

5 bgŌ [b] b [F YZYfYbW'6fYj

F YZYfYbW'6fYj ! ; Vb]b[

Hng_

F i gg_

GY\ f' [Y\ f\ f' < Yffž

....

: cfa Y ža UbXY] ['a cXhU] YfžbUj b' i _YbXh

GY\ f' [Y\ f\ f' : fU ž

....

: cfa Y ž _j] bXY] ['a cXhU] YfžbUj b' i _YbXh

GY\ f' [Y\ f\ f' 8 La Yb' i bX' < YffYbž

....

: cfa Y ža cXhU] Yf' bUj b' c [' _Ōb' i _YbXh

GY\ f' [Y\ f\ f' 8 La Yb' i bX' < YffYbž

....

: cfa Y ž bÁf' a Ub' \Ybj YbXYf' g] ['h] ' UXg_] [' Y' a YbbYg_ Yf' Y' Yf' Yb' \Y' ' UZXY] b [

GY\ f' [Y\ f\ f' 8 La Yb' i bX' < YffYbž

....

: cfa Y ža cXhU] Yf# cXhU] YfY' bUj b' c [' _Ōb' ž ' XgrĀ bX] [' i _YbXh

GY\ f' [Y\ f\ f' < Yff' GWa] Xž

· ! ·

: cfa Y ža UbXY] ['a cXhU] YfžbUj b' i _YbXh

GY\ f' [Y\ f\ f' : fU ' GWa] Xž

· ! ·

: cfa Y ž _j] bXY] ['a cXhU] Yfž [] žžbUj b' _YbXh

GY\ f' [Y\ f\ f' : fU ' GWa] Xž

· ! ·

: cfa Y ž _j] bXY] ['a cXhU] Yfžg] b [' YžbUj b' _YbXh

GY\ f' [Y\ f\ f' : fU ' GWa] Xž

· ! ·

: cfa Y ž _j] bXY] [' UZU YžbUj b' _YbXž Vj] g' h i gi _YbXh

⇒ W' gh\ Y' g\ f' [YfbY' UgF YZYfYbn' ZŌf' "" ni f

....

J YfZŌ i b ["

6 fi [hgca ' Yb' ÁVb] b [g ž Uj Y' bÁf' Yb' \Uf' bnXh i UfVY' XY' a YX' XYb' dYfgcb' gca ' \Ub# i b' g_ f] j Yf' ca

⇒ W' \ WY' "" ni Yfgh] b' "" _YbbYb [Y Yfbžž Ug Yf' ""

....

VY] hU' ""

6 fi [h] ' U h [] j Y' XYU' Yf' ca ' \j cfXUb' Yb' _YbXYf' _UbX] XU h Yb

5bgŌ[b]b[F YZYfYbW'6fYj



""\Uha]W' i a 'Y]b'9a dZ\`i b[ggWfY]VYb'ZŌ'gY]bY
6Yk YfVi b['Ug''''''''\W' ZFYi Y'a]W' g\^fzX]Yg\`Yfa]h
h' b'ni ` _CbbYb"

6fi [hgca `Yb`ÁVb]b[gZfUgY`bÁf`Yb`\Uf`bnXhUhiUFVY`XY`a YX`XYb`dYfgcb`gca `Ub#i b`g_f]j Yf`ca

8]Y'5fWY]hUg'7\YZ#J cf[YgYmhYf`#? c`Y[Yj cb`''''
gY]h'''''\Uha]fj]Y` : fYi XY`VfY]hYh'

6fi [hgca `Yb`ÁVb]b[gZfUgY`bÁf`Yb`\Uf`bnXhUhiUFVY`XY`a YX`XYb`dYfgcb`gca `Ub#i b`g_f]j Yf`ca

\W' ZFYi Y'a]W'žX]YgYg'9a dZ\`i b[ggWfY]VYb'ZŌ`''''''
j YfZUggYb`ni `XŌfZYb`" `b X]YgYa `GWfY]VYb'a ŌW'hY
]W' a Y]bYb`F YgdY`_hi bX'a Y]bY'6Yk i bXYfi b[`ZŌf
X]YgYb`'t b[Yb`A Ubb`#X]YgY`'t b[Y` : fU` ni a
5 i gXfi W` Vf]b[YbžXYf`#X]Y`Y]bYb`\YfU gfU] YbXYb
6Y]hU[`ni f'5fVY]ha Y]bYf` ; fi ddY [Y`Y]gYh`Uh'

