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The Big 3 Oh!

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...new

XPath
XSLT
XQuery

Hey... You cant count!

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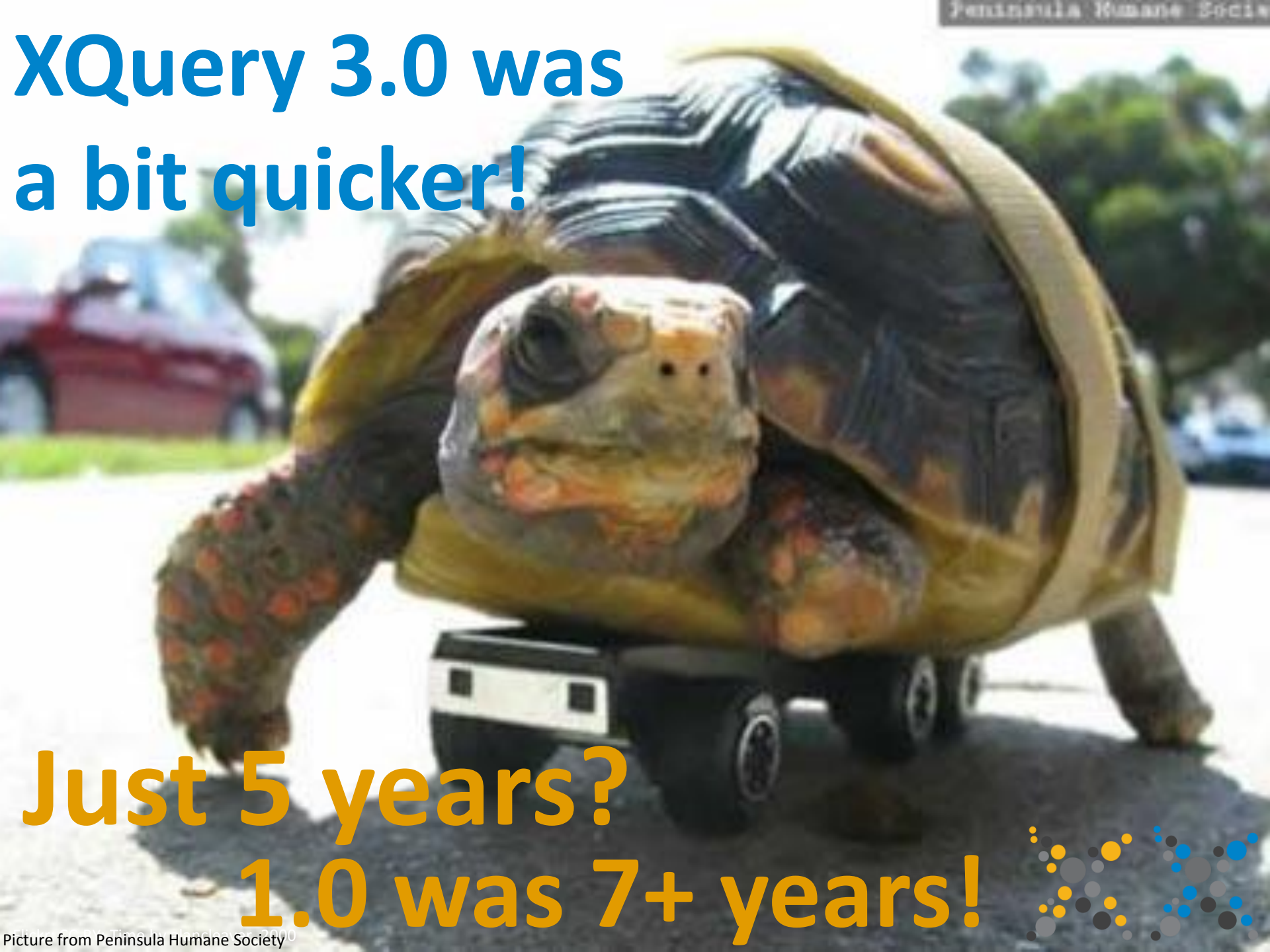
XQuery 3.0 was a bit quicker!



Just 5 years?
1.0 was 7+ years!

