AERO3410

5YfcgdUW Glfi Wi fYg

HYfa 'C bY''##'&\$&%

7ci fgY^{*}Cj Yfj]Yk

GHJZ:7cbHJWh8YHJ]`g

7cbj Ybcfg

B Ua Y	9a U]`	5j U]`UV]`]m	@cWJhjcb	D\cbY
; Ufth DYUfVW		f5ZhYf``YWifY'j]U	HYUa gž 5]bgk cfh\ &\$, 9	HYUa g

8Ya cbghfUhcfg

BUa Y	9a U]`	5j U]`UV]`] m	@cWUh]cb	D\cbY
8Ub]Y`K cb[XUb]Y`"g"k cb[4 i bgk "YXi "Ui			HYUa g
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GWXcc~7cbhJWh~abZcfa Uhlcb

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5Vcj Y '7 c ZZYY 'cb '7 Ua di g

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-.\$\$-).\$\$da ž'A cbXUm-: f]XUm

ł7`cgYX'cb'di V`]W\c`]XUmgž'GW\cc``gW\YXi `YX'Yj Ybhg'UbX'l b]j Yfg]hm'G\i hXck b

K YV

GWXcc`cZA YWXUb]WU`UbX'A Ubi ZUWi f]b['9b[]bYYf]b[

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<u>I BGK 'Gh Xm5VfcUX'UbX'9I VXUb[Y</u>'flcf']bVci bX'gh XYbhgŁ

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D\cbY

fŽ*%%Ł-',),)\$\$-BiWYigGhXYbh<iV

fŽ*%:&Ł'-',) '+**%'-'9b[]bYYf]b['=bXi qlf]U`'HfU]b]b[

7 ci fgY 8 YhU]`g 7 fYX]hDc]bhg '* Gi a a UfmcZ'h\Y'7ci fgY 5 YfcgdUW' A UhYf]U`g`UbX'h\Y]f`DfcdYffiYg. 'H\]g`a cXi 'Y`]bhfcXi W'g'h\Y'a UhYf]U`g'h\UhUyfcgdUW' ghfi Wi fYg`UfY 'Wcbghfi WhYX'Zfca . 'df]a Uf]`mU`i a]b]i a 'U``cmg`UbX' Wca dcg]hYg"'H\Y'dYfZcfa UbW' cZh\YgY a UhYf]U`g'k]```VY`UggYggYX fY`Uhj Y`hc'h\Y']a dcffUbhXYg][b'Xf]j Yfg`Zcf`U]fWfUZhghfi Wh fYg" 5 bU`mg]g`cZh\]b!k U``YX`Ghfi Wh fYg. 'H\]g'a cXi 'Y`[]j Yg`mci 'h\Y'WUdUV]`]mihc`UbU`mgY'g]a d'Y'U]fZfUa Y

ghfi Whi fYg UbX XY ^

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A c>	i `Y`E i]nnYg`	&\$I	Bch5dd`]WUV`Y	%ž [:] &
@UV	cfUlrcf]Yg [·]	&\$I	A cbXUmK YY_'-	&
Glfi	WhifU``5bU`mg]g`DfcYWh	&\$I	A cbXUmK YY_`%	%ž'&ž''
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5 hm/b XUb VW F Yei]fYa Ybhg

 $\hbox{Ghi XYbhg'UfY'ghfcb[`mYbWci fU[YX'hc'UhhYbX'U```WUggYg'UbX'fYj]Yk ``YWhi fY'fYWcfX]b[g''] }$

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A]WfcgcZhg'Wca a i b]WUh]cb'd`UhZcfa ž.<mark>A]WfcgcZhHYUa g</mark>žk]``'VY'i gYX'YI hYbg]j Y`m']b'h\]g'Wci fgY"'≠h\Ug bUh]j Y`Uddg'Zcf'K]bXck gž5bXfc]Xž']C G'UbX'a cfY"

a m5 WWYgg UbX A UhUV

IBGK 'a mbwwgg'dfcj]XYg'Uwwgg'hc'mci f'Yb[]bYYf]b['gcZhk UfY'Zfca 'a Ubm'X]ZZYfYbhXYj]Wrg"'H\]g Wti fgY'k]``i gY'A UhUV'YI hYbg]j Y`mž'k\]W\]g'Uj U]`UV`Y'h\fci [\'a mbwwgg'UbX'h\Y'Wta di hYf``UVg"