6fi [hgca `Yb`ÁVb]b[gZfUgY`bÁf`Yb`\Uf`bnXhUhiUFVY`XY`a YX`XYb`dYfgcb`gca `Ub#i b`g_f]j Yf`ca

GY`f [YfbY`j YfZUggY`]W' XUg'9a dZ\`i b[ggWfY]VYb
ZŌ`''''

6fi [hgca `Yb`ÁVb]b[gZfUgY`bÁf`Yb`\Uf`bnXhUhiUFVY`XY`a YX`XYb`dYfgcb`gca `Ub#i b`g_f]j Yf`ca

9g]gha]f`Y]bY`[fc»Y` : fYi XYžY]b
9a dZ\`i b[ggWfY]VYb'ZŌf`''''''ni `j YfZUggYb`''''''

6fi [hgca `Yb`ÁVb]b[gZfUgY`bÁf`Yb`\Uf`bnXhUhiUFVY`XY`a YX`XYb`dYfgcb`gca `Ub#i b`g_f]j Yf`ca

\W' _YbbY`''''gY]h''''žUg`Yf`#gY`Y]bYb`? i fg`VY]`a]f
VY`Y[hY`#VY[UbbžUg`''''ni `UFVY]hYb`"

6fi [h]h` `Uh[]j Y`XYhU`Yf`ca `j cfXU`b`Yb`_YbXYf`_UbX]XU`hYb

\W' _YbbY`''''gY]h'''']b'a Y]bYf`HÄh[]_Y]hUg`''''VY]`''''
"

6fi [h]h` `Uh[]j Y`XYhU`Yf`ca `j cfXU`b`Yb`_YbXYf`_UbX]XU`hYb

\W' k Uf`j cb`''''V]g`''''7\YZ#J cf[YgYmhYf`#? c`Y[Y`#
@Y`fYf`j cb`''''''

6fi [h]h` `Uh[]j Y`XYhU`Yf`ca `j cfXU`b`Yb`_YbXYf`_UbX]XU`hYb

''''UFVY]hYh'ZŌf`a]W' U'g`''''Ub`i bhYfgW]YX`]W'Yb
Dfc`_Y`_hYb`"5 i Z; fi bX`U[Y`gY]bYf`#]`fYf`5fVY]h
k ŌfXY`]W']`b`#g]Y`Ug`Y]bYb`#Y]bY`XYf`VYgYb`''''
Y]bg]W`ÄhYbžXYf`#X]Y`V]g`Ub[`ZŌf`i bg[YUFVY]hYh`Uh'

6fi [hgca `Yb`ÁVb]b[gZfUgY`bÁf`Yb`\Uf`bnXhUhiUFVY`XY`a YX`XYb`dYfgcb`gca `Ub#i b`g_f]j Yf`ca

5bg[b]b[F YZfYbW'6fYj



F YZfYbW'6fYj !: ÂfX][\XYf

Hng

F i gg

GY]h6Y[]bb'i bgYfYf'Ni gJb a YbUfVY]h\UWY'jW']\b'#
g]Y'U'g''''DYfgcb'_YbbYb[Y'YfbH'

.

6fi [h]` `UhVYg_fj] Y'Yhdcg]h] hUgdY_hUZ'_UbX]XUHybg'dYfgcb'][\YX

''nY]WbYfY'Yf'g]W'XUXi fW'U' g'XUgg''''

....

6fi [h]` `UhZcf'_UFY'XY'dcg]h]j Y'`cj YX'Y[Ybg_UWYf'gca'_UbX]XUHyb'\Uf'XYa cbgfYfYh

Ni `gY]bYb'#]\fYb[fO`hYb'GhAf'_Yb'nA'\`Yb''''

.

6fi [h]` `Uhj`]gY'_UbX]XUHybg'\cj YX'gmf'_Yf

9f'#g]Y'ghY]bfY'_fYU]j fY'`DfcV'Ya `Ogyff]bL'

.

6fi [h]` `UhVYg_fj] Y'Yb'_UbX]XUhgca `WfYXj]`][hUWdhYfYf'c[`Ogyf'i XZcfXf]b[Yf

9f'#g]Y'j YfZ[h]hOYf'Y]b]j]Y Z`h][Yg'GdY_hfi a `Ub
: A\][_Y]Hyb''

.

6fi [h]` `UhVYg_fj] Y'Yb'_UbX]XUhgca `Uf'U'g]X][Y Z`fx][\XYf

9f'#g]Y'_ca a i b]n]YfhgY]bY'#]\fY'`XYb'_`Uf'i bX
XYi h]W''

.

