



ARTS1091

A YX]Už'GcWjYmž'Dc`j]Wg

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

7ci fgY`Cj Yfj JYk

`GHUZZ7cbhUW`i8YHUJ`g`

`7cbj Ybcfg`

B Ua Y	9a Uj`	5j Uj`UVj`]m	@cWUjcb	D\cbY
HUFU`A W@YbbUb	h`a WYbbUb4 i bgk "YXi "Ui	K YXbYgXUmg`%Ja !`%&da `UbX`Vm Uddc]bha Ybh	K YVghYf`G5A cZjWg	

GWXcc`7cbhUW`i8Zcfa Ujcb

Fcca " %&Z`Yj Y`" `F cVYfhK YVghYf`6i]X]b[

D\cbY. f\$&E`- ' ,) (,) *

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

K YVghYf` [\hfdg.#gUa "Ufng"i bgk "YXi "Ui](#)

H\Y`GWXcc`cZ`hY`5fng`UbX`A YX]U`k ci `X`_]Y`9 † %o

7ci fgY'8YHJ]`g

7fYX]h'Dc]bHg '*`

Gi a a UfmcZ\Y'7ci fgY

5ggYgga Ybh

H\]g`Wci fgY`ci h]bY`XcW a Ybh]g`df]a Uf]`mU`dc`]WnXcW a YbhCB@M`D`YUgY`fYZf`hc`h\Y`7ci fgY`
#Zcfa Uh]cb`UfYU`cb`A ccX`Y`Zcf`Wca dfY\Ybg]j`Y`XYHJ]`g`UVci h\Y`Wci fgYz]bWi X]b[`h\Y`
UggYgga YbhHJg_g"

5ggYgga YbhHJg_g`

5ggYgga YbhHJg_g`			

ZUa Yk cf_gžhYcf]Ygž'UbX'W]hW`dYfgdYWj Yg Zca`hY'Wci fgY'a UHYf]U"

a YUb]b[ž `gYhcZcVgYfj Uh]cbg'cf'dc]bHg

Gi Va]gg]cb'bcH'g.B"6"8cbfñZcf[Yhlc'g][b'i d'Zcf'mci f'dfYgYbHh]cb'h]a Yg'jb'K 99? 'CB9"'GYY'A ccX'Y Zcf'XYHJ]g"

5ggYgga Ybh' . F YgYUfWx 'DcftZc`]c

GhUfhXUHY. '

@Yb[h. '5ddfcl "'%\$\$\$'k cfXg'dYf'YbHfm'

8YHJ]g. 'DcftZc`]cž&ž\$\$\$'hc'&ž) \$\$\$'k cfXgž) \$i. "'H\]g']g'hY' ZbU'Ugg][ba Ybh'7 \ccgY'HK C 'hcd]Wg'Zca 'hY gYVcbX'\U'ZcZHY'Vci fgYžUbX'a U_Y'dfcXi Wñj Y'i gY'cZHYgY'hcd]Wg'UbX'UggcW]UH'X'a UHYf]U'g'Zca 'hY Vci fgY'Ug'U'k \c'Yžhc'WYUH]j Y'mfYZYWñi dcb'UbX'UbU'mgY'gdYW]Z]WUgdYWg#Y'a Ybhg'cZci f'VcbH'a dcfUfm a YX]UH'X'k cfX": YXXVUW_k]'VY'dfcj]XYX'j]U'@A G"

5XX]h]cbU'XYHJ]g.

H\Y'DcftZc`]c]g'Vca df]gYX'cZhk c'YbH]Yg'h.UhUXXfYgg'hk c'Vci fgY'hcd]Wg'cZmci f'Wxc]W"'fMci 'WUb'W'ccgY Zca '@YVñ fY'hcd]Wg']b'K YY_g') !%\$" 'Mci f'hk c'd]H\X'hcd]Wg'UfY 'BC H'Uj U]UV'Y'Zcf'gY'YWñ]cb'E'Mci 'UFY YI dYWñX'hc'XfUk 'cb'UbX'YZZYWñj Y'mYb[U[Y'k]h'hY'fYUX]b[g'Zca 'hY'Vci fgY"'Mci 'UFY'YbVci fU[YX'hc i gY'hY'Vcbi g'fYUX]b[g'Ug'gi dd'Ya YbHfma UHYf]U' /Zmci 'k]g\žmci 'WUb'U'gc'XfUk 'Zca 'YI h'fbU' fYUX]b[g'UbX'gci fW'g"'Mci 'UFY'UXj]gYX'hc'Vca d]Y'Vci fgY'bcH'g'Yj Yfmk YY_Zca 'hY'fYUX]b[g'UbX 'YVñi fYgžUbX'hYgY'Vci fgY'bcH'g'WUb'hYb'VY'XfUk b'cb'UbX'dfcdYfmk f]H'Yb'i d'Zcf'mci f'DcftZc`]c'YbH]Yg"

