

# 2004 Departmental Staff

\* - Emeritus professors

79BYk g

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9X]rcf. :4b'A Uqpb

8Yg] b.'A YcXm7U'UAb

[ 7cj Yf]g g [c [c [[c [c ]



GWc Ufg\Uj YU'cbj \lgfmcZhfj Y'"CbYcZa nZj ci f]hYgcf]Yg  
lg'hUicZY[ YbXUfm fYbWkca Ub'5Yi UbXU8Uj ]XBY'zk\c'g'h  
cZZcf-bXjUUbXVYmbX]b%%UhhYUj YcZ('zhY'bj \Yf'i gUbx  
hUhg\Ykci 'XVYUWk ]h]b%'a cbhg'8]g i ]gb| \YfgYZUgU  
Vj [Uf'kca Ub'h]g]bhYd]Xhfj Y'Yfg WggZ `m'bhYXhYhYb'  
WgYXWi bfmZhfMzkU\_]b| ]bWbXg]bYnZca Q\_]a "GY  
Zj]YXcbh]gUha dhc fYUW\Yf] cU! h'YWd]Uz@UgU' bXj  
hYfYXg\YWcgYf'cU]YhY'cb| kUhfci bXZhfj Y'bj| h'fci [ \'  
XUUbZ?cfYUUbX7]bZUbXZbU'mZmf'a UbmUfga UX]hcbW  
a cfY]brc H]VhUbXi ]ha UYnrc @UgU'9b'fci h'g\YdfZMXX  
\Yf]H]VUz]g]hYbYXgi X]YXkfc]YUbx] ]g]hXa Ubn]UWgZ  
UW'a dU]XVnUmi b] H]VhUb'a cb\_k\ca 'g'Y'Uhf'UcdhX"  
5Yi UbXU8Uj ]XBY'Y'Yb] U'mfYi fbYXrc DU]g]ZmfU%'mUf  
Ug]bWUbxdfcX WXUbi a VfcZgYa ]bU'Vcc\_gcbhYH]VhUb'  
Wg]ca gUbXdfUW]Wg\Y\UXcVg]f YXZUgk Y'UgUbUW'i bhcZ  
\Yf]Uj Yg'"

ebYf]f]ha YgzhY[ fYUha X]Yj U'gWc U'5WUfXk Ugfydcf]hX  
hc\Uj YHU [ \h" ]bUbXUfci bXDU]gZUhfUW]b| "Uf]Ybi a VfgcZ  
g] X]b]gk \Yf]Y'Yk Yb]h'z\ ]g]h]ga cghZa ci gdi d] 'e\bcZ  
G]g]m' fmg]XVbW]b]b| UbchYf]H]UWf "S'cbYcZ]hYa k Yb]hrc'

6c'c[ bUUbXi b'YubYXk \Uh\Y\UXHj [ \h'g' hUicb \lgfYi fb\YUgc i b]U [ \h]h'"6c'c[ bU]g  
h'Yg]h'cZ]h'YUf ]Yg]cZ9 fcdYbi b]j Yfg]h'gUbXg]i X]b]g]f]Uj Y'YX'cb| X]g]LbW]g]rc VYh'YfZ  
UbX'Umf'rc UhhbXch YfgUgcZ Yub]b| ZU]U]ha Yk \Ybi b]j Yfg]h'g]b]9 fcdYk Yf]b]h'Yf]b|  
ZbW]h'5W]f]X]b| ]rc'cbYk f]h'f' "h'Yk UbX]f]b| ]gWc'Ufza ] ]fU]b| Zica 'cbYi b]j Yfg]h'rc UbchYfZ  
kUgUW'a a cb]g] [ \hcb]h'YfcU'g'cZ9 fcdY' Uih]g]ha Y'5g]bYk i b]j Yfg]h'g]k Yf]Zci bX]Xk ]h'  
Wbg]h] h'cbgV]g]Xcb]h'cgYcZ6c'c[ bU]h]Yg]i X]b]h]i b]j Yfg]h'nicf DU]g]h]h'Yi b]j Yfg]h'nicZa U]g  
h]f]g]h]h'Yn] ]f]X]h]UW]f]gZca h'Yg]zcf'ch Yf]Yg]U]g]YXi b]j Yfg]h'g'

H'Yg]h'U]h]cbgV]b]h]bi YhcX]h'5W]X]a ]WcVgUfYUj Yf]h'g]X]b]h]b]U]h]cbU'n]U]g]Uei ]W]fckgY  
h'fci [ \h'YdU] YgcZ]h'Y]h]a Yg< ] \Yf]9X] W]h]cbG dd'Ya Yb]zcf]h'Y; i U]X]UbK Y]\_m]Wi f]g]g'

5Zhf' +mUfg5Yi G h Yf UbXZ8YUbcZ9b[]  
bYf]b[] UbX: cfYgfmñfYfYfgUbX'a cj Ygcb'rc'  
bYk Uj Yohi fYg"<Yk f]hYg

÷hY'UH%\*SgñY8YdUfa Ybhk Ug]bU  
[ fckh d\UgYUbXgY\_]b[] bYk gUZZ=-Udd]YX  
Zca UdcgXcWcfUdcg]hcbUhGhBZcFX  
I b]j Yfg]mñcj YfUa cbh. "UHZZ:fUdcg]hcb'  
Uj YfhgX]b]h Yfh YbEBN9a U U]bY'HY  
I b]j Yfg]mñfUb\_<YbXfYcbUWU UnifYd]YXVm  
hYf]flá Uddc]b]b[] 'a Yk]h.ci hZ flhYfUc"  
=UWd]hXUbXk UgYVñXUh]h Yh.ci [ \hcZ  
kcf\_]b[] k]h: fUb\_k\c\UX'gidi V]g\X\lg  
Vcc\_ "CdYb^UbbY: :ck""

÷k UgcbnUmUf'UHf'hUi: fUb\_ Ubbci bWZ  
k\]Ygñ]b[] i gg\Yfm]b\lgcZVñhUhY  
k Ug'Yj]b[] 7UbñfVi fin<lgXc]Ufi fYk UgWb!  
hfcj Yfg]UUbXfYk Wá a Ybh]b]h.YbU]cbU'  
dfYggUbXk Ug]h.Yg VYñcZUWñrcbcbhY  
YX]rcf]U'dU YcZñ.YBN<YfUX'ñUgc Wñ gYX  
a Yrc'h]b\_ Uci h'Yj]b[] "<ck Yj Yf=]b\Y]ñX  
hkcj Yfm] ccXD.8 gi XbñgZca : fUb\_ zcbY  
k Ug8U] ]XDU]bñf'k\c\Ug]bVYVYbUbX  
Wb]bi Yg]rc VYUj Ui YXW'YU i YUbX=Ugc'  
gUk Ub'cddcfi b]m]rc fUd]Xm]g]U'g\ a ngYZ  
]b]hY'nXU ]Wb] ]bYf]b[] fYfUvch ]b]hY  
i b]j Yfg]m]UbXk ]h]b]h YdfcZgg]cb' a mñ  
XW]g]cb'rc "Yj Yk Ug]h.i gXYUnXZ]bXYX  
XYUnXZf'h]f]m]g] m]Ug'Bck ]h UgVYVb'  
a UX'UbX="Yj Ycb' %g]i Ubi UññSS) rc HUj  
cb]h Yfc YcZ7ca a ]gg]cbYf ]b]h Y9bj ]fcb!  
a Ybh7ci fñ

