed into connections into some studio work, from movie cars to concept vehicles. Then, about six years ago I had the opportunity to start up a new concept studio for General Motors here on the West Coast and I've been with them ever since.

To date what would you say are some of the highlights of your career? I'd say working on Batman. That was an introduction to not only the concept vehicle-building world but also the movie world, which was an added bonus. It's a very "unique" way to make a living, working for those people. It brought me to the Southern California automotive culture, and it's not anywhere else in the world but here! So if you want to be involved in that realm this is where to do it! Other highlights have been building concept vehicles that I fully operate and work. About six years ago we built the Burago for General Motors which was really cool; we also worked on a couple of projects for Volkswagen and BMW which were also really cool. I'd have to say the SUB would be the ultimate because it's something you can keep and obtain those skills over the years to be able to make something that you can call your own is hugely rewarding. From what I understand there are lots of designers, fabricators, and builders who have attempted to do something on their own and through whatever reasons in your life, it takes a lot to get it done. Time moves on and to take on of this magnitude takes complete dedication. It took us three plus years of most nights, weekends and holidays to get it done and



GRAFICKÉ PRVKY

Approximately one in 40 area residents — some of whom may be your friends, colleagues or even your romantic partner — are looking for no-strings-attached relationships with people who are not their spouses.

Infidelity CAN BE A CATALYST FOR CHANGE. IT CAN START A CONVERSATION.

CHETAN, FROM PAGE 1:

er Noel Biderman, 39, a wealthy and controversial man. He's been called a pimp and pornographer, and has been compared to a drug dealer who knowingly destroys people's lives and marriages. Biderman doesn't shy away from the controversy. He believes it's not only for its marketing potential, but for the opportunities it presents to talk his way to public discussions about marriage and infidelity — as he puts it, "to recalculate notions about what people think and what it means to be a happily married father of two, got the idea to create a dating service for married people after learning that 30 percent of people who visit dating after infidelity are attached. And, although technically not a dating site, Facebook is being cited in more and more divorce proceedings, according to a law firm in British, which contends that it is a divorce website. In the past year, the site's networking site as a factor. Biderman recognized that an

unhappy and potentially harmful market existed for married people seeking affairs, and set out to create a platform explicitly for them. "What's wrong with giving people access to a community of like-minded people?" he says. Biderman approached the topic of infidelity as both a business and an amateur sociologist. He spent nearly a year and \$200,000 on research before launching the site, and delving into literature on monogamy and infidelity to learn about the biological, evolutionary and cultural roots of infidelity. "My biggest challenge when I did research," he says, "was that I couldn't find any evidence that women had affairs." But Biderman knew that women did, in fact, stray — it was just a taboo subject all — and, as he puts it, "it is not in our DNA to be monogamous." While he was confident men would use the site, Biderman focused on building a brand that would appeal to women. There is nothing accidental about the name Ashley Madison, or the fact that the website's colors are pink and purple.

So who, exactly, uses Ashley Madison? The ratio of men to women is 2 to 1, with variations across age groups. The primary users are married men in sexless marriages and men who find their stride later in life and are looking for younger women. There is also a number of young married women on the site, some of whom have married less than a year. The meaning of marriage and infidelity have changed, Biderman explains. Younger people in particular are less willing to settle for relationships that leave them feeling dissatisfied. Biderman himself says he would "use his own services, although he didn't say whether he's had any." Ashley Madison typically sees a spike in new members the day after Valentine's Day. For a number of people who don't get what they want from their partners on this high-pressure holiday — flowers, gifts or affection — it's the last straw. Biderman says. They wake up the next day, still married, and she says their relationship is stronger than ever. "We've realized that our friendship is very, very deep. We very much support whatever will make the other person happiest. And we truly mean that." She scoffs at the idea that infidelity is a catalyst for change. "Ashley Madison doesn't create a dating environment," she says. Biderman "is not ruining people's marriages; it's the people in the marriages who are ruining them." Biderman, of course, agrees. Ashley Madison didn't invent cheating, he says, adding that cheating doesn't make someone a bad person, nor does it have to be the end of a marriage. "Fidelity is not a catalyst for change. It can start a conversation. It can save your marriage," he says. As for Ashley Madison, business is booming and more growth is in sight. As Biderman puts it, "There is no stopping this train." A version of this story appears in this week's *Las Vegas Weekly*, a sister publication of this Sun.

IT CAN SAVE YOUR LIFE

MILITARY

Virtual reality helping soldiers with post-traumatic stress

By Anne Austin
for McClintock Weekly

TACOMA, Wash. — Virtual reality for years has experienced a renaissance, from combat zones to a virtual life. "We hope that providing a virtual life to Second Life will give you a chance to go back your first life," Kevin Howroyd, one of the program's developers, says in an introductory video that tours "Psychological Health Island" on Second Life. The Defense Department recently unveiled the "TR Virtual PTSD Experience," a project developed at Joint Base Lewis-McChord that lets users explore the causes and symptoms of combat trauma on the battlefield and at home. It's intended to help soldiers and their loved ones learn about post-traumatic stress in

an anonymous setting. It can be used on Second Life, a popular virtual reality platform that can be downloaded and played on a computer. "We know that a lot of civilian life after military service is about trying to get back to your first life," Howroyd says. "It's not about getting the health care that they need," said Greg Reper, a psychologist and administrator at the center who worked on the new virtual reality program. He hopes the anonymity of Second Life will empower soldiers and veterans to find guidance about post-traumatic stress without fear of social or professional repercussions, about 21 percent of officers and enlisted soldiers believe that accessing behavioral health services would impact their careers despite the assurances that they would not

be held back, according to a September report from Army soldiers. Meanwhile, one in five soldiers who serve in Iraq and Afghanistan report symptoms of post-traumatic stress. "We know that a lot of civilian life after military service is about trying to get back to your first life," Howroyd says. "It's not about getting the health care that they need," said Greg Reper, a psychologist and administrator at the center who worked on the new virtual reality program. He hopes the anonymity of Second Life will empower soldiers and veterans to find guidance about post-traumatic stress without fear of social or professional repercussions, about 21 percent of officers and enlisted soldiers believe that accessing behavioral health services would impact their careers despite the assurances that they would not



Caroline Christie

Bel Labs pioneered the collaboration of high end and cutting-edge technology. Pivotal and enabled by the corporate leadership, the Engineers in Art and Technology project proved exciting for Robert Kauschitzky to John Cape. Caroline Christie looks at a unique partnership.

Being the wife of a CEO, a high-end fashion designer, and a Hollywood actress, Caroline Christie has a unique perspective on the intersection of art and technology. In her role as CEO of Bel Labs, she has been instrumental in creating a culture of innovation and collaboration. She has worked with some of the most talented minds in the industry, and she has seen firsthand the power of a strong partnership. In this interview, she discusses her experiences and the challenges she has faced along the way.

The Most Exciting People in Music

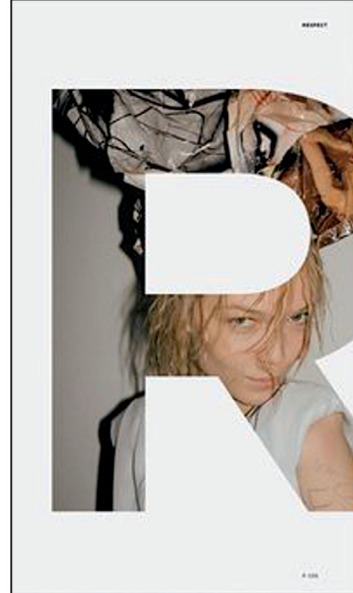
BRITAIN'S MUSIC

A portrait of the most exciting people in music. In an interview with 100, she discusses her experiences and the challenges she has faced along the way. She has worked with some of the most talented minds in the industry, and she has seen firsthand the power of a strong partnership. In this interview, she discusses her experiences and the challenges she has faced along the way.



If Men in Black, Stupidity Will Travel throughout the product

The implementation of the product in the real world is a complex process. It involves a lot of planning and coordination. It's not just about the technology, but also about the people who will be using it. It's a challenge that requires a lot of patience and persistence. But it's also a rewarding experience, knowing that you're making a difference in the world.



TR

The most exciting people in music. In an interview with 100, she discusses her experiences and the challenges she has faced along the way. She has worked with some of the most talented minds in the industry, and she has seen firsthand the power of a strong partnership. In this interview, she discusses her experiences and the challenges she has faced along the way.

12



THE ART OF WAYFINDING



Signage contributes a great deal to the overall design of a space. In order for it to be successful, it must be thoroughly studied and planned out. This signage can be used to indicate the location of a building or even to direct the flow of traffic. The design of the signage should be functional and clear, and it should be easy to read. The design of the signage should be functional and clear, and it should be easy to read.

13

Four questions that should be thought about when designing the sign include:

1. WHAT IS THE GOAL OF THE SIGNAGE?
2. WHAT ARE YOUR TARGET AUDIENCE'S DEMOGRAPHICS?
3. FROM WHAT DISTANCES DOES THE TYPE NEED TO BE SEEN & UNDERSTOOD?
4. HOW MUCH TIME DOES THIS AUDIENCE HAVE TO VIEW & READ THE SIGN?

GRAFICKÉ PRVKY



shanti sparrow	CLIENT:	Shanti Sparrow	AGENCY:	Shanti Sparrow	Job Title
	EMAIL:	shanti.sparrow@gmail.com			Oh Hay Magazine Issue 1
	WEBSITE:	www.shantisparrow.com			

**GRAFICKÝ
MANUÁL
FI MU**

<https://sablony.muni.cz/univerzita/univerzita-obecne/pravidla/designmanual>

The screenshot displays the website for the Masaryk University design manual. The browser address bar shows the URL: <https://sablony.muni.cz/univerzita/univerzita-obecne/pravidla/designmanual>. The page header includes the Masaryk University logo and the name 'MASARYKOVA UNIVERZITA'. The user is identified as 'Jana Malíková (Odhlásit)'. The main navigation area features a 'Šablony JVS MU' button and three numbered steps: '1 Výběr pracoviště', '2 Výběr kategorie', and '3 Výběr dat'. The left sidebar contains a 'Kategorie' section with a dropdown menu showing 'Pravidla' (expanded), 'Aktualizace jednotného vizuálního stylu MU', 'Design manuál MU', 'Loga a grafické prvky', 'Merkantilní tiskoviny', and 'Ostatní'. Below this is a 'Může vás zajímat' section with links to 'Časté otázky (FAQ)', 'Směrnice MU č. 2/2015', 'O vizuálním stylu MU', and 'Kontakty'. The main content area is titled 'Design manuál MU' and includes a description: 'V příloženém dokumentu naleznete platné kapitoly design manuálu MU týkající se použití loga Masarykovy univerzity, barevnosti, univerzitního písma Syntax ad. Nedílnou součástí design manuálu je dokument "Pravidla aktualizace jednotného vizuálního stylu MU".' Below the text are two tabs: 'Data' (selected) and 'Tipy a rady'. The 'Data' tab shows the title 'Design manuál MU' and the subtitle 'Platné kapitoly design manuálu MU'. The footer features the Masaryk University logo and the name 'MASARYKOVA UNIVERZITA'.

LOGA FI MU + ŠTÍTKY

<https://sablony.muni.cz/fakulty/fi>

The screenshot shows a web browser window with the URL <https://sablony.muni.cz/fakulty/fi>. The page is titled "Šablony JVS MU" (JVS MU Templates) and is part of the Masaryk University (MU) website. The main content area is divided into several sections:

- Navigation:** A dark blue arrow button labeled "Šablony JVS MU" is positioned at the top left of the main content area.
- Steps:** Three numbered steps are displayed: "1 Výběr pracoviště", "2 Výběr kategorie", and "3 Výběr dat".
- Může vás zajímat:** A sidebar section with a white background and a yellow border, containing links to "Časté otázky (FAQ)", "Směrnice MU č. 2/2015", "O vizuálním stylu MU", and "Kontakty".
- Fakulta informatiky MU:** The main heading for the Faculty of Informatics, followed by a paragraph: "Podklady JVS MU týkající se Fakulty informatiky MU. Data jsou pro snadnější orientaci rozdělena do dílčích skupin a podskupin. Pokud nenaleznete, co jste hledali, nebo pokud potřebujete poradit, ozvěte se nám."
- Pravidla:** A section with a white background and a yellow border, containing two links: "→ Aktualizace jednotného vizuálního stylu MU" and "→ Design manuál MU".
- Loga a grafické prvky:** A section with a white background and a yellow border, containing three links: "→ Štítky", "→ Znak (logo) FI MU", and "→ Znak (logo) MU".

ZNAČKA FI MU / BAREVNOST



CMYK: 0,11,80,0
RGB: 252, 212, 80
HEX: #FCD450

CMYK: 0,0,0,100
RGB: 26, 23, 27



CMYK: 0,11,80,0
RGB: 252,212,80

CMYK: 100,72,0,18
RGB: 0,68,137



CMYK: 0,0,0,100
RGB: 26, 23, 27

CMYK: 0,0,0,0
RGB: 255,255,255



CMYK: 0,11,80,0
RGB: 252,212,80

CMYK: 0,0,0,0
RGB: 255,255,255

<https://sablony.muni.cz/fakulty/fi>

Barevné provedení

Doporučeno pro většinu materiálů. Používá se na bílé nebo světlé pozadí.



PDF [stáhnout PDF \(69 kB\)](#) barevnost CMYK; pro tisk

PNG [stáhnout PNG \(13 kB\)](#) barevnost RGB; pro obrazovku & kancelářské použití

Barevné provedení inverzní

Barevné provedení pro tmavé pozadí nebo fotografie. (Barevný podklad není součástí souboru ke stažení.)



PDF [stáhnout PDF \(57 kB\)](#) barevnost CMYK; pro tisk

PNG [stáhnout PNG \(12 kB\)](#) barevnost RGB; pro obrazovku & kancelářské použití

Outline provedení pro černobílý tisk

Doplňková varianta. Pouze pro černobílý tisk.



PDF [stáhnout PDF \(64 kB\)](#) barevnost CMYK; pro tisk

PNG [stáhnout PNG \(11 kB\)](#) barevnost RGB; pro obrazovku & kancelářské použití

Outline provedení inverzní

Doplňková varianta. Pouze pro pozadí v barvě fakulty nebo pracoviště. Tato varianta se používá výjimečně. (Podklad není součástí souboru ke stažení.)



Barevné provedení

Doporučeno pro většinu materiálů. Používá se na bílé nebo světlé pozadí.

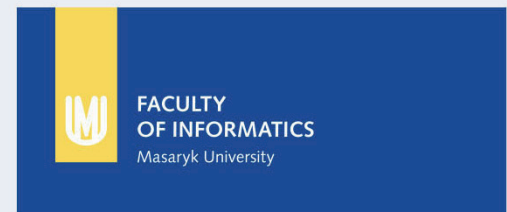


PDF [stáhnout PDF \(67 kB\)](#) barevnost CMYK; pro tisk

PNG [stáhnout PNG \(13 kB\)](#) barevnost RGB; pro obrazovku & kancelářské použití

Barevné provedení inverzní

Barevné provedení pro tmavé pozadí nebo fotografie. (Barevný podklad není součástí souboru ke stažení.)



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INFORMAČNÍ GRAFIKA

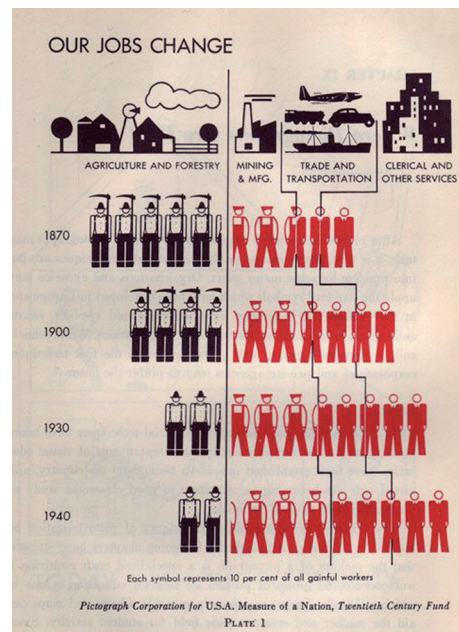
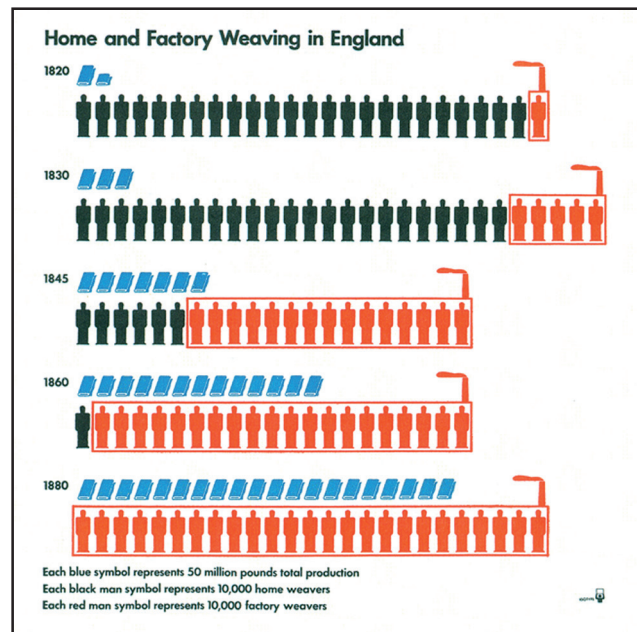
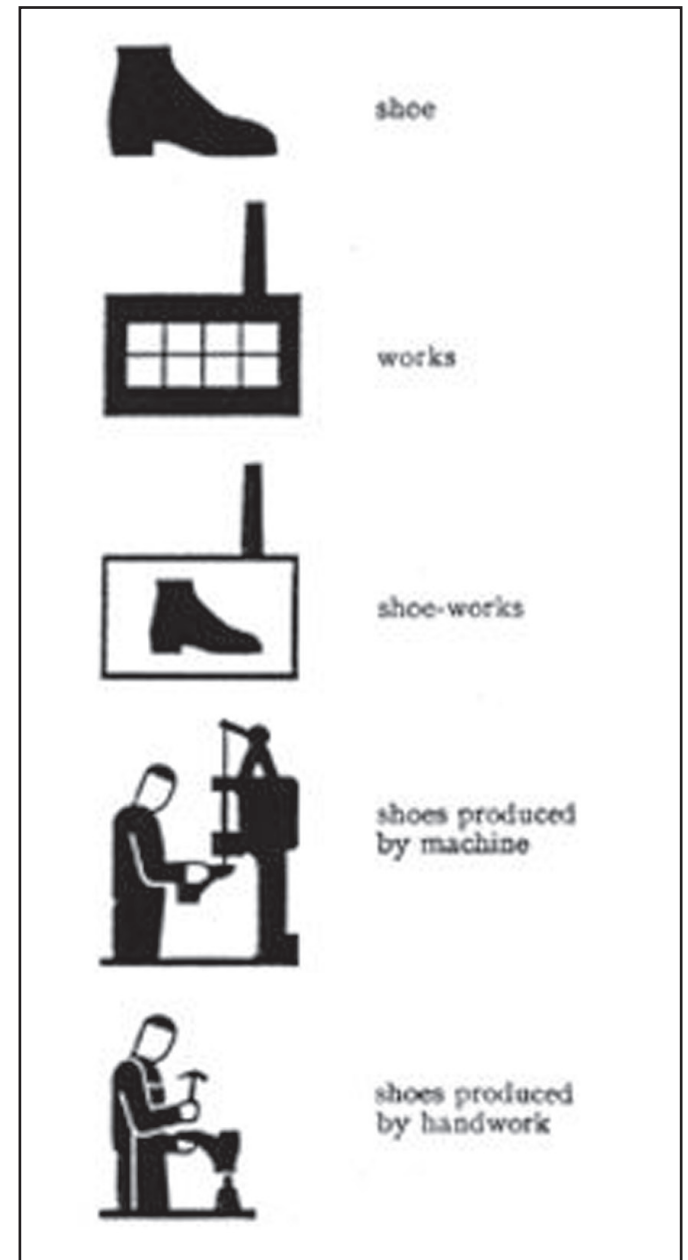
Otto Neurath (1882-1945), zakladatel informační grafiky.

Jeden obraz vydá za tisíc slov.

čínské přísloví

ISOTYPE (obrazový jazyk)

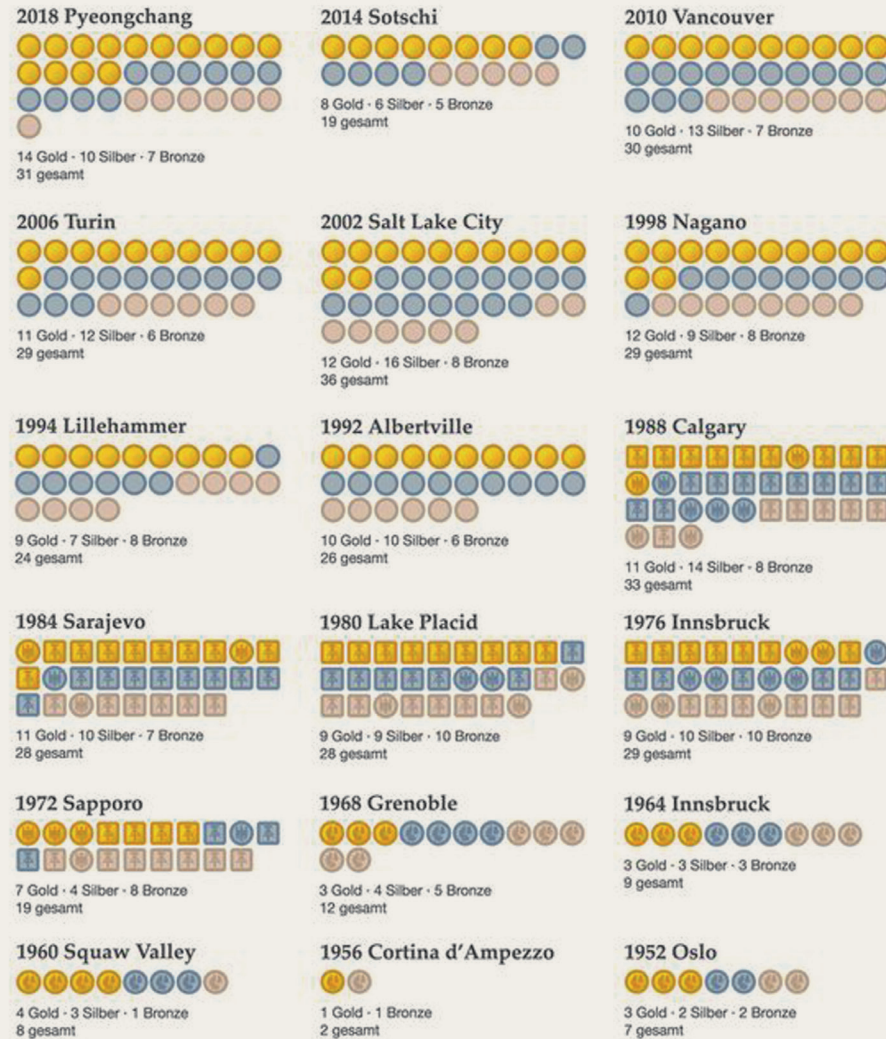
International System of Typographic Picture Education



INFORMAČNÍ GRAFIKA

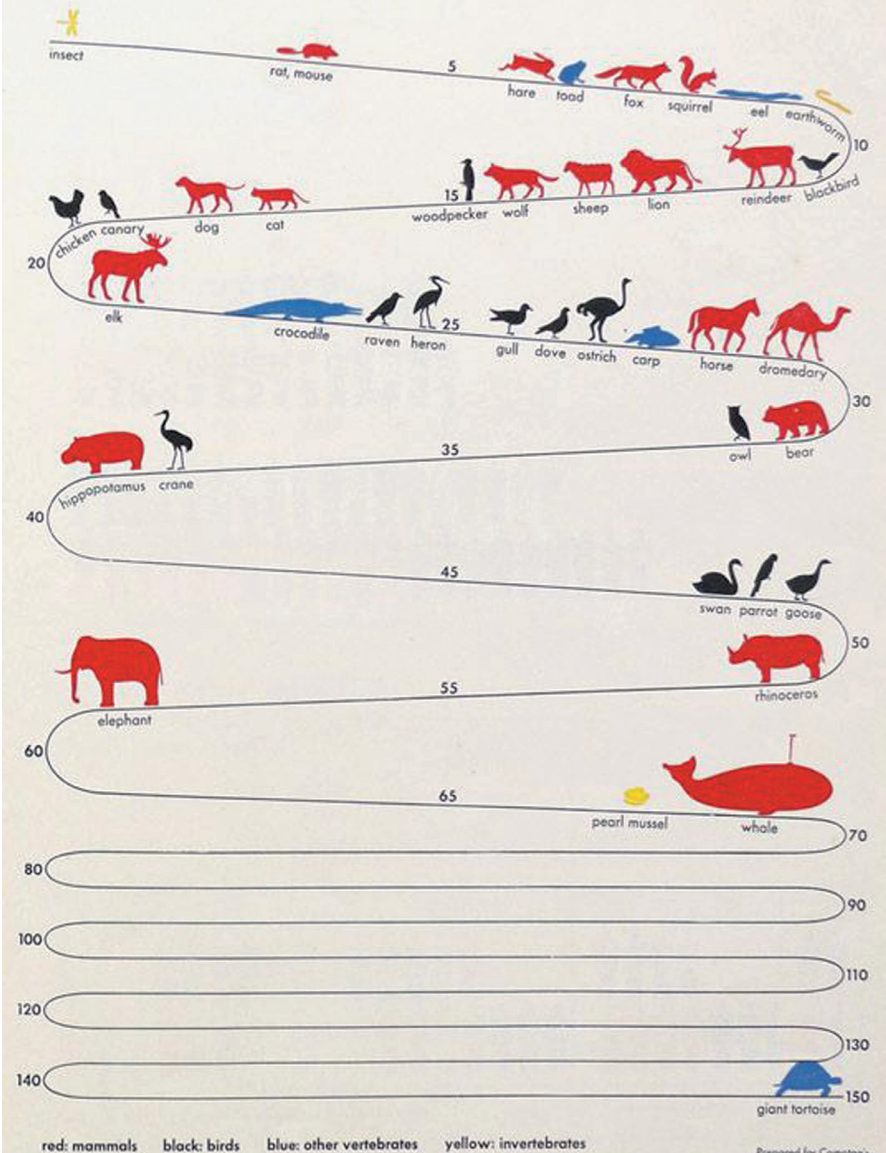
Alle deutschen Medaillen bei olympischen Winterspielen

In den Spielen vor der Wiedervereinigung sind die Medaillen von Athleten der Bundesrepublik und der DDR gesondert ausgewiesen. Von 1952 bis 1968 trat jeweils ein gemeinsames deutsches Olympiateam an. (Stand: 25. Februar 2018)



© ZEIT ONLINE

How Long Do Animals Live?

