



# ARTS3574

Hcd]Wg`]b`@Uh]b`5a Yf]WUb`7 ]bYa U

HYfa`H\`fYY`##`&\$&\$

7ci fgY`Cj Yfj ]Yk

GHJZ7cbhJW`8YhU]`g

7cbj Ybcfg

B Ua Y	9a U]`	5j U]`UV]`]m	@cW]h]cb	D\cbY
B U]U]U`C fh]n 7YVYf]c	b"cf]h]nWVYf]c4 i bgk "YXi "Ui	VmUddc]b]h Ybh	A 6&&,	W`b]UW`Vm Ya U]`

GWcc``7cbhJW`bZcfa Uh]cb

GWcc``cZ<i a Ub]h]Yg`UbX:@Ub[ i U[ Yg

@cW]h]cb. `GWcc``C Z]W`ZA cfj Yb`6fck b`6i ]X]b[ ž@Yj Y``&ž&),

CdYb]b[ `<ci fg.`A cbXUm! : f]XUmž - Ua `!) da

D\cbY. `ž\*%&`- ' , ) `)%\*, %

: Ul. `ž\*%&`- ' , ) ; , +\$)

9a U]: [\U`4 i bgk "YXi "Ui](#)

7ci fgY'8YHJ]`g

7fYX]hDc]bHg`\*`

Gi a a UfmicZ\hY'7ci fgY

H\]g`Wci fgY`YI Ua ]bYg`U`fUb[ Y`cZgi WwYggZ ``Z]a g`Zca `@Uhb`5a Yf]WU`dfcXi WwX`dcgh&\$\$\$`VmU`bYk  
[ YbYfU]hcb`cZ]a a U\_Yfg`Vcfb`UZYf`%`\*\$``#YI Ua ]bYg`hY`bYk `fYbXg`]b`A`YI ]Wbž`6fUn]]Ubž`5f[ Ybh]b]Ubž  
UbX`DYfi`j ]Ub`W]bYa Uhc[ fUd`m]fZ]a g`UbX`Wci b]f]Yg`j Ufm]Zca `mYUf`hc`mYUf`UbX`a Um]bWi`XY`Z]a g`gi`Wk`Ug`  
3\_`adWe`bWbae]`5 ]fk`aX9`aV]`BS`ie >STkq]`fZ] ?`afadUkU`W6 ]Sd]We] FZWE`WUdWf [ FZW]d`7kWež?`SVW]`geS]`  
#iU`gc`Wcbg]XYfg`X]ZYfYbW]g`VYhk`YYb`Wcb]Ya dcfUfm]Z]a `dfcXi`W]cb`UbX`hY`UYgh`Yh]W]g`UbX`dc`]h]W]c`Z`hY  
@Uhb`5a Yf]WU]b`W]bYa U`cZ`hY`%`\*\$g]!`%` ,`\$g``H`Y`Z]a g`UfY`gh`X]YX`]b`hY]f`dc`]h]W]ž`gcW]U`UbX`W`h`fU`  
Wcb]h]h`

7ci fgY`@YUfb]b[ `Ci hWca Yg

%` ⇒XYbh]ZmhY`gcW]U`žY`Wcbca ]W]UbX`dc`]h]W]`Wcb]h]h`hcZ@Uhb]f]c]5a Yf]WU]b`W]bYa U  
&`8 ]gW`gg`@Uhb`5a Yf]WU]b`Z]a g`Vch` ]b`hYfa`g`cZ]h]h`U`UbX`j ]gi U`UbU`mgYg  
'`" `8 ]gW`gg`hY`X]ZYfYbW]g`VYhk`YYb`hY`bYk `fYbXg`]b`@Uhb`5a Yf]WU]b`W]bYa U`UbX`hY`UYgh`Yh]W]g  
UbX`dc`]h]W]c`Z`hY`@Uhb`5a Yf]WU]b`B`Yk`7 ]bYa U`#`h]fX`7 ]bYa U`cZ`%`\*\$g]!`%` ,`\$g  
(`" `9i`d`U]b`hY`]a dUW]g`cZ[ `cVU]n]U]hcb`UbX`df] U]h]U]hcb`cZ@Uhb`5a Yf]WU]b`W]bYa Uhc[ fUd`m

