



ARTS3124

7c`UVcfUhj Y'DYfZcfa UbWY`A U_]b[

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

7 ci fgY`Cj Yfj]Yk

GHJZZ`7 cbHJW`8 YHJ]`g

7 cbj Ybcfg

B Ua Y	9a Uj`	5j Uj`UVj]m	@WJhcb	D\cbY
H\Yfcb`GWa]Xh	h'gVWa]Xh i bgk "YXi "Ui	VmUddc]bha Ybh	K YVghYf`%%&	- ' ,) `` &%

GWcc`7 cbHJW`bZcfa Uh]cb

GWcc`cZHY`5 frg`UbX`A YX]U

Fcca ``%&ž@Yj Y`` žF cVYfhK YVghYf`6i]X]b[`f] %Ł

D\cbY. f\$&Ł- ' ,) `(,) *

9a Uj]: [gUa 4 i bgk "YXi "Ui](#)

K YVg]hY: [k k k "Ufng"i bgk "YXi "Ui #gUa](#)

H\Y`GWcc`cZHY`5 frg`UbX`A YX]U`k ci `X`_Y`hc`F YgdYWw`m5W_bck`YX[Y`hY`HfUX]hcbU`7 i ghcX]Ubgž`hY`6YXY[U`fP`Ybg]b[hcb`WJa di gŁž; UX][U`f7]mUbX`5 ffr`8 Yg][b`7 Ua di gYgŁ`UbX`hY`B [i bbUk U`dYcd`Y`f5i gfrU]Ub`8 YZybW` : cfW`5WUXYa m]b`7 UbVYffUŁcZHY`UbXg`k \YfY`YUW`WJa di g`cZI`BGK`]g`cWJhYX"

5ggYgga Ybh

H\Y'Wci fgY'k]''fYgi 'h]b'U'Z]bU'dYfZcfa UbW'ci hWca Yz'Vi hi\Y'Zcfa Uhi\Jg'k]''fU_Y'k]''cVj]ci g'mXYdYbX
cb'h\Y'g]h U]cb'fY[UfX]b['7CJ =8!%- 'UbX'fYgf]W]cbg'cb'd\mg]W]'[U\Yf]b["'H\Y'dYfZcfa UbW'
ci hWca Y'k]''fU_Y'h\Y'gUZ'hmCZU''dUfh]W]dUbhg]bhc'UW'ci b'z'UbX'Wci 'X']bW' XY'Ui X]YbW'g'k \c'UfY''ja]hYX
]b'bi a VYf'z'k U\W']b['cb']bYz'UbX'#cf'dfYgYbhVi hid\mg]W]'m'X]ghUbW'Xz'fU_]b[']bgd]fU]cb'Zca 'Ufh]g'k \c
\Uj Y'k cf_YX'WYU]h] Y'mk]h'fYa chY'bYgg'UbX'dUfh]W]dU]cbz'Ug'k Y''Ug'XYj]g]b['ci f'ck b'gc'i h'cbg"

5hdfYgYb'z'mci 'g\ci 'X' _YYd'mci f'gV\YXi 'Y'Wca d'Yh'm'WYUf'Zc'f'h\Y'Zc'ck]b['h]a Yg']b'k YY_ '%%

- 5'HYW\ b]W]'F Y\YUfgU'k]h'mci f'[fci d'Xi f]b['h\Y'XUmCZA cbXUmz'&' 'Bcj Ya VYf"
- 5'8fYgg'F Y\YUfgU'Zca ') !- da 'cb'Hi YgXUmz'&'('Bcj Ya VYf'"fMci 'a UmbYYX'hc'a YYhk]h'mci f
[fci d'Xi f]b['h\Y'XUmUg'k Y''L
- Di V']WdYfZcfa UbW'g'UbX'dcghg\ck 'fY!gYhZca ') !%\$'da 'K YXbYgXUm: f]XUmz'&)'!&+'Bcj Ya VYf"

5ggYgga Ybh&. 7`Ugg`W]h]ei Yg

GHUfhXUHy.`

8YhU]`g.

7 f]h]WU`Wca dUf]gcb`cZtk c`dYfZcfa UbWg`Vmimci f`dYYfgž]b`fY`Uh]cb`hc`Wci fgY`h\Ya YgžfYUX]b[gžUbX
fYZfYbW`X`Ufh]g`" %&) \$!%) \$\$`k cfXg"

Hi fb]h]b`Wca a Ybhg"

.

Hi fb]h]b`gYh]b[. H\]g`Ugg][ba Ybh]g`gi Va]h]X`h`fci [\`Hi fb]h]b`UbX`gh XYbhg`WU`b`gYY`Hi fb]h]b`ga]Uf]hm
fYdcfng"

5ggYgga Ybh' .; fci d`dYfZcfa UbW

GHUfhXUHy.`

8YhU]`g.