6fi [h]` `h]` `VYg_fj] Y'Yb'_UbX]XUha YX'[cXY'_ca a i b]_U]cbgY] bYf

9f'#g]Y'_Ubb'a]h] YfUtk cfhi b[`i hi a [Y\Yb''

.

6fi [h]` `UhVYg_fj] Y'Yb'_UbX]XUhgca `Yf'[cX'h]` `UhgmfY'YhYUa `#dfc'Y_hc[`gca `UFVY'XYf'[cXhi bXYf'dfYg

9f'#g]Y'j YfZ[h]hOYf'Y]b'VfY]hYg'K]ggYb]b''''''

.

6fi [h]` `UhVYg_fj] Y'`j]` _Y Z`fx][\XYf'Yb'_UbX]XUhiU`YfYXY'_Ub'h]`VnXY

9f'YfZUgghbYi Y? cbnYdhY'`Ai » YfghgWbY`'i bX']gh
XUfOYf'\]bU g'cZYb'Zf'_cbgf_i]h] Y? f]h]_i bX
5ba Yf_i b[Yb'ni `gY]bYf'5fVY]h'

ž

6fi [h]` `UhVYg_fj] Y'Yb'XfYj Yb'c[`XmbLa]g'_UbX]XUz'a Y[YhfcgYbXY

5b'X]Ygyf'GHY`Y'a O`MH']W' Uba Yf_YbžXUgg'''''']gh
i b'X]Y: A\][_Y]hVYg]hZ''''''

ž

6fi [h]` `Uh[]j Y'gdVW]Z]_Y'XYhU`Yf'Ub[`ÁYbXY'Yb'_UbX]XUhg'Yj bY'h]` `Uh[O'f'bc[Yh

5 bgŌ [b]b[F YZfYbW'6fYj



GY[bY#]\fY'U »Yf[Yk Ō\ b`WY: À\[_Y]ž'žk Uf
j cb'[fc»Ya`K Yfh'
6fi [hĥ`'UhVyg_fj] Y'Yb`_UbX]XUhg'VYXgY`_j U]hYh

.
"

9f#gjY\Uh]b`ghYgY]bY'U_hj Y'F c`Y
Y]b[Ybca a Yb"

.

6fi [hĥ`'UhVyg_fj] Y'Yb`_UbX]XUhiXYf'Yf'U_hj 'c['_Ub`]XY'Uj Ā'fY']bj c`j YfYh]`g]hUfVY'XY

9f#gjY\À'hg]W`g'Yhg]Ub`HYfa]bUvgdfUW'Yb"K`Ybb
Yf#gjY'Y]b`5 b`Y] Yb`cXYf'Y]bY'F ØVZfU[Y'ni`Y]bYf
5i Z[UY'\Už'gdf]W'hYf#gjY'X]Yg`_Uf'i bX'XYi h]W
Ubž'i bX'[]VhXLa]hUbXYfYb`Y]bY'Gĥ]a a YžX]Y'nk Uf
À\ b`W`Ya dZ]bXYbžX]YgUWYf'b]W'hgU[Yb`_ŌbbYb
cXYf'k c`Yb"

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ž ž
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6fi [hĥ`'UhVyg_fj] Y'Yb`XfYj Yb`c[`XmbLa]g`_UbX]XUž'a Y[YhfcgYbXY

F YZfYbW'6fYj ! 5fVY'Xgca fĀXYf

Hng_

F i gglg_

K À\ fYbX`gY]bYf#]\fYf'NY]hWY]i bg'\UhYf#gjY`
8]YgY'J YfUbk cfh] b[`i a ZggY`

.
"

6fi [hĥ`'Uh[]j Y'Yb`]gY'cj Yf`j]`_Y'cd[Uj Yf'Yb`_UbX]XUh\Uf'dĀU[Yhg] ['c[`j UX'XY`j Yf']gĀf']bXYWUf

Ni`gY]bYb#]\fYb`k]Wĥ[ghYb`J YfUbk cfh]W`_Y]hYb
nÀ\`hYb`

.

6fi [hĥ`'Uh[]j Y'Yb`]gY'cj Yf`j]`_Y'cd[Uj Yf'Yb`_UbX]XUhdĀrc['g] [

GY[bY#]\fY'k ŌWYbh]WYb`5i Z[UYb`i a ZggYb`

.