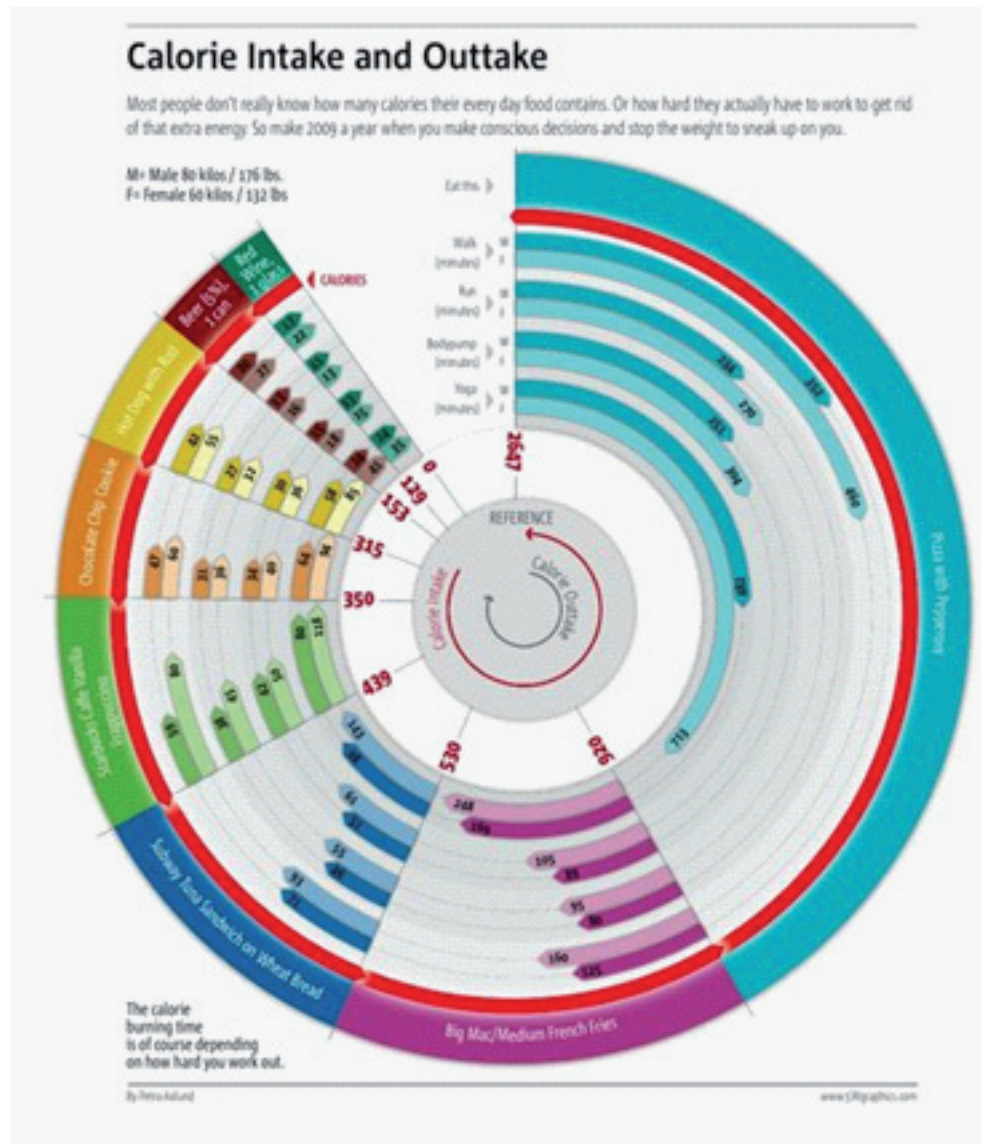


red: mammals black: birds blue: other vertebrates yellow: invertebrates

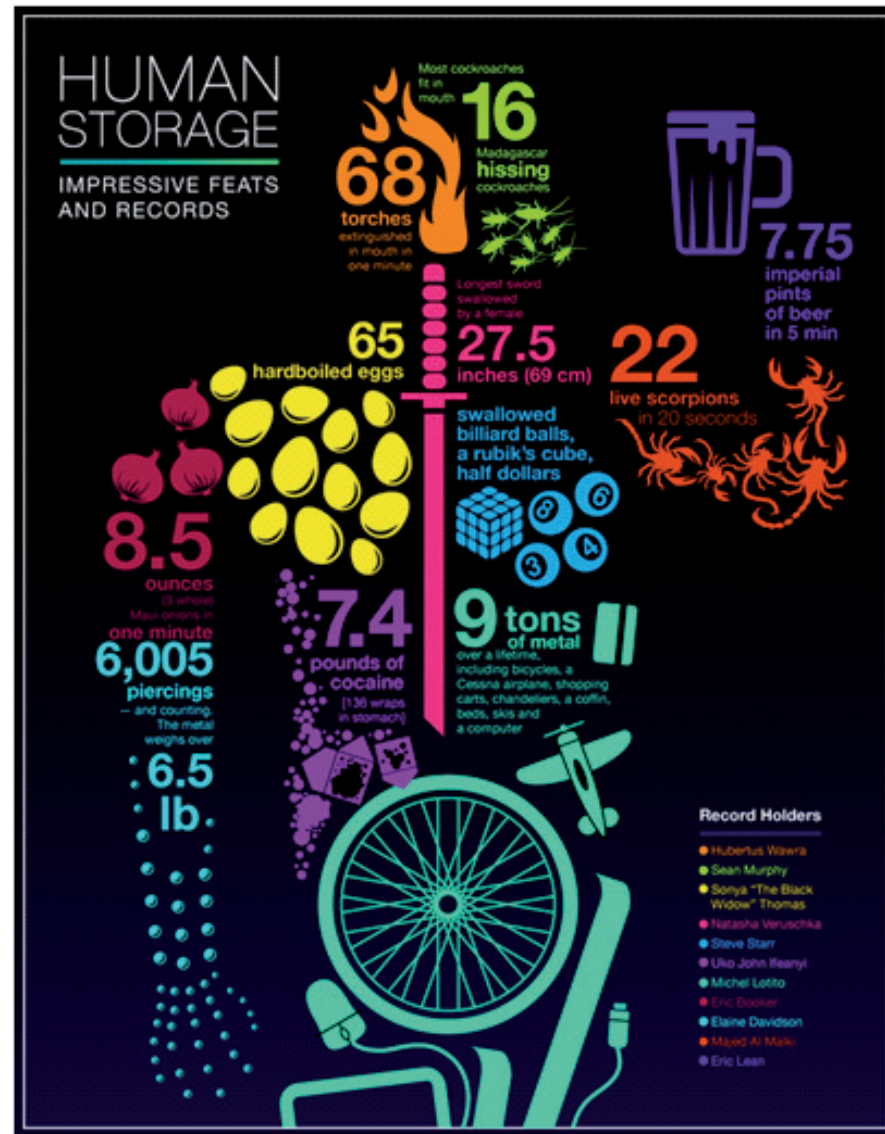
Average ages which certain animals may be expected to reach, based on reports of zoos and estimates of biologists. Individuals have been reported as far older. (Data from Field Museum of Natural History.)

Prepared for Compton's Pictured Encyclopedia
© International Foundation for Visual Education

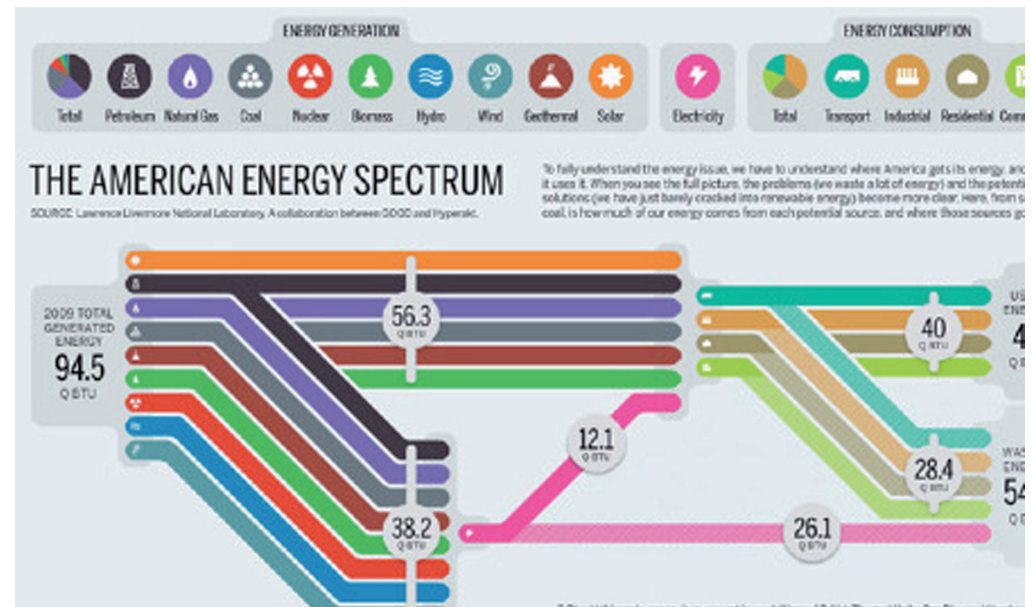
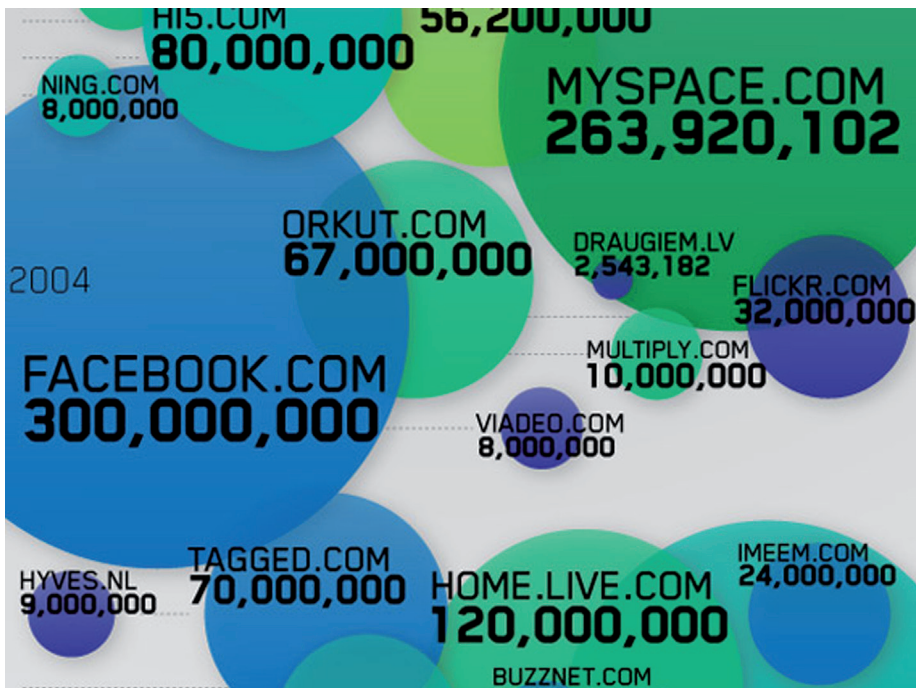
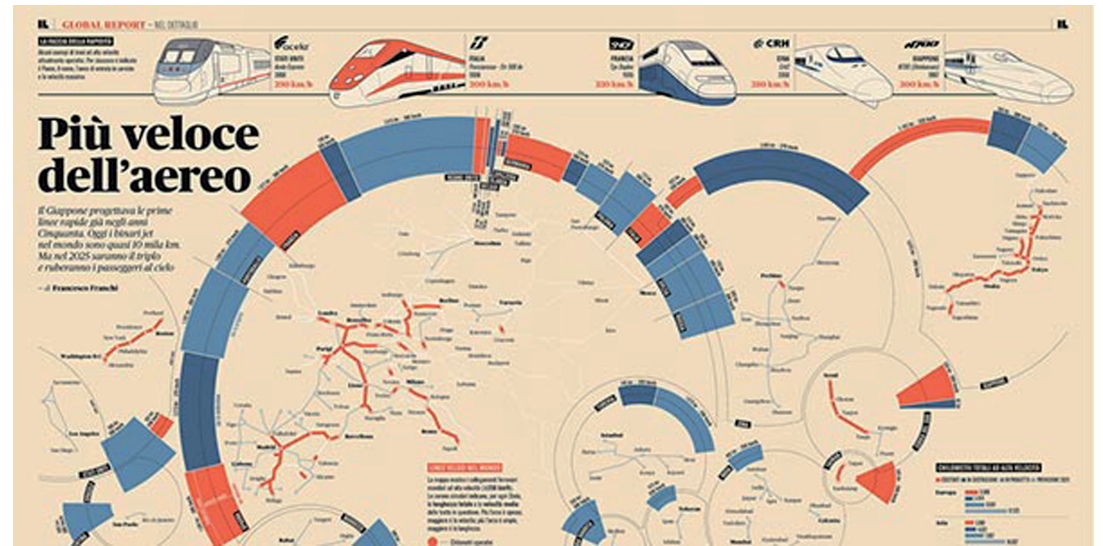
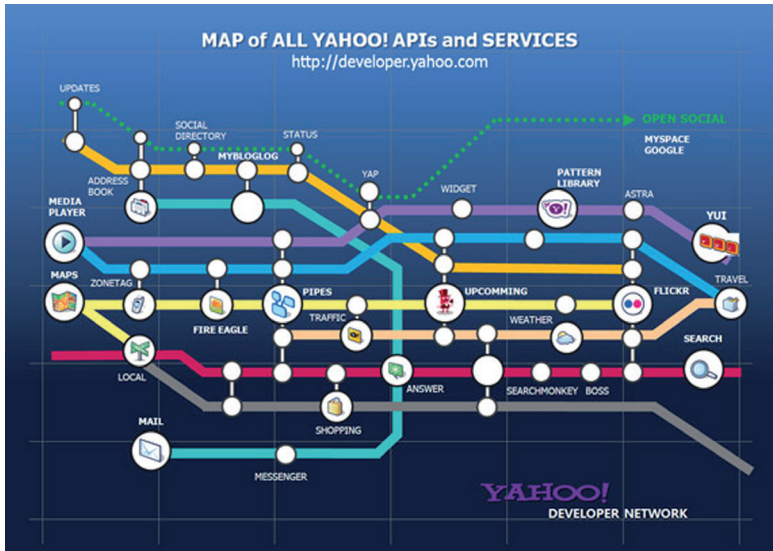
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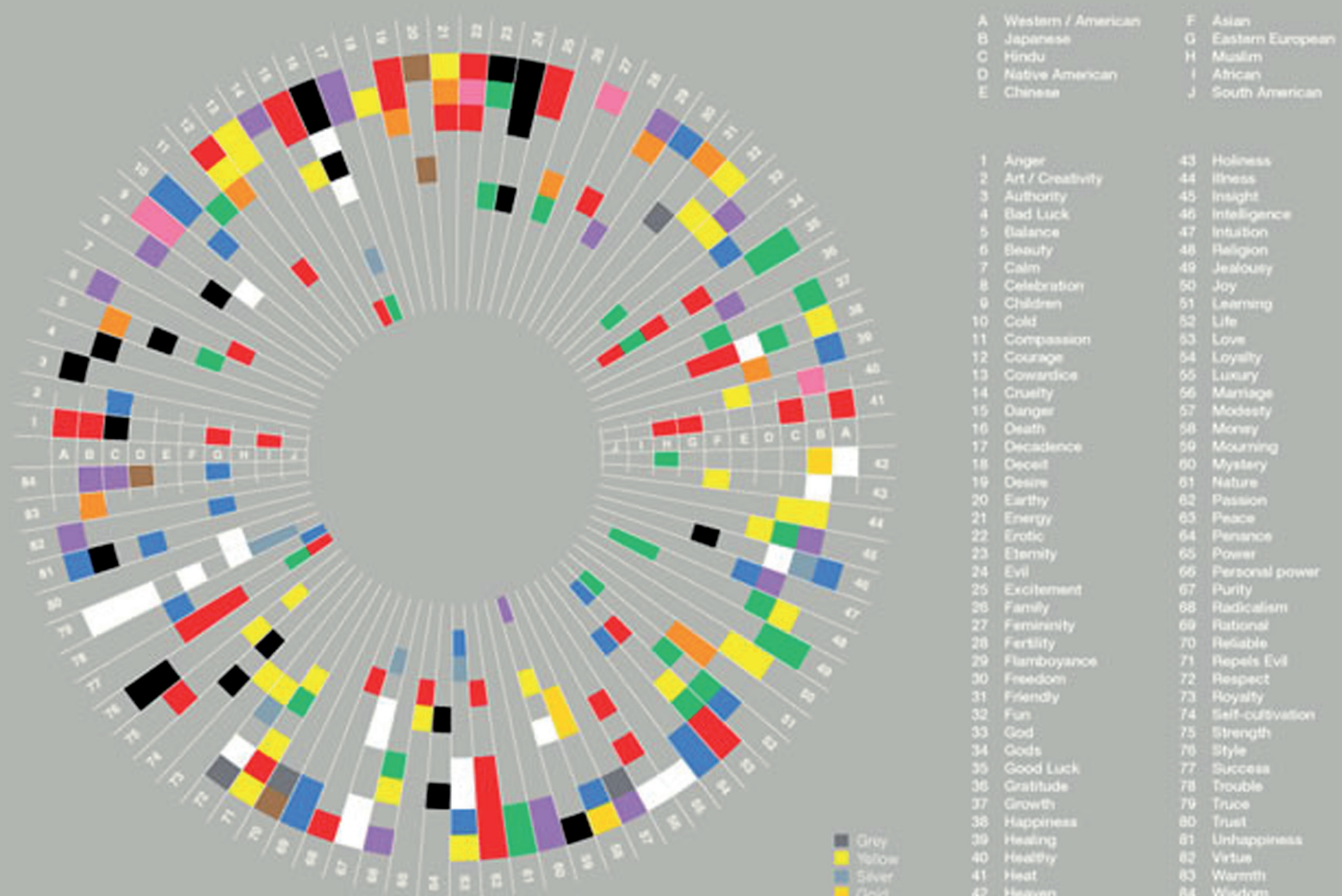


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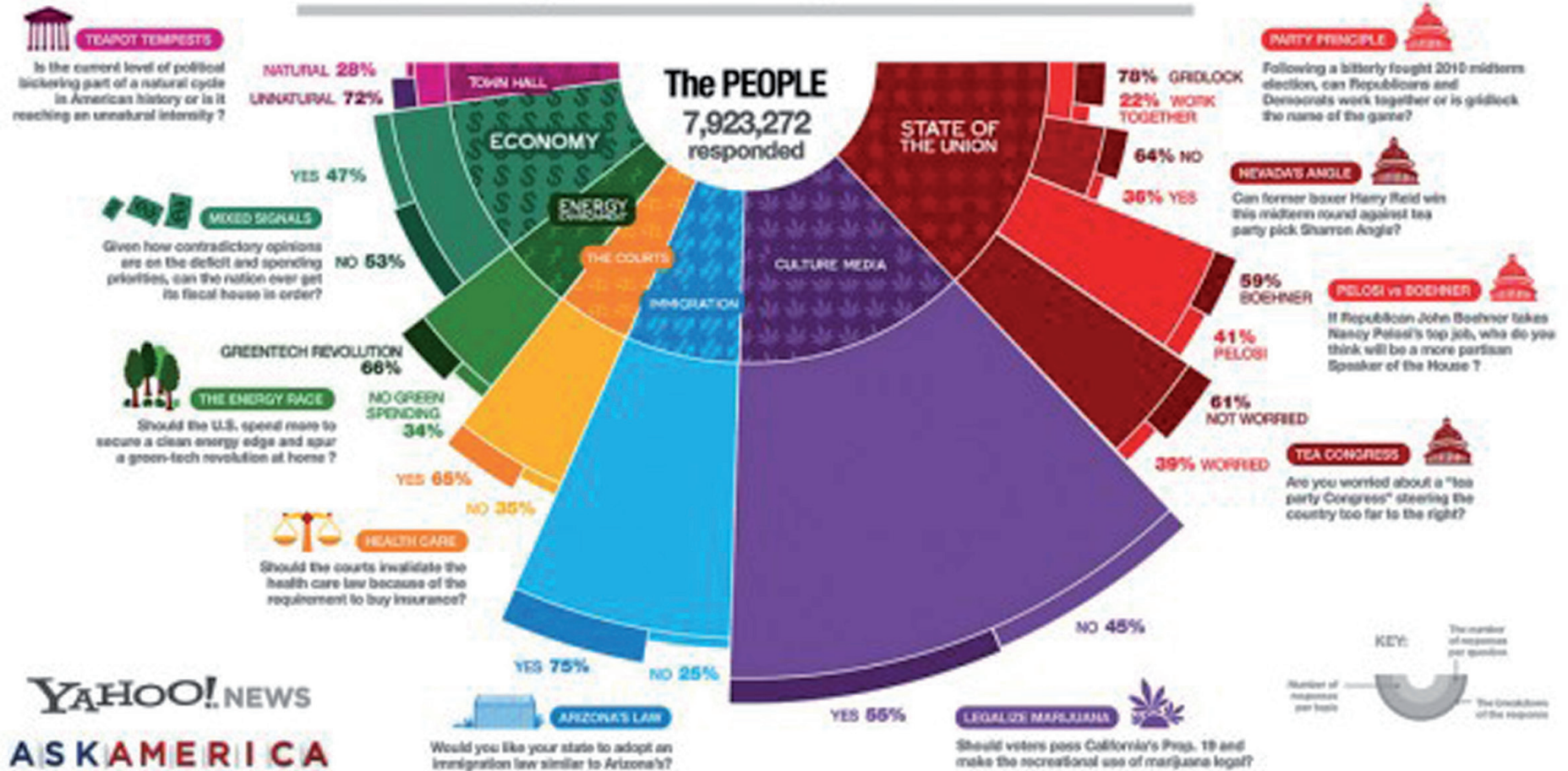