HfYya Ya cf]YgcZa mUfmñUfg]b]hY  
Xc]Ufa YbhYfYUñf]bccb]hUzVUWwCUX  
WUbyfgUbXUZccX'

GUWUñf]bccb k\Ybfi bb]b[] U: i ]XgAYWUbl  
]W]@VcfUrcfñW]gg=k Ug]Ug YZcdfV]g]m]h  
'%da zVñhY<YUX: i ]Xg]fWb]W]bz"Kci X  
mi ]\_Ym] fñU]bck z]g]f3"Dca dhñh" " Sca  
h]U]bXV]g]W]g]kci XYXY]j YfYXcbU  
g]j YfYXh]f]h]rc h.YcZVñhU]c]j Yfcc\_YXhY  
'UcfUrcfñk ]h h.Yei Yg]hcbz"K]" hU]hYU'z  
g]f3"H]b[] gk YfYXcbYdfcdYfñ]b]h.cgy]h]a Yg'

HYi b]j Yfg]m]i gX]rc Ya d'cn]bUfa n]cZ  
k\]h]WU]hXVUWwCUXWUbyfg' a cg]m  
a UYUg=fW" k\cgYg: Y'cVUddYfYX]rc'  
V]rc kU]hci ]g]XY'Wñ fYfcca gUbXfi g' ]b'  
rc WU]b]h.YVUWwCUXg]U]h.YWb]W]g]cb'cZ  
YUW'Wñ fY'H]gk Ug]bchWb]g]XfYXd]U]rcZUb'  
UW]Xá ]W]g'cV'K\U]h]YUfa n]X]Xci ]g]YXcZ  
h]fa ]h]a Y=Xc bch\_bck"

A]bcfZccXg]fYbchi bWá a cb]bU: i ]Xg'  
@VcfUrcfñ<ck Yj YfcbYX]hñ=]W] g]XUa Ucf  
cbYVñcdYb]b[] Ug] ]bW' ]b]hU]k Ug]g]""  
WbbYñX]X]fYWñrc h YWb]g]Ub]h\YUX]Ub\_"

Hc h Yf W]X]h]zUbXa m]ñ VuffUg]  
a Ybh]h Yh]Wb]W]U]g]W]a ñh]i fbYX  
h Ydi a d'cZ]fYWbbYñX]h.Y ]bY  
UbXWU]bYXi d"BchUkcfXk Ug]g]X  
Vi h=UX'Yf]b]h]U]i UY'Ygg]cb'  
Uci h]bch]i g' ]b[] ]b"

HY%+SgUbX, SgUbXYUfñ Sg  
k YfYj Yfm] ccXm]Ufg]rc VY]b]hY  
i b]j Yfg]m]U' ]ccX]Zm]i Yb'cñX  
h]UW]b[] UbXUj]b[] h.YZñYXca ]rc'  
di fg] Ym]i fYg]U]W] ]b]h]fYg]g'H Y  
i b]j Yfg]m]k Ug]YdUbX]b[] zU]fYg]U]fW  
W]h]fYá g ]X

## Transportation research grant

8f"5bXY8UbHg\UgfYWj\YXUa Ucf  
fyYUFW[fUbhZca bhhf]fUd\7cfdcfUjcb'  
fBNLYbUV]b[ UWWggrc bhhf]fUd\gFY[lg  
hfYXFYgUFW@VcfUcfmfdfc]fUa a Yzk\jW  
]bWXYg; YcglUjU'gZkUfYhc Uwa a YfWU'  
jUi YcZBN%SSSS"HYgZkUfYzk\jW  
]bWXYg"; Yca YXJU UbX"HfUgkcfUjcb'  
AUbU Yf" k]" ]b]U'mYi gXcbUdfc'YW  
Yb]hYX"HY7cbWdhcb'cZ\YBYk NUUbX  
HfUgkcfUjcb8UUKUfYci gY"H]gdfc'YW  
Ua ghc ]bj Ygh[ UYUbXwbWdh UlgYU"XU  
kUfYci gY k\jWwi XYj Ybi U'mZfa hY  
V]gjcZUBUjcbk ]XYHfUgkcfUjcb bZfa U  
hcbGgha "HYgZkUfYlgUg' Y]b[ i gYX  
ZcfhUW]b[ UWj ]hYg]b]hY8YdUfa YbhcZ  
7j] ]9b[ ]bYf]b[ "" ; Yca YXJU]gdfcj ]b[ hc VYU  
Zbh]g]Vmc' ZcfhUW]b[ hYwfywbWdlgcZ  
; -E' g]hg8f'8UbHg'

5hUa "YXVn9]W8UnjY" \UjgWfYXUb'  
Ubdcd ]a UYm % 'a ]" ]cbfyYUFWWbhfUW  
k ]h hY; ci bXUjcb ZcfFYgUFWG]WbWUbX'  
HWWbc'c[ mfiFGH'

HY\* nYUdfc'YmK ]" ZWgcbhYUW] ]micZ  
cf[ Ub]g]hcbg]c fYgcbXYZZWj YmZc`ck!  
]b[ Ua Ucf\UfXYj YbhUbXk ]" ZUhi fYWgY  
gh X]YgcZUbi a Vf'cZBNcf[ Ub]g]hcbg"HY  
dfc'YmK]Ua ]bWXYg5bXY8UbHgZg'b'  
@'AUg f]YfUbX5UbB]Wc'gcbZca 7j] ]  
9b[ ]bYf]b[ UbX'e\bJU]c Zca hY8YdUf  
a YbhcZ5Wwi bhUbWz ]bUbWUbX-bZfa U  
hcbGgha gUihYI b] Yfg]micZ7UbhM fin'  
9hfbU'w' UcfUcf]bWXYfyYUFWfgZca '  
hYI b] Yfg]micZ5i WUbXUbXZca hY?YghY'  
; fci d'fUdfj UYwa dUbnig]WU]g]b[ ]b]g'  
UbXYa Yf ]bWwa UbU Ya YbH'

"HYdfc'YmK ]" \YdBYk NUUbXcf[ Ub]gU  
hcbgfYWj Yf Ywba ]Wwa dYh]j YbYggUmf'  
\UfXYj Ybhz' g]hg9]W" "HYfYgUbYX  
ZcfFYgUFWZ'WgXcbcf[ Ub]g]hcbgZg]h  
]gcf[ Ub]g]hcbg]hUia UbU Yza Ub]U]bUbX  
cdYUfYci f]bzUg]fi WfYZWUfYci fYwba m  
UbXwbh]M hYhc'ci f'g'V]m"HYUW] ]micZ  
ca a dUbnig]WU]g]b[ ]b]g' ]UUbXVwa nich]

