



# ARTS2815

Dc`j]hVg`UbX`GYW f]hm]b`h\Y`#Xc!DUWZ]W

HYfa`Hk c`#`&\$&%

7ci fgY`Cj Yfj ]Yk

GHJZ`7cbHJW`8YHJ]`g

7cbj Ybcfg

B Ua Y	9a U]`	5j U]`UV]`]m	@cW]h]cb	D\cbY
5`YI UbXYf? cfc`Yj	U" _cfc`Yj 4 i bgk "YXi "Ui	K YXbYgXUm %{ .\$\$!%* .\$\$	A cfj Yb`6fck b	

7 ci fgY'8YHJ]g

7 fYX]hDc]bqg '\*

Gi a a UfmicZ\hY'7 ci fgY

H\Y' bXc!DUWZ]W]g U'bYk' UbX'XmbUa ]WfY[ ]cbžcbY'hUhdcgYg]g[ b]Z]W]b]h]W]U''Yb[ Yg'UbX'cddcfi b]h]Yg"
b'h]g]W]c' fgYžmci 'k ]''YI d'cfY'hY'W]cbW]d]hcZ\hY' bXc!DUWZ]W]Ug'U'W]c\YfYbhfY[ ]cbU'W]cbgfi W]žcbY'hU]h
fYZYW]g'hY' ]bW]YUg]b[ ] ]bhYfUW]cb'UbX'W]cbYW]h] ]m]VYh YYb'hY'5g]U!DUWZ]W]UbX'hY' bX]Ub'c W]Ub
fY[ ]cbg''H\Y'W]cbW]d]hcZ\hY' bXc!DUWZ]W]g'W]cbhYghYXž'UbX'mci 'k ]''YI Ua ]bY'X]Z]YfYbhW]cbW]d]h]cbg'cZ\hY
bXc!DUWZ]W]UbX'k \YfY ]h]g'fY[ ]cbU'Vci bXUf]Yg''Y'' bXc]b[ ]gcžmci 'k ]''U'gc'W]cbg]XYf'X]Z]YfYbh
UddfcUW]Yg'hc'fY[ ]cbg'UbX'fY[ ]cbU' ]ga ž'UbX'hY'dfcV'Ya g'UbX'dfcgdYW]g'hYfY]b''H\Y'W]c' fgY'k ]''U'gc
]b]fcXi W]mci 'hc'hY'g][ b]Z]W]b]h]d]c' ]h]W]ž'gfU]h[ ]W]UbX'Y'W]cbca ]W]g]g]i Yg'hU]h'hY'fY[ ]cb'dcgYg'UbX'hY
ZcfY][ b'dc' ]W]Yg'cZa U'cf'fY[ ]cbU'U'W]c'fgž' ]bW] X]b[ ] bX]Už7 \ ]bUž'hY'I Gž>UdUb'UbX'5i ghfU' ]U''H\YgY
]g]g]i Yg'UbX'W]U''Yb[ Yg'UfY'Vch' ]bhYfg]hY'UbX'fU]b]g]b]h]cbU'' ]b' bU]h' fYž'UbX' ]bW] XY'ghfU]h[ ]W]f]j U'f]m]UbX
W]ca dY]h] ]cb'VYh YYb'a U'cf'fY[ ]cbU'U'W]c'fgž'W]c' bhYf]d]f]U]W]ž'a Uf]h]a Y'gi fj Y]'UbW]ž'UbX'fU]X''

7 ci fgY'@YUfb]b[ 'Ci hW]ca Yg

%" 5bU'mgY'X]Z]YfYbhUddfcUW]Yg'hc'hY'W]cbgfi W]cb'cZfY[ ]cbg'UbX'fY[ ]cbU' ]ga 'UbX'Udd'm]h]YgY'hc
hY'W]cbW]d]hcZ\hY' bXc!DUWZ]W]
&" Ci h]bY'g][ b]Z]W]b]h]W]cb'h]Ya dcfUfm]g]g]i Yg'UbX'W]U''Yb[ Yg' ]b'hY' bXc!DUWZ]W]
' " 9j U'i U]h'hY'gW]c'U'f'm]'h]fU]h' fY'cb' \_Ym]g]g]i Yg'UbX'W]U''Yb[ Yg' ]b'hY' bXc!DUWZ]W]
(" 7cbXi W]h]b]XYdYbXYbhUbX'gW]c'U'f]m]fYgYU'f]W]"
)" 7cbgfi W]h]Ub'Yj ]XYbW]!VUgYX'Uf[ i a YbhVch'cfU''m]UbX' ]b'k'f]h]b[ "