AccX`Y

 $H\Y'A\ ccX'Y'@A\ G\Z'\underline{hhdg.\#a\ ccX'Y''hY'h'i\ bgk\ "YXi\ "Ui\ \#k\]```U`gc`VY'i\ gYX'Zcf'h\]g`Wci\ fgY`Zcf'UW]j\]h]Yg`UbX [fUXYVcc_ia\ UbU[Ya\ Ybh''Mci\ k\]``bchbYYX'hc`fY[i\ `Uf'm\W.Y\W_i'A\ ccX'Y'']$

FYei]fYX HYI hVcc_

 $A Y[gcb\check{z}H"<"; ""3[dJdSXfEfdgUfgdMe Xad7`Y[`WWd[`YEfgVW fel'G]]! h\"9X]h]cb""9`gYj]Yf"&$\%\&""f(h\"UbX") h\ YX]h]cbg"k]`"gi ZZ[WY'k]h\"a]bcf"]bWcbj Yb]YbWYŁ$

FYWca a YbXYX FYgci fWyg

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G\ci`X'h\Y'\\ci`fgY'\Uj Y'Ubmbcb!Y`Y\\fcb]\\UggYgga Ybhigi Va]gg]cbž'h\YgY'g\ci`X'\Uj Y'U'g\\bXUfX G\\cc``\\cij Yf'g\YYh'

 $5 ```gi Va]gg]cbg`UfY`YI dYWYX`hc`VY`bYUh`UbX`WYUf`mgYhci h'`Mci f`fYgi `hg`UfY`h\Y`d]bbUWY`cZU```mci f`\UfX k cf_'UbX`g\ci `X`VY`hfYUhYX`k]h\`Xi Y`fYgdYWf`DfYgYbh]b[`fYgi `hg`WYUf`m[]j Yg`h\Y`a Uf_Yf`h\Y`VYgh'W\UbW' cZi bXYfghUbX]b[`mci f`a Yh\cX/Yj Yb`]Zh\Y`bi a Yf]\W\``fYgi `hg`UfY`]b\\cffY\Wf$

UggYgga YbhidYfZcfa UbWYžmci 'UfY'Y`][]V`Y`hc'Udd`m'Zcf'GdYWJU``7cbg]XYfUhJcb'df]cf'hc'gi Va]htjb['UbUggYgga Ybhicf'g]htjb['Ub'Yl Ua"

: cf`XYhJ]`g`cZUdd`m]b['Zcf`GdYW]U``7 cbg]XYfUh]cb`UbX`WcbX]h]cbg`Zcf`h\Y`Uk UfX`cZgi dd`Ya YbhUfm UggYgga Ybhž'd`YUgY`gYY`h\Y`]bZcfa Uh]cb`cb`I BGK 'g`<u>GdYWU``7 cbg]XYfUh]cb`dU[Y</u>"

D`YUgY'bchY'h\Uhghi XYbhg'k]``bch'VY'fYei]fYX'hc'dfcj]XY'Ubm'XcW'a YbhUfm'Yj]XYbWY'hc gi ddcfh'UVgYbWg'Zfca 'Ubm'WUggYg'a]ggYX'**VYWU gY'cZ'7CJ=8!%** 'di V`]W\YU'h\ 'a YUgi fYg'gi W\'Ug]gc`Uh]cb"'| BGK 'k]``bch'VY']bg]gh]b['cb'a YX]WD`'Wfh]ZJWUh'g'Zfca 'UbmcbY'XYYa YX'hc'VY'U'dcg]h]j Y'WUgYž cf'k\Yb'h\Ym\Uj Y'fYWcj YfYX"'Gi W\'Wfh]ZJWUh'g'UfY'X]ZZJW 'hhc'cVhU]b'UbX'di h'Ub'i bbYWfggUfmghfU]b'cb ghi XYbhg'UbX'a YX]WU`'ghUZZ''

 $5\,dd^{3}WUhlcbg^{3}Zcf^{3}gdYW_{U}^{3}W^{3}bg^{3}XYfUhlcb^{3}k^{3}XYfUhlcb^{3}xYfUhlcb^{$