H\Y'DcftZc`]c]g']bH'YbXXY'hc'\Y'd'mci 'XcW'a YbhUbX'k cf_ 'h'fci [\ 'U'fUb[Y'cZ_Ym]ggi Ygž]XYUgžVcbW'dhgž Uf[i a YbhgžW]gY'gh X]YgžUbX'hYcfYh]W' 'hcc'g' H\]g'UggYgga Ybh]g'BC H'UVci hg]a d'mdfcj]X]b[gi a a Uf]YgžUbX']h]g'BC H'UVci hdUgg]j Y'mfY[i f[]H]h]b['VcbH'YbH'Zmci 'k]g\žmci 'a UmVY[]b'YUW'YbHfm Vmdfcj]X]b['U'ei]W_cj Yfj]Yk 'cZ_Ymdc]bHg'UbX'VcbW'dhg;-Vi h'hY'a U]b'ZcW'g']g'cb'\ck 'mci 'W]h]W'm X]gW'gg'UbX'fYZYWñicb'hY'W'bfU']ggi Yg'UbX'hYcf]Yg"'Mci 'UFY'fYei]fYX'hc'a U_Y'fY'Yj Ubh Vcbg'hfi Wñj Y'VcbW'dh U'VcbbYVñ]cbg'k]h'c'hYf'k YY_'m'hcd]Wg'UbX'a UHYf]U'g']b'mci f'YbH]Yg"

D'YUgY'bcH'h.Uh'hY'ZbU'YVñi fY'cZHY'f]a Ygh'f'k]'VcbH]b'i gYž `]bZca Uh]cb'cb'\ck 'hc'fYj]Yk žYX]h UbX'XYj Y'cd'mci f'dcftZc`]c'VYZcfY'gi Va]gg]cb"

5 HbXUbW F Yei]fYa Ybhg

Gh XYbhg UfY gfhcb [mYbWci fu[YX hc UHbX U WUggYg UbX fYj]Yk YWfi fY fYWcfX]b[g"

7 ci fgY GWYXi Y

[J Yk WUgg ha YhUVY](#)