HYUW]b[ `GhfUHY[ ]Yg`

H\Y`hYUW]b[ `d\]cgcd`micZ\h]g`Wci fgY`]g`]bZ`fa YX`Vm`hY`I`BGK` ;`i ]XY`]bYg`cb`@YUfb]b[ ž`UbX`WU]b`VY  
gi a a Uf]nYX`Ug`9b[ U[ Ya Yb]ž`7`cb]h]h`U`n]U]hcb`UbX`#`Wi`g] YbYgg`fgY`Y`  
[k`k`k`\["i \]XY`\]bYgcb`YUfb\]b\["i`bgk`"YXi`"Ui`\\_`E`"H`Y`Y`W\]h`fYf`\]b`W\]Uf\[ Y`gY`Y`\\_g`hc`dfc\] \]XY`U`j`Ybi`Y`Z`c`f`h`cgY`h`fY`Y`  
\\_Y`mdc\]b\]hgž`UbX`hY`fY`Z`fY`Ya`d`U\]g\]nYg`h`U\]h`hY`Uf\[ Yf`cV`Y`W\]j`Y`\]g`hc`hY`UW\]`gh`i`XYb\]hg`\`ck`hc`VY`Wca`Y`W\]h\]WU`  
YUfbYfg`"](#)

H\]g`Wci fgY`i`gYg`U`V`Yb`XYX`UddfcUW]`cZ`@Y`W]h`fYg`UbX`Hi`hc`f]U`gž`cf[ Ub]nYX`Ufci`bX`\_YmfYUX]b[ g`Ug  
Wcb]h]bYX`]b`hY`7`ci`fgY`F`YUXYf`"

5`Y`W]h`fY`YUW]`k`YY`\_`k`]`UXXfY`gg`hc`d]W]g]`UXXfY`gg`YX`]b`hY`Z]a`J`Yk`]b[ ;`i ]XYg`UbX`F`YUX]b[ g`"A`U`cf]h`m

## 5ggYgga Ybh

8i f]b[ 'h]g'Wci fgYžX]ZYfYbh@Uhb'5a Yf]WUbb'Z]a g'k ]'VY'X]gW ggYX'k ]h'U'fUb[ Y'cZ[ YbfYg'UbX'hc d]Wg ]bWi X]b[ žVi hbchi]a ]hYX'hcžYI ]Yž'a ][ fU]cbž]bX][ Ybci g'hYa Yg'UbX'gi V'Y'Wgž[ YbXYf'fYdfYgYbhU]cbž ]XYbh]mZcfa U]cbž]j c'YbWž'W'cb]nU]cb'UbX'W'h fU'Uddfcdf]U]cb'"H\Y'Z]a g'gY'Y'W'X'Zcf'h]g'WUgg'UfY ]bh'YbX'X'Zcf'a Uhi fY'Ui X]YbW'g'"H\i gž'a cghcZ'hYa 'W'cbU]b'hY'i gY'cZYI d']W'h'Ub[ i U[ Y'UbX'gca Y'a ][ \h \Uj Y'gYI 'gW'byG'cf'bi X]m'žmci 'Z]bX'UbmcZ'hYgY'UgdY'W'g'cZ]bg]j Yžcf'X]Z]W'h'hc'XYU'k ]h'd'YUgY'U' \_hc'hY'Wci fgY'W'cbj Ybcf'UVci hi'Y'fbU]h] Y'WUggfccca 'Ugg][ ba Ybhg'"5''Z]a g'k ]'VY'k U'hW'YX'df]j U'h'mUbX k ]h'hY'UV]]mZcf'mci 'hc'Z]ghZcfk UfX'h'fci [ \i bW'ca Zcf'U'Y'g'W'byG"

Gca Y'h]hYg'UfY'Uj U]UV'Y'Uh? 5BCDMžB9H: @Łžcf'I BGK '@]VfUfm'