:]bU`[fci d`dYfZcfa UbW`(&) | `[fci d`a Uf_`Ž`&) | `]bX]j]Xi U`Wcbf]Vi h]cb"Q

.

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

Di V`]WdYfZcfa UbW`]b`k YY_`%%

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

5 HbXUbW F Yei JfYa Ybhg

H\Y'Vei fgY'fi bg'cb'U'd\]cgcd\mi\hUhVcbh'bi U'ma U_]b['WYUhj Y'k cf_zk UH\X]b['ch\Yfgz'UbX'[]j]b['UbX fYVW]j]b['ZYXVUW_]g'YggYbh]U'hc'h\Y'YUfb]b['dfcWVgg"

5g'U'dfUW]W!VUgYX'Vei fgYzh]g'Vei fgY'jg'dfYgYbhmgWYXi 'YX'hc'fi b'ZUW!hc!ZUW']b'H' '&\$&\$'"5`
 H\UW]b['k]'H_U' d'UW']b'h\Y'h\YUhfY'gdUW'g'cZh\Y'9ga Y'H]a VYfm'7 fYUhj Y'DfUW]W'@JVzk \YfY'h\YfY'jg
 gi Z]W]YbhgdUW'hc'a U]b]U]b'd\mg]W]X]g]h]UbW'Zca 'YUW'ch\Yf'i bXYf'W ffYbh[c] Yfba Ybh[i]XY']bYg" K Y
 k]'U'gc'g'Y'VfYU'ci hgh X]cg'gc'hUhYUW' [fci d'Ug']hg'ck b'gdUW'Xi f]b['h\Y'gYVcbX'\U'ZcZh\Y'Vei fgY"

Zh\Y'Vei fgY'fi bg'ZUW!hc!ZUW'Ug'd'UbbYXzk Y'k]'\Uj Y'hk'c'a Yfh]b[g'dYf'k YY_ 'U'(!\ci f'[i]YXX
 k cf_g\cd f'Gh X]c'Zzk \YfY'h\Y'Vei fgY'Ve'b] YbYf'k]'ZUW]]hY'dfUW]W]YI YfW]gYg'UbX']b]fcXi W' \]g]rcf]W'
 UbX'Ve'b]h'a dcfUfm]Y Ua d'Yg/UbX'U' !\ci f'dfUW]W]g\Uf]b['f'c'h\Yf'Zk \YfY'mci 'k]'g\UfY'UbX'fYVW]j Y
 ZYXVUW_]cb'k cf_ 'mci '\Uj Y'XYj Y'cdYX']bX]j]Xi U'mfk YY_g' %d ('U'UbX']b[' fci dg'fk YY_g') !%\$E"

ZV]fW a gh]UbW]g'fYei JfY'hUh'h\Y'Vei fgY'a c] Y'dUfh]U'mcf'Ybh]fY'mcb']bYz'U'hYfbUhj Y'h\UW]b['UbX'g\Uf]b[
 Uff]b[Ya Ybhg'k]'VY'di h]b'd'UW'zk]h'a c]fY'Ya d\Ug]g'cb'UgmbW]fcbci g'fUg_g']b'cfXYf'hc'a]b]a]gY
 cb']bY'ZUj[i Y"

K \Y'h\Yf'ZUW!hc!ZUW'cf'cb']bYz']b'h\YgY'dfUW]W]g'Ygg]cbg'mci 'k]'UW]j Y'mYb[U[Y'k]h'Ve'fY'Vei fgY
 Vcb'h]bh'hUhk]'YbUV'Y'mci 'hc'XYa cbg]fU'h'U'h]ba YbhicZf'cf'\Y'd'mci 'hc'U'h]b]e'7 @c '%f'5dd'm
 Uddfcdf]U'h'h\Yc]fY]W]UbX'd\mg]W]fYgYUfW'dfUW]W]g']b'h\Y'WYU]cb'cZdYfZ'ca UbW'Z'7 @c '&
 f'9j U'i U'h'UbX'Ve'b]g]f] W]j Y'mW]h]ei Y'a U'h]f]U' [YbYfU'h'X']bX]j]Xi U'mUbX']b[' fci dg'Ug'dUfhcZh\Y'WYUhj Y
 dfcWVgg'Z'UbX'7 @c " 'f'k cf_YZYW]j Y'm']b]ga U' [fci dg'zXYj Y'cd]b['Ve''UVcfU]j Y'g_]g'UbX'gY'ZfY']UbW'
]b'd'Ubb]b['UbX'YI YW h]cb'Z"

5 HbXUbW'UhU''WUggYg']g'a UbXU'hc]fm]b'h']g'Vei fgY''i bYI W'gYX'UVgYbW'Zca 'a c]fY'h\Ub'&\$i 'cZ
 WUggYg'k]'fYgi 'h]b'h\Y'Uk UfX'U'Z]]' fUXY"