Hja YhUVY

8UhY	HmdY	7cbhYbh
K YY_% %* GYdhYa VYf! &\$ GYdhYa VYf	@YWi fY	Hcd]W! '8][]H' A YX]U'UbX'A YX]U'9ZZYWg D`YUgY`bchY`h.Uh`h.YfY`k]`VY`bc`h` hc`f]U`g`h`lg k YY_`z`Vi`h`h`Y`Z]fgh`Y`Wfi`fY`k]`VY`]a`dcffU`bh`Z`c`f` gY`h]b[`i`d`h`Y`Z]Ua`Yk`cf`_g`UbX`YI`dY`WU]h`cbg`c`Z`h`Y` Wci`fgY`" Mci`k]`U`gc`VY`Ug`YX`hc`[`c`hc`A`ccX`Y`hc`g`W`Y`Xi`Y` mci`f`d]h`W`Y`g`Z`c`f`5`gg`Y`gga`Y`bh`Hk`c`f`g`Y`Y`ci`f` Ugg`Y`gga`Y`bhg`]b`Z`c`E`"HU`_`Y`gca`Y`h`ja`Y`hc`f`Yj`]Yk`h`Y` Wci`fgY`]b`Z`c`fa`U]`cb`cb`A`ccX`Y`UbX`g`Y`Wfi`h`Y`h`c` hc`d]W`h`Uha`c`gh`Udd`Y`U`hc`mci`"Hi`hc`f]U`d]h`W` g`W`Y`Xi`Y`g`k]`VY`Uff`Ub[YX`U`W`W`c`f`X]b[`hc`U`Z]f`gh` Wca`Y`Z`Z]f`gh`g`Y`fj`YX`V`U`g]g`z`gc`d`Y`U`g`Y`VY`f`Y`U`X`m`hc` U`c`W`U`h`Y`mci`f`h`ja`Y`"H`Y`cb`]b`Y`g`W`Y`Xi`]b[Udd`]W`U]h`cb`g`k]`VY`a`U`X`Y`U`j`U`]U`V`Y`hc`k`U`f`X`g`h`Y`Y`b`X` c`Z`h`Y`Z]f`gh`Y`Wfi`fY`h`lg`k`YY`_"
K YY_&.&' GYdhYa VYf! &+ GYdhYa VYf		Hi hc`f]U`Hcd]W! '8][]H' A YX]U'UbX'A YX]U'9ZZYWg` @YWi fY`Hcd]W! `C`b`]b`Y`5`i`X]Y`b`W`g`Ub`X` B`Y`h`k`cf`_`Y`X`G`c`W]U`K`c`f`X`g` D`Y`U`g`Y`b`c`h`Y`h`Y`g`h`U`[`]`Y`f`Y`X`U`ff`U`b`[`Y`a`Y`b`h`c`Z`Y`Wfi`f`Y`g` U`b`X`h`hc`f]U`g`Z`c`f`h`lg`Wci`fgY`"9`U`W`h`hc`f]U` Z`W`g`Y`g`c`b`h`Y`hc`d]W`d`f`Y`g`Y`b`h`X`]b`h`Y`Y`Wfi`fY`Z`c`a` h`Y`d`f`Y`W`X]b[`k`YY`_"
K YY_`.'` \$ GYdhYa VYf! (`C`W`c`V`Y`f`		Hi hc`f]U`Hcd]W! `C`b`]b`Y`5`i`X]Y`b`W`g`Ub`X` B`Y`h`k`cf`_`Y`X`G`c`W]U`K`c`f`X`g` @YWi fY`Hcd]W! `A`i`h`ja`c`X`U`]m`C`b`]b`Y`. `G`Y`a`]`c`h]W`g`z` =a`U[`Y`Z`G`c`i`b`X`/`H`Y`I`h` f`D`Y`U`g`Y`g`Y`Y`A`cc`X`Y`Z`c`f`X`Y`U`]Y`X`]b`Z`c`fa`U]`cb`cb` Y`U`W`k`YY`_`f]`W`c`b`W`d`h`U`Z`c`W`g`t`
K YY_(`.+`C`W`c`V`Y`f`!`%%` C`W`c`V`Y`f`	5ggYgga Ybh	5ggYgga Ybh`C`b`Y`8`i`Y`. :`f]X`U`m`%`h`C`W`c`V`Y`f`z` %`%)`\$`da` Hi hc`f]U`Hcd]W! `A`i`h`ja`c`X`U`]m`C`b`]b`Y`. G`Y`a`]`c`h]W`g`z`=a`U[`Y`Z`G`c`i`b`X`Ub`X`H`Y`I`h`