5 WUXYa]W<cbYghmUbX D`U[]Uf]ga

 $\label{thm:continuous} IBGK ``Ug`Ub`cb[c]b[`Wcaa]haYbhhc`ZcghYf]b[``U`W``hifY`cZ`YUfb]b[`]bZcfaYX`VmUWUXYa]W]bHY[f]hm'`5``IBGK `ghiXYbhg`\UjY`U`fYgdcbg]V]`]hmhc`UX\YfY`hc`h\]g`df]bW]d`Y`cZUWUXYa]W]bHY[f]hm'D`U[]Uf]gaibXYfa]bYg`UWUXYa]W]bHY[f]hmUbX`]g`bchhc`YfUhYX`UhIBGK "`B'SY[Sde_SfG@EI[eVW{`WSege[YfZW_aXSekagdai`ž$

D`U[]Uf]ga `]g`U`lmdY`cZ]bhY``YWi U``lh\YZh''=i\WUb`HU_Y`a UbmZcfa gžZfca `XY`]VYfUhY`W\YUlf]b['lc`U\W]XYbHU``m Wcdm]b['Zfca `U`gci fW'k]h\ci hUW_bck `YX[Ya Ybh''I BGK `\Ug`dfcXi WYX`U`k YVg]hY`k]h\`U`k YU`h\`cZ fYgci fW'g`lc`gi ddcfhighi XYbhg`lc`i bXYfghUbX`UbX`Uj c]X`d`U[]Uf]ga žij]g]h 'ghi XYbh'i bgk "YXi "Ui #d`U[]Uf]ga_" H\Y`@YUfb]b['7 YbhY`Ugg]ghg`ghi XYbhg`k]h\`i bXYfghUbX]b['U\WXYa]W]bhY[f]hmUbX`\ck 'bchhc'd`U[]Uf]gY" H\YmU`gc`\c`X`k cf_g\cdg`UbX`\Wb`\Y`d`ghi XYbhg`cbY!cb!cbY"

Mci 'UfY'U'gc'fYa]bXYX'h\UhWUfYZ ``h]a Y'a UbU[Ya Ybh]g'Ub']a dcftUbhdUfhcZgh XmUbX'cbY'cZh\Y]XYbh]Z]YX'WUi gYg'cZd`U[]Uf]ga ']g'dccf'h]a Y'a UbU[Ya Ybh'Gh XYbhg'g\ci 'X'U``ck 'gi Z]W]Ybhh]a Y'Zcf fYgYUfW\žXfUZh]b['UbX'h\Y'dfcdYf'fYZYfYbW]b['cZgci fW/g']b'dfYdUf]b['U```UggYgga YbhHUg_g''

₹d`U[]Uf]ga i]gʻZci bXi]bimci fik cf_ik \Ybimci 'UfYi]bʻZ[fghmYUfžimci fi`YWi fYfik]``cZYfimci 'Ugg]ghUbWYihc
]a dfcj Yimci fi'UWUXYa]Wg_]``g'''H\Yma UmUg_imci ihci`cc_'Uhigca Yicb`]bYifYgci fWygžiUhhYbXih\Yi@YUfb]b[
7 YbhfYžcfigca Yh]a YgifYgi Va]himci fik cf_ik]h\h\YidfcV`Ya iZ[l YX'''< ck Yj Yfia cfYigYf]ci gi]bghUbWygi]biZ[fgh
mYUfžigi W\ugighYU`]b[iUbch\Yfighi XYbhgik cf_icfidUm]b[igca YcbYihciXcimci fik cf_žia UmVYi]bj Ygh][UhYX
i bXYfih\YiGhi XYbhA]gWcbXi WhDfcWYXi fYg''