INFORMAČNÍ GRAFIKA

Colours In Culture



America Speaks On Key Election Issues



YAHOO! NEWS
ASK AMERICA

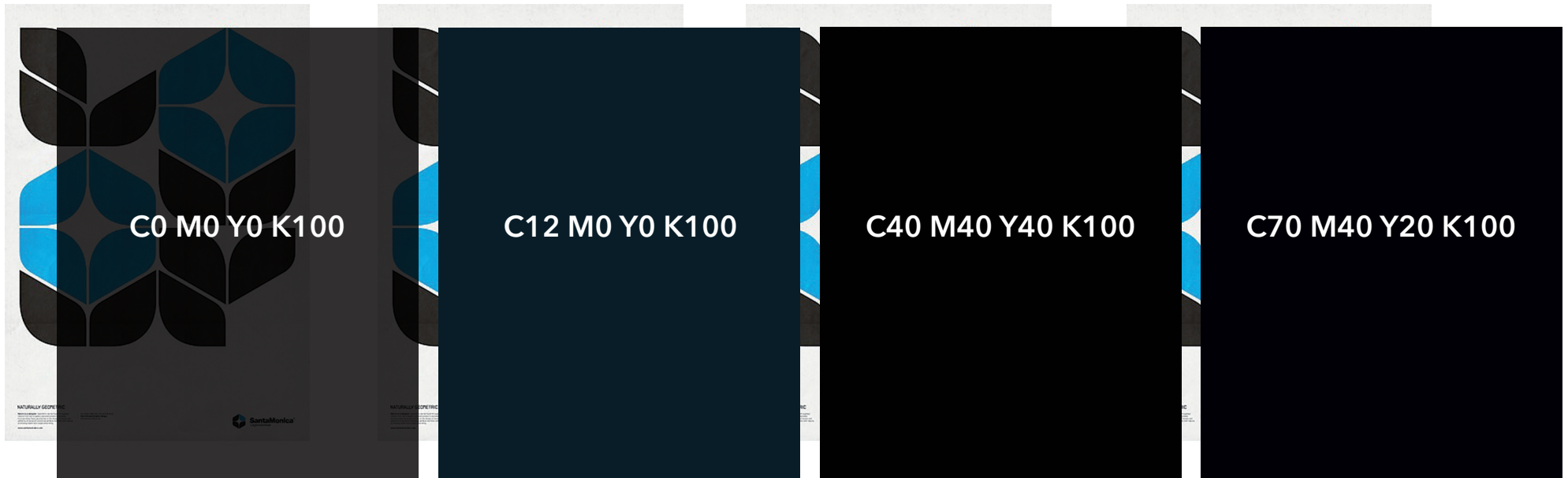
DTP

PŘÍPRAVA DO TISKU

VÝSTUPNÍ PLAKÁT BY MĚL SPLŇOVAT
BAREVNOST **CMYK** A ROZLIŠENÍ **300 DPI**.

TEXTY VŽDY 100% ČERNOU (C0M0Y0K100)

Rozdíly v tisku mezi černou barvou (C0M0Y0K100)
a namíchanou černou (součet jejích barev by neměl
přesáhnout 240 %).



VĚDECKÉ POSTERY

Functional Peptide β -sheets Microsponges

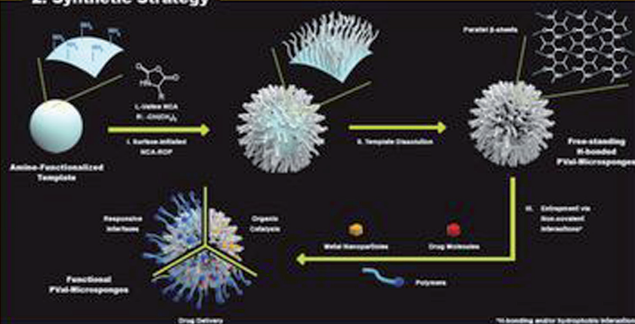
Steven Harris Wibowo, Dr. Adrian Sulistio, Dr. Edgar H. H. Wong, Dr. Anton Blencowe, Prof. Greg G. Qiao*
 Polymer Science Group, Department of Chemical and Biomolecular Engineering, The University of Melbourne, VIC 3010, Australia
 stevenhw@student.unimelb.edu.au; *greggq@unimelb.edu.au

1. Introduction

Polypeptides have attracted widespread attention as building block of complex materials due to their ability to form higher-ordered structures such as β -sheets.^{1,2} Still, the propensity of β -sheet-forming peptides to form unprocessable aggregates in solution remains a critical issue towards the preparation of well-defined β -sheet-assembled materials.

By employing surface-initiated N-carboxyanhydride ring-opening polymerization (SI-RCP), we recently reported a robust strategy to form well-defined peptide β -sheet architectures with sponge-like morphology. Herein, we demonstrate the unique ability of the H-bonded microsponges in entrapping metal nanoparticles, proteins, drug molecules and bio-relevant polymers via non-covalent interactions. This ability mimics the absorption/filtering ability of marine animals (e.g., sea sponges) and presents a simple yet versatile approach towards the fabrication of functional materials for various applications.

2. Synthetic Strategy



3. Results and Discussion

3.1. Synthesis of PVal-microsponges

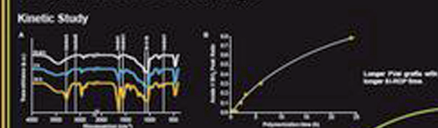


Figure 3.1.1. Fluorescence spectra of PVal-microsponges after surface SI-RCP time including β -sheet secondary structure. (A) Increase of Alexa 2 (500 nm) with conversion time including larger PVal grafts. (B) Conversion percentage over time.

3.2. Entrapment of Metal

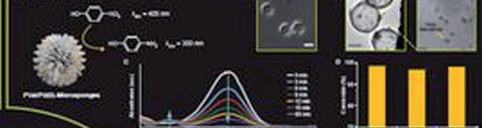


Figure 3.2. UV-Vis spectra and (B) TEM images of PVal-microsponges (scale bars are 2 μ m, 2 μ m and 10 nm). (C) Entrapment of absorbance spectra with increasing hydrothermal reaction time. (D) Conversion achieved in 10 min after 1 h of PVal grafts.

Morphology of Hollow PVal-microsponges

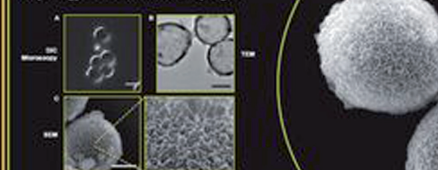


Figure 3.1.2. (A) Differential interference contrast microscopy and (B) TEM images of hollow PVal-microsponges formed after 2 h of SI-RCP and subsequent template dissolution. (C) SEM images (scale bars are 2 μ m) showing the morphology. (D) SEM images of PVal-coated microbeads (D: 7 μ m, pore size: 100 nm). Scale bars are 2 μ m.

Size of PVal-microsponges

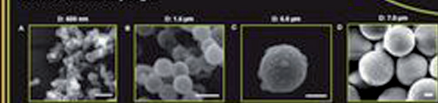


Figure 3.1.3. SEM images (scale bars) of PVal-microsponges fabricated by using microbeads with diameter of (A) 500 nm, (B) 1.5 μ m and (C) 2 μ m showing consistent sponge-like morphology. (D) SEM images of PVal-coated microbeads (D: 7 μ m, pore size: 100 nm). Scale bars are 2 μ m.

3.3. Entrapment of Macromolecules

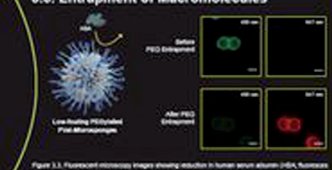


Figure 3.3. Fluorescence microscopy images showing reduction in luminescence (FITC), fluorescence quenching (BSA) after the entrapment of poly(ethylene glycol) (PEG), BSA, and FITC.

3.4. Multiple macromolecules?

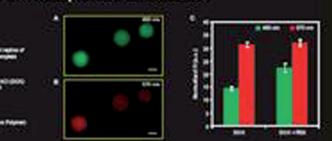


Figure 3.4. PVal-microsponges (scale bars) showing reduction in luminescence (FITC), fluorescence quenching (BSA) after the entrapment of absorbance hydrochloride and PEG. (C) Increase in fluorescence intensity at 480 nm associated with the conjugation of FITC.

4. Conclusion

The present study demonstrates the facile formation of polypeptide microsponges by employing surface-initiated N-carboxyanhydride ring-opening polymerization. We further demonstrate the ability of the β -sheets established microsponges in entrapping a range of organic and inorganic materials including metal nanoparticles, proteins, drug molecules and bio-relevant polymers via non-covalent interactions.

Further studies are currently directed at employing this surface-driven approach to fabricate other unique β -sheets-assembled nanomicro-architectures, as well as utilizing the reported hollow PVal-microsponges as platforms for organic catalysis and biomedical devices.

5. References

1. H. R. Nichelkorf, *Angew. Chem. Int. Ed.* 2006, 45, 6752-6764
2. S. H. Wibowo, A. Sulistio, E. H. H. Wong, A. Blencowe, G. G. Qiao, *Chem. Commun.* 2014, 50, 4571-4565.
3. S. L. Goh, A. P. Platt, K. E. Ruffledge, I. Lee, *J. Polym. Sci. A Polym. Chem.* 2008, 46, 5381-5389.

6. Acknowledgement

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Comparison of the evolutionary morphological differences between *Apis Mellifera* populations in Australia and Europe



introduction

150 years ago *Apis Mellifera*, or better known as the European Honey Bee was introduced into Australia to assist in the pollination of crops (Pain, 2004). European Honey Bees were regarded as more efficient pollinators when compared to other species of bees, as they could pollinate crops quicker, therefore Australian farmers readily introduced them to the wild (Pain, 2004).

The climates in Europe and Australia differ due to their locations being in different hemispheres. Australian climate is categorised as being hot and dry, often being in drought. (Sul et al., n.d.). Alternatively, Europe experiences a much cooler weather, rarely seeing any temperatures above 30°C.

Research indicates that the *Apis Mellifera* has a greater fitness in warmer areas rather than cooler climates allowing it to thrive under Australian climate conditions (O'Dwyer, et al., 1994). Although it is greatly debated over the natural origin of the *Apis Mellifera*, (Kothhoff et al 2013), the greatest number is found in Asia. Although the *Apis Mellifera* is often described as a medium-sized honey bee research has observed morphological differences between the two species located in different regions with climate differences (Guler et al., 2010). This research has concluded that each *Apis Mellifera* can confidently be identified and distinguished from each region (Guler et al. 2010). Research undertaken in this experiment will clarify these morphological differences experienced in different climate conditions by observing and contrasting the differences.

The aim of the experimental procedure is to appreciate and understand the evolutionary changes that introduced species can undertake and view these through different climate conditions. An additional aim is to gain a greater understanding about the *Apis Mellifera* and why these evolutionary changes are observed. These aims will be achieved by viewing the *Apis Mellifera* in Australia and using extensive research to compare and contrast

the morphological differences to the species found in Europe. They hypothesised for this experiment is that the *Apis Mellifera* within Australia will have undergone adaptations to survive within the warmer climate such as a large average size and a brighter coloured back. Our research will aid in the clarification of the evolution of the *Apis Mellifera* within different climate areas as viewed within the research undertaken on the Asian *Apis Mellifera*.

materials

Apis Mellifera were observed in an enclosed environment at a property located 143km southeast of Adelaide in a town called Meningie. The Bees were observed for a total of 42 minutes to encompass and record all visual aspects of the species. A description of the morphological features of the bees was identified and recorded. An appropriate table was constructed to record the results of this observation.

Research of the Australian European Honey Bee was then conducted. Peer reviewed journal articles were analysed to

appreciate and understand how the morphological features modify the behaviours and relationships. In addition to the Australian European Honey Bee, online research was conducted to identify the morphological features of the European Honey bee located in Europe. Key words such as the scientific name *Apis Mellifera* were used. The peer reviewed journal articles found were distributed among group members. Once analysis was conducted the results were gathered and collated. Further research was undertaken to give reasoning behind the morphological features and how

this relates to the behaviour of the bee. This was recorded in an appropriate table. Analysis of the differences between the two bee populations was completed. A table was used to compare the differences between the two different location adaptations.

Once all results were gathered a further analysis was conducted to determine if and why the *Apis Mellifera* differed between locations.

Morphological differences between Australian and European populations of *Apis Mellifera*

	European Population of <i>Apis Mellifera</i>	Australian Population of <i>Apis Mellifera</i>
Size	1.2 - 1.6cm Long	1.2 - 1.6cm Long
Colouring	Black, Brown, Yellow	Black, Brown, Yellow

Table 1: Morphological features (Size and Colouring) comparison between European Honey Bee and Introduced European Honey Bee in Australia.

results

There is no visible difference in the Honey bees when comparing them. From observations of the Introduced honey bee to Australia, the observations we gathered (Table 1) matched the same description as those of the native European Honey Bee.

Europe Temperature

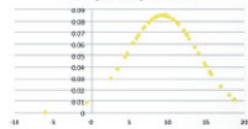


Figure 1: Standard deviation graphed for temperature of Europe, 2015.

Figure 1 shows the standard deviation of the temperature of Europe. The mean is found to be 9.34 for the whole of Europe. The standard deviation was calculated to be 4.68, indicating that 68% of the data is within $\pm 4.68^\circ\text{C}$ of the calculated mean. This standard deviation is very low indicating that the temperatures are very consistent across the country.

Australia Temperature

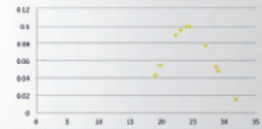


Figure 2: Standard deviation graphed for temperature of Australia, 2015.

Figure 2 shows the standard deviation of the temperature of Australia. The calculated mean was found to be 24.16. Compared to the mean calculated for Europe, this temperature is much higher. The standard deviation was calculated to be 4.01, slightly lower than the standard deviation calculated for Europe. This indicated that the temperatures in Australia are slightly more consistent and closer to the mean than the data found for Europe.

discussion

The aim of this experiment was to study the *Apis Mellifera* morphological features of populations in Europe compared to in Australia. Additional aims were to appreciate and understand the evolutionary changes that introduced species can undertake to adapt to certain environments. This aim was achieved by observations and research.

As viewed in table 1, the results of this research experiment indicated very small differences between the *Apis Mellifera* morphological features in Europe and Australia. Research and observations indicated that they were relatively the same size and share the same colourations.

As previous research suggested, morphological differences can be identified within the *Apis Mellifera* living in two diverse locations (Kothhoff et al. 2013). These differences were expected to be seen when comparing the two. The *Apis Mellifera* living within Asia is seen to be much larger in size being approximately 25mm whereas the *Apis Mellifera* living within Europe is seen to be approximately

15mm (Queensland Government, 2014). A prominent difference between the species in Europe and Asia is the colouring and stripes on the abdomen. With the results gathered not being inclined to show these morphological differences in the Australian and European populations of *Apis Mellifera*, possible problems arise. A major detail contributing to our results not indicating differences is the fact that the *Apis Mellifera* was only introduced to Australia 150 years ago (Pain, 2004). The species is known as a very slow evolving species (Kothhoff et al., 2013), this gives a possible reason as to why the results showed no changes in morphological features.

The *Apis Mellifera* introduced to Asia has evolved and morphologically changed from the population in Europe. *Apis Mellifera* has a greater fitness in warmer areas (O'Dwyer, et al., 1994) and as most of Asia experiences hot, humid and dry weather for a large portion of the year, showing similar climate patterns to Australia, this justifies the prediction that with time the species introduced in Australia will undergo similar changes to the

population in Asia. This is relevant to our research because Asia and Australia can view very similar climate conditions, as seen in figures 1 and 2. The Asian Honey bee has distinct differences to the European Honey bee and can be seen through observations. The Asian Honey bees are a lot smaller than the European honey bee, only reaching sizes of 1cm in length. The behaviour of these two different Honey bees is similar as they both share the same nesting habits and swarming behaviour, but remain completely different species, indicating that the Asian Honey bees is a subspecies of *Apis Mellifera*, (Queensland Government, 2014)

A major limitation with this experiment and area of study is the fact that the geographical distribution of the bees makes it difficult to analyse the species from different countries next to each other. All experiments need replicates for results to be reliable, meaning sufficient data from bee populations in each location has to be the data compared and analysed.

conclusion

In conclusion, although our results did not show any major morphological differences between the two different populations of *Apis Mellifera*, our further research in the evolutionary patterns of the species, our research on the short amount of time it has been living in Australia and our findings on its evolution in other countries and climates give us an insight

into the possible future evolutionary patterns of this species. Our research findings display evolutionary significance in the species' ability to live in a completely different environment and climate and still thrive whilst very slowly evolving within the new population. Research indicates that *Apis Mellifera* has a greater fitness in warmer areas than colder (O'Dwyer et al., 1994), therefore further

research could be applied in observing and documenting how the Australian population of *Apis Mellifera* differs in its evolutionary pattern from that of the European population and Asian Population over time, with emphasis applied into observing whether the European population or Australian population evolves more over time.

SUPRAORBITAL ETHMOID CELL: ANATOMIC STUDY AND SIGNIFICANCE IN FRONTAL SINUSOTOMY

2012

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SOEC PREVALENCE IN PREVIOUS STUDIES



SOEC PREVALENCE IN DIFFERENT POPULATIONS



1.

INTRODUCTION AND OBJECT OF THE RESEARCH

Detailed three-dimensional knowledge of the anatomy is necessary, whichever surgical technique is chosen in approaching the frontal sinus endonasally. Recognition of ethmoid cells step-by-step allows to gain access to the frontal sinus ostium (FSO) without damaging it and the surrounding orbital and cranial compartments.

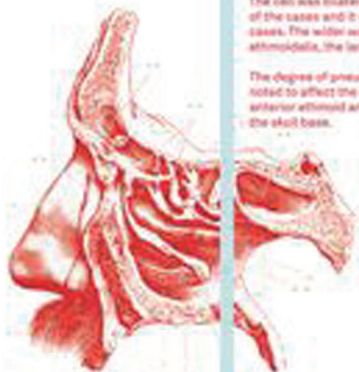
FSO failure and FO stenosis is commonly due to inadequate/incomplete removal of ethmoid cells. The supraorbital ethmoid cell (SOEC) is an anterior ethmoid cell with a variable prevalence. This cell is a frequent site of persistent or recurrent disease after surgery. The objectives of this study are to investigate the prevalence of the SOEC and to analyze the relationships with the FO.



2.

MATERIALS AND METHODS

Videoendoscopic examination and dissection of 50 fresh cadavers, from the Institute of Pathology, were carried out. Presence of the SOEC, degree of pneumatization, and relationship with frontal recess, FO and frontal sinus drainage pathway (FSDP) were analyzed.



3.

RESULTS

In our study the SOEC was found to be an expansion of the supraorbital recess (SBR) into the orbital plate of the frontal bone. The cell was observed descending posterior and lateral to the frontal recess, FO and FSDP from which was separated by a prolongation of the bulla lamella. The bulla lamella reached the skull base and the SOEC and FSDP were seen not communicating in all our specimens.

The outflow pathway of the SOEC was found to communicate through the hiatus semilunaris superior into the middle meatus. The SOEC prevalence was 24% in our study. The cell was bilateral in the majority of the cases and it was single in all cases. The wider was the first foramina ethmoidalis, the larger the SOEC.

The degree of pneumatization was noted to affect the distance of the anterior ethmoid artery (AEA) from the skull base.

4.

CONCLUSIONS

Ethmoid cells may surround the FO from medial, lateral, but especially from anterior or posterior direction. A postero-lateral cell is usually represented by the SBR or the SOEC. The latter showed a considerable prevalence in our study. Anterior and lateral, the FO may be narrowed by the upward development of the ethmoid infundibulum into the terminal recess/agger nasi cell and/or by frontal cells.

Ethmoid infundibulum usually ends blindly and the FO can be identified behind. During the dissection, the SOEC can be mistaken for the FO, especially if hyper-pneumatized. The anterior bulge of the bulla lamella can be in contact with the dome or the posterior wall of a frontal cell, severely narrowing the FSDP and hampering the dissection.

The forward displacement of the bulla lamella may result in inadvertent FO obstruction. The bulla lamella should be initially preserved as a landmark for the FSDP before definitive and exact visualization of the FO, in order to avoid disorientation. Moreover, the removal of the lamella exposes the anterior ethmoid artery. When a SOEC is present, it is more likely that the AEA courses freely or in a mesentery distant from the skull base, and, as a consequence, the risk of bleeding and skull base injury is higher.

Once identified the FO, it would be necessary to completely remove the bony septum in between the FO and the SOEC up to the skull base, in order to guarantee an adequate and long-lasting patency.

Toxic hepatitis associated with concurrent chemotherapy and a microcystin contaminated supplement

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Introduction

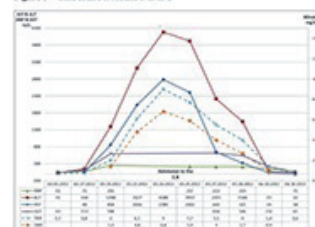
Dietary supplements containing algae and blue-green algae (BGA) have been produced and highly traded throughout Europe, Canada and the United States. Among these algae, *Spirulina* (BGA) and *Chlorella* have been extensively sold due to their alleged beneficial effects such as "detoxification", immune system stimulation, anti-cancer properties, and others. Due to the difficulty of separating and controlling for species bloom and little control of dietary supplements various non-toxic strains of BGA, such as *Spirulina*, have been seen to contain microcystin-LR (MC-LR) from toxic cyanobacteria. MC-LR is a hepatotoxin known to be the most common, studied and toxic microcystin.

Case Report

A 67-year-old male patient presented at emergency room (E.R.) with symptoms of anorexia, jaundice and chills, on the 22nd of March. The patient also referred complaints coincident with pruritus and erythematous lesions, on the 14th, from which he improved after taking an anti-histaminic.

The lab tests performed showed abnormal levels in the following parameters: AST – 2036 U/l (normal <34 U/l), ALT – 3127 U/l (normal <55 U/l), total serum bilirubin – 6.1 mg/dl (normal <1.2mg/dl), conjugated bilirubin – 4.8 mg/dl (normal <0.5 mg/dl).

Figure 1 – Time course of routine liver tests



The results of viral hepatitis markers (HBs Antigen, anti-HBc, total anti-HBc, anti-HCV) were negative and his renal function was normal, as well as the coagulation parameters.

The patient had history of pulmonary emphysema (without respiratory insufficiency), type 2 diabetes (controlled), dyslipidemia, benign prostatic hyperplasia and lung cancer (pulmonary adenocarcinoma, T3N0M0). There was no history of previous liver disease or alcohol abuse.