HYUW] ]b[ 'GhfU]h[ ]Yg'

H\Y'W]c' fgY'YI d'cfYg'hY'XYj Y'cda Ybh] ]b'hY'Yj'c'j ]b[ ] bXc!DUWZ]W]fY[ ]cb'h]fci [ \ 'hY''Ybg'cZ\hY
UW]XYa ]W]X]g]W]d' ]bY'cZ' ]bhYfb]h]cbU'fY'U]h]cbg'' h]VY[ ]bg'k ]h'hY'W]cbW]d]h' U]g]U]h]cb'cZU''fY[ ]cb''UbX'h]Yb
ZcW]gYg'cb'hY' ]bhYfg]hY'XmbUa ]W]g'Zca 'hY''Yj Y'g'cZVch' [ 'cVU'UbX'fY[ ]cbU' [ Ycdc' ]h]W]g''H\Y'W]c' fgY' ]g
]g'h]i [ \h]h]fci [ \ 'U'&! \ci f''YW]h' fY'UbX'U' % \ci f' h' hc]f]U''H\Y''YW]h' fYg'dfcj ]XY'VUW] [ fci bX'a U]h]f]U'UbX
UbU'm]g]Yg'XfUk b'Zca 'hY'YI dY]h]g]Y'cZ\hY''YW]h' fYf'UbX'Zca 'hY'fY'Yj Ubh]UW]XYa ]W]h]fU]h' fY''H\Y' % \ci f
h' hc]f]U'k ]''VY''YX'Vmg'c' Y''Y]U %o %o %o

# 5ggYgga Ybh

## 5ggYgga YbhHUg\_g

5ggYgga YbhHUg_	K Y][ \h	8i Y'8UH	Gh XYbh@YUfb]b[ Ci hWta Yg'5ggYggYX
7`Ugg`ZJW`]HU]cb`	&)	Bch5dd`]WUV`Y	&ž' ž)
7 f]h]WU`F Yj ]Yk`	&)	\$&# \$+ #&\$&\$ \$) . \$\$`DA	' ž' (ž)
A U`cf`9ggUmi	) \$	% # \$, #&\$&\$ \$) . \$\$`DA	%ž &ž' (ž)

## 5ggYgga Ybh8YHU]`g

5ggYgga Ybh%`7`Ugg`ZJW`]HU]cb

GHUfhXUH. `Bch5dd`]WUV`Y

8YHU]`g.

%!%) `a ]b`WUgg`ZJW`]HU]cb`VUgYX`cb`Ugg][ bYX`fYUX]b[ g`]b[ fci dg`cZ' !( `gh XYbhtg`Zc`ck YX`VmX]gW gg]cb"  
5`gh XYbhtg`k ]`fYW]j Y`hY`gUa Y`a Uf`\_"

Gh XYbhtg`k ]`fYW]j Y`k f]h]b`ZYXVUW`k ]h]b`%\$`k cf\_]b[ `XUmg`cZ`hY]f`ZJW`]HU]cb`"