7 ci fgY'GVX'YXi 'Y

[J \]Yk'WUgg'h\]a YhUV'Y](#)

H]a YhUV'Y'

8 UH	HmdY	7 cbh/bh
K YY_ '% '%('GYdh'a VYf! % 'GYdh'a VYf		dfcXi W]cb'hc'Ve''UVcfU]j Y'a U_]b[. 'GYY]b['h\Y a]fUW'ci g
K YY_ '& .&%GYdh'a VYf! &) 'GYdh'a VYf		Hi YgXUm]gh X]c. '5i hcV]c[fUd\]W]d'YfZ'ca UbW'UbX]X]c]gmbW]U]W[Ygh' fYg" : f]XUm]g\Uf]b[. 'Gc'c'hUg_'%fUi hcV]c[fUd\]W]a UdL dfYgYbh'X']b!WUgg
K YY_ " . '& , 'GYdh'a VYf! &'C'W'cVYf		

K YY_) . %&'C WtcVYf!' %* C WtcVYf		6Y[]bb]b[' [fci d'k cf_
K YY_*. %- 'C WtcVYf!' & C WtcVYf		: 'YI 'k YY_ 'gY'Z[i]XYX'[fci d'YI YfW]gY'hc 'VY Wca d'YhX']bXYdYbXYbhm
K YY_+. '&'C WtcVYf!' '\$ C WtcVYf	5ggYgga Ybh	[fci d'k cf_ 'Z'ZYXVUW_ 7 'Ugg'W]h'ei Y f%&) \$!%) \$\$'k cfXgŁ'Xi Y') da 'cb A cbXUmž '&'C WtcVYf
K YY_'. '&'Bcj Ya VYf!' '* Bcj Ya VYf		[fci d'k cf_ 'Z'ZYXVUW_
K YY_'. '- 'Bcj Ya VYf! '% 'Bcj Ya VYf		[fci d'k cf_ 'Z'ZYXVUW_
K YY_ '%\$. '%* 'Bcj Ya VYf! &\$'Bcj Ya VYf		[fci d'k cf_ 'Z'ZYXVUW_ K YY_ '%%' DfcXi W]cb'k YY_ 'HYW.b]W]fi b'cb A cbXUm'XfYgg'fY\YUfgU'cb'Hi YgXUm'di V]W dYfZcfa UbW]g'cb'K YXbYgXUnž'H\i fgXUmž UbX : f]XUmfH67 'VUgYX'cb'fYgh]W]cbg'cb [Uh\Yf]b[Ł

F Ygci fWg

DfYgWf]VYX`F Ygci fWg`

H\YfY`k]`VY`g\cfhVfYU_g`Uhgj]hUV`Y`dc]bfg`Xi`f]b[`YUWX`k`YY`_`m`WUgg"i`gY`cZd\cbYg`UbX`Udhdg`k]`
bchVY`dYfa]hYX`Xi`f]b[`WUgg"i`6f]b[`hc`YUWX`WUgg. VcHhY`cZk`Uhf`UbX`U`gbUW`z`Wca`ZcfhUV`Y`WcH`Yg`Zcf`
a`cj`Ya`Ybhz`UbX`U`bchVcc`_`UbX`dYb"

F YWca a YbXYX`F Ygci fWg

D`YUgY`gYY`@Y[`Ubhc`Zcf`hY`]ghcZfYWca`a`YbXYX`hY`hg`fY`UfYX`hc`YUWX`k`YY`_`f`hYa`Yzk` \]W`k]`VY`i`gYZ`
Zcf`hY`WUgg`W]h`ei`Yg"

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`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`"Ʒmci`
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`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`"Ʒmci`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`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'5Ww'dhUV'Y'I gY'cZ I BGK '⇒H'F Ygci fW'g'Dc`]Wm
- VY'Uk UfY'cZh'Y'ghUbxUfXg'cZVY\Uj]ci f'YI dYW'X'cZYj Yfmcby`]b'h'Y'I BGK 'Wc'a a i b]m
- `cWJh'gYfj]W'g'UbX'j]bZcfa Uh]cb'UVci hl BGK 'UbX'I BGK '@]VfUfm

Gca Y'cZh'YgY'UfYUg'k]`VY'ZJa]]Uf'hc'mci ž'ch'Yfg'k]`VY'byk "; U]b]b['U'gc`]X'i bXYfghUbx]b['cZU`h'Y fY'UH'X'UgdYW'g'cZ9@G9'k]`Y'd'mci 'a U_Y'h'Y'a cghcZmci f'gh X]Yg'Uhl BGK ""

[\hd. #gj V'YWf i \]XYg" \]VfUfm'i bgk "YXi "Ui #'\]gY#JVci h' \]gY](#)

5 WUXYa]W=Zcfa Uh]cb

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

- fYei Ygth`Zcf`Yl Hrbg]cb/