He was taking chronic medication such as: metformin + sitagliptin, atorvastatin, budesonide, formoterol, tiotropium bromide and recently (since the 6th of February) paclitaxel plus carboplatin (165 mg/m² and 275 mg/m² for a body surface area of 1.82 m²). A few days after the beginning of the first cycle of chemotherapy, the patient started taking dietary supplements such as milk thistle, vitamins and minerals, chlorella and colostrum.

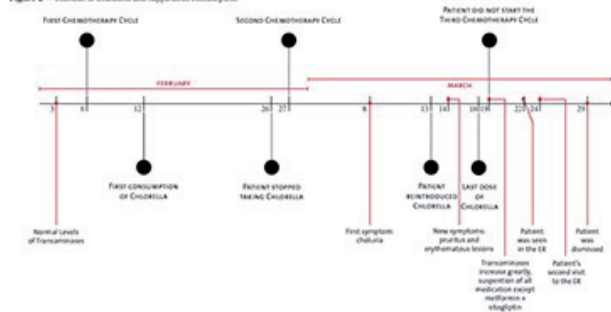
Despite the increased hepatic enzyme levels detected on the first E. R. visit (22nd of March) the patient had already stopped taking his treatments (except metformin + sitagliptin) because of elevated transaminases, already noticed on the 19th of March, in a routine oncology appointment. Consult Figure 2.

Evaluation of the clinical and laboratory tests indicated the diagnosis of toxic hepatitis, which was primarily linked to the chemotherapy regimen and its chronological relationship with the event.

The patient was seen and dismissed the same day (22nd of March), but was admitted to hospital two days later (24th of March), due to chills and jaundice worsening. Routine liver tests were repeated and were at higher levels: AST – 2784 U/l (normal <34 U/l), ALT – 4188 U/l (normal <55 U/l), total serum bilirubin – 9.0 mg/dl (normal <1.2 mg/dl), conjugated bilirubin – 6.8 mg/dl (normal <0.5mg/dl). The patient's rapid recovery led to his discharge 5 days later without permanent liver injuries.

The dietary supplements' role in this toxic event was never ruled out; not only because some of them can actually interact and change body's functions, but also due to the chronological relation between their intake and the appearance of symptoms. There were special concerns regarding *Chlorella*'s supplement due to the knowledge of how difficult it is to cultivate algae without any contamination.

Figure 2 – Timeline of treatment and supplement consumption



Methods

Ten capsules of *Chlorella* were opened and their contents homogenized and weighed. An average mass of 623.4 mg ± 55 mg (CV=8.7%) per capsule was obtained. The sample extract was prepared according to Ramanan et al., Lawton et al. and Pinheiro et al. with some modifications. These extracts were lysed and re-suspended in water and 50% methanol for ELISA and LC-MS/MS analysis.

Microscopic Analysis

The sample of *Chlorella* was observed through optical microscope to detect the presence of other species of micro-algae.

Quantification of microcystins through ELISA

Immunosay ELISA was performed with antibodies specific for microcystin whose detection limit is 0.1 µg/L. The kit microcystin/nodularin (ADDA) ES ELISA of Abraxis was used.

Quantification of microcystins through Liquid Chromatography/ Mass Spectrometry (LC-MS/MS)

For the analysis of mass spectrometry a system of HPLC Surveyor (Thermo Scientific), an automated pump and sampler Surveyor LC, a photodiode detector (PDA) Surveyor combined with a mass spectrometer of Thermo Scientific containing an electrospray was utilized. The LC-MS analysis followed studies done with environmental samples naturally contaminated with toxic cyanobacteria, with some modifications. Samples were equilibrated for ten minutes in between injections. The mass spectrometer was run with positive ion electrospray. MC-LR was analyzed using the mass-to-charge ratio (m/z) of transition 995⁺ 599.

Results

The presence of hepatotoxins was identified and quantified through ELISA and LC-MS/MS. Through ELISA the MC level was found to be 0.74 µg per gram of biomass of *Chlorella* and through LC-MS/MS the level of MC-LR was found to be 1.08 µg per gram of bio-mass of *Chlorella* was contained in our sample.

Discussion

Our patient took 1 capsule/day during 15 days (1st February – 26th February), stopped taking the supplement for 15 days (27th February – 12th March), and restarted on the 13th of March. One day after, the patient presented new symptoms: pruritus and erythematous lesions. The first symptom noticed was chills, on the 8th of March. He was consuming 60.01 µg/kg/day, which is a quarter of the TDI recommended by WHO (0.04 µg/kg/day). These data call into question the possible need for further assessment and readjustment of the recommended TDI for MC-LR.

To assess the causal relationship between the suspected products and the hepatotoxicity the CROMS/ RUCAM scale was applied for both. For paclitaxel the score obtained was 9, which corresponds to a definite or highly probable relation; for chlorella supplement (contaminated with MC-LR) the score obtained was 8, which corresponds to a probable relation.

Conclusions

The available clinical and laboratorial data suggest that MC-LR influence was determinant to the occurrence of acute toxic hepatitis in this patient, although both - chemotherapy and MC-LR - seem to have contributed and converged to final hepatotoxicity.

This case outlines the necessity for stricter control of dietary supplemental use and also the need for an increased awareness of the general public about the risks of concurrent consumption of supplements and chemotherapy.

Acknowledgments

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References

- Cornish-Bow, 2008. Cyanobacteria secondary metabolites—the cyanotoxins. *Journal of Applied Microbiology* 10: 445-59
- Giloy, D.J., Kaufman, K.W., Hall, R.A., Huang, X., and Cha, P.S. 2000. Assessing potential health risks from microcystin toxins in blue-green algae dietary supplements. *Environmental Health Perspectives* 108: 435-50
- King, F.D., and Perry, M.C. 2000. Hepatotoxicity of chemotherapy. *The oncologist* 6: 362-70
- Lawton, L.A., Edwards, C., and Oehl, G.A. 1994. Extraction and high-performance liquid chromatographic method for the determination of microcystin in raw and treated water. *Analyst* 119: 1257-59
- Pinheiro, C., Azevedo, J., Coutinho, A., Loureiro, S., and Vasconcelos, V. 2010. Absence of negative allopathic effects of cyanobacterially and microcystin-LR in selected marine and freshwater phytoplankton species. *Hydrobiologia* 1:27-43
- Ramanan, S., Tang, J., and Vidyasaran, A. 2000. Isolation and preparative purification of microcystin variants. *Journal of Chromatography A* 883: 303-12



ACTIVITY-BASED TRAVEL DEMAND MODEL FOR SINGAPORE

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Co-Principal Investigator: Professor Y. D. Lee, Singapore Institute of Technology
Research Fellow: Associate Professor Y. D. Lee, Singapore Institute of Technology
Research Fellow: Associate Professor Y. D. Lee, Singapore Institute of Technology

1. INTRODUCTION

This paper presents the structure and implementation of activity-based models in Singapore. The key activity-based models currently operating in Singapore are based on the Singapore Household Activity-Based Travel Survey (SABTS) data.

In addition, planning data for land use, land cover from the Land Transport Authority (LTA) is also used to develop the models.

The key activity-based models present the best description of activity and travel in an activity-based manner at the city activity or travel level that are all of possible activities. The key models are available at the following:

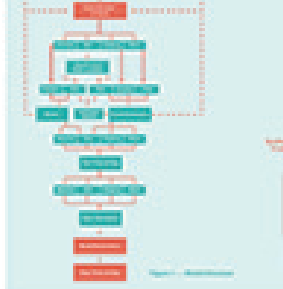
- **Travel**
- **Destination choice**

2. DEMAND MODEL STRUCTURE

The structure of the key activity-based models is composed of several models. Only the models that are currently in use are shown in this paper.

The models are fully integrated by considering the influence of travel choice from activities to travel choice and vice versa. The models are also integrated with other models such as land use, land cover, and other.

The paper also discusses the integration of the models with other models. The models are fully integrated by considering the influence of travel choice from activities to travel choice and vice versa. The models are also integrated with other models such as land use, land cover, and other.



3. VERIFICATION OF THE MODEL

A key effort for the integrated demand and travel demand model from the activity-based models is the verification of the model. The model is verified by comparing the model results with the observed data.



Figure 3. Verification of the model. The model is verified by comparing the model results with the observed data.



INTEGRATED ACTIVITY-TRAVEL SMARTPHONE-BASED SURVEY OVERVIEW

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1. MOTIVATION

Activity-based models of travel benefits from rich, detailed data. However, traditional travel surveys are limited in the amount and accuracy of data they collect.

Smartphones are ideal "life loggers".

- Multiple sensors (GPS, GSM, IMU, accelerometer, etc.)
- Nearly always charged and carried
- Widely available and standardized platforms

3. SURVEY WITH SINGAPORE LAND TRANSPORT AUTHORITY

- Integrated in Household Interactive Travel Survey (HITS 2012)
- Each participant is invited to provide 14 days of loggged data used to validate 7 days in their interface
- Recruitment currently in progress
- Target: 1000 users
- Expected end date: April 2013

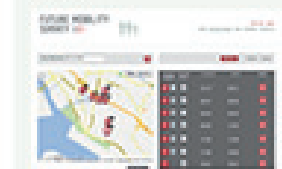
Current numbers, as of 1 January of 2013:

- persons registered: 215
- users that have collected and uploaded data: 236
- users that have collected 14 or more days of data: 126
- users that have completed the survey: 54
- days validated overall: 1040
- days collected overall: 3200

2. CONCEPT



Smartphone app — Collects and uploads sensor data
Server — Inference about activities and modes from raw data; machine learning from user interactions and database
Web interface — Interactive, prompted-recall activity diary



3. RESEARCH AND ENG. CHALLENGES

- Prompted-recall survey design
- User interface design
- Learning and inference of modes, activities, stops and trips from data and user interactions
- Database and technical scalability
- Data quality in smartphone battery trade-off
- Robust and efficient software quality test

6. RESULTS TO DATE

- Software: Complete and fully functional architecture, with seamless integration of all components
- Inference algorithms: Fully automated inference of modes, stops and activities
- Pilot test completed: From Feb to July 2012, all components of HITS were thoroughly tested in field trial. HITS is being used as a survey tool since August 2012.

USING TIMING BASED SPECTROSCOPIES AT HIGH BRILLIANCE STORAGE RINGS

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Recent years have seen important developments in instrumentation for photoelectron spectroscopy [1]. Resolution and efficiency in electron spectrometers has increased by many orders of magnitude over the latest decades. In addition, light sources with increased brilliance are fundamental for exploring the persistent interest in electron spectroscopy as an important tool for material science. The high brilliance storage ring has not been the obvious choice for experiments requiring light in short pulses with repetition rates in the MHz range or lower. Storage rings optimized for high intensity drivers light in pulses with 100-500 MHz repetition rate and tens to hundreds of ps pulse length. New accelerator designs first and foremost aims at decreasing storage ring emittance towards the diffraction limit. Nevertheless, it is of great interest for the spectroscopy community to utilize these new high brilliance light sources for timing based experiments.

A significant part of recent instrument development has taken place in the area of time-of-flight (TOF) based electron spectroscopy. Although TOF-spectrometers are by no means new; they are now entering areas previously reserved to hemispherical deflection analysers (HDA). This is marked for example by the novel angle-resolved time-of-flight spectrometers [2-5], which are now commercially available. By utilizing a many-element cylindrical electrostatic lens and a position sensitive detector, the angle resolved TOF-instrument can determine electron energy and emission angles with resolution exceeding state-of-the-art hemispherical analysers.

Other advancements have come in the area of magnetic bottle spectrometers [6]. For detection of ions, the TOF analyser is also an indispensable tool.

To take full advantage of recent advances in TOF-instrumentation, it is necessary to understand the recently expanded capabilities of storage rings with regard to their timing characteristics. Developments have taken place in accelerator and beamline technology which enhances the capability of storage rings to provide light with suitable characteristics for state-of-the-art electron and ion spectroscopy. It is now possible to create local single-bunch pulse structures for instruments with timing requirements, while other beamlines simultaneously can benefit from high intensity light. Use of timing-based instrumentation at storage rings will not be restricted to designated time-slits.

The main problem facing implementation of TOF systems at storage rings is their inherent requirement for pulsed light. A large temporal dispersion is demanded for high resolution. In addition, high precision timing instrumentation puts demands on the length of the light pulse. We have explored how these properties can be manipulated at storage rings with modern equipment and ideas.

OPPORTUNITIES FOR MAX IV

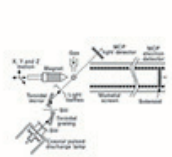
MAX IV will be the brightest storage ring light source in the world when it is inaugurated in 2016. The facility will host two storage rings:

- The 3 GeV ring
- The 1.5 GeV ring

Their outstanding properties are possible due to the multi-bend achromat lattice, a low-frequency (100 MHz) RF-system and damping Landau cavities.

MAX IV has unique temporal properties: Large bunch separation and exceptionally long pulses. These unique temporal characteristics allows us to exploit accelerator modes, choppers, gates and coincidence schemes for timing based spectroscopy.

The MAX IV user community has expressed an interest in using timing based spectroscopies at MAX IV. These include ion-TOF instruments, magnetic bottle spectrometers and angle-resolved time-of-flight electron spectrometers. One should therefore explore how the techniques and equipment discussed here can be utilized at MAX IV.



ATOF spectrometer

SPECTROMETER GATING

By installing an electron gate on a spectrometer, one attempts to block unwanted electrons from reaching the detector.

Gating is applied to the individual instrument. The feasibility of a gating scheme however depends on the temporal characteristics of the light source. The relatively long 10 ns intermediate time between light pulses at MAX IV provides us with an advantage compared to other storage rings. Using high speed electronics, a gate could be developed where particles originating from a single multi-bunch could be separated from the others. This requires a gate with rise and fall times each below 10 ns. In an earlier publication we have proposed such a gating scheme. We are currently carrying out tests with this gate on the ATOF spectrometer.

COINCIDENCE MEASUREMENTS

Techniques where the detection of an additional particle in coincidence with the time-of-flight electron can determine the start time in the experiment.

Coincidence experiments using hemispherical analysers (HDA) in coincidence with electron TOF instruments can benefit from the temporal properties of MAX IV. A major concern in coincidence experiments is to achieve high resolution while keeping a reasonable transmission in the electron spectrometers. Recently it has been shown how the ATOF can be used to achieve high transmission while keeping the high energy resolution of HDA [10]. The detection of an electron in the HDA is used as a start trigger for the ATOF instrument. The measurement uncertainty is determined by the temporal spread of monoenergetic electrons in the HDA, which is 6 ns for 200 eV pass energy. This spread dominates the total measurement error and becomes even more dominating if the pass energy is decreased. At MAX IV we can assign each detected electron to a light pulse since temporal broadening in the HDA is less than 10 ns. The ATOF then maintains its original resolution. The HDA pass energy can be set below 20 eV before time dispersion exceeds 10 ns. This electron coincidence scheme would provide users at MAX IV with the highest resolution practically achievable at any storage ring in the world.

We will perform a proof-of-principle experiment to test this timing scheme at MAX IV during next year. Lessons learnt from that experiment can be used to develop a state-of-the-art coincidence experiment at the future MAX IV ring.



CHOPPERS

Choppers artificially change the time structure of the light by physically blocking unwanted pulses. They come in two classes: Parallel and perpendicular. They often require the storage ring to be run in certain filling modes, such as hybrid modes.

Choppers are necessary for magnetic bottle instruments. All choppers currently in use at storage rings require dedicated single-bunch or hybrid modes. Two choppers have been reported with time windows below 330 ns: The ESRF chopper and the Jülich MHz chopper.

The Jülich MHz chopper [3] represents to this day the chopper with the shortest window. Thus, choppers are only a possible solution to timing based instrumentation if a hybrid mode exists with at least 10 ns hybrid window. Using a modified version of the Jülich MHz chopper could satisfy the users of magnetic bottles and ion-TOF at the large or small ring at MAX IV, given that a single-bunch mode is available.

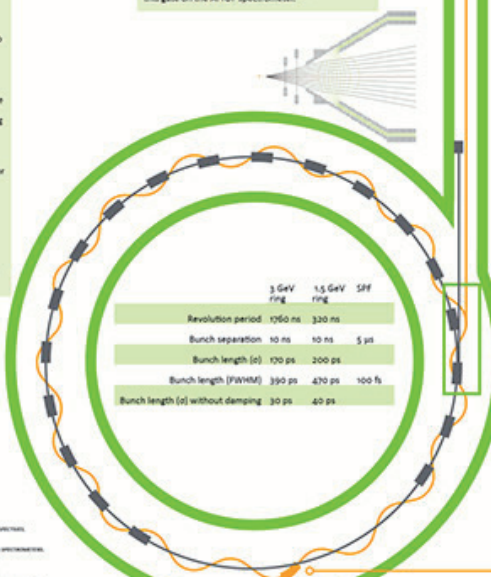


ACCELERATOR ADAPTATIONS

The storage ring itself can be adapted to suit the needs of timing-based instrumentation. This involves:

- Single bunch operation, where the filling pattern of the storage ring is changed.
- Short pulse operation and "low-alpha" modes, where the sizes (and often intensities) of pulses are decreased.
- Pseudo-single-bunch (PSB), where one operation mode tries to accommodate the needs of both photon hungry experiments and timing-based experiments.

The feasibility to introduce a PSB scheme at MAX IV is currently under discussion. It would build on recent developments at BESSY with so-called "resonant pulse picking" [7]. A selected bunch is repeatedly excited by a stripline kicker magnet, causing it to blow up in size and divergence. The light emitted from the bunch can be separated from the bunch train in the beamline. The MAX IV accelerator design is not particularly well suited for single-bunch operation, due to the passive Landau cavities. When the total beam current is reduced, the nominal single-bunch charge (5 nC) cannot be kept and must be significantly reduced. Thus, any single-bunch operation at MAX IV under present conditions will offer significantly less intensity than those dedicated single-bunch operations at other storage rings. Discussions have recently been raised to explore this mode. A single-bunch or PSB mode at the 1.5 GeV ring would have a 330 ns repetition rate (3.0 MHz). Compared to many other rings with dedicated single-bunch modes it is a high frequency. Nevertheless, it is sufficient for most applications of the ATOF and similar instrumentation. ATOF users have identified low-dose electron spectroscopy as one area where angle-resolved time-of-flight spectrometers are beneficial [8]. Studies of sensitive and fragile systems require very small light intensities and consequently need high transmission instruments for an efficient data collection. A 3.0 MHz single-bunch rate would theoretically increase the collection efficiency by a factor 2.5 compared to the larger BESSY ring.



References

- [1] T. J. Lee, *Photoelectron Spectroscopy: Principles and Instrumentation*, Elsevier, Amsterdam, 2010.
- [2] M. Samkari, R. Nyholm, *Phys. Rev. Lett.* **105**, 104801 (2010).
- [3] M. Samkari, R. Nyholm, *Phys. Rev. Lett.* **105**, 104801 (2010).
- [4] M. Samkari, R. Nyholm, *Phys. Rev. Lett.* **105**, 104801 (2010).
- [5] M. Samkari, R. Nyholm, *Phys. Rev. Lett.* **105**, 104801 (2010).
- [6] M. Samkari, R. Nyholm, *Phys. Rev. Lett.* **105**, 104801 (2010).
- [7] M. Samkari, R. Nyholm, *Phys. Rev. Lett.* **105**, 104801 (2010).
- [8] M. Samkari, R. Nyholm, *Phys. Rev. Lett.* **105**, 104801 (2010).
- [9] M. Samkari, R. Nyholm, *Phys. Rev. Lett.* **105**, 104801 (2010).
- [10] M. Samkari, R. Nyholm, *Phys. Rev. Lett.* **105**, 104801 (2010).

MECHANISMS OF CRYOPROTECTION

A handful of species have learned how to survive in freezing climates. To do so, the animals must counteract the damaging effects of ice crystal formation, or keep from freezing altogether. Here are a few ways they do it.

ANTIFREEZE PROTEINS

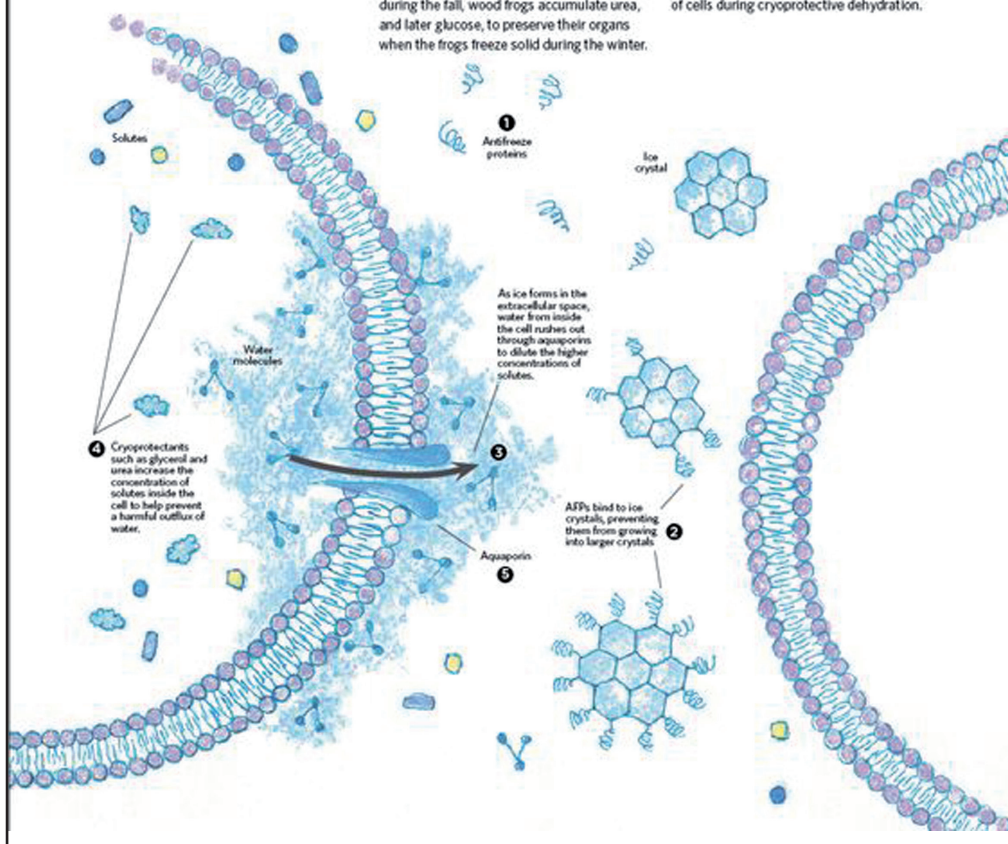
Antifreeze proteins (AFPs) **1** first identified in the blood of Antarctic fishes, have repeating structures that bind to the surface of ice crystals and prevent them from growing into larger crystals **2**. AFPs isolated from the blood of these fishes have been used successfully to preserve rat and pig hearts at below-freezing temperatures for up to 24 hours.

CRYOPROTECTANTS

As the temperature drops, extracellular water begins to freeze, leaving behind a slush of concentrated solutes. In an attempt to dilute those solutes, water rushes out of the cell **3**, causing significant cell shrinkage and death. But cryoprotective compounds such as glycerol, glucose, urea, and trehalose accumulate inside cells to help equalize the imbalance of solutes, preventing water loss and cell damage **4**. Scientists have found that during the fall, wood frogs accumulate urea, and later glucose, to preserve their organs when the frogs freeze solid during the winter.

AQUAPORINS

Water can make its way through a cell membrane unaided through the process of osmosis, but a quicker way into or out of a cell is through an aquaporin—a membrane protein that regulates the flow of water into and out of cells **5**. Scientists have found that aquaporins help some freeze-tolerant frogs move not only water but glycerol into cells in preparation for freezing. Aquaporins also help freeze-avoiding insects move water out of cells during cryoprotective dehydration.



Future Fictions

An experience design approach to producing
 and consuming transmedia novels

Abstract

There is something magical about reading fiction. For a moment, you travel to another universe, without ever leaving your couch. You may finish a good book in a matter of days, but it will stay with you forever.