## 5XX]h]cbU`XYHU]`g.

Mci`UFY`fYei ]fYX`hc`gYfj Y`Ug`"VX ]YZX]gW`ggUbtg`"cZ`hY`fYUX]b[ g`]b`hY`gYa ]bUf`Uh`YUgh]cbW`Xi f]b[ `hY`  
Wci`fgY`8YdYbX]b[ `cb`hY`g]nY`cZ`hY`WUggZ`YUW`k YY`\_`h`fY`cf`Zci`f`gh`XYbhtg`k ]`k`cf`\_`Ug`U`hY`Ua`UbX`  
`YUX`cZ`hY`X]gW`gg]cb`"H`Y`dfYgYb]h]fg`a`i`gha`U`\_`U`%)!&\$`a`]b`dfYgYb]h]cb`cZ`hY`k`YY`\_`g`fYUX]b[ g`UbX`  
ZJW`]HU]`X]gW`gg]cb`"F`U`h`Y`f`h`Ub`g]a`d`mgi`a`a`Uf]n]b[ `hY`fYUX]b[ g`i`bXYf`ei`Ygh]cb`f]fYgi`a`UV`mU`  
k ]`\_`Uj`Y`fYUX`]hZ`hY`X]gW`gg]cb`ZJW`]HU]h`cf`g`l`ci`X`W`f]h]W`mYb[ U[ Y`k ]h`hY`a`Uh]f]U`UbX`hY`UgY`  
ci`hgdYV]Z]Wei`Ygh]cbg`cf`dfcV`Ya`g`h`Uh`UddYUf`k`cf`h`mc`Z`U`hY`b]h]cb`UbX`WU`b`VY`U`VUg]g`Zc`f`  
X]gW`gg]cb`"5`gh`XYbhtg`]b`U[ fci`d`XY`Y[ U]hX`k ]h`hY`fYgdc]g]V`]h]m]c`YUX`hY`X]gW`gg]cb`k ]`fYW]j Y`  
hY`gUa`Y`a`Uf`\_"

Hi fb]h]b`gYh]b[ .`H\]g`]g`bchU`Hi fb]h]b`Ugg][ ba Ybh

5ggYgga Ybh&.`7`f]h]WU`F Yj ]Yk`

GHUfhXUH. `Bch5dd`]WUV`Y

@Yb[ h.`+) \$`k`cfXg`

8YHU]`g.

H`Y`W`f]h]WU`fYj ]Yk`fYei ]fYg`gh`XYbhtg`hc`gY`Y`W`icbY`U`W`U`X`Ya ]WUf]h]WY`Z`ca`U`k`YY`\_`f]fYUX]b[ `UbX`  
XYa`cbg]fU`h`U`W`cgY`Yb[ U[ Ya`YbhUbX`UbU`mg]g`k ]h`hY`a`U]b`Uf[ i`a`Ybhtg`UbX`WU]a`g`cZ`h`Uh]f]h]WY`"H`Y`  
k`cfX`Yb[ h`cZ`hY`fYj ]Yk`]g`+) \$`k`cfXg`"

: YYXVUW\_ GHi XYbhtg:k ]`fYVW]j Y`k f]htYb`ZYXVUW\_`UbX`U`bi a Yf]WV`[ fUXY`k ]h]b`hk`c`k YY\_g`cZgi Va ]gg]cb  
h`fci [ \ `h`Y`I` b]j Yfg]mfj @YUfb]b[ `A`UbU[ Ya YbhGmg]Ya `f@A`GL`

5XX]h]cbU`XYHJ]`g.

Mci `UFY`fYei ]fYX`hc`dfYdUfY`U`"fYUW]cb`d]YVW`Z`k \]VX`g`lci `X`dfYgYbhmc`i`f`fYgdcbgY`hc`z`UbX`W]h]ei Y`c`Z`  
h`Y`a`U`cf`Uf[ i`a`Ybhtg`Z`ca`U`k`YY\_g`fYUX]b[ "Mci `WJb`gY`YVh`h`Y`k`YY\_c`Z`mci`f`]b`h`fY`gh`hc`fY`ZY`Vh`cb`z`Vi`h`  
mci`f`gY`YVh]cb`g`lci`X`VY`X]ZY`fY`bh]Z`ca`h`Y`k`YY\_c`Z`mci`f`WU`gg`Z`W]j]h]h]cb`f`B`gg][`ba`Ybh`%`&`H\]g`Y`ggUm]g`  
Xi`Y`cb`>`i`m`&`Mci`k`j`"fYVW]j`Y`k`f]htYb`ZYXVUW\_`k`]h]b`%`\$`k`cf\_]b[ `XUm]g`"H\Y`ZYXVUW\_`g`Y`Y`h`fi`Vf]Wk`j`  
VY`Uj`U]UV`Y`hc`gh`XYbhtg`U`h`h`Y`gh]U`f`hc`Z`h`Y`W`ei`fgY`gc`h`U`h`h`Y`m`WJb`k`cf\_`hc`k`U`f`Xg`gd`Y`W]Z`Y`X`gh]U`b`X`U`f`Xg`"