## Chess Olympian

♣CwEwFz&SS(zFc[ yfBc\_YgUhbXXhY  
'\*h^YggC`ma d]UX\YX]b^Uj ]LzAUcfWz  
GdUbK\YfY\YkUgUa Ya VfcZhY%&  
gfcb[ BNWYgghLa "HYyYbhUhfUWX  
%ShLa g]b^hYcdYbgWcbUbXa cfYhUb  
, ShLa gZUi fX]b^hYgdUfUyk ca Yb-g  
gWcb"

"HY\[\]\hZfa YkUga nZfgj ]Mfm  
U]UbgU; fUbXa Uhf! FcX]]cJUgi Yh  
Zca ^]Z'gUgFc]Y""=Ug\UXUbYVh





# Farewells

## Rob Davis

9a Yfli gDcZggcfFcV8Uj lglf Yca YWUblWfMa Yrc BYk NUUbXZca  
 h.YI G5]b%+&lgUgYbJcf YWfYz]bhbXbl lrc gUhzcf nUfg'Bck UZMf  
 ' &nUfgUhh.YI bJ YfglmcZ7UhhfM fin.Y'cc.gVUWk]h'gca YZ:bX  
 a Ya cflg' "hik Uj YmUgnrc gthY\ YfZ' gUgFcV' "g YmabYk Uj Ym  
 ZYbXnUbx' YdZ. Zh.Y]ZgmYk Uj UbXg] "lgj YmndYgUbi'5h'h Yha Y  
 =UWdhXh.Y'cV=XfXbch\_bck Uglb] Y?'k]"Bck =a 'a UffYXrc'cbY"  
 <Ybck fY]UXg\ja gYZgU?'k]lrc"

FcVfYw'gZ'K\Yb=ZfghMa Yzh.YI bJ Yfglmk Uj]bU] c'XybUj Y'hk Uj  
 UkcbXfZ 'dUWrc'kcf\_ "g Yfih]b] fUbc] ]hYa cFYhUbUHyYd'cbY  
 W'"hgUj YmXZfYbhdUWbckzk ]h'a UbU] YfUgga dYfj U]b] '  
 Y' Yfih]b] "B'Y Yfh.YYggh.YI bJ Yfglmh]' \Ugca Yj Ymndcglj] Ydc]b]gZ  
 h.Ygi XnUj Ygn]ha Zf\_g]bY: Y'ckg.]dgUbx] ccXgi Xiblg'"<YUXgZ  
 "HUW]b] ]gi Xiblg\UgVYb'a n]glb] Y] fUhg]yb'cra Ybi'"FcVgUg  
 h.Uh.Y]g]drci XcZV]b] U] ccXhUWf'Ubx]a dUff]b] \lg\_bck YX'Y  
 lrc'gi Xiblg'"=Uj Y'c] YXhUW]b] Ubx]h.YwobUWk]h'gi XiblgUbx  
 [ fUkcf'a Uh'g\Uga UX'a m'cVkc'f'h'k\]Y'"CbYdUff]WUfUffUWcb'  
 \UgVYb'h.U]b]BYk NUUbXzh.Ygi Xibhcdci 'UjcbWj YfgUk'c'Y  
 gYwMi a 'cZU] ]h]gZca 'a YXcWYrc Y WdhcbU! h'YfY]gbc ClZfX  
 cf'7La V]X] Yrc W]La 'cZ]h.Ya cgh]b]h]' ] Ybhgi Xiblg'"<YfYk Y] Yh  
 gi XiblgcZU' U] ]h]gZ]bW]X]b] Y'hYa Ym]b]h]' ] Ybcb]g]! h.Ugk\Uh  
 a Ujg]hUW]b] \YfYg' ]bh]ng]b] "

6cfb UbXfUg]X]b] 7\U]hUcc] UZ]h]b]YgZfFcVWa d'YhX\lg  
 i bXf] fUX' Uhygi XnUhh.YI bJ YfglmcZBY] U]U]bX' ]gD.8 Uhh.Y  
 I bJ YfglmcZBYk 'A Y ]Wz5 Vi ei Yfei Yzk \Yf\YV] U] \lgUW]Xa ]W

WfYfUgU'Wf'fY'c] Yf  
 h.YmUfg\YX] YcdYXUb'  
 ]bhfbU]cbU'dfcZ]YUbx  
 ]g] Ym] ] \ nY] UfXX  
 ]b\lgZ'X'K\Yb\Y  
 kUgUk UfXXh.Y]hY  
 cZ9a Yfli gDcZggcfz  
 ]bUddfYU]hcb'cZ\lg  
 g]f] ]Wg]rc h.YI bJ Yfglm  
 cZ7UhhfM fnc] Y' &  
 nUfgZ'U]bW'cf8f  
 FcV]b]A Ubb]g]X\Y  
 kUgUfYbck bYX]g]UWf'UbxUbx'Y'a dUfihUWf]b] Yca YWUblWgZ  
 g]'a YWUblWUbxUfhei U]Y]b] ]bY]f]b] "<Y]gh.YU h'cfcZ]k'c'  
 Vcc\_g] Elasticity and Geomechanics UbxPlasticity and Geomechanics'"5g  
 U]W]g' ]h]b]h'Y'UgVYb]b]c] YX]b]Ubi a VfcZ] ] \ d'fcZ]Ydfc'W]g  
 ]bW]X]b] UfY] ]k'cZ]ei YZU]cb]f]g' Z'f'h'YK U]h]Ua Yh'Ubc'd'U]b]h'  
 fcU]b] Ubx'gcdYg]U] ]h]b] Yg] ] U]cbgcb'h.YfYa Uf.UV'gC.]Z]X'  
 ]ei YZU]cb]f]g' U]Ung]gZ'f'h'Yg]U] ]k' @ Vi 'g]c]U]YZU] ]h]Ubx  
 X]g] ]b]b] Yf]h'ei U]Yz'ca i U]cbgcb'h.Y'7]f]g]W] fW]h'Y'W]a Vi ]X]b] "

FcVcZ]W]m]f]h]YXcb' S'a bYz8S( 'Vi h]Z]X'cYg'h'cc\_ ]h]ggck ]b] '  
 XckbZ'f]a "'K'Y\U]Z'ci fUW]g]b]ClZ'f]Xrc'dch]f'Uci bXcbUbx  
 \Uj YfYw]hina ccfXUcU]b]BYgcb! a nk ]Z]Ubx'cdYrc W]Wa Y  
 a cFYWa dYh]b]h]g]U] ]b] !g'k'Y\U]Yd'Yb]h]c' Yd]i g'M] g]n] Bch]U]m  
 lrc ] j] Y] d'h]UW]b] 'i g]m]z' Y] ]bh]Yg]rc a U]b]U]b] Udf]g]b]W]b]h'Y  
 X]d]U]a Yb]h]g]f]ei ]Y]Z'k ]h' k'c'dcg] ]fUX' Uhygi Xiblg]g] ] [ c]b] Z]Ubx  
 \Ug'd]UgZ'f]Uch.Y'Vcc\_ "