Electronic books have been created and studied for 20 years, however, the work is almost exclusively focused on active, interactive reading, not the consumption of what people escape into every day. My research focuses on how and why people read, especially fiction. I also

completed a review of current commercial and academic work, and explored how transmedia creates immersive story experiences spanning film, television, and video games.

Moving forward, I will take what I have learned and prototype a new type of novel that leverages the operational and creative capabilities of digital technology to create an immersive story experience.

“I love novels beyond almost anything else in the world... There is a psychological state of bliss that exists within a story.”
 —participant 2

ACADEMIC

Academic research on digital reading and immersive storytelling

Academic Landscape

“So far as we know no (or very few) researchers have built robust theoretical readings in a digital environment.”
 —researcher



COMMERCIAL

Commercial research on digital reading and immersive storytelling

Survey of iPad Enhanced Fiction

A representative survey of iPad fiction books open for teens and adults with interactive or media reader features.



READER

Reader research on digital reading and immersive storytelling

Reader Motivations

These address motivations for pleasure reading surveyed from my research. These participants were also required to read for classes, their motivations were not included in this framework.

Unlike traditional user types, people often fall into multiple categories based on their motivations from book to book.



Preferred Enhancements

My card sorting and survey research found a number of possible enhancement features — from navigable maps, to chatting with other readers, to following characters on social networks.

This framework represents how interested participants were in each category of enhancements. The categories relate broadly to the reader motivations, but do not match up exactly.



KEY FINDINGS

Academic, commercial, and human opportunity to enhance immersive pleasure reading

Immersive storyworlds feel real and have empathetic, relatable characters

Analog books, a considerable number of people still prefer analog books

Seamless experience, without distractions like pop-ups or notification

Experience before technology, any solution should consider and evaluate the user experience and not rely on novel technology.

DESIGN OPPORTUNITIES



DESIGN DIRECTIONS



Augmented physical novel



Native digital/transmedia novel



TIMELINE



LONG-TERM AND TAILORED CAPACITY STRENGTHENING (CS) IN SOCIAL AND BEHAVIOR CHANGE COMMUNICATION (SBCC)

AUTHORS: Antje Becker-Benton, Emily Bookh, and Sarah Meyanathan, C-Change, AED

BACKGROUND

The goal of the C-Change project is to improve the effectiveness and sustainability of SBCC. To this end, C-Change and its partners—Ohio University, Soul City, the Southern African AIDS Trust (SAAT), the Communication Initiative, CARE, and other organizations—have been strengthening SBCC capacity in over 15 countries.

SBCC Framework

SBCC has three characteristics:



1. SBCC is an interactive, researched and planned process.



2. SBCC applies a socio-ecological model to find the tipping point for change.



3. SBCC operates through three main strategies: advocacy, social and community mobilization, and behavior change communication.

RESULTS

C-Change is measuring its CS activities with the following selected indicators:

- % of local partner organizations that incorporate one or more SBCC models or theories into the design of their activities
- % of people trained who apply and exhibit increased SBCC skills
- # of trainees able to plan MLE activities for SBCC interventions
- % of trained organizations using SBCC tools
- % of master trainers with competency for sustained training in SBCC
- # of people completing online trainings on C-Change's SBCC Modules
- # of institutions that meet center of excellence criteria in SBCC
- # of regional diploma and post-graduate students trained at SBCC centers of excellence courses

SUBJECT

C-Change has developed a Capacity Strengthening (CS) Toolkit with seven components:

1. A theory-based SBCC Framework to identify tipping points for social and behavior change
2. SBCC capacity assessment tools to tailor CS activities to needs
3. A C-Modules Learning Package for face-to-face training that has more than 90 C-Tools, uses highly participatory methodologies, and offers mentored skills application
4. Online SBCC courses with Ohio University and on USAID's Global Health e-Learning website

5. Masters and certificate courses at the Center of Excellence established at the University of Witwatersrand with Soul City
6. The C-Capacity online resource center and newsletter in partnership with the Communication Initiative
7. Introduction and guidance on using highly participatory processes to develop materials (Action Media Manual, HIV Community Communication Toolkit, and Adaptation Bulletins).

C-Change tailors the use of these CS components according to program needs.



Example Application of the CS Toolkit

With 21 members of the SAT regional network in five countries, C-Change has conducted SBCC capacity assessments (13 members in four countries) led a 5-day training in participatory facilitation methods and a 10-day regional SBCC training, with follow-up assignments and mentoring (20 members) conducted a 3-day MLE training, with follow-up assignments and mentoring provided selected opportunities to apply SBCC skills in practice used newsletters and other online resources offering training, tools, and other CS opportunities in SBCC



With SAT, C-Change plans to:

- conduct a data analysis training
- conduct refresher training and training of trainers
- identify master trainers in SBCC in five countries in the SAT regional network
- roll out training to the rest of the network, with partner mentoring
- establish a community of practice within the SAT network

Total use of the CS Toolkit thus far:



C-Capacity website and newsletters:



CONCLUSIONS

C-Change anticipates increased and sustained use of the CS Toolkit for the following reasons:

- It can be easily tailored to program needs, based on capacity assessment
- The assessment tools are designed to function as baseline to allow measurement of increased SBCC capacity
- Components can be used interchangeably, face-to-face and online (See www.south-ohio.edu/~c-change/default.asp)
- Center of excellence courses are being developed at universities in South Africa, Nigeria, Guatemala, Albania, and Jamaica
- The toolkit is freely available, easy to access, and can be continuously tailored. It can be downloaded at <http://c-change-program.org/focus-areas/capacity-strengthening/SBCC-Toolkit>. Open files of all components can be requested at CChange@ohio.edu

Next Steps:

- Continue to make CS tools available
- Increase their use by NGOs, ministries of health, and USAID missions through training and mentoring
- Document results and lessons learned



www.c-changeprogram.org



C-Change is a public, donor- and/or grant-funded project implemented by partners and managed by AED.



The HIV-1 Glycan Shield as a Target for Vaccine Design

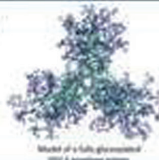
Laura K. Pritchard¹, Camille Bonomi¹, Gemma Seabright¹, Dan Kulp¹, Sergey Menis¹, Louise Royce¹, Daniel I. R. Spencer¹, D. Cameron Dunlop², Christopher N. Scanlan¹, William R. Schief³, Katie J. Doores¹, Max Crispin¹

¹ Oxford Glycology Institute, Department of Biochemistry, Oxford, United Kingdom, ² Center for HIV/AIDS Vaccine Immunology and Immunogen Discovery, The Scripps Research Institute, CA, United States of America, ³ Tulipier 101, Culture Science Centre, Wageningen, United Kingdom, ⁴ Yonge College London School of Medicine, Guy's Hospital, London, United Kingdom

Background

The gp120 envelope spike of HIV-1 is coated in N-linked glycans, which shield the underlying protein epitopes from recognition by neutralising antibodies. However many of the glycans are of the oligomannose type, which are rarely observed on secreted mammalian glycoproteins. The emergence of a number of broadly neutralising antibodies (bnAbs)^{1,2}, which target these 'non-self' glycans, suggests that the oligomannose patch on gp120 represents an immunogenic region that could be targeted in a vaccine context. The main aims of this work were the following:

- Determine the conservation of the oligomannose patch across different HIV-1 clades
- Investigate the stability of the oligomannose patch in response to deletion of individual glycan sites
- Explore the sensitivity of N332-specific bnAbs to glycan site-deletion.



Model of a fully glycosylated HIV-1 envelope spike

Results

Fig. 1 - Cross-clade conservation of oligomannose

An effective HIV-1 vaccine depends upon conservation of the target epitope across diverse strains. How variable is the oligomannose population?

A - Normal phase LysC profiles of gp120 N-linked glycans. Glycans were released from recombinant gp120 expressed in HEK293T cells by treatment with periodic acid. N-glycosidase F. HexN fluorescently labeled with 2-AA. Oligomannose-type glycans are highlighted in blue. **B - Cross-clade analysis of oligomannose-type glycans.** Abundance of individual oligomannose-type glycans were measured across a panel of 28 isolates. Overall abundances varied between 24-13%.

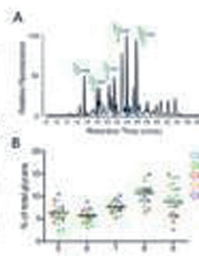


Fig. 2 - Effect of glycan-site deletion on glycosylation

Escape mutations by HIV-1 often result in deletion of glycan sites. How does loss of a glycan site impact glycosylation and the oligomannose population?

A - Oligomannose sites of gp120(N42). Predicted sites of complete-type glycans (based on published N-linked glycan sequons), predicted sites of oligomannose-type glycans (pink boxes), and conserved glycan sites across clades. Data derived from 1215 published sequences³. **C - Effect of glycan site deletion on overall abundance of oligomannose-type glycans.** (Mann-99 and Mann-99/104, (Mann-99)) Glycan sites were deleted by site-directed mutagenesis. Arrows indicate changes in abundance predicted upon loss of a fully-processed glycan site.

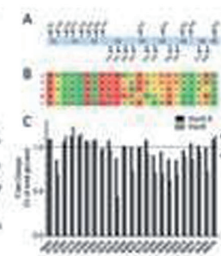


Fig. 3 - Stabilising interactions of individual glycans

Loss of certain glycan sites were found to have larger than expected destabilising effects on the oligomannose population. Could involvement in particular molecular interactions explain this?

A - Disruption of glycosylation upon loss of the N332 glycan site. The panel shows the 101 glycan profiles (pink) overlaid with the glycan profile of the N332A mutant (blue). The bottom panel shows the difference plot. **B - Molecular modelling of the glycosylated spike.** Model based on crystal structure from (6). The N332 glycan is clustered with the N334A glycan. **C - Disruption of glycosylation upon loss of the N332 glycan site.** As above. **D - 812 ELISA binding data.** 812 is a conformation-dependent antibody that binds the CD4 binding site of gp120.

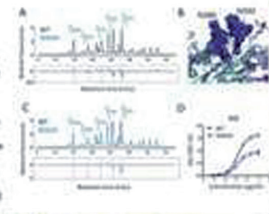
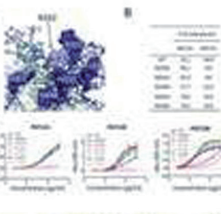


Fig. 4 - Glycan promiscuity of N332-specific bnAbs

Several bnAbs target the glycan at the N332 site. How does removal of nearby glycans affect the processing at this site? What is the effect of recognition by bnAbs?

A - Location of the N332 glycan site. The N332 glycan lies in the outer domain of gp120 and is linked among a high density of glycans. **B - Oligomannose present at the N332 site upon deletion of neighbouring glycans.** A typical glycosylated containing the N332 site was purified by IM-SEC. The glycosylated protein, and their abundances, were determined by MALDI-MS. **C - ELISA data of a panel of N332-specific bnAbs.** bnAbs targeting the N332 glycan were evaluated for their recognition of glycan-site deletion mutants (PCT123). Additional contacts to N332; PCT128 also contacts N332.



Conclusions

- The oligomannose patch is a highly conserved, cross-clade feature of HIV-1, which is stable upon deletion of individual glycan sites.
- The extremely high density of glycans on gp120 contributes to their limited processing, and reduction of this density can influence processing at nearby glycan sites.
- Broadly neutralising antibodies display a degree of promiscuity in their glycan recognition, recognising more than one particular glycoform.
- The conservation and stability of the glycan shield validates it as a target for vaccine design.

References

1. Wilson, J. M. et al. Broad neutralisation coverage of HIV by multiple highly potent antibodies. *Nature* **478**, 660-666 (2011).
 2. Wilson, J. M. et al. Broad and potent neutralising antibodies from an African donor reveal a new HIV-2 vaccine target. *Science* **326**, 285-9 (2009).
<http://dx.doi.org/10.1126/science.1174001>
 3. Adams, J. P. et al. Crystal structure of a soluble classed HIV-1 envelope trimer. *Science* **314**, 1147-1151 (2013).





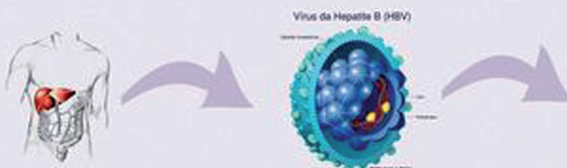
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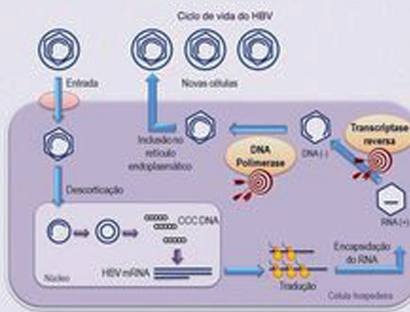
HEPATITE B

DA RESISTÊNCIA À EVOLUÇÃO NA TERAPÉUTICA

HEPATITE B... É uma doença inflamatória altamente infecciosa que afeta o fígado, podendo causar cancro do fígado ou cirrose, infectando atualmente cerca de 400 milhões de pessoas no mundo. [1]



- Virus de DNA • Família Hepadnaviridae • 8 genomas víricos, parcialmente de cadeia dupla
- Transmissão: contacto com sangue ou fluidos corporais infectados

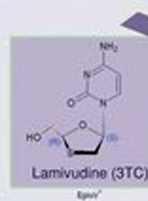


... DA RESISTÊNCIA AOS ANÁLOGOS DE NUCLEÓSIDOS...

A terapêutica mais utilizada nos últimos anos recorre ao uso de análogos de nucleósidos, como o lamivudine e o entecavir. No entanto, a longa duração do tratamento pode induzir resistência.



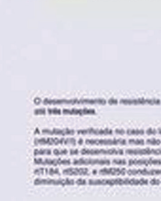
Lamivudine (3TC)
Isómero DL: mais ativo e menos tóxico
Análogo da citidina
Base pirimidínica
Formas ativas:
Lamivudine trifosfato (3-TP)
Lamivudine monofosfato (3-MP)
Inibidor competitivo da desoxicitidina trifosfato (dCTP)



Resistência resulta de uma mutação única a nível da transcriptase reversa na posição 204 (direto a mutação) e/ou a nível da transcriptase (RT) na posição 189, entre a leucina e metionina (L189M).



Entecavir
Polémica in vitro 30 vezes superior ao lamivudine
Análogo da guanósina
Base purínica
Forma ativa: entecavir 5'-trifosfato
Inibidor competitivo da desoxiguanosina trifosfato (dGTP)



O desenvolvimento de resistência requer três mutações.
A mutação verificada no caso do lamivudine (204G>T) é necessária mas não suficiente para que se desenvolva resistência ao entecavir. Mutações adicionais nas posições RT189, RT189L, RT202, e RT202I conduzem a uma diminuição da susceptibilidade do entecavir.

... À DESCOBERTA DE NOVOS AGENTES ANTIVÍRICOS

Nos últimos anos, os estudos têm vindo a incidir sobre a pesquisa de novos agentes anti-HBV com outros alvos e mecanismos.

Ácido glicirretínico
Metabolito farmacologicamente ativo
Composto líder
Hepatoprotetor

Potencial antivírico?

NOVOS ANÁLOGOS

- Alvo: hepatócitos
- Inibem a secreção do antígeno de superfície da hepatite B (HBsAg), do antígeno e da hepatite B (HBeAg) e a replicação do DNA vírico em hepatócitos

Derivados do ácido glicirretínico: relação estrutura-atividade [3]

- Essencial à atividade anti-HBV
- Esterificação: e citotoxicidade
- Essencial à atividade anti-HBV
- Esterificação: e citotoxicidade
- Essencial à atividade anti-HBV
- Esterificação: e citotoxicidade
- Substituintes adequados: e atividade

Planta: *Glycyrrhiza glabra*

Alvo: hepatócitos

Mecanismo de ação: Inibem a secreção do antígeno de superfície da hepatite B (HBsAg), do antígeno e da hepatite B (HBeAg) e a replicação do DNA vírico em hepatócitos.

CAROTENOID-BASED COLOUR ORNAMENTATION PREDICTS SOCIAL DOMINANCE IN SERINS, *Serinus serinus*

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1 > INTRODUCTION

Social interactions frequently take the form of dominance hierarchies that help settling disputes. Phenotypic traits that reliably signal an individual's fighting ability or aggressiveness may predict individual's position within those dominance hierarchies (reviewed by Senar 2006 in Bird Coloration).

We asked if the carotenoid-based, yellow plumage ornamentation of European Serins (*Serinus serinus*), a gregarious species that feeds in flocks, predicts social dominance in a feeding context. We tested if colour, colour extension, age and body size predicted dominance.

2 > MATERIAL AND METHODS

28 male birds captured from the wild were colour-ringed, aged and measured yellow colour extension and body size (PC1 from a PCA on body weight, wing, tarsus and beak length).

Colour reflection in the best-visible range (320–700 nm) was measured in the forehead, throat, breast and belly. We computed mean brightness, hue, saturation and UV chroma across these body parts.

7 groups of 4 same-sex unfamiliar birds were formed 2 days before the tests.

Over 5 consecutive days agonistic interactions in a feeding context were filmed for 30 minutes after 2h of food deprivation.

We recorded the number of attacks and displays between the males, and calculated David's score to rank the members of each group in a dominance hierarchy.

3 > RESULTS

Aggressiveness was repeatable among individuals between successive days ($R=0.34$, $F_{1,10}=1.52$, $P<0.001$).

Dominance relationships were highly consistent: steepness value from David score = 0.70 ± 0.063.

The best model (AICc model selection) indicates that colour saturation is the best predictor of social dominance (Table 1), with dominant males having more saturated yellow.

Focusing on colour saturation of each individual body part, forehead saturation is the best predictor of dominance (Figure 1, Table 2).

4 > CONCLUSIONS

Dominance hierarchies were stable/repeatable, and ornamental colour saturation, particularly in the forehead, was related to higher dominance.

Carotenoid-based colour ornamentation may be a reliable predictor of social status in male serins, since carotenoids are a limited dietary resource required both for pigmentation and immune function (Suzano, 1994; Olsson 2010).

Since female serins also prefer saturated yellow colouration in males (Leitão et al. accepted BES), the same carotenoid signal may be used both in intra- and inter-sexual contexts.

Future work should experimentally manipulate forehead yellow saturation to control for correlated variables and determine whether this colour patch functions as a badge of status per se.

Table 1. Model selection, using mean colour across body parts

Model order	Predictors in the best model	AICc	ΔAICc
1	sat	145.438	0
2	hue, sat	153.374	7.936
3	hue, sat, age	153.019	7.581

Predictors in the full model: brightness (hue, saturation (sat), hue, chroma (hue saturation), colour extension, body size, age. In addition to the above predictors, three models (2) of using the best information Criterion also included "group" as a fixed factor, to control for differences among experimental groups. Models with a $\Delta AICc < 2$ are considered to be well supported.

Table 2. Model selection, using colour saturation for each body part

Model order	Predictors in the best model	AICc	ΔAICc
1 <td>%</td> <td>144.029</td> <td>0</td>	%	144.029	0
2 <td>% body size</td> <td>145.647</td> <td>0.718</td>	% body size	145.647	0.718
3 <td>% % body size</td> <td>148.213</td> <td>3.284</td>	% % body size	148.213	3.284

Predictors in the full model: group (fixed factor), forehead saturation (h), throat saturation (th), breast saturation (br), belly saturation (bd), body size, age. See legend in Table 1 for statistical symbols.

Forehead saturation predicts social dominance
 $F_{1,10}=11.538$; $p=0.003$

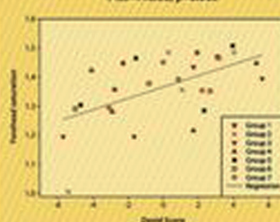


Figure 1. Relationship between forehead saturation and David score (social dominance). Different symbols are used for individuals in different groups.

THE INFLUENCE OF MAGNETIC FIELDS, TURBULENCE, AND UV RADIATION ON THE FORMATION OF SUPERMASSIVE BLACK HOLES



CAROLINE VAN BORM* AND MARCO SPAANS
VAN BORM, C., & SPAANS, M. 2013, A&A, 553, L9

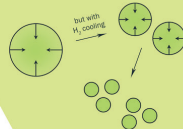


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Several very bright quasars have been detected as early as $z > 6 \Rightarrow$ some supermassive black holes (SMBHs) with masses of $\sim 10^9 M_\odot$ already existed < 1 Gyr after the Big Bang. One possible scenario: SMBH seeds may have formed through the **direct collapse** of primordial gas in $T_{\text{vir}} \geq 10^4$ K halos, whereby the gas must stay hot ($\sim 10^4$ K) to avoid fragmentation^[1-4]. Hence, **formation of H_2 must be inhibited**, otherwise H_2 cooling will lower the gas temperature to ~ 200 K.

H_2 can be **photo-dissociated** by a supercritical level of Lyman-Werner (UV) radiation, or destroyed by **collisional dissociation** as a result of the dissipation of a sufficiently strong magnetic field^[5-6].



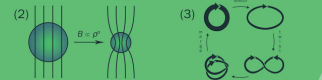
To explore the interplay between **magnetic fields, turbulence, and a UV radiation background** in the post-recombination Universe and during the gravitational collapse of primordial gas in a halo, in particular, to examine the possibilities for avoiding fragmentation.

A **one-zone model** was used to follow the evolution of a cloud of primordial gas from its initial cosmic expansion through turnaround, virialization, and collapse up to a density of 10^7 cm^{-3} .



Magnetic fields:

- Dissipated by (1) ambipolar diffusion (AD).
- Magnified by:
 - (2) gravitational compression,
 - (3) small-scale dynamo: magnetic field lines are stretched and folded by turbulence until saturation^[7].

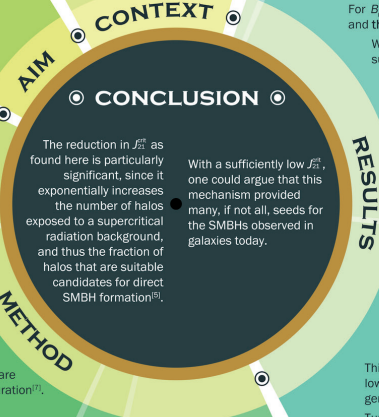


Turbulence:

- Generated by infalling gas^[8].
- Turbulent dissipation = additional heating source.



UV background:
Two different blackbody spectra considered:
• T4 (\sim Pop II spectrum),
• T5 (\sim Pop III spectrum).



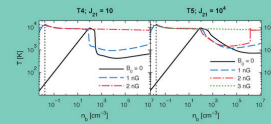
CONCLUSION
The reduction in $J_{\text{UV}}^{\text{eff}}$ as found here is particularly significant, since it exponentially increases the number of halos exposed to a supercritical radiation background, and thus the fraction of halos that are suitable candidates for direct SMBH formation^[9].

RESULTS
With a sufficiently low $J_{\text{UV}}^{\text{eff}}$, one could argue that this mechanism provided many, if not all, seeds for the SMBHs observed in galaxies today.

Without significant turbulence or magnetic field:

- T4: $10 < J_{\text{UV}}^{\text{eff}} \leq 10^2$
- T5: $10^4 < J_{\text{UV}}^{\text{eff}} \leq 10^5$

Consistent with values found by [9] and lower by a factor ~ 10 than previous estimates^[10] (due to different H_2 dissociation rates).



With magnetic field:

For $B_0 \sim 2-3$ nG: $J_{\text{UV}}^{\text{eff}}$ is lowered by a factor ~ 10 , and the stronger the field, the lower $J_{\text{UV}}^{\text{eff}}$.

Without UV background: need $B_0 \sim 13$ nG for sufficient AD heating to overcome H_2 cooling.

Amount of AD heating depends on scaling of B with $\rho \Rightarrow$ important to model this relation correctly.

Current upper limit on primordial magnetic field is ~ 1 nG comoving; a 2 nG field is then reached by $\sim 2\sigma$ upward fluctuations.