H\]g'g]g'U'V'YbX'YX''YUfb]b[ 'Wci fgYžUW]j Y'X]gW gg]cb'UbX'dUfh]W]dU]cb'UfY'fYeI ]fYX''5W]j Y'dUfh]W]dU]cb ]b'h]g'Wci fgY'a YUbg'hUhmci '\Uj Y'a UXY'U'W'cbgfi W]j Yž]bZcfa YX'W'cbf]Vi h]cb'hc'WUgg'X]gW gg]cbg" D'YUgY'W'ca Y'hc'WUgg'dfYdUfYX'"H\]g'a YUbg.'gY'Y'hY'k YY\_'m]Z]a g'UbX'fYUX'hY'dYfh]bYbhUfh]WYg'Zcf'hY dUfh]W'Uf'k YY\_'gc'mci 'UfY'dfYdUfYX'Zcf'WUgg"

## 5ggYgga YbhHUg\_g'

5ggYgga YbhHUg_	K Y][ \h	8i Y'8UH'	Gh XYbh@YUfb]b[ Ci hW'ca Yg'5ggYggYX
h!WUgg'dfYgYbhU]cb'	' \$i	k YY_'!-	%ž&ž ž{

lc'HYb'a ]bi H'g'cZWUgg'X]gW'gg]cb"Mc'k ]'HJ'\_žBC H'F 958"

⊕'UXX]hcb'lc'a U\_]b[ 'hY ]b!WUgg'dfYgYbHhcbžYUW'ghi XYbhk ]''gi Va ]hUb'UbbchHhX'V]V'c[ fUd\m  
f%\$\$\$'k cfXgłž'k \]W'k ]'XYU'k ]h'U'a ]b]a i a 'cZ) 'UWXYa ]Wgci fWg'i gYX ]b'hY'fYgYUfW''YUX]b[ 'lc  
hY'dfYgYbHhcb": cf'YUW'cZ'hYgY'fYZ'fYbW'gž'hY'ghi XYbhk ]'Vf]YZmci h]bY. 'Uł'žca 'k \YfY'hY'hY' h'k Ug  
gci fWX/Vł'k \m]h]g'ja dcfhUbhž'f'hY'łcd]Wgh X]YX/Wł'\ck 'h'k Ug ]bhY[ fUHhX']bhc'hY'dfYgYbHhcb" H\Y'

5XX]h]cbU`XYHJ]g.

5ggYgga Ybh8YgW]dh]cb. 'Gh XYbhg`bYYX`lc`fYgYUfW`U`lc]WfY`Yj Ubhlc`@U]b`5a Yf]W]b`7]bYa U`Vi h  
X]ZZYfYbhZfca`hY`cbY`WcgYb`Zcf`hY`[ fci d`dfYgYbhU]cb""9UW`gh XYbhYXXg`lc`k f]h  
U` \$\$!k cfX`YggUmUbX`]bW` XY`U`V]V`]c [ fUd`micZUh`YUghhYb`UWXYa ]Wgci fWg`Wcbgi`hX`]b