FYdYUHYX'd`U[]Uf]ga 'fYj Yb']b'Z|fghmYUfłź'd`U[]Uf]ga 'UZHYf'Z|fghmYUfźcf'gYf]ci g']bghUbWYgža Um'U`gc'VY]bj Ygh][UhYX'i bXYf'h\Y'Gh XYbhA]gWcbXi WhDfcWYXi fYg"'H\Y'dYbU'h]Yg'i bXYf'h\Y'dfcWYXi fYg'WUb']bWi XY U'fYXi Whcb']b'a Uf_gž'ZU]`]b['U'Wci fgY'cf'Zcf'h\Y'a cghgYf]ci g'a UhHYfg'fi]_Y'd`U[]Uf]ga ']b'Ub'\cbci fg h\Yg]gŁYj Yb'gi gdYbg]cb'Zfca 'h\Y'i b]j Yfg]mm''H\Y'Gh XYbhA]gWcbXi WhDfcWYXi fYg'UfY'Uj U]`UV'Y'\YfY.

kkk"[g"i bgk"YXi"Ui #dc]Wn#XcWa Ybhg#ghi XYbha]gWcbXi WhdfcWYXi fYg"dXZ

5 WUXYa]W = DZcfa Uhjcb

7 fYX]hdc]bhg

7 ci fgY'WfYX]h']g'WU'W 'UhYX']b'I b]hg!C Z 7 fYX]hfl C 7 L'''H\Y'bcfa U`'k cf_`cUX'YI dYWfUh]cb'Zcf'cbY'I C 7]g'UddfcI]a UhY`m'&) '\ci fg'dYf'hYfa "'H\]g']bWi XYg'WUgg'WcbhUWh'\ci fgz'df]j UhY'ghi Xmz'ch\Yf'`YUfb]b[UWfj]]h]Ygz'dfYdUfUh]cb'UbX'h]a Y'gdYbh'cb'U``'UggYggUV`Y'k cf_"

A cgh'Wci fgYk cf_'Wci fgYg'Uhl BGK 'UfY'*'I C7'UbX']bj c'j Y'Ub'YghJa UhYX'%) \$'\ci fg'hc'Wca d'YhYžZcf'Vch\fY[i`Uf'UbX']bhYbg]j Y'hYfa g"'9UW.'Wci fgY']bWi XYg'U'dfYgWf]VYX'bi a VYf'cZ\ci fg'dYf'k YY_'fl* Ł'cZ gW.YXi 'YX'ZJWY!hc!ZJWY'UbX#cf'cb`]bY'WcbhJWf'5bmUXXJhJcbU''hJa Y'VYmcbX'h\Y'dfYgWf]VYX'WcbhJWh\ci fg g\ci 'X'VY'gdYbh']b'a U_]b['gi fY'h\Uhmci 'i bXYfghJbX'h\Y''YWh fY'a UhYf]U'ž'Wca d'YhJb['h\Y'gYh Ugg][ba YbhgžZ fh\Yf'fYUX]b['z'UbX'fYj]g]b['Zcf'UbmYl Ua]bUhJcbg"

Cb!WUa di g WUgg UHYbXUbW

Di V`]WX]gHJbW]b['W&bX]h]cbg'a i gh'VY'Zc``ck YX'Zcf'U```ZJWY!hc!ZJWY'WUggYg"'Hc Ybgi fY'h\]gžcb`mighi XYbhg Ybfc``YX']b'h\cgY'WUggYg'k]```VY'U``ck YX']b'h\Y'fcca "'7`Ugg'fcghYfg'k]```VY'UhtJW\YX'hc'WcffYgdcbX]b[fcca g'UbX'W]fW'`UhYX'Ua cb['`UV'XYa cbghfUhcfg"'Bc'cj Yf!Ybfc`a Ybh]g'U``ck YX']b'ZJWY!hc!ZJWY'WUgg" Ghi XYbhg'Ybfc``YX']b'cb`]bY'WUggYg'WJb'gk Ud'h\Y]f'Ybfc`a YbhZfca 'cb`]bY'hc'U``]a]hYX'bi a VYf'cZcb! WJa di g'WUggYg'VmGi bXUmž'K YY_'%"D`YUgY'fYZYf'hc'mci f'Wci fgYfg'A]WfcgcZhHYUa g'UbX'A ccX'Y'g]hYg'Zcf a cfY']bZcfa Uh|cb'UVci hWUgg'UhhYbXUbWY'Zcf']b!dYfgcb'UbX'cb`]bY'WUgg'gYWflcbg#JWflj]hJYg"