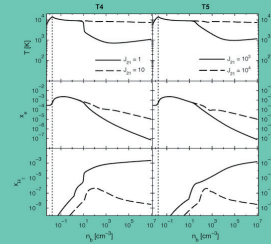
With turbulence ($M_{\text{turb}} = 10^9 M_\odot$):

- T4: $1 < J_{\text{UV}}^{\text{eff}} \leq 10$
- T5: $10^3 < J_{\text{UV}}^{\text{eff}} \leq 10^4$

$\Rightarrow J_{\text{UV}}^{\text{eff}}$ is a factor ~ 10 lower than without turbulence and magnetic fields.

This is due to turbulent heating, so $J_{\text{UV}}^{\text{eff}}$ is even lower for larger halos and/or halos with stronger turbulent heating.

Turbulent halos with $M \gtrsim 10^{11} M_\odot$ (depending on the strength of the turbulence) stay hot without any UV background.



REFERENCES

[1] Bromm, V. & Loeb, A. 2003, *Apl*, 596, 34
 [2] Spaans, M. & Silk, J. 2006, *Apl*, 652, 902
 [3] Schleicher, D. R. G., Spaans, M., & Glover, S. C. O. 2010b, *Apl*, 712, L69
 [4] Laati, M. A., Schleicher, D. R. G., Schmidt, W., & Niemeyer, J. 2013, *MNRAS*, 433, 1607
 [5] Dijkstra, M., Haiman, Z., Mesinger, A., & Wyithe, J. S. B. 2008, *MNRAS*, 391, 1961
 [6] Sethi, S., Haiman, Z., & Pandey, K. 2010, *Apl*, 721, 615
 [7] Kazantsev, A. P. 1968, *Soviet Journal of Experimental and Theoretical Physics*, 26, 1031
 [8] Schleicher, D. R. G., Banerjee, R., Sur, S., et al. 2010a, *A&A*, 522, A115
 [9] Shang, C., Bryan, G. L., & Haiman, Z. 2010, *MNRAS*, 402, 1249
 [10] Omukai, K. 2001, *Apl*, 546, 635

THE NEW RESEARCH GROUP



ORGANIC SYNTHESIS

Probes developed in the group are designed and synthesised in our lab using rational approaches.



SPECTROSCOPIC STUDIES

We design probes that change spectral properties (NMR/fluorescence) in the presence of metal ions or changes in redox state.



RATIOMETRIC SENSORS

The group aims for innovative sensing methods that will allow absolute quantification of analytes.



CONFOCAL MICROSCOPY

Probes are used by the group in cell models immediately for characterisation and biological experiments.



IMAGING HEALTH & DISEASE

We aim to develop both fluorescent tools and MRI contrast agents for better human imaging of a wide scope of diseases.

HONOURS PROJECTS 2015

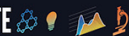
FLUORESCENT SENSORS FOR METAL IONS



with Dr Liz New

Almost all biological processes require metal ions for correct functioning, particularly as cofactors in many enzymes. If metal levels are too low, enzymes will lose function, but if they are too high, incorrect metal complexes can form, leading to diseases like Alzheimer's. We will design fluorescent sensors for metal ions such as Ni(II), Mn(II), Cu(I) and Cu(II) that will allow us to understand the roles of metals in disease.

SENSORS THAT CHANGE COLOUR WITH REDOX STATE



with Dr Liz New

This project involves developing new fluorescent sensors for oxidative stress in biology, a condition that is linked to all age-related diseases. In this project, we will design and synthesise new fluorescent probes that change emission colour with changing redox state. We will then use these probes to study models of disease in cultured cells.

MRI PROBES FOR HYPOXIA



with Dr Liz New & Dr Paul Bonnitcha (Kolling)

Hypoxia (oxygen starvation) occurs in many diseases such as heart attack, cancer and stroke, so it is important to be able to identify hypoxic tissue within the body. MRI offers the possibility of non-invasive, 3D imaging, and contrast agents can be used to amplify the signal. This project involves developing new metal complexes for use as MRI contrast agents that are sensitive to hypoxia.

STUDYING PLATINUM ANTICANCER DRUGS



with Dr Liz New & Prof. Trevor Hambley

Platinum-containing drugs are amongst the most important cancer therapeutic agents, but many aspects of their cellular behaviour are still not understood. In this project, we will develop new fluorescent methods to study platinum complexes, which we will apply to the study of platinum complexes in cells.

TARGETED IMAGING OF DISEASE



with Dr Liz New and A/Prof. Andrew Katsifis (RPA)

Positron emission tomography (PET), magnetic resonance (MR) and luminescence imaging all provide valuable clinical and pre-clinical information, but directing imaging agents to specific cells remains a challenge. This project will involve tethering targeting groups onto imaging platforms and then testing their localisation in cultured cells and in animal studies. We will then investigate the utility of these probes in studying diseases such as cancer and neurodegenerative disorders.

BIOMIMETIC SYNTHESIS OF CaCO_3 IN ALGINATE HYDROGELS MODIFIED WITH AMINO ACIDS

Ivan Ilić, Mirica Andrija Čigović, Milica Plodinec, Miran Čerš, Dami Kralj, Blažer Božić, Anđelija Šegvič, Goran Čičević, Jozef Štefan Institute, Ljubljana, Slovenia

Mimicking nature... BIOMINERALS

CALCIUM CARBONATE biominerals – organic inorganic composite materials – the formation of the inorganic phase is controlled by a matrix of proteins and polysaccharides that compose the organic phase.
Interactions between the organic and inorganic phases results in materials that are highly adapted for their functions
MORPHOLOGY of CaCO_3 crystals is predominantly controlled by present organic macromolecules responsible for gel-like properties of matrix

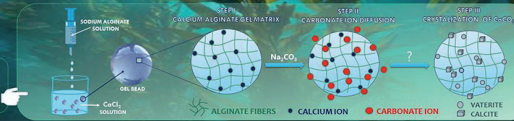
Mineralization in gelling environment...

GEL-LIKE MATRICES NOT ONLY SERVE AS A SCAFFOLD BUT ALSO PROVIDE FOR CONTROLLED CRYSTAL NUCLEATION AND GROWTH – influence extent over the biomineral and its morphology

MICROSTRUCTURE OF GEL PRECURSORS?

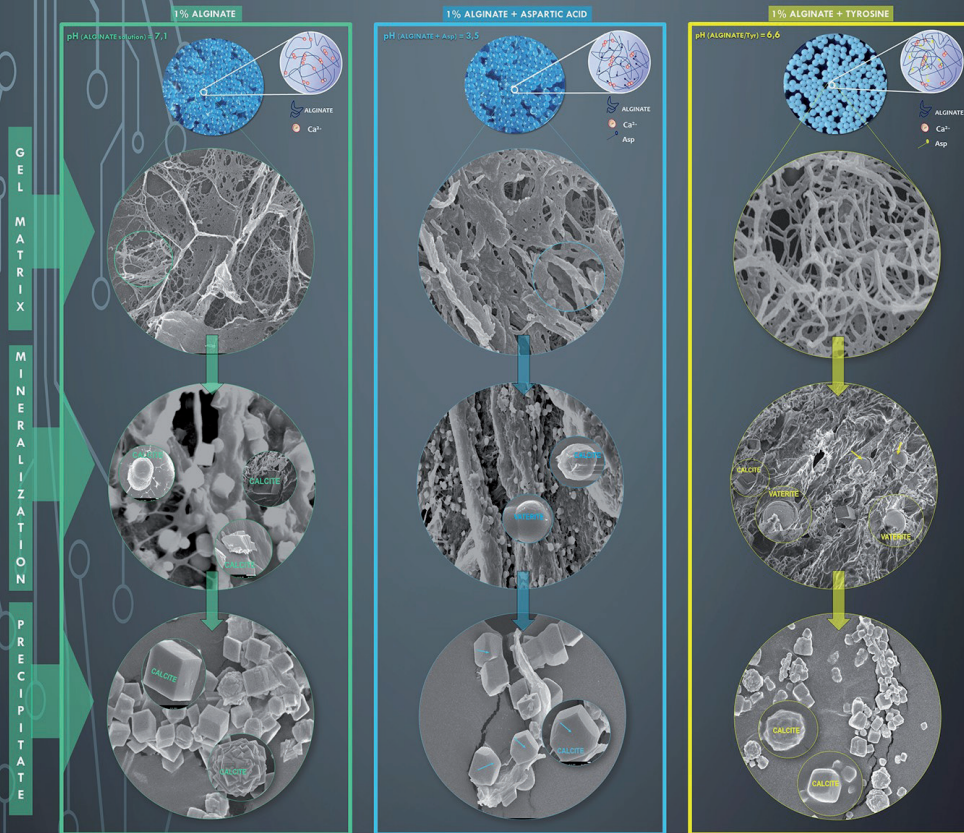
This research presents the study of crystallization of calcium carbonate in GELLING POLYSACCHARIDE MATRIX and the ADDITION OF AMINO ACIDS (Ty, Asp) which we assumed to have an important role in the structure of precipitates which are relevant for biomineralization.

How we did it?

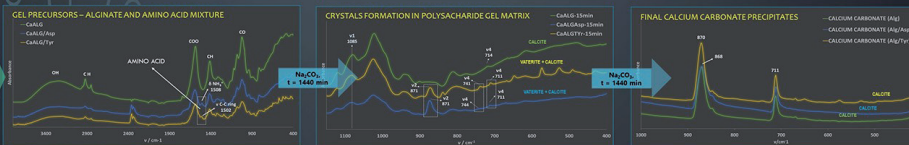


INTERMEDIATED METASTABLE PHASES?

MORPHOLOGY?



SELECTED SCOPY



PROUDLY SPONSORED BY:

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Are we any smarter?

- The morphology of calcite crystals depended on extent of cross-linking of alginates and the addition of amino acids
- The viscosity of alginate solutions increase as pH decreases and reach a maximum at pH 3-3.5 (carboxylate groups in the alginate backbone become protonated and form hydrogen bonds). Addition of amino acid influenced the pH change of the alginate solution therefore changed the viscosity and subsequently gel matrix structure
- In the systems with amino acid added, stable and unstable phases coexisted at early stages of mineralization process, as confirmed by SEM and FTIR-ATR spectroscopy
- Alg hydrogel matrix, without addition of AA → well defined rhombohedral single calcite crystals and step-like calcite aggregates precipitated
- Alg + Asp hydrogel matrix only → calcite with morphology of „un-finished“ rhombohedra precipitated; morphology is influenced by C-block/Asp reduction of growth rate of otherwise fast growing faces
- Alg/Ty hydrogel matrix → rhombohedral and rouse-like calcite crystals with rounded, smooth edges precipitated

COPPER AND THE BRAIN

Clara Shen
Anthony White
Elizabeth New

School of Chemistry
The University of Sydney
Department of Pathology
University of Melbourne



Copper and the brain
Cu is an essential element that has been linked to neurodegenerative disease



Combinatorial approach
Fluorophores and receptors are synthesised and combined to generate ratiometric Cu probes.



Ratiometric probes
Eliminate the influence of probe concentration, distribution and background fluorescence.



Cellular and animal model studies
These probes can be used to answer questions about copper physiology in health and disease.

Introduction

There is growing evidence that copper homeostasis is a common factor in the mechanisms of Alzheimer's and Parkinson's disease. To uncover the nature of this relationship and the complex mechanisms involved, we require tools to visualise copper at a molecular level in cells. While the tightly bound copper pool has been relatively well covered, there remains a gap in our understanding of how the labile copper pool changes with important cellular events.

Aims

1. Develop ratiometric Cu probes
2. Study copper homeostasis in the brain and other tissues
3. Investigate the mechanisms of copper based neuroprotective agents

RCS3 - A ratiometric copper probe

RCS3 is a ratiometric BODIPY probe that responds selectively to Cu(I) in a 1:1 binding fashion. It exhibits two fluorescence emission peaks (515 nm & 560 nm) of which the 560 nm emission increases when the probe is bound to copper. It has a K_d of 7.6×10^{-12} M.

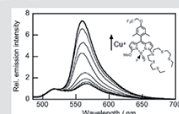


Fig. 1. Fluorescence response of $x \mu\text{M}$ RCS3 (structure shown) to $x \mu\text{M}$ Cu^+ . Spectra acquired in 20 mM HEPES, pH 7.0, 25 °C (λ_{exc} X nm, λ_{em} X nm).

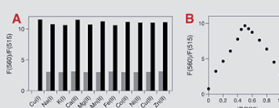
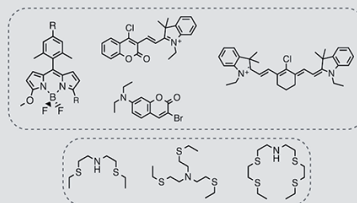


Fig. 2. (A) Fluorescence responses of RCS3 to metal ions (grey = addition of $x \mu\text{M}$ indicated metal ion, black = subsequent addition of $x \mu\text{M}$ Cu^+). (B) Job's plot of RCS3 and Cu^+ . Total concentration of RCS3 and Cu^+ were kept at $x \mu\text{M}$.

Next generation copper probes

Development is underway for new fluorescent probes for Cu(I) with improved stability and more distinct ratiometric fluorescence responses. We are aiming for increased control over the cellular localisation as well as varied binding affinity. This is achieved by combining fluorophores with different spectroscopic properties and receptors with different binding affinity for Cu(I).



Scheme 1. (Top) Chemical structures of select fluorophores including high intensity coumarins and infrared wavelength cyanines. (Bottom, Left to right) Low to highest affinity copper receptors have been synthesised in preparation for combinatorial investigation with a library of fluorophores.

Conclusions & Future work

1. We have been able to understand more about the potential intriguing roles of copper as a signalling molecule in metabolic pathways.
2. The utility of our probes for answering meaningful questions about copper neurobiology has been demonstrated with spectroscopic and biological studies.
3. Future investigations of dynamic copper levels in stressed and amyloidogenic cells will also provide valuable information and encourage new research directions for this critical field.

RCS3 detects changes in Cu(I) within cells

Molecular imaging of RCS3 in HEK and 3T3L1 cells establishes this probe as a new chemical tool that can detect changes in labile Cu(I). RCS3 appears to localise in lipid droplets, attributed to the hydrophobic BODIPY domain, and allows us to visualise dynamic changes in copper distribution during lipolysis. Bar graphs are plotted using ratio of emissions at 560/515 nm.

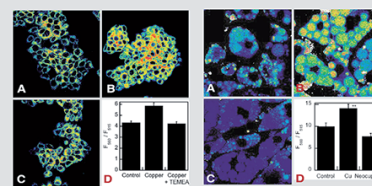


Fig. 3. Molecular imaging of (A) Control HEK cells, (B) HEK treated with 100 μM Cu(I) for 24 h, and (C) HEK subsequently treated with TEMA for 12 h, each incubated in 5 μM RCS3 for 15 min. (D) Plot of mean fluorescence intensity (A-C).

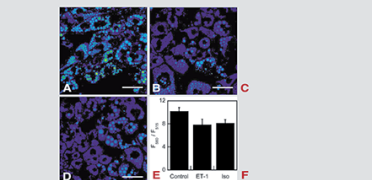


Fig. 4. Molecular imaging of (A) Control 3T3L1 adipocytes, (B) 3T3L1 treated with 100 μM Cu(I) for 24 h, and (C) 3T3L1 subsequently treated with hecoperone for 12 h, each incubated in 5 μM RCS3 for 15 min. (D) Plot of mean fluorescence intensity (A-C).

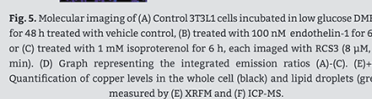


Fig. 5. Molecular imaging of (A) Control 3T3L1 cells incubated in low glucose DMEM for 48 h treated with vehicle control, (B) treated with 100 nM endothelin-1 for 6 h, or (C) treated with 1 mM isoproterenol for 6 h, each imaged with RCS3 (8 μM , 15 min). (D) Graph representing the integrated emission ratios (A-C). (E)+(F) Quantification of copper levels in the whole cell (black) and lipid droplets (grey) measured by (E) XRFM and (F) ICP-MS.

Acknowledgements

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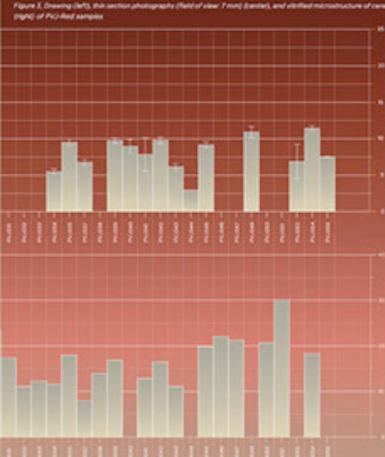
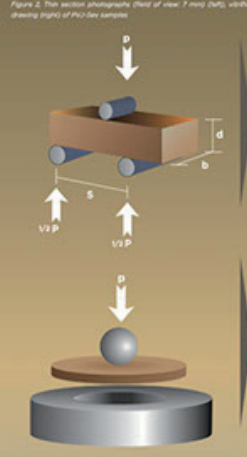
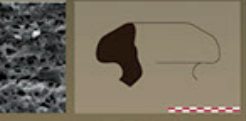
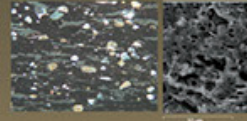
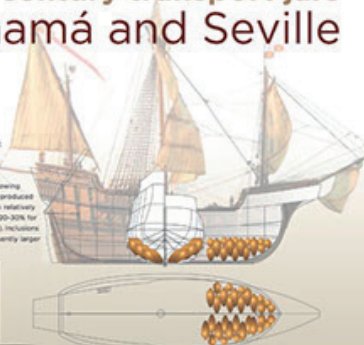
The mechanical properties of 16th century transport jars from Panamá and Seville

The sixteenth century is the beginning of the colonization of the American territories as an economic enterprise supported by the Spanish Habsburgs. Primary activities settled in Seville, Europe's gateway to America. Many workshops were specialized in certain types of wares. The guild of botaneros, for example, manufactured large transport jars destined for the commerce of goods with the new foundations in America. One of these foundations is Panamá (Central America), which was established in 1509 and lasted until 1821 when it was destroyed by a sea level by Henry Morgan. Excavations at Panamá Viejo have brought to light European transport jars but also vessels called *capellaneras de pasta roja* (red paste transport jars). The latter appear to imitate European vessels but are manufactured with a local ceramic paste and interpreted as a result of acculturation in Panamá.

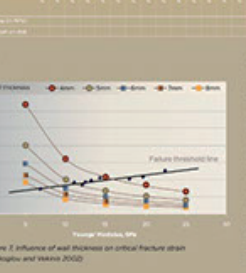
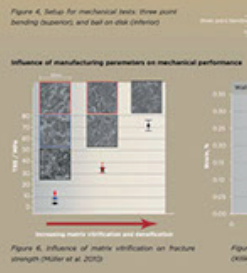
Mechanical properties of transport jars
 Transport jars must be able to keep their contents safe to the final destination. During transport, they should be able to withstand stresses related to weight loads, e.g. their stacking vessel layers, but also stresses arising from collisions, caused by movements of the ship. Flexure strength and toughness describe a material's ability to withstand such mechanical stresses. Fracture strength is related to the stress a material can be exposed to until crack initiation, while toughness gives a measure of the energy required for such fracture initiation and propagation. In order to assess the mechanical performance of transport vessels found at Panamá Viejo, 29 shards, chemically characterized from Seville and 18 shards from Panamá were tested for their fracture strength. In addition, material parameters which would allow making inferences on a ceramic's mechanical performance, such as firing temperature, porosity and amount of apatitic inclusions were also determined.

Manufacturing technology
 Analysis of archaeological samples (SEM, XRD, EDX and thin section petrography) confirmed that a calcareous bone clay, tempered with moderate amounts of sand from the banks of the river (Quadrado) was employed in the manufacture of Seville transport jars (PVJ-Sec). Containing many metacrystals, rough fragments, quartz and alkali feldspar, but also a smaller proportion of carbonate fragments, chert and zirconite inclusions, jars were fired to high temperatures, resulting in a vitrified body. Panamanian red paste containers (PVJ-Red) were made from a non-calcareous marine clay, with lower igneous rocks, argonite pyroxene, alkali feldspars, biotites, oligoclases and low proportion of quartz as inclusions. Unlike Seville jars, Panamanian vessels do

not appear to be intentionally tempered but it seems that artisans used naturally coarse clays in manufacture. Firing temperatures appear lower than in Seville manufacture, with samples showing less extensive vitrification. Both locally produced and imported vessels show moderate to relatively high amounts of apatitic inclusions (i. 20-30% for Seville jars and c. 5% for Panamá samples). Inclusions in Panamá samples are, however, frequently larger than in Seville samples.



Mechanical tests on jars
 An average of 36.7 MPa was found for the ceramics of Seville manufacture (PVJ-Sec), while Panamanian samples (PVJ-Red) had an average of 16.6 MPa in ball on disk experiments. This corresponds to a fracture strength of c. 16.7 MPa and 0.3 MPa respectively, when normalized to 3 point bending test (factor 1.8).



Summary
 The use of calcareous clay and high firing temperatures in Seville manufacture resulted in a vitrified microstructure, while non-calcareous clays with lower firing temperatures in Panamanian manufacture resulted in a less vitrified microstructure and a material which has lower strength levels. It is worth noting that the difference in wall thickness between local and imported jars from Seville has the same effect as in locally produced vessels. However, the locally produced ceramic material has been compensated with thicker vessel walls. Imported vessels show higher porosity and higher amount of apatitic inclusions than local samples. Both factors that are expected to reduce strength levels in spite of this, however, PVJ-Red samples appear much more stronger than PVJ-Sec samples in the fracture tests, indicating that the adverse effect of high porosity and high temper amount is best compensated by a more highly vitrified microstructure, alongside with the greater use of alkali inclusions in Seville samples.

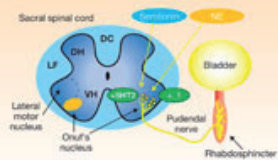
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Duloxetine versus Placebo in the Treatment of Stress Urinary Incontinence: The North American Phase 3 Trial

Norman Zinner¹, Roger Dmochowski², John Miksa³, Peggy Norton⁴, Ivan Valcaro⁵, Richard Bump¹
For the Duloxetine UI Study Group
¹Western Clinical Research, Inc., ²Harvard University,
³Atlanta Urology Associates, ⁴University of Utah, ⁵El Lilly and Company
Sponsored by El Lilly and Company

Figure 1. Serotonin and Norepinephrine Effects at Onuf's Nucleus

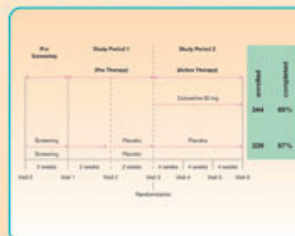


METHODS

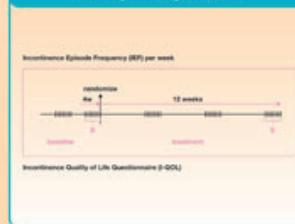
Study Population

- 883 women 22-84; predominant SUI
- ≥7 weekly stress incontinence episodes
- Normal frequency (<9 voids per day)
- Urge not predominant
- Normal bladder capacity
- Cough stress test positive
- Stress pad test >2gm

STUDY DESIGN



Primary Efficacy Variables



Secondary Efficacy Variables

- Patient Global Impression – Improvement (PGI-I)
- Mean Time Between Voids (minutes, MTBV)
- I-QOL domains
 - Avoidance and Limiting Behaviors
 - Psychosocial Impacts
 - Social Embarrassment

Methods: Intent to Treat Analysis

- Van Elteren's test for median percent change in IEF from baseline to endpoint with stratification variable being baseline IEF
- Analysis of Covariance for mean change in I-QOL from baseline to endpoint
- Cochran-Mantel-Haenszel test for PGI-I at endpoint

SAFETY

Results: Discontinuations*

	80mg n = 83	Plac n = 14	p
Overall Discontinuation	24%	4%	<.001
Nausea	6.4%	0%	<.001
Fatigue	2.6%	0.3%	=.02
Insomnia	2.0%	0.3%	=.07
Somnolence	2.0%	0.3%	=.07
Dizziness	1.5%	0.3%	=.22
Blurred Vision	1.2%	0%	=.12

*All events ≥ 1% with duloxetine.