6fi [hĥ`'Uh[]j Y'Yb`]gY'cj Yf`i [Ybh][Y'cd[Uj Yf'gca`Yb`_UbX]XUhdĀrc['g] [

F YZfYbW'6fYj ! 9j Ui Yf]b[

Hng_

F i gglg_

⇒W`a ŌWY'WYfcbYbžXUggYgY]bY': fYi XY'k Ufž'a]h`
ni`UfVY]hYb"9f#gjY]ghY]bY'j Yf'Āgg]W'Yi bX`_i [Y
DYfgcb'a]hY]bYa`U`g[YdfĀ[hYb`G]bb`Zf`<i a cf"

. ž
ž ž
"

6fi [hĥ`'Uh[]j Y'Yb`dcg]h] `Yj Ui Yf]b[`UZ'Yb`_UbX]XU

K`Ybb`gY]bY#]\fY`@Y]gh] b[`]b`i bgYfYa
l`bhYfb\`a Yb`Ug`-bX]n`Zf`gY]bY#]\fY`@Y]gh] b[`W]
⇒bYb[Y`hYb`_UbbžXUbb`k ĀfY'Yf#gjY]Y]bY'W'WY
6YfY]WYfi b[`Zf`⇒fY':]fa U'

. ž
ž ž
. ž

5bgô[b]b[
F YZyfYbW'6fYj



5bgŌ[b]b[F YZYfYbW'6fYj



6fi [hĥ]`Uh[]j Y'Yb'a Y[Yhdcg]h]j `Yj Ui Yf]b[`UZ'Yb'_UbX]XUh

A Y]bYf'A Y]bi b[`bUW`'gh`""Y]b'g\^f'Z Y]»][Yf'i bX
Y][Ybj YfUbrk cfh]VWYf'A]hUfVY]hYfzXYf Y]b'Dfc'Y_h
gYf]g]b'gY]bYf'; ĀbnY'Xi fVXf]b[H'

..... ž
" ž

6fi [hĥ]`Uh[]j Y'Yb'a Y[Yhdcg]h]j `Yj Ui Yf]b[`UZ'Yb'_UbX]XUh

""YZYf]h]gY]bY'5 fVY]hU gbUa `cgei U]hUj
`cVWk Yf]h[`i bX'hYfa]b[YfYVhU"

6fi [hĥ]`Uh[]j Y'Yb' dcg]h]j `Yj Ui Yf]b[`UZ'Yb'_UbX]XUh

8]Y'Y]bn][Y'GVWk ĀWYzX]Y]W'ni `gY]bYf'#]\fYf
@Y]gh] b[`Uba Yf_Yb'_Ubbžk Uf""

..... "ž" !
.....

6fi [hĥ]`Uh[]j Y'Yhby[U]h] hUgdY_hj YX'Yj Ui Yf]b[`UZ'Yb'_UbX]XUh

A Y]bYf'A Y]bi b[`bUW`'gc`hY`""XYb'J cfni [`j cf
UbXYfYb'? UbX]XUhYb'Yf\U'hYbžk Y]""

ž ž

6fi [hĥ]`Uh]UbVZYU'_UbX]XUhYb'dĀ[fi bX'UZ'VYgY'a hY[fi bXYz'Yb'a Y[Yhdcg]h]j `a ĀXY'UhYj Ui YfY'Yb'_UbX]XUhdĀ

F YZYfYbW'6fYj !'5Zgi Hb]b[

Hng_

""k ĀfY'Y]bY[`fc»Ufh[Y'6 YfY]VWYfi b[`ZŌf`≠f
Dfc[fUa a " : Ōf'k Y]hYfY`≠Zcfa U]cbYb'gh\Y]VW
≠bYb[Yf]b' dYf'9a U]`cXYf'HY'YZcb'ni f'J YfZŌ[i b["

F i gg]g_

.....
"
ž
"

6fi [hĥ]`Uh]UZgi HhY'Yha Y[Yhdcg]h]j hfYZYfYbW'VfYj

≠W[YVY'a Y]bY'bUWVfŌW`]VWY'9a dZ\`i b[`ZŌf`""
U""9f'#g]Y'k ĀfY'Y]bY'6 YfY]VWYfi b[`ZŌf`≠f
Dfc[fUa a "

..... "

