



ARTS3122

K cf_]b[']b'h\Y'DYfZcfa]b['5 fmg

HYfa 'H\fYY'##'&\$&\$

GWXcc``cZHAY'5fmg'UbX'A YXJU``# 'I BGK ``5fmg'UbX'GcWJU``GWYbWg

7ci fgY`Cj Yfj]Yk

GHJZZ7cbHJW`8YHJ`g

7cbj Ybcfg

B Ua Y	9a Uj`	5j Uj`UVj`]m	@cWjhcb	D\cbY
7Ufc`]bY`K U_Y	Wk U_Y4 i bgk "YXi "Ui	K YXbYgXUm&!` da	F cca `&(` *9ž @Yj Y`&ž F cVYfh K YVghYf	- ' ,) ` \$+&\$

GWcc`7cbHJW`bZcfa Uhjcb

GWcc`cZhY`5fng`UbX`A YX]U

F cca ` ` %&ž@Y] Y` ž F cVYfhK YVghYf`6i]X]b[`fl` %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`5fng`UbX`A YX]U`k ci `X`_]Y`fc`F YgdYWz`m5W_bck`YX[Y`hY`HfUX]hcbU`7i`ghcX]Ubgž`hY`6YXY[U`fP`Ybg]b[hcb`WJa di`gŁž; UX][U`f7`]mUbX`5fh/`8Yg][b`7 Ua di`gYgŁ`UbX`hY`B [i`bbUk U`dYcd`Y`f5i`ghfU]Ub`8YZYbW` : cfW`5WUXYa m]b`7 UbVYffUŁ`cZhY`UbXg`k \YfY`YUW`WJa di`g`cZI`BGK`]g`c`WJhYX"

7 ci fgY'8YHJ]`g

7 fYX]hDc]bng`*`

Gi a a UfmicZh\Y'7 ci fgY

DfYdUFY`mci fgY'Zcf'U'WUfYf'j]b'h\Y'dYfZcfa]b['Ufng"K cf_]b[]b'h\Y'DYfZcfa]b['5fng'dfcj]XYg'Ub
cf]YbHh]cb'hc'k cf_]b[]b'h\Y']bXi gfmhcXUm'i'K]h['i Ygh'YWhi fYg'Zca]bXi gfm'YUXYfgz'mci 'k]`YI d'cfY
dYfgdYWh] Yg'cb'h\Y'Yj c'i h]cb'cZh\Y'dYfZcfa]b['Ufng'UbX'[U]b]bg][\hg:]bhc'h\Y'W'hi fU'ZcfWg'h\Uhg\UdY
dfcXi Wh]cb'UbX'dfc[fUa a]b['XYW]g]cbg'hcXUm'i'Mci 'k]`k cf_]cb'U'[i]YX'fYgYUfW' d'cf'YWh'hc'd'Ub'U
gYUgcb'cf'W fUHY'dYfZcfa UbW'dfc[fUa 'Zcf'Ub'Ufng'cf[Ub]gU]cb'mci '\Uj Y'W'cgYb" H\Y'U]a]g'hc'W'cbYWh
mci f'YUfb]b['Uhi b]j Yfg]mik]h'h\Y'W fYbghfUHY'cZh\Y'Ufng'UbX'YbW'ci fU[Y'mci 'hc'YI d'cfY'dfcgdYWh]Zcf
W'cb]Vi h]b['hc'h\Y']bXi gfmUZYf'mci '[fUXi UHY"

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

%` #j Ygh[UHY'h\Y'Z]Y'X'cZ5i gfu']Ub'h\YUfYz'dYfZcfa UbW'UbX#cf'XUbW'UbX'h\Y'gcW]U'zYh]WU'UbX
W'hi fU'UgdYWh]cZdfcXi Wh]cb'UbX'W'cbgi a dh]cb
&" 5bU'mgY'g][b]Z]W]bhk cf_g'cZh\YUfYz'dYfZcfa UbW'UbX#cf'XUbW']b'fY'U]cb'hc'gW'c'Uf'mfYgYUfW
UbX'Uf]gh]WdfUWh]W
' " #hYfdYh'h\Y'h\YUf]W' d'fUWh]W'g'g'mYg'UbX'W'cbj Ybh]cbg'cZ5i gfu']Ub'h\YUfYz'dYfZcfa UbW
UbX#cf'XUbW'hc'XYj]gY'Uf]gh]WZ]Ua Yk cf_g'Zcf'dfc[fUa a]b[
(" 5dd'mg_]`g]b'fYgYUfW'UbX'W fU]cb'hc'dfYgYbhcf][]bU']XYUg'Zcf'dfc[fUa a]b[]b'dfYgYbHh]cbg
UbX'k f]h]b[