		@YWi fY'Hcd]W! :Xyb]mUg'8UHJ. 'H\Y A cbYh]nUh]cb'cZci f'="8"
K YY_) .%('C WtVYf!' % C WtVYf	6`YbXYX	Hi hc]U'Hcd]W! :Xyb]mUg'8UHJ. 'H\Y A cbYh]nUh]cb'cZci f'="8" C b`]bY`YWi fY!' GcW]U`A YX]U'UbX`Xc`c[m`Ci f @j Yg`C b`]bY D`YUgY`bcH. 'h]g`k YY_`hYfY`k]`VY`bc`]b!dYfgcb 'YWi fY`]b`hY`7`UbWn5i X]hc]j a`" `bghYUXZ`Ub`c b`]bY j]XYc`YWi fY`k]`VY`a UXY`Uj U]V`Y`hc`mci`Uh`hY gUa Y`h]a Y`Ug`mci f`i gi U`YWi fY`h]a Yg`c]f`
K YY_*. '&%C WtVYf!' &) C WtVYf		Hi hc]U'Hcd]W! :GcW]U`A YX]U'UbX`Xc`c[m`Ci f @j Yg`C b`]bY @YWi fY'Hcd]W! : fUa Yg`cZA YUb]b[]`b`HfYbX]b[BYk g. 'G\Ud]b[`hY`5[YbXU D`YUgY`bcH. 'H\Y`]b!dYfgcb`YWi fY`Uh`hY`7`UbWn 5i X]hc]j a`]g`VUW`i d`UbX`fi bb]b[`h]g`k YY_`"
K YY_+. '& 'C WtVYf!' % Bcj Ya VYf		Hi hc]U'Hcd]W! : fUa Yg`cZA YUb]b[]`b`HfYbX]b[BYk g. 'G\Ud]b[`hY`5[YbXU @YWi fY'Hcd]W! :5`[cf]h]a]W7i `hi fY. `5i X]YbWgZ 5Wwgg`UbX`6i g]bYgg
K YY_). '('Bcj Ya VYf!' Bcj Ya VYf		Hi hc]U'Hcd]W! :5`[cf]h]a]W7i `hi fY. 5i X]YbWgZ`5Wwgg`UbX`6i g]bYgg @YWi fY'Hcd]W! :5ZcfXUbWg`UbX`hY`5`hYb]cb 9W`bca m
K YY_-. '%Bcj Ya VYf!') `Bcj Ya VYf		Hi hc]U'Hcd]W! :5ZcfXUbWg`UbX`hY`5`hYb]cb 9W`bca m @YWi fY'Hcd]W! :XYU`g`cZ`hY`Di V`]WGD`YfY. 'hY `b`hYfbYhZ`>ci fbU]ga`UbX`8Ya cW`UWnCb`]bY
K YY_%. '% `Bcj Ya VYf!' &&`Bcj Ya VYf	5ggYgga Ybh	5ggYgga YbhH`fY`8i Y. : f]XUm&&bX`cZ Bcj Ya VYfZ`%) \$da Hi hc]U'Hcd]W! :XYU`g`cZ`hY`Di V`]WGD`YfY. 'hY `b`hYfbYhZ`>ci fbU]ga`UbX`8Ya cW`UWnCb`]bY @YWi fY'Hcd]W! :A YX]U]nUh]cb. ; `cVU` : `ck`g`UbX 7i `hi fU`7cb]h]g D`YUgY`bcH`h`Uh`hY`YWi fY`h]g`k YY_`k]`cZyf `\Y`dZ`]]bZcfa U]cb`UVci h\ck`hc`fy] jYk`ZfY]bY`UbX W`a d`Yh`mci f`Z]bU`UggYggga YbZ`hY`F YgYUfW Dc`fZ`]c"

F Ygci fWg

DfYgWf]VYX`F Ygci fWg`

F Ygci fWg`Zcf`hY`Wci fgY`k]`VY`dfcj]XYX`j]U`A ccX`Y"

D`YUgY`U`gc`bch`h`Uhh`YfY`k]`VY`k cf_g\cdg`]b`hi`hcf]U`g`h`gi`ddcfhgh`XYbthg`]b`dfcXi`W]b[`h`Y]f`UggYgga`Ybh]Ug_g"

F YWca a YbXYX`F Ygci fWg

F Ygci fWg`Zcf`hY`Wci fgY`k]`VY`dfcj]XYX`j]U`A ccX`Y"

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

F YZf`h`A ccX`Y"

Gi Va]gg]cb`cZ5ggYgga YbhHUg_g

Gi Va]gg]cb`cZ5ggYgga YbhHUg_g

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

Ẓmci `YbWci bhYf`U`dfcV`Ya `k \Yb`U`H`Ya dh]b[`hc`gi Va]hmc i f`Ugg][ba YbhHfci [\`Hi fb]h]bžd`YUgY
H`Yd\cbY`9I H`fbU`Gi ddcfhcb`-` ,) `` `` ` %cf`Ya U]`H`Ya `cb`YI H`fbU`H`hgi 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`m`YUfL` Ẓmci
UfY`i bUV`Y`hc`gi Va]hmc i f`Ugg][ba YbhXi Y`hc`U`ZU` `hk]H`Hi fb]h]b`mci `a UmiUdd`miZc`f`Ub`YI H`bg]cbžVi hmc i
a i ghfYH]b`mci f`h]W`Yhbi a VYf`Zca `9I H`fbU`Gi ddcfhfU`cb[`k]H`Ubmch`Yf`fY`Yj UbhXcW a YbHgk`hc
]bWi XY`Ug`Yj]XYbW`hc`gi ddcfhmci f`YI H`bg]cb`Udd`]W]h]cb" Ẓmci `Ya U]`9I H`fbU`Gi ddcfhmci `k]`