6fi [hĥ]`Uh]UZgi HhY'Yha Y[Yhdcg]h]j hfYZYfYbW'VfYj

≠W`V]b'ni j Yf]g]Vh]VWzXUgg`""U W'ni `ŌbZ]h[`gY\ f
`Y]gh] b[gg]Uf`_gY]b'k]fX""9f'#g]Y'\Uha Y]bY'\ŌWgY
9a dZ\`i b["

ž
" #
"

6fi [hĥ]`Uh]UZgi HhY'Yha Y[Yhdcg]h]j hfYZYfYbW'VfYj

≠W`_Ubb']\b'#g]Y'c\bY'YXYb'J cfV\Uhg\ f
Ya dZ\`Yb"" : Ōf'F ŌWZfU[Yb'gh\Y]VW`≠bYb[Yf]bY
dYf'9a U]`cXYf'HY'YZcb'ni f'J YfZŌ[i b["

..... #
" ž

5bgŌ[b]b[F YZYfYbW'6fYj



6fi [hĥ]`UhiUZgi HĥY`YhY_gfYa hĥcg]ĥj ĥfYZYfYbW`VfYj

≠W [`U WYZYghUb'gY]bY#]`fY`U »Yf[Yk Ōb`]WXYb
: Å\][_Y]ĥYb`Ug`"i bX`Ya dZÅ`Y`]\b`#g]Y
bUWxfŌW`]W`ni f`K Y]ĥYfV]`Xi b[`Ub`≠fYf
l b]j Yfg]ĥĥk c`Yf`#g]Y`g]W`k Y]ĥYfYbtk]W`Yb`i bX
gY]bY`#]`fY`HU`YbĥY`Y]bgYmYb`_Ubb"

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..... ž #
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6fi [hĥ]`UhiUZgi HĥY`YhY_gfYa hĥcg]ĥj ĥfYZYfYbW`VfYj

9g]ghia]f`Y]bY`[fc»Y: fYi XYž]`a`#]`f`a Y]bY
`ŌW`gY`9a dZÅ`i b[`U gni gdfYW`Yb"≠W`cZYZ`XUgg
X]YgY`≠Zcfa U]cb`ZŌf`G]Y`]\`ZY]W`]gĥ"

..... ž #
..... ž
.....

6fi [hĥ]`UhiUZgi HĥY`YhY_gfYa hĥcg]ĥj ĥfYZYfYbW`VfYj

≠W`_Ubb`"bUWxfŌW`]W`U`g]]Yj YfgdfYW`YbXYb
? UbX]XUĥYb`Ya dZÅ`Yb"

6fi [hĥ]`UhiUZgi HĥY`YhY_gfYa hĥcg]ĥj ĥfYZYfYbW`VfYj

≠W`UWY`gY`ĥYb`X]Y; Y`Y[Yb`Y]ĥ`Ya UbXYb
j cfW`U`hcg`ni`Ya dZÅ`Yb"8 U`Yf`]gh`Yg`a]f`Y]bY
[fc»Y: fYi XYžX]Yg]a : U`Y`j cb`"h`b`ni`_ŌbbYb"

..... !
..... ž "
.....

6fi [hĥ]`UhiUZgi HĥY`YhY_gfYa hĥcg]ĥj ĥfYZYfYbW`VfYj

≠W`fYgdY`_h]YfY`"U`g? c`Y[Yb`#? c`Y[]b`/fch`X`Ya
a i gg]W`≠bYb`Y`f`]W`Yfk Y]gY`a]ĥY]`Ybž`XUgg]W`
]b`#g]Y`ZŌf`≠f`l b]ĥYb`Y`a Yb`Y]X`Yf`b]W`h
Ya dZÅ`Yb`_Ubb"

..... ž ž #
..... ž
.....

6fi [hbÁf`Yb`_]Y`ZŌf`U`h`_UbX]XUĥYb`Yf`dUggYbXY`ĥ]``c`W`Yh

: Ōf`k Y]ĥYfY: fU[Yb`gh`Y`]W`≠bYb`[YfbY`ni`f
J YfZŌ]i b["

..... ž
.....

6fi [hĥ]`UhiUZgi HĥY`Yhĥcg]ĥj ĥfYZYfYbW`VfYj

: Ōf`k Y]ĥYfY`≠Zcfa U]cb`Yb`gY`Y`]W`≠bYb`[YfbY
dYf`6f]YZ`#9a U]`ni`f`J`YfZŌ]i b["

#Y!a U]ž

6fi [hĥ]`UhiUZgi HĥY`Yhĥcg]ĥj ĥfYZYfYbW`VfYj