HYUW]b['GhfUHY[]Yg`

H\]g'W'ci fgY'd'UW'g'Ub'Ya d\Ug]g'cb'W'ca d'YI 'W]h]W'UbX'W'hi fU'h]b_]b[z'k]h'h\Y'U]a 'hc'Yb\UbW'h\Y
gh XYb]gf]W]dU]m]Zcf'UbU'm]W'YI W'YbW'UbX'gfu]Y[]Wd'Ubb]b[" #i]g'U'gc'XYg][bYX'hc'XYdYb'h\Y]f
'Yj Y'cZYb[U[Ya Ybhk]h']hg'fUb[Y'cZ\]g'hc'f]W'z'Uf]gh]W'z'dc']h]W'UbX'gcW]U' h]g'UbX'ei Ygh]cbg" H\Y
ZcW'g'cb'h\Y'5i gfu']Ub'h\YUfYz'XUbW'UbX'dYfZcfa]b['Ufng']bXi gfu]Yg]g]bhYbXYX'hc'VfcUXYb'h\Y
gh XYb]gf]i bXYfg]UbX]b['cZh\Y]f'ck b'W'hi fY'UbX'cZh\Y'5i gfu']Ub'dYfZcfa]b['Ufng]z'UbX'hc'dfcj]XY'U
'YUfb]b['UbX'fYgYUfW'YI dYf]YbW'h\Uhk]`dfYdUFY'h\Ya 'Zcf'Z hi fY'Ya d'cma Ybh' #h'Y' !\ci f'k cf_g\cdg
gh XYb]h]dfc'YWh]k]`VY'g\UfYXz'X]gW'ggYXz'dfYgYbh'X'UbX'W'ca d'UfYX" H\Y'k cf_g\cdg'UfY'XYg][bYX'hc
YbW'ci fU[Y'h\Y'W'ca V]b]h]cb'cZ'W'cbW'dh] U'UbX'Ya VcX]YX'i bXYfg]UbX]b['h\U]g'W'UfUWh]f]gh]WcZh\Y
gh XYb]gf]a U]b'cV'YWh]cZgh Xnzh\YUfYz'XUbW'UbX'dYfZcfa UbW' @YUfb]b['k]`VY'Ui [a Ybh'X'k]h'cb']bY
X]gW'gg]cb"

Ž'7 f]hW'UddfcUW'-'UbU'mg]g'cZ'UbX'W]hW'Yb[U[Ya Ybhk]hžhY' _YmHl hg'mci 'UfY'XfUk]b['Zca
Ž'Ghf' W' fY'-'cf[Ub]gU]cb'cZmci f'YggUm]b'U'WYUf'UbX'`c[]W'k Um
Ž'GmY'-'Zi Ybž'WYUf'UbX'VčbW]gY'k f]h[

@YUfb]b['Ci hW'a Yg

%' 'b] Ygh[UH' h'Y' Ž]Y'X'cZ5i ghfU']Ub'h'YUhfYž'dYfZcfa UbW' UbX#cf'XUbW' UbX'h'Y'gcW]Už'Yh.]W' UbX
W' h' fU'UgdYWg'cZdfcXi W]cb'UbX'Včbgi a dh]cb
&"'5bU'mgY'g][b]Z]W]bhk cf_g'cZh'YUhfYž'dYfZcfa UbW' UbX#cf'XUbW']b'fY'U]cb'hc'gW'c'Uf'mfYgYUfW' UbX
Ufh]gh]WdfUW]W
("'5dd'mg_]`g]b'fYgYUfW' UbX'W fU]cb'hc'dfYgYbhcf][]bU']XYUg'Zc'f'cfc[fUa a]b[]b'dfYgYb]h]cbg'UbX
k f]h[