Results: Adverse Events*

	Duloxetine	Placebo	p
At least 1 AE	74%	50%	<.001
Nausea	22.7%	2.1%	<.001
Fatigue	14.8%	3.8%	<.001
Insomnia	14.2%	2.4%	<.001
Dry Mouth	12.2%	0.9%	<.001
Constipation	9.6%	2.1%	<.001
Somnolence	8.7%	0.3%	<.001
Dizziness	7.6%	2.4%	=.002
Headache	7.3%	3.5%	=.04
Diarrhea	6.1%	2.7%	=.04

*All events ≥ 5% with duloxetine.

Nausea in Perspective

- 20 of 78 (26%) subjects who experienced treatment emergent nausea discontinued the study due to it
- Of the 58 subjects who continued despite treatment emergent nausea, 31 (53%) had resolution of nausea within one week and 47 (81%) within one month
- Nausea occurs early; 91% within the first 4 weeks

Initial Severity	n (%)	Got Worse	Discontinued
Mild	36 (46.2%)	3 (8.3%)	8 (22%)
Moderate	32 (41.0%)	0	8 (25%)
Severe	10 (12.8%)	n/a	4 (40%)

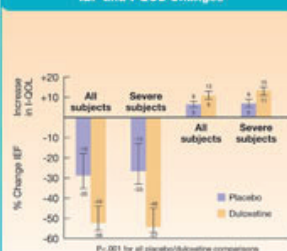
EFFICACY

Baseline Severity

- Weekly IEF
 - Placebo 18.97
 - Duloxetine 18.17
- 64% had ≥14 IEF/wk at baseline
- I-QOL*
 - Placebo 64.3
 - Duloxetine 62.0
- PGI-S (moderate-severe) at baseline
 - Placebo 66.6%
 - Duloxetine 68.4%

*All evaluable subjects.

IEF and I-QOL Changes



Responder Analysis

	Percent	p
IEF (last 7 days)		
Placebo	33.5%	<.001
Duloxetine	51.4%	
I-QOL		
Placebo	35.5%	=.001
Duloxetine	47.7%	

Frequency and I-QOL Subscales

	80mg	Plac	p
Voiding Interval Minutes	+20	+2	<.001
I-QOL Scales			
• Avoidance and Limiting Behaviour	+11.1	+7.1	<.001
• Psychosocial Impact	+10.2	+5.7	<.001
• Social Embarrassment	+12.4	+8.4	=.02

Efficacy: PGI-I (p<.001)

	Dulox	Plac
Very Much Better	12.6%	9.3%
Much Better	25.7%	13.2%
A Little Better	23.7%	17.1%
All Better	62.0%	39.6%
No Change	36.2%	52.9%
All Worse	1.8%	7.5%
A Little Worse	1.5%	5.1%
Much Worse	0.3%	2.1%
Very Much Worse	0.0%	0.3%

CONCLUSIONS

These first phase III data are consistent with phase II data and provide further evidence for the safety and efficacy of duloxetine 80 mg/day as a pharmacological agent for the treatment of SUI of all levels of severity.

PERSONALITY, SEX DIFFERENCES, AND MATE CHOICE IN THE EUROPEAN SERIN

Ana V. Leitão* & Paulo G. Mota

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*Corresponding Author: anavleitao@gmail.com

INTRODUCTION

- Animals can demonstrate individual behavioural traits that are consistent over time and in different contexts, also known as personality traits (Réale et al., *Philosophical Transactions* 8, 2010).
- Personality has increasingly been the focus of ecological studies to understand the evolution and maintenance of these and its consequences.
- While several hypothesis have been considered, sexual selection has been scarcely studied although it is possible that it may play an important role in the origin and maintenance of personality differences (Schuett et al. *Bio Reviews* 2010).

OBJECTIVES

- Study consistent interindividual differences in behaviour in the serin (*Serinus serinus*).
- Understand how sexes differ in their behavioural traits.
- Understand how different behavioural contexts are related and differ between sexes.
- Explore a possible role of personality traits in female mate choice.



METHODS

- Wild serins (30 males and 17 females) were captured, and maintained in an indoor aviary until the end of the experiments.
- Individuals were subjected to four behavioural tests to assess fear (a), neophobia (b), sociability (c), and exploration (d), and tested for repeatable individual differences in two rounds.
- Mate choice tests were performed in an aviary (e) with a random female and a unique combination of two males with similar colouration.

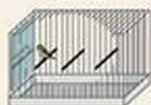
(a) Tonic immobility test



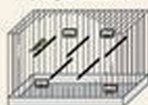
(b) New Object test



(c) Mirror test



(d) Cage exploration test



(e) Mate choice



RESULTS

REPEATABILITY

Males and females differ in their consistency

Trait	Sex	Mean	SD	Repeatability
Fear	Male	4.2	2.0	0.187
	Female	3.8	2.1	0.122
Neophobia	Male	4.1	2.0	0.200
	Female	3.9	2.1	0.176
Sociability	Male	4.2	2.0	0.200
	Female	3.8	2.1	0.176
Exploration	Male	4.1	2.0	0.176
	Female	3.9	2.1	0.176

Note: Repeatability is the ratio of between-individual variance to total variance for each personality trait. Sample size: Test: 10; Male: 30; Female: 17.

SEX DIFFERENCES

Males are more sociable than females ($t = -2.017$, $P < 0.050$)

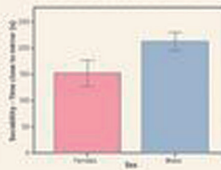
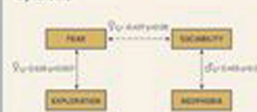


Figure 1. Sex differences associated with a test for the personality traits here we present the only significant difference, for sociability.

RELATIONSHIP ACROSS BEHAVIOURAL TRAITS

Females and Males differ in their behavioural syndrome



MATE CHOICE

Female number of visits to males was related to their own personality trait (sociability; $X^2 = 10.455$, $p = 0.001$)

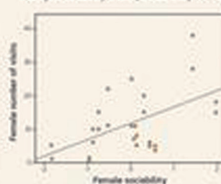


Figure 2. Relationship between female number of visits to males in the mate choice test and female sociability. A SEM repeated measures was performed to test female visits using two PCs of female personality as covariates. PC2 was significant and represents female sociability.

CONCLUSIONS

- Individuals showed repeatability in the four behavioural tests.
- Males and females differed in their consistency and behavioural responses across the different tests.
- Behavioural traits were correlated, indicative of a possible behavioural syndrome, but differed between females and males: More neophobic males were also more sociable, and females that were more sociable were less fearful and marginally less explorative.
- In mate choice tests, female personality was related with its own behavioural performance.
- Our results stress the importance of looking for sex differences in personality, and for considering the influence of personality in mate choice context.

Modelle des Selbst: visuelle Übersetzungen.

Legende

Die Plakaterien sind ein Versuch, unterschiedliche philosophische Texte über das Selbst des Menschen durch eine prozessualinhaltliche Analyse und ein ästhetisches grafisches Konstrukt in die visuelle Formensprache zu übersetzen.



George Herbert Mead - Geist, Identität und Gesellschaft - 3. Kapitel Identität

3.1. Stufen der Identitätsentwicklung

Die Stufen der Identitätsentwicklung sind in drei Phasen unterteilt: 1. Das Individuelle, 2. Das Kollektive, 3. Das Soziale.



Das Individuelle ist die Basis der Identitätsentwicklung. Es umfasst die körperlichen und geistigen Fähigkeiten des Einzelnen.

Das Kollektive ist die zweite Stufe der Identitätsentwicklung. Es umfasst die Interaktion mit anderen Individuen.



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Das Soziale ist die dritte Stufe der Identitätsentwicklung. Es umfasst die Interaktion mit der gesamten Gesellschaft.



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George Herbert Mead - Geist, Identität und Gesellschaft - 3. Kapitel Identität

3.1. Identität und Organismus

Die Identität ist ein Prozess, der sich über die Zeit entwickelt. Sie ist ein Ergebnis der Interaktion zwischen dem Individuellen und dem Kollektiven.



3.2. Mechanismen der Identitätsentwicklung

Die Identitätsentwicklung wird durch drei Mechanismen bestimmt: 1. Das Individuelle, 2. Das Kollektive, 3. Das Soziale.



3.3. Das Ich- und das -MICH-

Das Ich ist die individuelle Identität, das MICH- ist die soziale Identität. Sie sind zwei Seiten derselben Medaille.





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 Leamington, Warwick, CV35 9EF
 Warwick University, Coventry, CV4 7AL

Influence of Thermal Treatments on Calcium and Magnesium Distribution in BOVINE CHEESE-MAKING MILK

Miguel Acosta, C. Gerda Anagnostis, L. E. and Septhida, S. R. *

1 Abstract

Calcium and magnesium in milk are distributed into three main groups: micellar, soluble, and ionic. This distribution is relevant for technical purposes since it defines some functional properties, such as rennet and acid coagulation properties. Thermal processes used in the industry modify the balance of minerals hence modifying the technical properties of milk.

The aim of this research was to assess the changes on the Ca and Mg distribution in the milk phases after thermal treatments.

Soluble calcium and magnesium were affected by thermal treatments. High temperatures solubilized Mg and unsolubilized Ca. Ionic Ca concentration is lowered by higher treatment temperatures while ionic Mg increases. All treatment temperatures over 60°C the behavior of SM and IC does not change (µmol/kg) however the proportions between ionic and no ionic forms of each mineral in the soluble phase continue changing at higher temperatures, suggesting that Mg dissociates in the soluble phase allowing IC to associate with the released anions. SC and SM contents do not significantly varied with treatment time.

2 Introduction

Calcium and Magnesium are present in different forms in milk in the soluble phase of milk, associated to different anions, or dissociated as an ionic form, and included in the colloidal phase in milk (1-4).

The balance of the diverse forms in which calcium is present in milk is extremely important since it defines major properties of milk, which are relevant in the production of cheese (5).

Thermal treatments applied to milk prior to manufacture of dairy products play an important role modifying the technical properties of milk. Calcium and Magnesium concentrations in the micellar and soluble phases are modified by thermal treatments hence modifying the ability of milk to coagulate.

3 Objective

The objective of this research was to assess the changes on the calcium and magnesium distribution in the soluble phase (ionic and no ionic forms) and micellar phase of milk after thermal treatments at different temperatures.

4 Materials And Methods

Raw whole bovine milk was obtained from a local farm immediately after milking. Milk was skimmed and phosphate composition was assessed.

Table 1.

Moisture (g / 100g)	90.5 ± 0.1
Fat (g / 100g)	0.9 ± 0.4
Protein (g / 100g)	3.3 ± 0.1
pH	6.6 ± 0.02
Na (mg / L)	406 ± 27
K (mg / L)	1125 ± 26
Ca (mg / L)	1249 ± 29
Mg (mg / L)	74 ± 6

Table 1. Proximate composition of raw skim milk.

Milk samples were subjected to different thermal treatments (5, 2, 25, 35, 55, 60, 70, and 80°C). Immediately after treatments temperature was reached the samples temperature was adjusted to 20°C.

Dispersed and soluble phases of milk were separated by ultrafiltration centrifuging in 0.22 µm cellulose acetate tube filters at 20,000 x g for 20 min just after thermal treatment conditions were reached.

Soluble calcium (SC) and magnesium (SM) were measured by atomic absorption spectrometry from the ultrafiltration permeate. Ionic calcium (IC) and ionic magnesium (IM) were measured employing a calcium and calcium/magnesium selective ion electrode, respectively. All measurements were carried out at controlled room temperature.

A total of three replicates of the experiment were assessed. Analysis of variance was conducted using Minitab version 14 (Minitab Ltd., Coventry, UK). Tukey's multiple means comparison was conducted at a 95% confidence level.

5 Results

Figure 1.

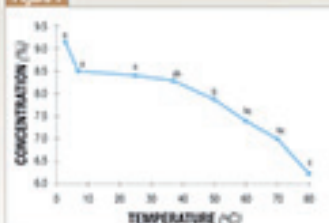


Figure 1. Ionic calcium percentage content in milk residue at different temperatures. *1,1,1,1 values without a common superscript letter were significantly different (P<0.05). Values are expressed as a percentage of the total calcium content in the skim milk (100 mg/L).

Figure 3.

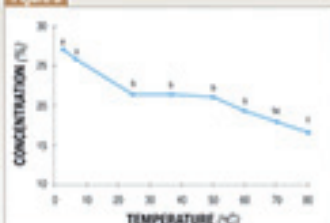


Figure 3. Soluble calcium percentage content in milk residue at different temperatures. *1,1,1,1 values without a common superscript letter were significantly different (P<0.05). Values are expressed as a percentage of the total calcium content in the skim milk (100 mg/L).

Figure 2.



Figure 2. Ionic magnesium percentage content in milk residue at different temperatures. *1,1,1,1 values without a common superscript letter were significantly different (P<0.05). Values are expressed as a percentage of the total magnesium content in the skim milk (74 mg/L).

Figure 4.



Figure 4. Soluble magnesium percentage content in milk residue at different temperatures. *1,1,1,1 values without a common superscript letter were significantly different (P<0.05). Values are expressed as a percentage of the total magnesium content in the skim milk (74 mg/L).

6 Conclusions

The present study characterizes the interaction between calcium and magnesium after thermal treatments, suggesting an interaction between these two cations, which may play a relevant role defining rennetability and thermal stability.

The findings of this study show that the increment on the IC concentration when temperature is increased is proportional to the increment on the IM concentration, suggesting that both cations can transfer anions between them to maintain milk soluble phase equilibrium.

Acknowledgements

The authors thank Royal Society, Dairy Systems, Coventry University and Dairy Skills for their technical assistance. This work was supported by the Warwick National Council of Science and Technology (ENACT) and UK Higher Education Research Council (EPSRC) project number 098-0984-0-0000.

References

- 1. Wainman, F., Wainman, J. Dairy J. 2000 Dairy science and technology. 2nd Edition. CRC Press, Taylor & Francis Group, Boca Raton, Florida.
- 2. Bloor, W.J., Lewis, R.J., & Gordon, A.J. (2006). In: J. Dairy Science 89(3) 60-66.
- 3. Bloor, Wainman, F., De Gooijer, H.A., Ferris, W., & Duns, G. (1998). J. Dairy Sci. 81(1) 68-75.

QR-010

QR-010, an RNA Therapy, Restores CFTR Function in $\Delta F508$ -CFTR Mice

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Introduction

- Cystic fibrosis (CF) is caused by mutations in the cystic fibrosis transmembrane conductance regulator (CFTR).
- The most common gene mutation is $\Delta F508$, which results in deletion of three nucleotides and results in a non-functional CFTR protein. $\Delta F508$ -CFTR mice have mRNA homologous with human mRNA at the $\Delta F508$ locus.
- Nasal potential difference (NPD) is an accepted tool for diagnosis of CF in humans as the basal potential difference and response to stimuli are specific to the CFTR dysfunction. $\Delta F508$ -CFTR mice have NPD patterns similar to humans with CF.
- The saliva secretion assay (SSA) is an investigational tool described in $\Delta F508$ -CFTR mice, which is a surrogate of the sweat chloride test used in humans.
- QR-010 is an investigational single-stranded, chemically modified RNA oligonucleotide designed to repair mRNA in CF patients with the $\Delta F508$ mutation and result in translation of wild-type CFTR.
- To assess if QR-010 restored normal CFTR function in $\Delta F508$ -CFTR mice, we assessed NPD before and after intranasal administration of QR-010 as well as SSA before and after oro-tracheal administration of QR-010.

Objectives

- Assess if topical administration of QR-010 could restore the CFTR-mediated chloride transport in $\Delta F508$ -CFTR mice by measuring the nasal epithelial potential difference.
- Assess if oro-tracheal administration of QR-010, as a mimic of inhaled delivery, could restore the CFTR-mediated saliva secretion in $\Delta F508$ -CFTR mice.

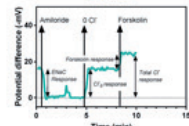
Materials & Methods

NPD:

- Mice: $\Delta F508$ -CFTR mice (FVB-*Ctfr*^{tm1Yj} male/female, 12w and older).
- Treatment: 6 intranasal (i.n.) QR-010 (2mg/kg) every other day.
- Readout: NPD before treatment and 48hrs after the last (6th) dose.
- Protocol: Leal T et al.⁶



WT mouse



SSA procedure:

Modified from Best et al.²

- Use 2.5%/2.0% isoflurane/air mixture for anesthesia.
- Subcutaneous (s.c.) injection (50 μ l, 1mM) atropine to block the cholinergic and adrenergic system.
- A cotton bud was used to absorb any remaining saliva.
- S.c. injection (50 μ l, 1mM) atropine and (100 μ l) isoprenaline to induce CFTR-mediated saliva production.
- Saliva was absorbed in pre-weighed pieces of filter paper and replaced every 3min for 30min.
- Total saliva production was calculated by weighing all filter papers, subtracting pre-weight and corrected for bodyweight.

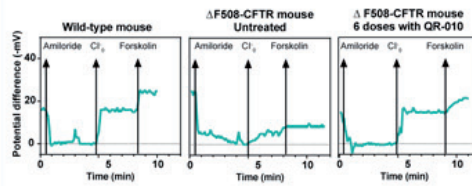
SSA:

- Mice: $\Delta F508$ -CFTR mice (FVB-*Ctfr*^{tm1Yj} male/female, 12w and older).
- Treatment: 6x oro-tracheal (OT) QR-010 (10mg/kg) every other day.
- Readout: SSA before treatment and 24hrs after 1, 2, 4 and 6 doses.



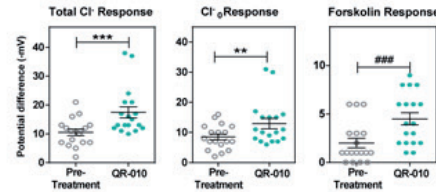
QR-010 Increases CFTR Function as Measured by NPD

QR-010 restores NPD to normal in $\Delta F508$ -CFTR mice



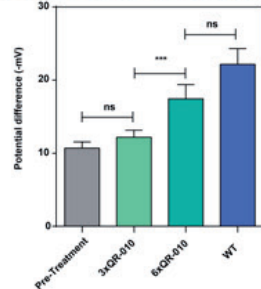
Representative NPD traces of a wild-type mouse and a $\Delta F508$ -CFTR mouse before treatment and after 6 doses of QR-010 are shown. Both amplitude of the response and response-time to stimuli revert toward wild-type after QR-010 treatment.

QR-010 improves CFTR-specific NPD parameters



Dots depict individual mice pre- and post-treatment with 6 i.n. doses of QR-010 (2mg/kg). Both the zero-chloride as well as the forskolin response were improved after QR-010 treatment. Line with error bars show means \pm SEM, paired T-test, n=18. ***p<0.0005, **p=0.0030, ##p<0.0001.

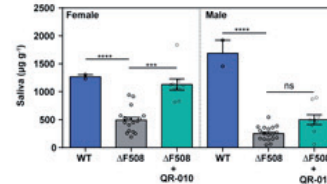
Total Chloride response is dose dependent



Summary of Total Chloride Response: 3 doses of QR-010 did not significantly improve chloride response. In contrast, 6 doses did improve chloride response to levels not significantly different from wild-type (WT). Means \pm SEM is shown for $\Delta F508$ -CFTR mice pre-treatment, after 3 (n=6) and 6 (n=18) i.n. doses of QR-010 (2mg/kg) and WT mice (n=6). Results were compared by unpaired T-test (vs. WT) and paired T-test (vs. pre-treatment), n=18. ***p<0.0005, ns=not significant.

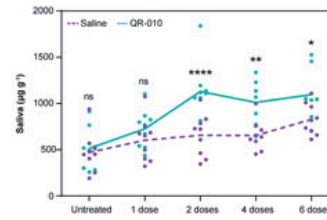
QR-010 increases CFTR Function as Measured by Saliva Secretion

QR-010 increases total saliva secretion volume in female $\Delta F508$ -CFTR mice



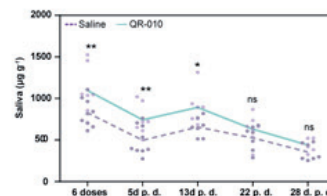
Total CFTR-mediated saliva production (corrected for bodyweight) in female and male WT and $\Delta F508$ -CFTR mice (pre-treatment and after treatment with 2 doses of QR-010). Bars with error bars show mean with SEM. Both male and female $\Delta F508$ -CFTR mice have significantly lower CFTR-mediated saliva production compared to WT (****p<0.0001, Unpaired T-test). 2 doses of QR-010 significantly improved CFTR-mediated saliva production in $\Delta F508$ -CFTR mice to WT levels (**p<0.0001, Paired T-test). QR-010 had no effect in males (ns: non-significant).

Saliva secretion improves after 2 doses of QR-010



Lines show the mean CFTR-mediated saliva secretion corrected for bodyweight (ug saliva/g bodyweight) and circles show individual measurements for saline (dotted purple) and QR-010 (n teal) treated females in $\Delta F508$ -CFTR mice. Treatment groups were compared by two-way ANOVA with Fisher's LSD test. QR-010 improved CFTR-mediated saliva production significantly compared to saline 2, 4 and 6 doses in female $\Delta F508$ -CFTR mice. There was no effect of QR-010 observed in male $\Delta F508$ -CFTR mice. ns=non-significant, ****p<0.00001, **p=0.0029, *p=0.0233.

Effect of QR-010 on CFTR mediated saliva secretion remains up to 13 days post-dosing



Lines show the mean CFTR-mediated saliva secretion corrected for bodyweight (ug saliva/g bodyweight) and circles show individual measurements post-dose (p.d.) for saline (light purple dotted) and QR-010 (light teal) treated female $\Delta F508$ -CFTR mice. Treatment groups were compared by two-way ANOVA with Fisher's LSD test: ns=non-significant, **p_{Saline}=0.0038, **p_{QR-010}=0.0076, *p=0.0149.

Discussion

Topical (intranasal) administration QR-010 restores CFTR function in $\Delta F508$ -CFTR mice as assessed by nasal potential difference measurements

- Topical application of QR-010 (2mg/kg, intranasal) restores nasal potential difference to 80% of wild-type levels to $\Delta F508$ -CFTR mice.
- Inter-animal variation is observed which may reflect variable uptake of dose, route of administration, or factors not yet characterized.
- A significant improvement of total chloride transport was seen after 6 but not 3 doses suggesting a threshold response to therapy.

Oro-tracheal administration of QR-010 restores CFTR function in female $\Delta F508$ -CFTR mice as assessed by the saliva secretion assay

- Systemic absorption of QR-010 significantly improves CFTR-mediated saliva secretion volume in female $\Delta F508$ -CFTR mice compared to placebo (saline).
- Two OT doses of QR-010 (10mg/kg) restored CFTR-induced saliva secretion to 80% of WT level in female $\Delta F508$ -CFTR mice which was maintained but did not increase after 4 or 6 doses.
- The effect of QR-010 remained until 13 days after dosing completed.
- There was no effect of QR-010 observed in male $\Delta F508$ -CFTR mice. Different responses between male and females in the SSA is consistent with previous publications.²
- The impact of repeated measurements of SSA is not as well characterized, but may explain differences in magnitude of response over time.