## Kevin McManus

5Znf%&nUfgk ]h' h.Y8YdU]a Ybz'=  
 \j YXW]X]Xrc "fYfY' Uhh.YYbXcZ  
 : Ym] Uf]8S) lrc W]Wa Yub]b]X]b]X  
 Ybh] Ych]W]b]W]d'U]h]cb]Y' H'k'Yj Y  
 nUfg]g]d]f' U]gUfYU]j Ym]f]Yz  
 g'c'i f]bZ]i h]h]g]Ya g'Ucb] ]h'a Yrc'a Y'  
 H'YfU]h'cZ]W]b] Y]b]h.Y8YdU]a Ybh  
 \UgUW]YfU]h'X'fYw]h]r]k ]h'a cYf'cf  
 YggUk'c'Yb]k ] Yb]fU]cb'cZ]W]X]a !  
 ]W]Y]b] fYw] ]h]Xrc fYd'U]h'cg]Yk'c'  
 \Uj YfYf]YX'cfa c] YXcb' ]hg]Ya g' ] Y  
 U]ccX]h'a Yrc g]h]d'U]U]b]X] ]j Yh'Yg'  
 b]k' d'Ycd'Yk ]h'a Ubn]Z]g' ]X]U]gh'Y  
 Z]YX'ca lrc fYm] ]X]h.Y8YdU]a Ybh  
 Ub]k'"=k]g' h.Ya k'Y'"

5\ ] \ ] \ h'cZa n]mUg]b]h'Y8YdU]h  
 a Ybhk Ugh.YdY]cXg]Ybh]g'c8Z]Zca % , ' % - "H.]gk U]U]h'a YcZ  
 fUd]X]W]b] Yz'k ]h' h.YI bJ Yfglm]g Ym]j YX]a U]X]b] Ua cY'a Ub] Yf]U  
 g]m]cZ] b]j Yfglm]U]X8YdU]a Yb]h' Y'X]Yf]g.]d' "An]d]c'W]Wa Ub] ]a Ybh  
 V]W] ]fci bX]d]f' U]g]d]f]c] YX'YdZ ]b] ]b] ]h]U]b] ]h]g]f]U]g] ]cb]k ]h] ]b]h'Y  
 8YdU]a Ybh'An]Y]g]h'a Ya c]nrcZ]h]g]h'a Yk U]g]ci f]Z]g]Y] YZ]U]Xcb]r]a  
 8YdU]a Yb]h'f]g]X]b]U]f]f]YU]h'YX]U]h' ]j Yf]cb]@X' Y]b]5\_U]c]U]b]5df]'  
 % , "H'Ya U]b]g]U]h'X'cV]W]j YZ'f]h]g]f]f]YU]k U]g]c'Z'ca i U]YU]g]f]U]M ]W  
 d'U]bZ'f]h'Y8YdU]a Ybh' a na U]b'a c]h]j U]cb]h'ci [ \ k U]g]c' MYU' Xckb  
 V]ff]Y]g]U]X] ]h]Y] Ym]b]YU ]b] ] lrc YU]Wch'Yf]b]U]f]YU'YX]Y] ]f]c]b'a Ybh'  
 =h] ]b\_ h.Yf]f]YU]k U]g]U]f]U]g] W]g] ]b]V]h'f]g]W]g]H'Yg]f]U]M ]W]U]b'  
 k'Y] Ybh' U]m]Z'ca i U]h'X]g]g] ]b]i g]Yrc X]r]k ]h'a cX]Z]W]h]cb]g]Z]U]b]X]h'Y  
 U]h]b]X]b]W]U]b]X]d]j c]U] ]b]d]i ]g'cZ]h'Yg]Y]f]U] ]b] ]h'X]b]X] g]f]m]d]U]h]W]U]b]g'  
 YX]rc h'Yz'ca U]cb]cZ]h'Y'X]g]f]m]d]U]g]b]7ca a ]h]h'Yz'cf]m] b]b'Y'cZ]h'Y  
 d]f]g]b]h]j ] ]g] ]b]Y]f]b] ] 5X ]g]c]m]6c]U]X'

5bch.Yf' ] \ ] \ h'U]g]V]Yb]d]U]h]W]U]cb]c] Yf]h'Ym]U]g]b]h'Y9b] ]b]Y]f]b] '  
 ; Yc'c]n]Z]Y]X]f]d]h'fci [ \ 7]b]h'U]CH] c'U]b]X]a U]b]d]ci f]'H]g]h]f]d'\Ug  
 U]g'c'V]Yb]U] ]f]U]h' ] \ ] \ h'z'ca U]b]n]g]i X]b]g]Z]f]g' ]b] ]b]9b] ]b]Y]f]b] '  
 ; Yc'c]nrcZ]h'V]b]b] ]h'Ya c]g]h]d]d]i 'U]Z]b]U' n]U]f]W]i f]g]' H'Y]g]i X]b]g]  
 [ Y]hrc'g]Y]U]a U]h]b] ]g] ]n]g]g' W]U]g]h'Yi b]X]f] ]fci b]X]f]U]b]U] Y]U]f]Y]g]U]h  
 6]Yk Ym]f]Y] ]b]h'Yz'ca Yf]7]ca k'Y'; c]f] Y]U]b]X] ]h'rc'g] ]W]h'Yf]Z]b] Y]g]  
 ]b]rc'h'Yg'cZ]W]U]h]ci [ Ycb]h'Yz] ]i f]Yd'U]b]YcZ]h'Y7'n]X'U]b]X]g] ]X]Z]X]Y]d'  
 i b]X]f] ]fci b]X' h'U]g]V]Yb]Z]b'U]b]U]d]f] ]Y] Yrc ]b]h'f]U]W]k ]h' h'Y]g]i X]b]g]  
 cb]h' ]g'c'X]g]g]n] ]b]rc'h'Yk'cf'XcZ]W] ] Yb] ]b]Y]f]b] ] =cdYh'U]h'Y]Z]Y]X]f]d'  
 W]b]h]b]i Y]g]U]X]a U]b]h'U]b'g]U]Y'ck'YX]rc'8U] ]X]6Y' U]b]X]f] ]d]h]b] U]Z]ca  
 ; Yc'c]n]k'c'U]Y]h'Ya U]b]X]f] ]b] ] Z'f]W]Y' ]b]X]h'Yf]d]Z]U]X]rc'U'k'c'  
 d]Y]a ]h]U]W]g]g]rc'h'Yd]f]c'Y]W]g]h]g]U]b]X'Yd]U]g]rci f] ]i ]X]g'