Hi`fb]h]b`g`Y`H]b[ .`H\]g`U`gg][`ba`Ybh]g`gi`Va`]htYX`h`fci [ \ `Hi`fb]h]b`UbX`gh`XYbhtg`Xc`b`chgY`Y`Hi`fb]h]b`  
g]a`]Uf]mifYdcftrg`"

5ggYgga`Ybh`. `A`U`cf`9`ggUm

GhUfhXUHY. `B`ch`5`dd`]WUV`Y

@Yb[`h`. `&) `\$\$`k`cfXg

8YHJ]`g.

H\Y`Y`ggUm]g`h`Y`Z]bU`U`ggYgga`Y`bh`c`Z`h`Y`W`ei`fgY`"

hifYei ]fYg`gh`XYbhtg`hc`XYa`cbghfUHY`Yb[ U[ Ya`Ybhk`]h`h`Y`W`efY`h`Ya`Yg`UbX`]gg]`Yg`fU]gYX`]b`h`Y`W`ei`fgY`  
UbX`h`Y]f`UV]`]m]hc`W`cbg]fi`W`h`U`d`Y`fgi`Ug]j`Y`UbX`k`Y`!`Yj`]X`Y`b`W`X`Uf[ i`a`Ybh`H\Y`k`cfX`Yb[`h`c`Z`h`Y`Y`ggUm]g`  
&) `\$\$`k`cfXg`"

: YYXVUW\_ GHi XYbhtg:k ]`fYVW]j Y`k f]htYb`ZYXVUW\_`UbX`U`bi a Yf]WV`[ fUXY`k ]h]b`hk`c`k YY\_g`cZgi Va ]gg]cb  
h`fci [ \ `h`Y`I` b]j Yfg]mfj @YUfb]b[ `A`UbU[ Ya YbhGmg]Ya `f@A`GL`"H\Y`ZYXVUW\_`g`Y`Y`h`fi`Vf]Wk`j`VY`  
Uj`U]UV`Y`hc`gh`XYbhtg`U`h`h`Y`gh]U`f`hc`Z`h`Y`W`ei`fgY`gc`h`U`h`h`Y`m`WJb`k`cf\_`hc`k`U`f`Xg`gd`Y`W]Z`Y`X`gh]U`b`X`U`f`Xg`"

5XX]h]cbU`XYHJ]`g.

H\]g`Z]bU`Y`ggUm]WJb`VY`cb`U`hc`d]Wc`Z`mci`f`]b`h`fY`gh`Vi`h`V`U`g`Y`X`c`b`c`f`fY`U`h`X`hc`h`Y`W`eb`h`b`h`c`Z`h`Y`W`ei`fgY`  
UbX`#`f`h`hc`f]U`X]g`W`gg]cbg`"H\]g`Y`ggUm]g`h`Y`Z]bU`U`ggYgga`Y`bh`Z`f`h`Y`W`ei`fgY`"H\`fci [ \`ci`h`h`Y`h`fa`z`mci`  
g`lci`X`h`]b\_]U`Vci`h`U`hc`d]Wc`Z`mci`f`]b`h`fY`gh]UbX`\`ck`]h`WJb`VY`UbU`m`Y`X`"H\Y`Y`ggUm]d`f`c`d`c`g`U`b`Y`Y`X`g`hc`VY`  
X]g`W`ggYX`k`]h`h`Y`]b`gh`fi`W`c`f`Xi`f]b[`h`Y`c`Z]W`\`ci`fg`c`f`j`]U`Ya`U]"H\Y`Z]bU`Y`ggUm]g`Xi`Y`cb`5`i`[`i`gh`  
%`"

Hi`fb]h]b`g`Y`H]b[ .`H\]g`U`gg][`ba`Ybh]g`gi`Va`]htYX`h`fci [ \ `Hi`fb]h]b`UbX`gh`XYbhtg`Xc`b`chgY`Y`Hi`fb]h]b`  
g]a`]Uf]mifYdcftrg`"