Mci f`\YU`h\`UbX`h\Y`\YU`h\`cZh\cgY`]b`mci f`WUgg`]g`Wf]h]WU``mi]a dcffUbh'`Mci 'a i ghighUm'Uh\ca Y`]Zmci 'UfY g]W_`cf`\Uj Y`VYYb`UXj]gYX`hc`gY`Z]gc`UhY`VmBGK_`\YU`h\`cf`[cj Yfba Ybh'Ui h\cf]h]Yg"'7 i ffYbh'U`Yfhg`UbX`U `]ghcZ\chgdchg`Wb`VY`Zci bX`\YfY"'Mci 'k]``bchVY`dYbU`]gYX`Zcf`a]gg]b['U`ZUWY!hc!ZUWY`UWN]j]hmXi Y hc`]``bYgg`cf`U`fYei]fYa Ybh'hc`gY`Z]gc`UhY"'K Y`k]``k cf_'k]h\`mci 'hc`Ybgi fY`Wcbh]bi]hmcZ`YUfb]b['Xi f]b[mci f`]gc`Uh]cb`UbX`\Uj Y`d`Ubg`]b`d`UWY`Zcf`mci 'hc`WUhW\`i d`cb`UbmWcbhYbh'cf``YUfb]b['UWN]j]h]Yg`mci 'a Um a]gg"`K\YfY`h\]g`a][\hbch'VY`dcgg]V`Yž`Ub`Udd`]WUh]cb`Zcf`ZYY`fYa]gg]cb`a UmVY`X]gWi ggYX": i fh\Yf]bZcfa Uhlcb`]g`Uj Uj`UV`Y`cb`UbmWci fqY`A ccX`Y`cf`HYUa q`q]hY"

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: cfa cfy]bZcfa Uhjcbžd`YUgY`fYZYf`hc`h\Y

: 5E g. \hdg.#k k k "Wcj]X!% "i bgk "YXi "Ui #gUZY!fYh fb!WUa di g!ZJeg

; i]XY`]bYg

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- 5HYbXUbW
- I_BGK_'9a_U]`'5XXfYaa
- GdYWU`'7cba]XYfUhcb
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- 5WUXYa 1W<cbYghmUbX'D'U[]Uf]ga_

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- Gh XYbhF Ygci fWg
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- A U YfadUW
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- <u>9ei]hUV`Y`@YUfb]b['GYfj]WYg</u>

a U[Y'7fYX]h

J Ubg5]fWfUZhž777'6MG5'("\$'žj]U'K]_]a YX]U'7ca a cbg

7F = 7CG

7F = 7CG Dfcj]XYf 7cXY. \$\$\$-,;

5W_bck `YX[Ya YbhcZ7ci bhfm

 $K Y : UW\underline{b}ck "YX[Y : h, Y : 6YXY[U : dYcd"Y : k \c : UfY : h, Y : hfUX]h\underline{b}cbu" : W ghcX]Ubg : cZh, Y : `UbXg : cb : k \] WX : I B G K ? Ybg]b[hcb : WUa di g :]g : cWUhYX"$

5ddYbX]l. '9b[]bYYfg'5i glfU`]U'f95Ł'DfcZYgg]cbU`'9b[]bYYf'7ca dYhYbWm GHJbXUfX

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?bck YX[Y'UbX'g_]``VUgY	
D9%"%7cadfY\Ybg]j Yž'h\YcfmVUgYX'i bXYfgHJbX]b['cZh\Y'i bXYfd]bb]b['bUhi fU`'UbXd\mg]\WJ`'g\\Yb\W'g'UbX'h\Y'Yb[]bYYf]b['Z bXUaYbHJ`g'Udd`]\WJV`Y'hc'h\Y'Yb[]bYYf]b['X]g\\Jd`]bY	
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D9%" '±b!XYdh\'i bXYfghUbX]b['cZgdYW]U`]ghVcX]Yg`cZ_bck `YX[Y`k]h\]b`h\Y`Yb[]bYYf]b[X]gW]d`]bY	
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D9%') '? bck `YX[Y`cZYb[]bYYf]b['XYg][b`dfUWfJWY`UbX`WcbHYI hi U``ZUWcfg`]a dUWf]b['h\Y Yb[]bYYf]b['X]gWJd`]bY	