5ga n]b]c]j Ya Ybhk ]h' ] Ych]W]b]W]d'U]h]W]U]g] ]b]W]U]g]X]b]f]Y]W]b]h  
 n]U]f]g] =U] Y\U]X]U'ch'cZ] ]b] ]h]U]W]b] [ Ych]W]b]W]Y]b] ]b]Y]f]b] ]rc'ci f'  
 i b]X]f] ]fUX' Uhygi Xiblg'5bn]h'a Yh'Y]f]c'a W]Wa Y]g]c]g]n]U]b]X]X]g]b]  
 h'f]g]h'X]f]Z]b]k ]h'a cFYh'U]b]8S'g]i X]b]g]h'Yg]X]h]g] =U] Y]g]a dm  
 g]c]d]d]X]k'cf\_ ]b] ]cb]h'Ycf]m]U]b]X] ]b]h'c]X' W]X]g]ca Yf]Y]j U]b]d]f]c'W]m' =a ] \ h'  
 Y]k'cf\_ ]b] ]cb'"<ck Y] Y]f]a i b]X]b]Y]h'Y]g]i X]b]g] ]a Y]X]U]Y]n]g]r]d]h]U\_ ]b] '  
 U]b]X'cZ]h]m]i a ] \ h' Y]f]U]d]b]X]cd' h'Y]f] ]b]h'f]g]h]b]d'U]m]W]U]d] ]W]h]cb'  
 U]Z]f]n]U]f]g]cZ]g]i X]n]g]g] [ f]YU] =g]f]cb] n]m]Y]j Y]h'U]h]b] ]b]Y]f]b] ] ]g]h]i ]  
 ]cb]g]g' W]U]g]h'Y8YdU]a Yb]h'a i g]h'Y]b]c]j Y]X]b]H]U]W]b] ]Z]f]g]U]W]Z]U]b]X'  
 D]U]M]W]U]g]Y]a d' ]Z]Y]X]V]na U]b]rcZ]h'Y] ]f]U]h]Y] ] Yb] ]b]Y]f]g' =cdYh'U]h'ci f'  
 b]Yk ] Yb]f]U]cb'cZ]W]X]a ]W]k ] ]b]c]j Y]h'Ya g]j Y]g]U]W]j Y]n]k ]h' d'U]m]W]j  
 U]b]X' =cdYh'U]h'imi Zh'Yf]U]X]f]g'cZ]79B]k'g]k ] Y]b]W]i ]U] Y]U]b]X]U]M]h]U]Y'  
 g'W] ]b]h'f]U]W]cb'

H]U]b'g]rc'U' a n]g]i X]b]g]c]j Yf]h'Ym]U]g]U]b]X]rc' a n]W' Y]U] ] Yg]U]W]X]a ]W]g'  
 h]W]b] ]W]h]g]Z]U]b]X]g]W]M]U]f]g]Z'f]m]i f]Z]Y]b]X]g] ]d]U]b]X]g] d]c]f]f]' =cc\_ Z'f]k U]X  
 lrc a U]b]U]b]b] ] W'g]h'Y]g]k ]h' h.Y8YdU]a Ybh'



# Civil Engineering International Staff 2004



“&\$'fg\_l]bYbXchYfj\_lghcfiggdYbhlja Y]b'hYXIdUfra YbhXi f]b[ '8SS(žk ]h' gca YWbh]bi ]b[ 'cb ]bhc'8SS) ""H.YmUY.”

## HUjk Ub

6Ub] !:i \ 7YbzBUjcbU'G bMfHG'b"  
I b]j Yfghnä?U' gli b] fzi ]Xa YWub]M

I ?

DfM'7i a Vfz<Yf]chK Uh1 b]j Yfghnä'  
9X]bVi f] \ fzfYL

=Ub?Ya UbzFcb] GeV]mā7Uā Vf]X Yf]lg.  
a Ub] Yā YbHL

A ]MU'6Y'za dM]U'7c "Y] Yz@bXcb"  
fifUbgclfHL

AUf]bCbU]hzi b]j YfghnäZ6]fa ]b[ \Uā ž  
6]fa ]b[ \Uā fifUbgclfHL

## I G5

žā YgA ]YV]ZA ]W] UbHWb]W]I b]j Yfghnä  
<ci [ \cbzA ]W] Ub f]b] ]fcbā YbHL

?i fhDUHf]gcbzA ]W] UbHWb]W]I b]j Yfghnä  
<ci [ \cbzA ]W] Ub f]b] ]fcbā YbHL

8U ]XG] Ybgi HU GHYI b]j Yfghnä@ ]bž  
I HU f]b] ]fcbā YbHL

8U ]XFc]k g nāCf] ]cbGHYI b]j Yfghnä  
7cf] U]gžCf] ]cbf]lg' a Ub] Yā YbHL

FcVfhK \ ]hzi G: cfYhDcX Wg@UcfUcfrā  
AU]gcbzK ]gWb]b]fzfYL



# Student Prizes

H.YXYdUfha Ybhk ci `X`\_Yrc YI HvbX`  
Vtb[ fUhi `Uj]cbgtrc U` h.Ygri XYbhgk \c k cb`  
df]nYgZcf h.Y]f YI W` Ybhk cf\_ ]b`&\$\$ ("H.YgY`  
df]nYgLUfYa UXY`doggjVYVni` YbYfci gjg ddcfhi  
cZ]bXi gfrmgcbgcfj`

7cbVfMhY/UbX 7Ya Ybh5ggcV]Uj]cb BNDf]nY`  
8bX Dfc: <UhxYb`6ck Yb`  
' fX Dfc: 8]cb AUff]ch

7j] ]`9b[ ]bYf]b[ Df]nY`  
9k UfXDi a a Yf`

7cbVfMhY Df]nY`  
7.f]gtrcd\Yf<UfhYm

A K < BN@X#Ja `A WUfUbyA Ya cf]U Df]nY`  
?Uf]ggU<nkY

FK `A cf]g Df]nY Zcf 7cUj]U Ubx`CVMUb`  
9b[ ]bYf]b[ ``  
]a YgA WfMhY Ubx]HggU 6Yh]La

BN55 Df]nY ]b HLUZ]V9b[ ]bYf]b[ ``  
6Yb]La ]b<Ukh UfX



## Student ambush!

H.Y&\$\$(`Yb[ ]bYf]b[ ] Yc`c[ nZ]YXf]d hcc\_`  
dUW]b`5df]zk ]h 8Uj Y6Y`Z]a 8Uj ]YgUbx`  
?Y]b`A WUbi gdfcj ]X]b[ Y]dYh]W]a a Yb]Uf]r]a  
Ubx]h.YbYk Yg]g]UZZa Ya VYf`cZ]h Y] fci dZ`  
]a YgAUWY]Wb]Y]UW]b[ Ug`X]j YfUbx]ci f!`  
]g]i`H.Y]f]dk Ybh]gZ]f]gci h`UgAUb]Uci f]`  
Ubx]bW]X]j ]g]g]h`a`c]h`cZ]h YUf] Y`n]f`c`  
gW]a Yg]b]h YGci h`g`Ubx`"Gi X]bhgk YfY`  
]a dYg]X]k ]h h.YgW]YcZ]h Ydfc`W]g]g]Y]b[`  
h.Yf]U] YcZ] Yc`c[ ]W]W]b]X]h]cbg]Ubx]Yb`cm]X`  
Y] Yb]b[ g]b]h.Y]f]U]h]cb]U]Z]g ]cbZ`g]g]a Yg`