Conclusion

QR-010 corrects CFTR function in $\Delta F508$ -CFTR mice in two independent assays

References

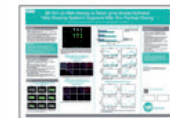
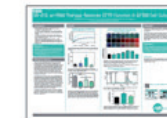
- Grubb, B.R., Vick, R.N. & Boucher, R.C., 1994. Hyperabsorption of Na⁺ and raised Ca²⁺-mediated Cl⁻ secretion in nasal epithelia of CF mice. *The American Journal of Physiology*, 266(5 Pt 1), pp.C1478-83.
- Best, J.A. & Quinton, P.M., 2005. Salivary secretion assay for drug efficacy for cystic fibrosis in mice. *Experimental Physiology*, 90(2), pp.189-93.
- Van Doorninck, J.H. et al., 1995. A mouse model for the cystic fibrosis delta F508 mutation. *The EMBO Journal*, 14(18), pp.A403-11.
- Leal, T. et al., 2006. Successful protocol of anaesthesia for measuring transepithelial nasal potential difference in spontaneously breathing mice. *Laboratory Animals*, 40(1), pp.43-52.

Thank you:

We would like to thank Prof. Hugo de Jonge, the Cystic Fibrosis Foundation and the Netherlands Enterprise Agency (RVO) for InnovatieKrediet IK12062



See our other QR-010 posters



MULTIPLE INTELLIGENCES THEORY

THE EIGHT TYPES OF INTELLIGENCES

LOGICAL/MATHEMATICAL
 Logical/Mathematical intelligence is all about numbers and logic. Those who possess this intelligence can understand the relationships between symbols, processes, and actions. Skills include finding patterns and analyzing and solving complex problems.

Scientists
 Engineers
 Accountants

Bankers
 Detectives
 Directors

Solving a Puzzle
 Playing Chess
 Analyzing How a Machine Works

NATURALISTIC
 Naturalistic intelligence is the appreciation of nature. It is the ability to relate to the world by recognizing patterns and using scientific reasoning to understand the natural environment.

Farmer
 Animal Behaviorist
 Meteorologist

Botanist
 Park Ranger
 Geologist

Studying Plants
 Taking Care of a Garden
 Predicting the Weather

MUSICAL
 Musical intelligence is the awareness of tonal and rhythmic patterns. This intelligence also includes the appreciation of music and knowledge of how emotions are expressed through music.

Singers
 DJs
 Musicians

Composers
 Conductors
 Piano Tuners

Playing a Musical Instrument
 Singing
 Planning Music for a Party

VISUAL/SPATIAL
 Visual/spatial intelligence is the understanding of relationships between physical objects in space. Skills include the creation of visual images, pictorial imagination, knowledge of images and their meanings, and solving spatial problems.

Artists
 Designers
 Photographers

Architects
 Engineers
 Inventors

Interpreting a Painting
 Creating a Logo
 Designing a Building

BODILY / KINESTHETIC
 Bodily/kinesthetic intelligence is all about communicating or thinking in movements. It is the ability to self-express or accomplish a goal through precise movements. Skills include manual dexterity, physical agility and balance, and eye and body coordination. Those who possess this intelligence are able to relate information better by doing an activity.

Dancers
 Athletes
 Soldiers

Chefs
 Surgeons
 Crafts-people

Juggling
 Tossing a Pizza
 Choreographing

INTRAPERSONAL
 Intrapersonal intelligence is the understanding of one's self. It is knowledge of one's own purpose, feelings, limits, and abilities, and even how one relates to others and the world. This intelligence helps one to achieve, learn, and bring personal satisfaction.

Astrone
 Poets
 Actors

Musicians
 Artists
 Counselors

Setting Personal Goals
 Making Decisions
 Solving Personal Problems

VERBAL/LINGUISTIC
 Verbal/linguistic intelligence is the communication of ideas or information through speech or writing. Those who possess this intelligence can interpret information through reading or listening and explain concepts through writing or speaking.

Poets
 Writers
 Translators

Lawyers
 Journalists
 Speakers

Writing a Novel
 Giving Instructions
 Speaking at an Event

INTERPERSONAL
 Interpersonal intelligence is the ability to relate well to people through social interaction. Someone with this intelligence can understand the motives, emotions, perspectives, and moods of other people. It is useful for managing relationships, understanding situations, and negotiating conflict.

Teachers
 Psychologists
 Salespeople

Therapists
 Clergy
 Doctors

Explaining a Difficult Concept
 Empathizing
 Making an Agreement

GENDER DIFFERENCES

A study was conducted in four high schools in North Cyprus. 527 students (284 girls and 243 boys) were asked to rate each type of intelligence on a 5-point Likert scale. The participants could choose one response out of the 5 provided: a lot like me, like me, not sure, a little like me, and not like me at all. Out of the eight types of intelligence, girls scored a higher mean for verbal/linguistic, intrapersonal, interpersonal, bodily/kinesthetic, naturalistic, and musical. The following table represents the mean answers for the six types of intelligence for both boys and girls.



NATURAL OR LEARNED?

According to the theory, people can either be born with or acquire skills in a particular type of intelligence. For example, one individual might be born with a high intellectual potential in musical abilities and be able to naturally sing very well with some practice. On the other hand, another individual would have to take vocal lessons and practice many hours to reach the same level of singing as the former individual. Both individuals can become great singers but have different ways of mastering that skill, whether it is quantitatively (how fast they master the skill) or qualitatively (what process they take to master the skill).

ONE OR MANY?

Though many may think that people belong to one or two types of intelligences, the theory actually explains that each person (unless there is severe damage at birth or acquired brain damage) possesses all the intelligences. An individual may do well in one type of intelligence but not as well in another. Each person has varying levels of strengths and weakness for each type of intelligence.

SAMSO

The Energy Self-Sufficient Fantasy Island



ISLAND PROFILE

Country: Denmark
Area: 41.2 Square Miles
 About the size of Vermont

Population: 4,200
 Coast Longmeyer

Largest City: Nykøbing
 400 residents

Communities: 22 Villages

Agriculture: Cows, Cattle, Sheep, Pigs, Chickens, and other animals

Origin: Samso is located in the center of a windy sea area. The Danes used Samso's nature to gather energy. Nature is Samso's friend. The islanders have used wind energy to power their lives for centuries. Now it is gathering power for those who want to have low-carbon power that is self-sufficient and carbon neutral.

HOW THEY DID IT

WIND POWER
 100% OF THE FACTORY

SOLAR & BIOMASS
 75% OF THE FACTORY

WIND TURBINES

Quantity: 17
Height: 100 meters
Capacity: 1.5 MW
 The turbines are spaced out to maximize the wind catch.

WIND POWER

Quantity: 17
Height: 100 meters
Capacity: 1.5 MW
 The turbines are spaced out to maximize the wind catch.

THE LARGEST CARBON-NEUTRAL SETTLEMENT ON EARTH

100% RENEWABLE ENERGY

SOLAR PANELS

Quantity: 17
Height: 100 meters
Capacity: 1.5 MW
 The solar panels are spaced out to maximize the sun catch.

STRAW BURN PLANTS

Quantity: 1
Height: 100 meters
Capacity: 1.5 MW
 The straw burn plant is spaced out to maximize the straw catch.

COMMUNITY CONTRIBUTORS

Samso is a small island with a population of 4,200. The islanders are proud of their energy production and have made it a goal to be carbon neutral. The islanders have used their energy to power their lives for centuries. Now it is gathering power for those who want to have low-carbon power that is self-sufficient and carbon neutral.

HOME

Home Energy: The islanders have used their energy to power their lives for centuries. Now it is gathering power for those who want to have low-carbon power that is self-sufficient and carbon neutral.

BUSINESS

Business Energy: The islanders have used their energy to power their lives for centuries. Now it is gathering power for those who want to have low-carbon power that is self-sufficient and carbon neutral.

TRANSPORTATION

Transportation Energy: The islanders have used their energy to power their lives for centuries. Now it is gathering power for those who want to have low-carbon power that is self-sufficient and carbon neutral.

WHAT IS SAMSO?

It was the self-sufficient Danish island of Samso that inspired the world to see that it is possible to have a low-carbon power that is self-sufficient and carbon neutral. The islanders have used their energy to power their lives for centuries. Now it is gathering power for those who want to have low-carbon power that is self-sufficient and carbon neutral.

In the mid 1990's Samso was widely dependent on oil and coal. It was used to heat the homes. Samso's energy production was limited by the amount of oil and coal that was available. The islanders wanted to have a low-carbon power that was self-sufficient and carbon neutral.

In 1997 Samso was the first island government to purchase and install a wind turbine. The islanders were proud of their energy production and wanted to have a low-carbon power that was self-sufficient and carbon neutral. The islanders have used their energy to power their lives for centuries. Now it is gathering power for those who want to have low-carbon power that is self-sufficient and carbon neutral.



Distribution and natural history of large invasive waterfowl in Texas

Egyptian Goose and Mute Swan

(*Alpechen aegyptiacus*) (Cygnus olor)

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Relatively little work has been done with alien birds in the state of Texas (C.F., Brooks 2009). In June 2008 a citizen-science study was initiated to study six avian species invading the state of Texas.



A standard questionnaire was developed and circulated among multiple bird watchers to provide unbiased data.



The objectives of this study are to elucidate ecology, behavior and reproduction of Egyptian Goose (*Alpechen aegyptiacus*) and Mute Swan (*Cygnus olor*) in the state of Texas based upon reports generated from the citizen-science project.

METHODS

When designing the questionnaire for distribution, care was taken to create non-competitive questions that would elicit honest answers from competitive bird watchers.

The form (Fig. 1) was circulated among several local Ornithologists with a presence in the local bird watching culture to provide comments to insure questions would elicit honest answers.

Once the questionnaire was finalized, it was offered in hard copy at monthly meetings at several local bird watching clubs, annual bird watching festivals, and circulated on Texas bird watching Internet lists-servs.

The form was posted at this website: <http://www.hmns.org/files/involvebirds.doc> and ultimately was well distributed amongst the Texas bird watching community.

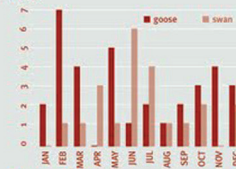


Fig. 1

Data used herein span June 2008 through July 2011, but data are still being collected for possible future analyses. A total of 28 reports from 21 individuals were received for Egyptian Geese, and 16 reports from 9 individuals for Mute Swans. Some reports left parts of the questionnaire blank or provided insufficient answers to be included in analyses.

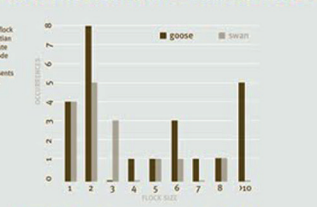
TEMPORAL ASPECTS Year-round residents

Number of reports received per month for Egyptian Goose and Mute Swan (Fig. 3)



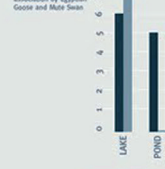
POPULATION AND NESTING ASPECTS

Fig. 4 Frequency of flock sizes for Egyptian Goose and Mute Swan. The mode of 2 in both species represents banded pairs.



HABITAT

Most situations involved a manicured urban component such as a park or golf course.



Acknowledgments

I am indebted to Marcia Hoang (HMNS Graphic Designer) for expertly executing design, layout and fabrication of this poster. Heartfelt thanks to the following individuals for providing reports that permitted this study: E. Bask, John Berner, Peggy Boston, Lauren Brookfield, Claire Brooks, David Bryant, Gary Clarke, Sarah Fretwell, Lindsay Gassett, Greg Goodwin, Shari Hamilton, Barbara House, Kiki Hummel, Greg Kelso, James Kessler and Ann Ansbury, Steve Mayes, Terry Mikulak, Myke Hoover, Jeff Moody, Vincent O'Brien, Anne Parsons, Paul Pruitt, Steven Ramirez, Chuck Sexton, Shannon Tompkins, Robert and Treva Wiggins. Many of these individuals also provided maps, e-pix and video. Also thanks to Fred Collins for recommending large waterfowl be added as species to monitor as part of this study, as well as for providing connections to people who provided reports who I may have otherwise missed.

DISTRIBUTION IN TEXAS

The most reports for both species were generated from the Edwards Plateau region of Central Texas.

- Egyptian Goose distribution in Texas from reports generated
- Mute Swan distribution in Texas from reports generated
- Most reports of Egyptian Geese (New Braunfels)
- Most reports of Mute Swan (Austin)



Egyptian Goose	Mute Swan
Earliest populations reported early to mid 1980's	Earliest populations reported in "1980s"
Active 07:00 (January) - 19:00 (mid May, mid July)	Little data on diel cycle (i.e., 10:00 - 15:30)
One report of geese flying to roost site at night, and depart at dawn.	

BEHAVIOR Foraging was most frequent behaviors reported (Fig. 5)

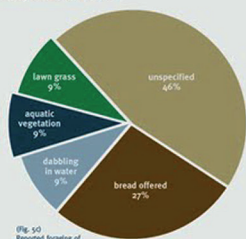
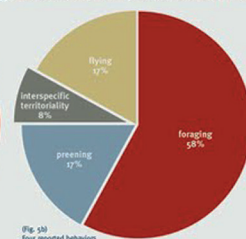
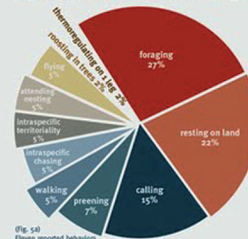


Fig. 5a

Fig. 5b

Fig. 5c

Mean group size = 4.8 (range = 1-35, N = 24; Fig. 4)

Nesting mid March - early May

A flock of 7 contained 2 sub-adults (29% of flock) in mid July

Another flock of 16 contained 4 sub-adults (25% of flock) in August

Reproduction (sets, young birds with juv. feathering) was reported in the following counties: Comal (common), Galveston (abundant), Kendall, Montgomery (exploded population), Wilson

One report detailed nesting in tree cavity as follows:

Emerg only in morning from nest hole and fly to lake to walk around, immerse neck and head back under, and then walk off. Unable to see nest hole or domestic waterfowl.

They had difficulty entering the nest hole especially the male, when entering there to the hole to get their bodies and feet submerged in the nest hole water. They would fly to the nest hole to get their feet submerged.

Nest in a large tree trunk with a natural hollow at the junction of two main branches - 100 ft off ground (Fig. 4).

Both parents appeared to spend time in the nest - individually as well as together.

Swimming young from the nest were being fed by both birds.

Another nest (adult nesting nest) was described where parents were observed standing a cluster of eggs while being followed by a brood of 6, probably hatched in the tree.

Only one of the six goslings was still alive but a year later (Feb. 2011). Multiple failed attempts were observed over a period permitting the incident, especially due to being in water.

Mean group size = 3.8 (range = 1-8, N = 15; Fig. 4)

Sub-adults observed mid June - mid July

Several reproduction events (nests, young birds with juv. feathering) were reported in Travis Co., where annual nests were observed since '80s, but others reported breeding since the 1990s

One report detailed nesting as follows:

Nest - 15 ft in diameter, an olive and 1 in high water (Fig. 4)

Made of long, dead grasses and built on top of short lawn grass.

Surrounding vegetation includes long grass, a halberd cypress and some mesquite vegetation.



Fig. 4a

72% of observations on land, 28% in water

These often overhanging water - pecan, live oak, bald cypress, sycamore, pine, most on some trees

Substrate components - grass, weedy fields, aquatic algae, large rocks and gravel

80% of observations in water, 20% of observations on land

Call, taat, dead snags in lakes, cypress, tall grasses

ARE THESE SPECIES A THREAT TO OUR ECOSYSTEM?

Are these species outcompeting native species?

Probably not - most reports indicate both of these species share ponds/lakes with a variety of ducks (both wild and domestic), suggesting they are tolerant of smaller waterfowl.

Very few of the reports indicate other species of geese or swans share the same ponds/lakes with these species, and only one had Egyptian Geese and Mute Swans present on the same lake.

This may actually be beneficial, as the territorial nature of Egyptian Geese and Mute Swans (Oksanen et al. 2009) is likely that large colonies will never permanently occupy a given region, diminishing the chance for high levels of toxic bacteria.

Are these species a threat to the water we use?

While elevated levels of potentially harmful bacteria (Feare et al. 1999) could be attributed from the droppings of large populations of Egyptian Geese and Mute Swans, this has not been measured yet.

Again, considering the territorial nature of Egyptian Geese and Mute Swans (Oksanen et al. 2009) it is likely that large colonies will never permanently occupy a given region, diminishing the chance for high levels of toxic bacteria.

Again, considering the territorial nature of Egyptian Geese and Mute Swans (Oksanen et al. 2009) it is likely that large colonies will never permanently occupy a given region, diminishing the chance for high levels of toxic bacteria.

Literature Cited

- Ankney, C.D. 1996. An embarrassment of riches: too many geese. *Journal of Wildlife Management* 60: 127-129.
- Brooks, D.M. 2009. Behavioral ecology of a blue-crowned cormorant (*Phalacrocorax auritus*) in a subtropical urban landscape far from its natural range. *Bulletin of the Texas Ornithological Society* 42: 78-82.
- Osman, L., S. Fretwell and D. Janssen. 1979. Interspecific aggression and the limiting similarity of close competitors: the problem of size gaps in some community arrays. *American Naturalist* 114:117-129.
- Feare, C.J., M.J. Sanders, R. Blasco and D.D. Bishop. 1999. Canada goose (*Branta canadensis*) droppings as a potential source of pathogenic bacteria. *Perspectives in Public Health*. 119: 146-155.





Influence of Sample Spatial Positioning and Composition on the Measurement of Instrumental Texture Attributes of MEXICAN CHIHUAHUA CHEDDAR-LIKE CHEESE

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Tecnologías de Alimentos

1 Abstract

Many instrumental methodologies have been suggested for textural determinations in Cheddar and Cheddar-like cheese. Texture Profile Analysis (TPA) has been conducted under different conditions yielding results of great variability. There is still uncertainty regarding what sources of variation play an important role in producing the observed data dispersion in these determinations.

The aim of this study was to determine the influence that relative position of the samples inside a cheese block has over the four main texture parameters measured in TPA of Cheddar cheese.

TPA results showed that hardness and springiness vary depending on the position of the slice within the cheese block. Higher hardness and springiness values were obtained in slices just inside from the end of the block. Crust samples showed lower springiness values than center samples, but showed no difference in hardness (giving). Chewiness and Cohesiveness showed to be affected by an interaction between slice position within the block and sample position within the slice (cut). Water and acidity contents varied with slice position that may be related with observed changes in texture.

The findings of this study indicate that it is of utmost importance to employ appropriate sampling strategies when conducting TPA on short ripened Cheddar cheese.

2 Introduction

Texture is an extremely important characteristic in cheese. It is well known that texture is a determinant quality attribute that gives identity to each type of cheese.

Since the classification of texture characteristics proposed by Szczepaniak et al. (1), many instrumental methodologies have been suggested for textural determinations in cheddar and cheddar-like cheese, where texture profile analysis (TPA) is the most commonly used.

TPA in Cheddar-like cheese has been conducted under different conditions. Compression rate, deformation amount, age and time between compressions vary considerably among different studies. Differences in measurements usually are attributed to changes in composition, ripening time, and other cheese properties. However, there is still uncertainty regarding what sources of variation play an important role in producing the observed data dispersion in these determinations since variation among samples from a single point of cheese are usually observed.

3 Objective

The aim of this study was to determine the influence that the relative position of the samples inside a cheese block has over the four main texture parameters measured in the TPA of a Cheddar-like cheese (hardness, springiness, chewiness and cohesiveness).

4 Materials and Methods

Twenty days old one kilo Chihuahua cheese blocks produced in the central highlands of Chihuahua State in Mexico, were sliced into 2 cm slices. Figure 1 each slice was cut into 2 cm cubes obtaining samples from the crust and from the central part of each slice. Control samples were discarded.

TPA was measured with a TA.XT Plus texture analyzer (Cubic Micro Systems, UK) at 25% of deformation, 10 mm/s of compression speed, and a relaxation time of 3 seconds between slices as it was proposed by Poury et al. (2007). TPA conditions were chosen due to the reproducibility of preliminary measurements in Chihuahua cheese (Figure 2).

Measurements were applied to each sample to determine the effect of the position of the sample within the slice on texture parameters, and the effect of the slice as well.

A total of four repetitions of the experiment were assessed. Analysis of variance was conducted using Minitab version 9 (Minitab Inc., Coventry, UK) Tukey's multiple means comparison was conducted at a 95% confidence level.

Figure 1

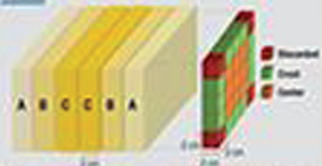


Figure 1. Cheese block sampling. A: Crust, B: End, C: Center. Each slice was cut into 2 cm cubes obtaining samples from the crust and from the central part of each slice. Control samples were discarded.

Figure 2

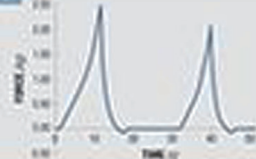


Figure 2. Texture profile analysis (TPA) conditions used for the experiment.

Table 1

Parameter (g)	Hardness	Springiness	Chewiness	Cohesiveness
SD	0.54	0.04	0.01	0.01

Table 1. Error standard deviation (SD) for each parameter. Error is the standard deviation of the mean of the four repetitions of the experiment.

5 Results

Figure 3

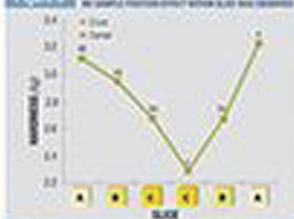


Figure 3. Hardness measured with TPA in Chihuahua cheese. Error is the standard deviation of the mean of the four repetitions of the experiment.

Figure 4

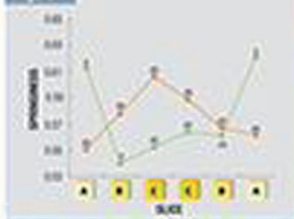


Figure 4. Springiness measured with TPA in Chihuahua cheese. Error is the standard deviation of the mean of the four repetitions of the experiment.

Figure 5



Figure 5. Chewiness measured with TPA in Chihuahua cheese. Error is the standard deviation of the mean of the four repetitions of the experiment.

Table 2

Sample	Moisture (g/100g)	NaCl (mg/100g)	Acidity (%)	
			Crust	Center
SLICE A	Crust	43.8 ± 0.3	889 ± 10	90.8 ± 1.5
	Center	42.7 ± 0.4	536 ± 17	85.1 ± 0.7
SLICE B	Crust	43.7 ± 0.1	823 ± 24	88.8 ± 0.7
	Center	42.5 ± 1.1	565 ± 21	83.2 ± 0.8
SLICE C	Crust	43.6 ± 0.3	846 ± 10	89.1 ± 0.8
	Center	41.8 ± 0.8	551 ± 24	83.3 ± 0.8

Table 2. Moisture content and acidity in Chihuahua cheese.

6 Conclusions

The findings of this study indicate that it is of utmost importance to employ appropriate sampling strategies when conducting TPA of short ripened Cheddar cheese. Slice location variation on water and acidity observed in this study is large enough as to be able to conceal differences that may exist between slices, hence spatial distribution of samples must be studied prior to conducting any studies where differences between cheese blocks are to be determined.

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The authors thank David Santolucito and Lorena Quintana for their technical assistance. This work was supported by the Mexican National Council of Science and Technology (CONACYT) and Chihuahua State Government through FOMEX project number CDM-2016-01-0002.

References

1) Szczepaniak, A. S. (1991). Food for thought. *Food Technol.*
2) Coussanel, S., & M. M. M. (2007). Cheese Texture and Sensory. *IC Food Res. Technol.*
3) Poury, J., Carmona, R., Rodriguez, J., Lopez, J., Ponce, L. A. & Fernandez, M. H. (2007). Food Res. Technol. 40(2) 450-455.

Děkuji za pozornost.



Použitá literatura:

G. Ambrose, P. Harris: **Layout, velký průvodce grafickou úpravou** (Computer Press, 2009)

Z. Dvořáčková: **DTP a předtisková příprava** (Computer Press, 2008)

B. Blažej: **Grafická úprava tiskovin** (Státní nakladatelství Praha, 1990)

Timothy Samara: **Grafický design** (Slovart, 2008)