Hi fb]h]b'gYH]b[. H\]g'Ugg][ba Ybh]g'gi Va]H'X'h'fci [\ 'Hi fb]h]b'UbX'ghi XYb]g'Xc'bchgYY'Hi fb]h]b
g]a]Uf]m'fYdcf]g"

5ggYgga Ybh&. '7i fUhc'f]U'#dfc[fUa a]b['dfc'YW'idfc'c'cgU'

GHUfhXUH'. 'Bch5dd`]WV'Y

@Yb[h. '%&) \$'k cfXg

8YH]`g.

%&) \$'k cfX']bX]]Xi U'`dfc'c'cgU'"

Gh XYb]g'k]`'fYW'j] Y'U'fi Vf]W]bX]W]h]b[]Yj Y'`cZdYfZcfa UbW' U[U]bghYUW' UggYgga YbhW]h'f]Už'k f]H'Yb
Zcfa U]h] Y'ZYXVUW_ž'UbX'dYfW'bh]U[Y'a Uf'_"

5XX]h]cbU'XYH]`g.

K f]h' U'%'&) \$'k cfX']bX]]Xi U'`dfc'c'cgU'ž'Zc'W'g]b['cb'Y'h'Yf'Ufh]gh]WfYgYUfW'ž'_YmVčbW'dhg#]g]cbž']bXi ghfm
dUfbYfg\]dgž'a Uf_Y]h]b[#di V]W]m'cf'ž' bX]b[#dfcXi W]b['Zc'f'mci f' [fci d'W' fUhc'f]U'#dfc[fUa a]b['dfc'YW'

5ggYgga Ybh7 f]h'f]U

Ž'7 cb]h]b]-'mci f'Ufh]W' U]cb'cZh'Y'VčbW'dhcf'dfc'YW'h'Ya Y#_Ym]XYU'UbX'\ck' mci f'Vča' dcbYbhk]`
gi ddcf]h]g
Ž'7 f]hW'UddfcUW'-'UbU'mg]g'cZh'Y'Yh.]W'ž'gcW]U'UbX'dc`]h]W']ggi Yg'UbX'Yb[U[Ya Ybhk]h'U'Uf[Yh
Ui X]YbW
Ž'Ghf' W' fY'-'cf[Ub]gU]cb'cZmci f'dfc'c'cgU']b'U'WYUf'UbX'UW]W]gg]V'Y'k Um
Ž'GmY'-'Zi Ybh'WYUf'UbX'VčbW]gY'k f]h[

@YUfb]b['Ci hW'a Yg

%' 'b] Ygh[UH' h'Y' Ž]Y'X'cZ5i ghfU']Ub'h'YUhfYž'dYfZcfa UbW' UbX#cf'XUbW' UbX'h'Y'gcW]Už'Yh.]W' UbX
W' h' fU'UgdYWg'cZdfcXi W]cb'UbX'Včbgi a dh]cb
' "' 'b]fd'fYh'h'Y'h'YUf]W' d'fUW]W]gž'gmiYg'UbX'Včb] Ybh]cbg'cZ5i ghfU']Ub'h'YUhfYž'dYfZcfa UbW' UbX#cf'
XUbW'hc'XYj]gY'Ufh]gh]W]Ua Yk cf_g'Zc'f'cfc[fUa a]b[
("'5dd'mg_]`g]b'fYgYUfW' UbX'W fU]cb'hc'dfYgYbhcf][]bU']XYUg'Zc'f'cfc[fUa a]b[]b'dfYgYb]h]cbg'UbX
k f]h[

Hi fb]h]b'gYH]b[. H\]g'Ugg][ba Ybh]g'gi Va]H'X'h'fci [\ 'Hi fb]h]b'UbX'ghi XYb]g'Xc'bchgYY'Hi fb]h]b

g]a]Uf]mfYdcfng"

5ggYgga Ybh' . '7i fUc f]U`#dfc[fUa a]b['dfc ^WidfYgYbhU]cb

GhUfhXUHY. 'Bch5dd`]WV`Y

@Yb[h. '%\$a]b

8YhU]`g.