CbYcZ]h YUg]h]bg]W]h]cbgk U]g]U]h]Y?Uk UfU`  
V]X] Y]k \Yf]Y]dc]f]g]a Yg]`gh X]bhg`  
]a Vi g]YX]h Y] fYb]`cf]b]g]UZZa Ya VYfUbx`  
X]a Ubx]X]`Yk U`h.Yd]U] ]U]h]Yf]Y]dYbgY`  
\U] ]b[ YUW]g]W]h]W]X]h]c[ Y]h Yf`&]f]h [ Yh`  
j U] YZ]fa cbYm]h Yg]h X]bhg]Ugc]a Ub]U]X]h`  
dYf]g UXY]h YcdY]U]c]f]g]h`Ybg]fYZ`" ]a a Yf!`  
g]cb`cZ]h Yf]j ]W]a "Mi b] Yf]a Ya VYf]g]cZ]g]UZZ`  
UfY]b]W]i fU] YX]h]c]i b]h]Yf]U]g]X]f]j Yf]g]Z]f]b]Y]h`  
m]U]g]Z]Y]X]h]dZ` \YU]X]g`



## Class of '69 reunited

H.]f]h]tc]bY69f]7j ]]f] fU]i U]h]g] U]h.YfYX]U]h`  
h.Yi b]j Yf]g]m]z]c]f]h.Y7Ugg]cZ]`- fY]b]cbZ`  
\YX]c]j Yf]@]V]ci f]k Y]Y`YbX]&\$\$ ("DU!`  
H]V]d]U]b]g]W]a YU]g]Z]d



## APEC delegation visits Civil Engineering

5[ fci d'cZ5D97'cZM'Ug'UbXM' glbYgg'd'cd'Y

## Turkish delegation inspects earthquake engineering research

HYYH f\_lg\ 8Ydi mD)a YA|b|ghfz<lg'g W!  
YbW5gg'WHD'cZ'gg'f'5VX'a`UH'ZG'b'fz`YX  
U%&g'fcb|`XY|U'jcb'lc'h'YX'd'f'ra`Ybh|b`  
G'd'h'a`Vf'8SS'(z'ic`Y'ub'c'Z'f'g'U'F'W'V|b|`  
i'b'X'f'U`Y'b'lc'g'f'Y'b|'h'Y'b'M`|X|b|g'U'b'X'ch'Y'f'  
g'f'i`W'f'g'U`U'j'g'h'Y'f'h'e'i`U`Y'X'l'a`U`Y'":c`!  
'ck|b|'h'Y%'--`ra`|h'Y'f'h'e'i`U`Y'z'e'\b'A`U'b'X'f`  
k`U'g'd'U'h'c'Z'b'5'a`Y'f'W'b'h'U'a`k`\J'W'Z'Y'k`lc`  
H'f`Y'f'ic`|b'Y'g'h|`U'h'h'Y'X'l'a`U`Y'U'b'X'U'j`lg`Y`  
h'Y'c'W'g'c'b`\ck'lc'f'd'U'f'V`|X|b|g'z'V'f'X`Y'g`  
U'b'X'j`|U'X`W'g`D'c'Z'gg'f'A`U'b'X'f'lc`X'h'Y'X'Y`!  
Y|U'j'cb'h'U'h'Y'Z'W'g'c'Z`|g'f'g'Y'U'F'W'U'h'7'U'b|  
h'f'V`f'ink`U'g`\ck'lc'f'Y'f'ic'Z'h'Y`|g'h|b|`V`|X|b|g'z`  
X'g|h|b'b'Y'k`g'f'i`W'f'g'U'b'X'X'c'f'lg`U'gg'Y'g'a`Y'bh`  
Z'f`U|`Y'i`f'U'b'U'f'U'g`"



Ci fdfYgYbh]b\_gk]h : fYbWUWUYa ]U\U Y  
Wta YUvci hñfci [ \ h.Y]bzi YbWcZ:ε\bi  
6Yff] fi Yca YWUbjWj" Hk c'cZ:ε\bgZcfa Yf  
gi XYbrgUFYVffYbhm]b: flbWzcbY'ock  
gi Xn]b[ hck UFXUD\8 UbXcbYWta a YbW  
]b[ Udcg]XcVtcfU Ubdic]bha Ybh]b Ua Ucf  
fYgUfW UcfUhcñi H.Y]f gcf]YgUFYhc X  
W'ck "

## Jane Jarram ~ Grenoble

AbYkf]hñg : "Zb]g\YXa n69ft cbg]7j ] ]b  
&SS&k ]h Ugfcbl ]bhYg]b; Yca YWUbjWj  
UbXG]ga c'c[ n]UbX=k UbhXlc gi Xñh YgY  
g V'WgUaUg]f-g'Y'Y" <ck Yj YfZUhh Y  
glä Y]ja Yz-k Ug'cc\_]b[ ZcfUWUbl YcZgWbY  
Ht h]gYbZ-glc\_Yk ]h 8f" ε\bi 6Yff] Uvci h  
h Ydcg]V] ]hñcZc]b[ UAUg]f-g]b g fcdY'  
ε\bi\UXU[ ccXWb]UW]b; fYbcVYz flbW! U  
dfcZgg fluhñYfYg]fW'Uca - ]° UñcZg U iV& Q ]j]"





Ci f]bhYfbU]cbU`gi XYbrgWwa YZca`  
H.fYVWw bhf]YgUci bXh.YDUWZVW]a UbX`  
fydfYgYbhX]ZZYfYbhW`h fYgUbX`Yi dYf]YbWg`  
<YfYh.Ymtr`gca Yh.]b[ cZh.Y]fVUW] fci bXZ`  
fYgUWV]bhYfYgUbX`]Z]bBYk NUUbX`

AU f]M`HU `lg! 7\]Y

=k UgVcfb]bCbh]U cz7\]Y`5ZM`Xc]b[ a m`  
Z]ghXX] fY]b 7]j ]`9b[ ]bYf]b[ h.YfZUbXh Yb`  
kcf\_]b[ ZcfUk\]Yz=gccbZYhh.YbYXhc`di fl`  
g`YUa cfYWU`Yb[ ]b[ UM] ]m`K\`Yb=a Yi`  
k]h`a nZ`fa Yf7\]Yub`g dYf]gcfZUbXhc`X`  
\]a h.Uh`k UbhXhc`Xc Udeg]fU] UYXX]fY`  
]bUbch`YfWi b]fira`Y]a a YX]U`Yng [ ]YghX`  
BYk NUUbX`