5 hYbXUbW`F Yei ]fYa Ybhg

6 ch`"YWhi fYg`UbX`hi hcf]U`g`UFY`a UbXUhcfmWUggYg`]b`5F HG&, %) `]b`H&Z`&\$&\$"

7 ci fgY`GW`YXi `Y

[J \]yk`WUgg`hja`YhUV`Y](#)

H]a`YhUV`Y`

8UhY	HmdY	7cbhYbh
K YY_`%`" `%A Um!`(`>i bY	@YWhi fY	Cj Yfj ]Yk`/`@c[ ]gh]Vg`cZ7ci fgY. `Dc`]h]Vg`UbX`GYW`f]hm]b`hY`&Xc!DUW]Z]W`X]ZYfYbh`Yj`Y`g`cZ`UbU`mg]g/a`U`c`f`UW`c`fg`]b`hY`&Xc!DUW]Z]W`fY[ ]cb`"``
	Hi hcf]U`	Dc`]h]Vg`UbX`GYW`f]hm]b`hY`&Xc!DUW]Z]W`X]ZYfYbh`Yj`Y`g`cZ`UbU`mg]g/a`U`c`f`UW`c`fg`]b`hY`&Xc!DUW]Z]W`fY[ ]cb`"8]g]f]Vi`h]cb`cZ`hY`d`fYgY`b`h]cb`h`c`d]Vg`"`.
K YY_`&.`+`>i bY`!`%%>i bY	@YWhi fY	H`Y`V`c`b`W`d`h`c`Z`h`Y`&Xc!DUW]Z]W`Xi`ZYfYbh`U`d`d`f`c`U`W`Y`g`h`c`V`c`b`W`d`h`U`]n]b[ `U`fY[ ]cb`/`W`]h]WU`[`Y`c`d`c`]h]Vg`j`g`"WUgg]WU`[`Y`c`d`c`]h]Vg`"
	Hi hcf]U`	







F Ygci fWg

DfYgWf]VYX`F Ygci fWg`

5`fY`Yj UbhWci fgY`]bZcfa Uh]cb`UbX`fYei ]fYX`fYUX]b[ g`UfY`Uj U]UV`Y`cb`h\Y`A ccX`Y`g]hY`Zcf`h]g`Wci fgY`"  
D`YUgY`fY[ i`Ufm`WXYW`Zcf`i dXUH`gZ`Ubbci bW`a Yb]gZ`UbX`c`h\Y`f`fY`Yj UbhWci fgY`fY`UH`X`]bZcfa Uh]cb`cb  
A ccX`Y`"

F YWca a YbXYX`F Ygci fWg

hZcfa Uh]cb`UVci hUXX]h]cbU`fYUX]b[ g`UbX`fYgci fWg`]g`U`gc`a UXY`Uj U]UV`Y`cb`h\Y`A ccX`Y`g]hY`Zcf`h]g`  
Wci fgY`"