Picture from Peninsula Humane Society

New Shiny Things

Group By

- Introduces Grouping into FLWOR
  - Group on Expressions(s)
  - Group on Collation

```
let $max := 3
for $d in //bar-tab
where $d/price > $max
group by $dn := $d/drink-name
return
   <drink name="{$dn}">
      Number of these costing more than {$max} € is
{count($d)}
   </drink>
```

Group By - Results

```
<drink name="hefeweissen naturub">
   Number of these costing more than 3 3 3 € is 200
</drink>
```

The result is maybe not what you expected?!?

- Bindings that are not ‘grouped upon’ are sequences in the result.
  - Use distinct-value(...)
  - Externalise the binding before the FLOWR

Switch Expression

- Switch on an Expression
- Case statements may also have Expressions
- Note - All Expressions are atomized!

```
switch(//drink/@name)
        case “beer” return
                “Yes Please”
        case “brandy” return
                “No Thanks!”
        case “jägermeister” return
                “More beer first!”
        default return
                “Yes”
```

Windowing

- A ‘view’ onto the bound sequence
  - Extract/filter
    - Paging
    - Sub-sequences
    - Calculations
    - etc.
- Very *very* powerful
  - I am still learning...
    - You need to know this to win iPads!

Tumbling Window

- Each Window tumbles over the next
  - i.e. They never overlap

```
for tumbling window $w in (2, 4, 6, 8, 10, 12, 14)
start at $s when fn:true()
only end at $e when $e - $s eq 2
return
        <window>{ $w }</window>
```

```
<window>2 4 6</window>
<window>8 10 12</window>
```

Window bindings

- 9 Variables that can be bound
  - Window
  - Start:
    - Item
    - Position
    - Preceding Item (previous)
    - Following Item (next)
  - End:
    - Item
    - Position
    - Preceding Item (previous)
    - Following Item (next)

Sliding Window

- Each Window slides along the bound sequence
  - i.e. They can overlap

```
for sliding window $w in (2, 4, 6, 8, 10, 12, 14)
start at $s when fn:true()
only end at $e when $e - $s eq 2
return
        <window>{ $w }</window>
```

```
<window>2 4 6</window>
<window>4 6 8</window>
<window>6 8 10</window>
<window>8 10 12</window>
<window>10 12 14</window>
```

Annotations

- Can be applied to:
  - Prolog
  - Variable
  - Function (inline and declared)
- Enabled Private Functions

```
declare
%private
function($a) {
        <hello/>
};
```

```
declare
%public
function($a) {
        <hello/>
};
```

```
declare
%sql:get("name", "select name from people where id = 2657;")
function($name) {
```

try/catch

- Handle (and recover) from errors by catching dynamic and type errors
- Catch any or multiple errors in one step
- 7 variables that can be bound, containing error information

```
try {
   $x cast as xs:integer
}
catch * {
   0
}
```

try/catch

```
try {
   $x cast as xs:integer
}
catch err:FORG0001 | err:XPTY0004 {
 <error>
        <code>{$err:code}</code>
        <value>{$err:value}</value>
        <description>{$err:description}</description>
        <module>{$err:module}</module>
        <where>
              <line>{$err:line-number}</line>
              <col>{$err:column-number}</col>
        </where>
 </error>
}
```

Higher Order Functions

- Invoke functions dynamically

```
let $f := function-lookup(xs:QName(“local:my-func”), 2)
return
        $f(“hello”, “world”)
```

- Inline functions

```
let $f := function($name as xs:string, $value as xs:string) {
        element { $name } {
                $value
        }
} return
        $f(“hello”, “world”)
```

Higher Order Functions

- Pass functions to functions

```
declare function local:say-hello($hello-fn as function()) {
        <hello>{$hello-fn()}</hello>
};
let $f := function() {
        concat("bob at ", current-date())
} return
        local:say-hello($f)
```

- Partial Function Application

```
let $drinks-fn := function($name as xs:string,
$drink as xs:string) {
        concat($name, " drinks ", $drink)
} return
    let $beer-drinker := $drinks-fn(?, "Beer")
return
        $beer-drinker("adam")
```

XQuery 1.0 made me feel like...

But, with XQuery 3.0...

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