Ccz=Uff] YX]bBN]b`8SSZhc`Xc Ub`A9]bBUi`!  
fUfYgci fWg9b[ ]bYf]b[ Uh@bW`bI b]j Yf]m`i`  
5h`ci [ \`a nrc] ]bU`d`Ub`k`Ug`hc`gi Xnh]a VY`  
X]g[ bz=gccbVWw`a Y]bhYfYghX]b`g`]Xk UgY`  
a Ub] Ya Ybz]gh]g]gbck UM] d]cVYa ]b`  
7\]Y`=bh]gk Uh`Ww`a Y]bhc`WbhUWk ]h`8f`  
AU`\_A]\_Yzk`c`VWw`a Ya mA`9h`Yggg`dYf] ]l`  
gf`K`Ykcf`YXcb`a`cXZ]b[ h`Y<nX`c`c[ ]W`  
g`Ui Uhcb`cZ@bXZ`DfZ`fa UbWf`9@E`  
a`cX`Y`hc`a`U`Y]hg ]hVYZcf7\]Yub`WbX]!`  
hcbgZUbXUgUgYd]c`YWUg`W]MUYXh]g`  
a`cX`Y`g`h`Uh]h`Wi`XW`i`g`X]b`BYk`NUUbX`  
H`X`U`h`ci`fj`Y`X`g]h`Z`9@]g`h]U`g`Y`Z`ca`h`Y`  
I`7`k`Y`g]h`Y`ub`X`U`g`V`Y`b`X`c`k`b`c`U`X`X`V`na`c`f`Y`  
)`S`d`c`d`Y`]b`Uh`Y`Uh`Q` h`

# Industry Funded Academic Staff

H Y 8 Y d U f r a Y b h c Z 7 j j ' 9 b [ j b Y f ] b [ j g i b l e i Y  
j b B y k N M U b X i b j Y f g l h Y g j b \ u j b [ U U f Y  
b i a W f c Z j b X i g f n i z b X Y X U M M Y a J m g H U Z "

h U X j h c b r e h Y & Z " l h a Y d c g l h c b g Z b X X  
V n h Y I b j Y f g l m h f e i [ \ g i X b h Z Y g U b X  
[ c j Y f b a Y b h [ f U b g k Y W f Y b h m U Y g l  
d c g l h c b g Z b X X V n h X i g f n i c f g U m g Y W f  
c f [ U b g l h c b g " H Y g H U Z j b h Y g d c g l h c b g  
d f c j X Y i g k j h ' a U b n k j b k j b g W b U f c g " K Y  
U Y U V Y r e d f c a c h h Y k j g Y g c Z h Y Z b X j b [ ' .  
U Y b M g i g l b [ Y d Y f i g U Z a Y a Y f g k \ c  
k c i X c h Y k j g Y b c h Y U h 7 U b h f M f i r H Y g Y  
g H U Z a Y a Y f g W f n i c i h g Y W U j g X h U W b [ ' .  
U b X f g U F W j b h Y U Y g Z f k \ W h Y n f Y  
Z b X X Z U b X h Y n U g : f X i W h Y h U W b [ ' .  
d f Y g f Y c b c h Y f g H U Z U c k j b [ a c f Y j U i U V Y  
h a Y r e Y g Y b h c b f Y g U F W U b X j b X i g f n i  
j b h U W j c b U m g g h Y k \ c Y 8 Y d U f r a Y b h

H Y g Y d c g l h c b g U c k h Y 8 Y d U f r a Y b h r e  
Z e g h f Y i W Y b h f Y U h c b g \ j d g k j h h Y V j j '  
Y b [ j b Y f ] b [ d f c Z g g c b z a U b i Z M Y f g U b X  
[ c j Y f b a Y b h c f [ U b g l h c b g Z f a i h U V b Y Z f i  
5 b X i 6 i W U b U

## Carter Holt Harvey funds

A f A [ Y G d M U d c ] b h j g h Y B y k N M U b X : j f Y G f j W 7 c a a j g j c b  
@ M i f f ] b : j f Y 9 b [ j b Y f ] b [ " H j g d c g l h c b k U g Y g l U j g Y X j b % - ' U i  
h Y h a Y c Z j a d Y a Y b h U h c b c Z h Y % - & 6 i j X j b [ ' 5 M k \ j W U c k Y X  
Z f Y Y b [ j b Y f ] b [ h e V y d U m g X j b b y k k U g j b B y k N M U b X " 5 h j f X  
Z j Y n U f h f a c Z h Y W b h U M \ U g f Y W b h m Y b g l b X ' A [ Y g j b h M Y g g  
j b W X Y Z f Y X j Y c d a Y b h Z U m j Y Z f Y d c h W j c b g h a g Z f Y f g Z  
U b X Y g U Y Z c a i Z f n i c h \ Y g W a d e Y j b e \ j g D 8 b i n g Y W f c b j W  
Y i W U b [ Y c Z Z f Y X U U " H j g d c g l h c b g d d c f g h Y j Y n i g W g g Z " .  
a i U g Y g X i f f a i b o z i n h i b j b Y b l o t H a r v e y f u n o p m m e the ear

8 f 6 i W 8 Y U a j g h Y a [ W j m f G h j Y b 9 E 7 @ M i f f ] b 9 f h e i U Y  
9 b [ j b Y f ] b [ Z i b X X V n h Y 9 U h e i U Y 7 c a a j g j c b f E 7 E < Y U g Y V b  
j b h j g d c g l h c b Z f Z j Y n U f g U b X k Y f Y W b h m W b W X X b j c h U h c b g  
k j h h Y 9 E 7 Z f U g W b X Z j Y n U f h f a " 6 i W \ U g Y V b h U W b [ ' .  
k j X n j b Y U h e i U Y Y b [ j b Y f ] b [ U b X W f n j b [ ' c i f f Y g U F W j b r e  
\ c i g l b [ z g Y j b [ Z U b X c h Y f U g Y W g c Z W b W h Y U b X h a Y f g f i W i f Y  
V Y U j c i f ] b Y U h e i U Y g < Y U g U b U m j Y f c Y k j h h Y B y k N M U b X  
G e W m i c Z 9 U h e i U Y 9 b [ j b Y f ] b [ U b X j g W c f X j b U j b [ X j Y c d a Y b h c Z  
h Y I b j Y f g l m c Z 7 U b h f M f i n U h e i U Y 9 b [ j b Y f ] b [ F y g U F W ; f c i d "

8 f 4 a Y g A U W W W b j \ c X g h Y 7 7 5 B N : Y c k g \ d Z i b X X V n h Y  
7 a Y b h U b X 7 c b W h Y 5 g g V U h c b c Z B y k N M U b X < Y U g g f j Y X Z i f  
m U f g c Z U Z j Y n U f W b h U M U b X X i f j b [ h U h a Y U g a U X Y U a U c f  
W b h f i h c b r e W b W h Y h W b c c [ n j b B y k N M U b X Z W g j Z i b [ ' .  
U [ f Y U h g U b X j b j Y g j [ U j b [ X i f U ] j n i c Z a U n i m Y g c Z W b W h Y j b  
W g Y W b g h U h c b k j h h Y X Y g l b d f c Z g g c b U b X a U b i Z M Y f g " 4 a Y g  
h U W Y g W b W h Y h W b c c [ m U b X Y U h X g V Y W g r e i b X Y f U X U Y U b X  
d c g l f U X U Y g i X b g "