Gi Va ]gg]cb`cZ5ggYgga YbhiHUg\_g

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

≠mci`YbWci bHYf`U`dfcV`Ya`k` \Yb`UH`Ya` dh]b[`hc`gi`Va`]hmc`i`f`Ugg][`ba`Ybhi`h`fci`[`\`Hi`fb]h]b`z`d`Y`Ug`Y`  
HY`Yd`cb`Y`9I`HY`fb`U`Gi`ddc`fh`cb`-`'`,`)`"``'``%`cf`Ya`U]`h`Ya`i`cb`YI`HY`fb`U`HY`hgi`ddc`fh`4`i`bgk`"YXi`"Ui`""Gi`ddc`fh`  
`l`ci`fg`Uf`Y`,`.\$`\$Ua`-`-%`\$.`\$\$`da`i`cb`k`YY`\_X`Umg`U`b`X`-`.`.\$`\$Ua`-`-`.`.\$`\$`da`i`cb`k`YY`\_Y`b`X`g`f`l`\*)`X`Umg`U`m`Y`U`f`l`"≠mci`  
Uf`Y`i`b`U`V`Y`h`c`gi`Va`]hmc`i`f`Ugg][`ba`Ybhi`Xi`Y`h`c`U`Z`Ji`h`k`]h`Hi`fb]h]b`mci`i`a`Um`U`dd`m`Z`c`f`U`b`YI`HY`bg]cb`z`Vi`hmc`i`  
a`i`gh`f`Y`h]b`mci`f`h]W`Y`h`bi`a`V`Y`f`Z`f`ca`9I`HY`fb`U`Gi`ddc`fh`f`U`cb[`k`]h`U`b`m`c`h`Y`f`f`Y`Y`j`U`b`h`X`c`W`a`Y`b`h`g`k`h`c`  
]b`Wi`X`Y`U`g`Y`j`]X`Y`b`W`h`c`gi`ddc`fh`mci`f`YI`HY`bg]cb`U`dd`]W`h]cb`"≠mci`Ya`U]`9I`HY`fb`U`Gi`ddc`fh`mci`k`]`  
Ui`h`ca`U`h]W`U`m`f`Y`W`]j`Y`U`h]W`Y`h`bi`a`V`Y`f`z`Vi`h]Z`mci`HY`Y`d`cb`Y`mci`k`]`b`Y`Y`X`h`c`g`d`Y`W`Z]W`U`m`U`g`\_`Z`c`f`c`b`Y`"  
Hi`fb]h]b`U`g`c`d`f`c`j`]X`Y`g`i`d`X`U`h`Y`g`c`b`h`Y`]f`g`m`g`h`Y`a`i`g`h`U`h`g`c`b`H`k`]h`Y`f`"

;`Y`b`Y`f`U`m`z`U`gg`Y`g`g`a`i`gh`V`Y`gi`Va`]h`Y`X`Y`Y`W`f`c`b]W`U`m`j`]U`Y`]h`Y`f`Hi`fb]h]b`c`f`U`A`cc`X`Y`  
U`gg][`ba`Y`b`h`i`h`]b`g`h`U`b`W`g`k` \Y`f`Y`h`l`g`]g`b`c`h`d`c`g`g]V`Y`z`]h`k`]`V`Y`g`h`U`h`Y`X`c`b`mci`f`W`c`i`fg`Y`g`A`cc`X`Y`g`]h`k`]h`  
U`h`Y`fb`U`h]`Y`gi`Va`]gg]cb`X`Y`h]g`"

:`c`f`]b`Z`c`f`a`U`h]c`b`c`b`l`c`k`h`c`gi`Va`]h`U`gg][`ba`Y`b`h`g`c`b`]b`Y`j`]U`A`cc`X`Y`.\`h`d`g`#`g`h`X`Y`b`h`i`bgk`"YXi`"Ui`#`c`k`!  
gi`Va`]h`U`gg][`ba`Y`b`h`a`cc`X`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]h]Yg'Ug'U'gh XYbhUhl BGK
- VY'Uk UfY'cZd'U[ ]Uf]ga ž'Wc'dmf][ \hž' BGK 'Gh XYbh7cXY'cZ7cbXi W'Ubx'5W'W'dhUV'Y'I gY'cZ I BGK '⇒H'F'Ygci f'W'g'Dc`]W'h
- VY'Uk UfY'cZ'Y'ghUbxUfXg'cZVY\Uj ]ci f'YI dY'W'X'cZYj Yfmcby`]b'h'Y'I BGK 'W'a a i b]m
- `cW'W'h'gYfj ]W'g'UbX' ]bZ'fa U]cb'UVci hl BGK 'UbX'I BGK '@]VfUfm

Gca Y'cZ'Y'gY'UfY'Ug'k ]`VY'ZJa ]]Uf'hc'mci ž'c'h'Y'fg'k ]`VY'bYk "; U]b]b[ 'U'gc`]X'i bXYfghUbx]b[ 'cZU`'h'Y fY'U'Y'X'UgdY'W'g'cZ9@-G9'k ]`'Y'd'mci 'a U\_Y'h'Y'a cgh'cZ'mci f'gh X]Yg'Uhl BGK ""

[\h'hd.##gi V'Y'W'f'i \]X'Y'g"\]V'f'U'f'm'i b'gk "Y'X'i "U'i #' \]g'Y'#\]V'c'i h' \]g'Y](#)

5 WUXYa ]W=Zcfa Uh]cb

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