5ggYgga Ybh7f]hYf]U

Ž'7cbhYbh-:mci f'Ufh]W`Uh]cb'cZhY`VebW`dhicf'dfc`YWh`hYa`Y#_Ym]XYU`h'fci`[\`h`Y`gY`YW]cb'cZUfh]g]g
Ž'7f]h]W`UddfcUW`-`UbU`mg]g`k`]h`h`Y`Yh`]W`ž`gcV]U`UbX`dc`h]W`]ggi`Yg`UbX`Yb[`U[`Ya`Ybhk`]h`U`h]f[`Yh
Ui`X]YbVW

Ž`Ghfi`W`fY`-`cf[`Ub]gU]cb'cZmci`f'dfcdcgU`]b`U`WYUf`UbX`UWY]gg]V`Y`k`Um

Ž`GhmY`-`Zi`YbhWYUf`UbX`VebV]gY`k`f]h]b[

@YUfb]b[`i`hV`a`Yg

%`:`b]`Ygh[`Uh`h`Y`Z]Y`X`cZ5i`ghfU`]Ub`h`YUhfY`ž`dYfZcfa`UbVW`UbX`#`f`XUbW`UbX`h`Y`gcV]U`ž`Yh`]W`UbX
W`h`fU`UgdYVW]cZdfcXi`W]cb`UbX`Vebgi`a`dh]cb

&`5bU`mgY`g[`b]Z]W]bhk`cf_g`cZhYUhfY`ž`dYfZcfa`UbVW`UbX`#`f`XUbW`]b`fY`Uh]cb`h`c`gW]c`Uf`mfYgYUfW`UbX
Ufh]gh]WdfUW]VW

'`:`hYfdYh`h`Y`h`YUhf]W`dfUW]VW]gž`ghmYg`UbX`Veb]`Ybh]cbg`cZ5i`ghfU`]Ub`h`YUhfY`ž`dYfZcfa`UbVW`UbX`#`f`
XUbW`h`c`XYj`]gY`Ufh]gh]WZ]Ua`Yk`cf_g`Zc`f`dfc[`fUa`a`]b[

(`5dd`mg_]`g`]b`fYgYUfW`UbX`W`fU]cb`h`c`dfYgYbhcf][`]bU`]XYUg`Zc`f`dfc[`fUa`a`]b[`]b`dfYgYb]h]cbg`UbX
k`f]h]b[

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

F Ygci fWg

DfYgWf]VYX`F Ygci fWg`

F YWca a YbXYX`F Ygci fWg

9I dYWX`fYgci fWg`Zcf`hY`Wci fgY`UFY`Uj U]UV`Y`hfcI [\`@Y[Ubhc`cb`hY`Wci fgY`A ccX`YžhY
I BGK `@]VfUfmiUbX`W`h`fU`]bgh]h`hcbg"

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

DYf]cX]W`mghi XYbhYj U`i Uh] Y`ZYXVUW`cb`hY`Wci fgY`]g`[U`hYfYXž`i`g]b[`Ua cb[`chYf`a YUbgž`I BGK`fj
Gh XYbhGi fj YmidfcWgg" Gh XYbhZYXVUW`]g`hU`Yb`gYf]ci g`mž`UbX`Wc`bh]bi U`]a dfcj Ya Ybhg`UFY`a UXY`hc
hY`Wci fgY`VUgYX`]b`dUfhcb`gi W`ZYXVUW`"G][b]Z]WbhW]Ub[Yg`hc`hY`Wci fgY`k`]"`VY`Wca a i b]W]hYX`hc
gi VgYei YbhWc`cfhg`cZgh XYbhg`hU`]b[`hY`Wci fgY`"

Gi Va]gg]cb 'cZ5ggYgga YbhiHUg_g

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

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'Wcdmf][\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'j]b'h'Y'I BGK 'Wca a i b]m
- `cWJh'gYfj]Wg'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 ""

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

5 WUXYa]W=Zcfa Uh]cb

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

- fYei Ygh]Zc`Yl H`bg]cb/
- `Uh`gi Va]gg]cbg`[i]XY`]bYg/
- fYj]Yk `cZa Uf_g/
-