A f ; ' Y b ? c f Y m g h Y H U b g j b X i B y k N M U b X @ M i f f ] b  
H U b g c f U h c b 9 b [ j b Y f ] b [ " H j g d c g l h c b k U g j b j U m Y X Y n 8 f 5 b X Y  
8 U b U z k \ c \ U g h U b g Z f Y X i r e h Y W b h j b i j b [ g H U Z ; ' Y b j g c b Y n U f  
j b r e U Z : i f n U f W b h U M " < Y j g U b Y d Y h j b f c U g Z i m a j Y a Y f j W  
X g l b U b X W W d U b j b [ Z U b X j g W a d Y h j b [ \ j g D 8 j b i f U \ ] \ k U h  
g Z h m H j g d c g l h c b g d d c f g h Y j Y n i g W g g Z " a U g m f g X i f Y j b  
h U b g c f U h c b Y b [ j b Y f ] b [ " f i H U b g j b X \ U g b c k a Y f j X k j h h Y  
@ G z Z f a j b [ " @ b X H U b g c f h B N E

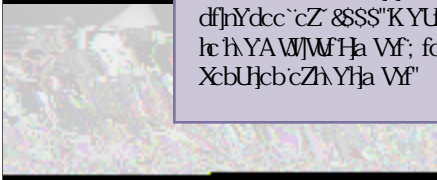
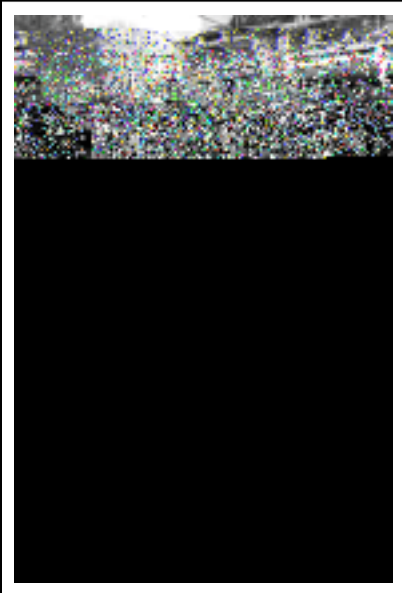
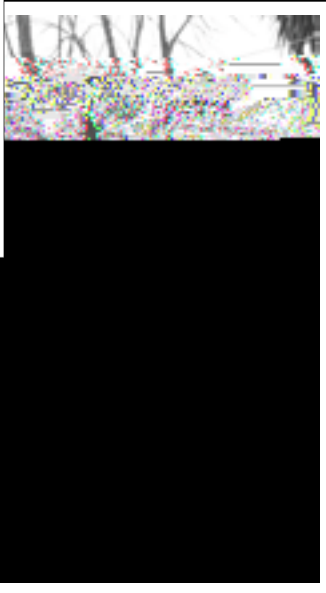
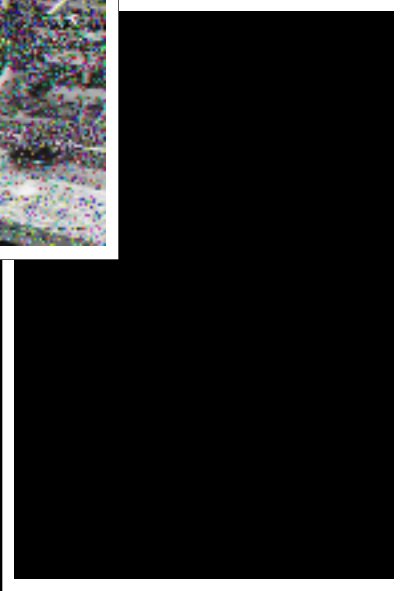
D f c Z g g f 8 Y g 6 i " j g h Y < c V a 5 X i b W d f c Z g g f c Z 7 c b W h Y 8 Y g l b " .  
H j g l g U d f h h a Y d c g l h c b Z b X X V n h Y a U c f W a Y b h W a d U m  
< c V a B y k N M U b X ' 8 Y g l U Y g U a U c f d U h j b h U W b [ c Z j b U n U f  
f j b Z f W X W b W h Y g f i W f Y g U b X j g j b c j Y X j b a U n f Y g U F W d f c W W g  
j b c j j b [ g Y g a j W X g l b U b X h Y W b g f i W j c b c Z W b W h Y g f i W f Y g < Y  
j g U g : Y a d c m X V n h Y < c a Y g 7 c b g j b [ ; f c i d j b 7 f l g W i f W Z U b X  
j g U V Y r e V j b [ U i b l e i Y a j c Z h Y c f n U b X d f U W W j b r e h Y W g g c c a "

## 6-5: jfY5Xj JgcfmDbyY

7\UfYm YgWa Ubb\Ug'c]bYXU[ fci d'cZ  
YUX]b] ZfYI dYf'gcb hY6-5: jfY5Xj Jgcfm  
DbyY"HYdUbyY\UgWYb YgUV]g\YX  
Z`ck]b] WbVfbg]hUhY; cj Yfa YbhXcYg  
Qh\Uj Yg ZV]d'f'g]k]h @ZfYg QihL L V  
]bX] gfmHYdUby Wb]XbhZ]a dcfUbhZfY  
gZm]gg YgUhU YfngU Yg hUhYmWb  
WUddfcd]UfYmUWXcb"

## J]g]hcf

h'8SS( kYkYWa YX]WU] Ygh XbhgCg  
\_Uf9] ggbUbXA UXY]bB] ggbZca @bX  
I bj Yfgh"8f Dmf 7i a VfZca <Y]chK Uhi  
I bj Yfgh"8S U \X



## Bridge-breaking

5`Uf[ YWckX[ Uh YfXcb h YWb\_gcZhY  
 Fj Yf5j cb]b Gdha Vfz88S( 'r:kUW  
 a cfYh.Ub%SS%gndc Vj]' Yb[ ]bYf]b[ '  
 gi XbfgdUf]VdUY]b h.YUbbi U'WU'Yb[ Y  
 cZM ]Xb[ UM]X YWdUYcZc X]b[ '  
 bc'a cfYh.Ub'kc dYcdY"Gi Xbfgk YfY  
 1 X] YXg WggZ `]Zh Yf V]X YW' UdgX  
 UZM'h YUX]hcb cZU'h ]Xdfgcb" H.Y  
 Y] Ybh]ggh Ygi Xbfg- bck YX YcZ  
 dck Yf!c:k Y[ \hfU]cZUbXUWwi bfgZ:f  
 &\_1 `cZh Yf ZbU'a U\_ ]b'h Y8Yg[ ] b%  
 Wi fgY'

7UfY<c'h<Uj Yndfcj ]XXZ]bUW]g d!  
 dcfhZcfh YWa dY]hcbzk \]W\UXUWg`  
 df]nYdcc`cZ 88SS"KYUfYUgc [ fUHZ`  
 hc hYAW]M]Hja Vf; fci d@X'Zcfh Yf  
 XcbU]cb cZh YHja Vf'