7ci fgY`9j U`i Uh]cb`UbX`8Yj Y`cda Ybh

Gi Va ]gg]cb 'cZ5ggYgga YbhiHUg\_g

Hi fb]h]b 'Gi Va ]gg]cb

Ʒmci 'YbWci bHYf'U'dfcV'Ya 'k \Yb'UH'Ya dh]b[ 'hc'gi Va ]hmc i f'Ugg][ ba YbhiH'fci [ \ 'Hi fb]h]bž'd'YUgY  
HY'Yd\cbY'9I HYfbU'Gi ddcfhcb'-', ) " ' ' %cf'Ya U] 'H'Ya 'cb'YI HYfbU'HY'fgi ddcfh4 i bgk "YXi "Ui "'Gi ddcfh  
\ci fg'UfY', .\$\$Ua '—%\$.\$\$da 'cb'k YY\_XUmg'UbX'-. \$\$Ua '—) .\$\$da 'cb'k YY\_YbXg'fI \*) 'XUmg'U'mYUfI" Ʒmci  
UfY'i bUV'Y'hc'gi Va ]hmc i f'Ugg][ ba YbhiXi Y'hc'U'Zi 'hk ]H'Hi fb]h]b'mci 'a UmUdd'm'Zcf'Ub'YI HYbg]cbž'Vi hmc i  
a i ghfYHU]b'mci f'h]W\_Yhbi a VYf'Z'ca '9I HYfbU'Gi ddcfhfU'cb[ 'k ]H'UbmcH'Yf'fY'Yj UbhXcW a YbHgE'hc  
]bWi XY'Ug'Yj ]XYbVW'hc'gi ddcfhmc i f'YI HYbg]cb'Udd'jW]h]cb" Ʒmci 'Ya U] '9I HYfbU'Gi ddcfhmc i 'k ]  
Ui 'ca UH]WU'm'fYW]j Y'U'h]W\_Yhbi a VYfž'Vi h]Zmci 'HY'Yd\cbY'mci 'k ]'b'Y'X'hc'gd'Y'W]WU'mUg\_ 'Zcf'cbY"  
Hi fb]h]b 'U'gc'dfcj ]XYg'i dXUH'g'cb'H'Y]f'gmgh'Ya 'ghU'hi g'cb'Hk ]H'Yf"

; YbYfU'mž'UggYgga YbhiHUg\_g'a i ghVY'gi Va ]H'Y'X'Y'Y'W'fcb]WU'mj ]U'Y]H'Y'f'Hi fb]h]b'cf'U'A ccX'Y  
Ugg][ ba YbH' 'b]bg]H'UbVW'g'k \YfY'H'g ]g'bc]hd'cgg]V'Yž'hk ]'VY'gh'UH'X'cb'mci f'Wci fgY'g'A ccX'Y'g]H'k ]H  
U'HY'fbUH] Y'gi Va ]gg]cb 'XYHU]g"

: cf]bZ'fa UH]cb'cb'\ck 'hc'gi Va ]hUgg][ ba YbHg'cb]bY j ]U'A ccX'Y. \h'hdg.#gh XYbhi bgk "YXi "Ui #ck!  
gi Va ]hUgg][ ba YbH'a ccX'Y

## 5 WUXYa ]W< cbYgmiUbX`D`U[ ]Uf]ga

D`U[ ]Uf]ga `]g`i`g]b[ `h`Y`k`c`f`X`g`c`f`]X`Y`U`g`c`Z`c`h`Y`f`g`i`U`b`X`d`f`Y`g`Y`b`h]b[ `h`Y`a` `U`g`m`c`i`f`c`k`b`" `#`W`U`b`h`U`\_`Y`a` `U`b`m`  
Z`c`f`a`g`Z`Z`c`a` `X`Y`]V`Y`f`U`h`Y` `W`X`Y`U`h]b[ `h`c` `U`W`W`Y`X`Y`b`h`U` `m`i`W`c`d`m]b[ `Z`c`a` `U`g`c`i`f`W` `k` ]h`c`i`h`U`W`\_`b`c`k` `Y`X[ `Y`a` `Y`b`h`

I`B`G`K` `[`f`c`i`d`g`d`U[ ]Uf]ga `]b`h`c` `h`Y` `Z`c` `c`k` ]b[ `W`U`h`Y`[ `c`f`]Y`g.

- i bXYfgHUbX'mci f'f][ \hg'UbX'fYgdcbg]V']hYg'Ug'U'gh XYbhUhl BGK
-

## 5 WUXYa ]WbZcfa Uh]cb

: cf`YggYbh]U`gh XYbh]bZcfa Uh]cb`fY`Uh]b[ `tc.

- fYei Ygh]Zcf`YI H`bg]cb/
- `UhY`gi Va ]gg]cbg`[ i ]XY`]bYg/
- fYj ]Yk `cZa Uf\_g/
- I B GK `<YU`h`UbX`GUZY`midc`]WYg/
- YI Ua ]bUh]cb`dfcW`Xi fYg/
- gdYW]U`W`bg]XYfUh]cb`]b`hY`Yj YbhcZ]`bYgg`cf`a ]gUXj Ybh fY/
- gh XYbhYei ]mUbX`X]gUV`]m/
- UbX`c`hYf`YggYbh]U`UWUXYa ]W]bZcfa Uh]cbž`gYY