5 WUXYa]W<c bYghmUbX`D`U[]Uf]ga

D`U[]Uf]ga `]g`i g]b[`hY`k cfXg`cf]XYUg`cZchYfg`UbX`dfYgYbh]b[`hYa `Ug`mci f`ck b" `hWUb`hU`Y`a Ubm
Zcfa gž`Zca `XY`]VYfUHY`WXYU]b[`hc`UWV]XYbhU`mW`dm]b[`Zca `U`gci fW`k]h`ci hUW_bck`YX[Ya Ybh`

I BGK `[fci dg`d`U[]Uf]ga `]bhc`hY`Zc`ck]b[`WUHY`[cf]Yg.

7 cdm]b[.`i g]b[`hY`gUa Y`cf`j Yfmg]a]Uf`k cfXg`hc`hY`cf][]bU`hYI hcf]XYU`k]h`ci hUW_bck`YX[]b[`hY`
gci fW`cf`i g]b[`ei chU]cb`a Uf_g" `H\]g`U`gc`Udd`]Yg`hc`]a U[Ygž`UfhUbX`XYg][b`dfc`YWgž`Ug`k Y`Ug`
dfYgYbhU]cbg`k \YfY`gca YcbY`dfYgYbh]g`UbchYf`g`]XYUg`cf`k cfXg`k]h`ci hW`YX]h`

hUddfcdf]UHY`dUfUd`fUg]b[.`7`Ub[]b[`U`ZYk`k cfXg`UbX`d`fUgYg`k`Y`a cghmifYU]b]b[`hY`cf][]bU`
ghfi W`fY`UbX`#`f`dfc[fYgg]cb`cZ]XYUg`cZ`hY`cf][]bU`ž`UbX`]bZcfa U]cb`k]h`ci hUW_bck`YX[Ya Ybh`H\]g`U`gc`
Udd`]Yg`]b`dfYgYbhU]cbg`k \YfY`gca YcbY`dUfUd`fUgYg`UbchYf`g`]XYUg`cf`k cfXg`k]h`ci hW`YX]h`UbX`hc`
d]YW]b[`hc[YhYf`ei chYg`UbX`dUfUd`fUgYg`]bhc`U`bYk`k \c`Yž`k]h`ci hUddfcdf]UHY`fYZYfYbW]b["

7 c`i g]cb.`k cf_]b[`k]h`chYfg`Vi hdUgg]b[`cZ`hY`k cf_]Ug`U`dYfgcb`g`]bX]j]Xi U`k cf_]7 c`i g]cb`U`gc`
]bWi XYg`dfcj]X]b[`mci f`k cf_]hc`UbchYf`gh`XYbhVYZc`fY`hY`Xi Y`XUHYž`cf`Zc`f`hY`di fdcgY`cZ`hY`a

- 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'U'g'U'bx'Uf'X'g'c'Z'V'Y'\Uj]ci f'Y'I d'Y'W'X'c'Z'Y'j Y'f'm'c'b'Y'']b'h'Y'I BGK 'W'c'a a i b]m
- 'c'W'U'h'g'Y'f'j]W'g'UbX'j]b'Z'c'f'a U'h'c'b'U'V'c'i h'l BGK 'UbX'I BGK '@]V'f'U'f'm

Gca Y'cZ'U'g'Y'U'f'Y'U'g'k]''VY'Z'Ja]]U'f'hc'mci ž'c'h'Y'f'g'k]''VY'b'Y'k "; U]b]b['U'gc'X'i bXYfghUbx]b['cZU''h'Y'f'Y'U'h'X'U'gd'Y'W'g'c'Z'9@-G'9'k]''\Y'd'mci 'a U_Y'h'Y'a c'g'h'c'Z'mci f'g'h X]Y'g'U'hl BGK ""

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

5 WUXYa]WbZcfa Uh]cb`

: cfYggYbh]U`gh XYbh]bZcfa Uh]cb`fY`Uh]b[`rc.

fYei Ygh]ZcfYI hYbg]cb/