Introducing PHP 5.4(.7)

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- PHP Core Developer since 2001
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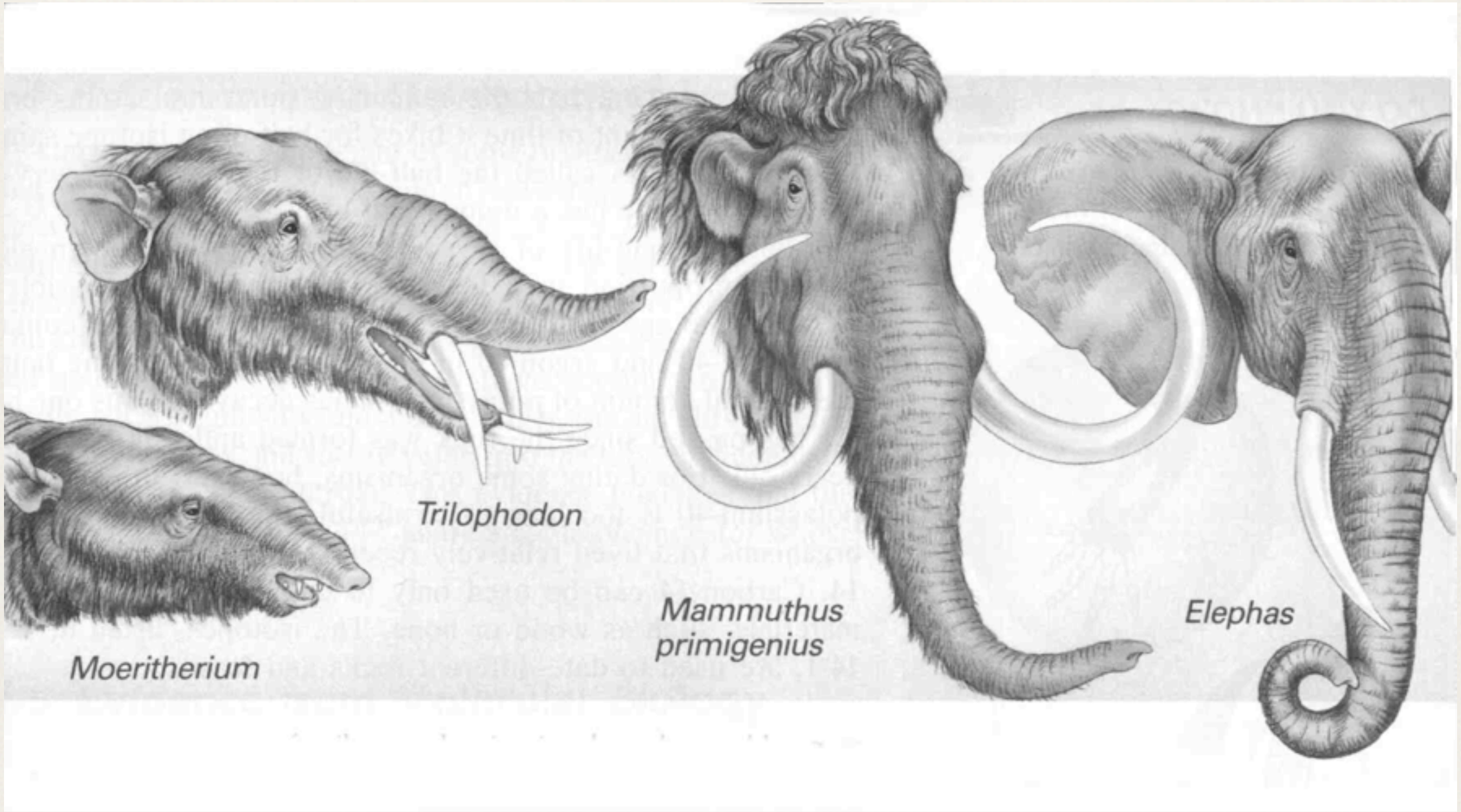
Evolutionary Progression



The little things ...

Array Dereferencing (finally!!)

You can finally put the temporary variables to rest and retrieve values from returned arrays directly.

```
$a = "hello world";
echo explode(" ", $a)[0]; // prints hello
```

```
function test() {
        return array("test" =>
                     array("foo" => "bar"));
}

echo test()['test']['foo']; // prints bar
```

<?= “they always work now” ?>

```
<?= "no more ini settings to worry about" ?>
```

Printing Short Tags

Compact Array Syntax

```php
$a = [1, 2, 3];
// Equivalent of array(1, 2, 3);

$b = ['a' => 'b', 'x' => 'y'];
// Same as array('a' =>'b', 'x' => 'y');
```

JSON Serialization Helper

via **jsonSerializable** interface

```php
class myClass implements JsonSerializable {
    private $data, $multiplier;

    public function __construct($a, $b) {
        $this->data = $a;
        $this->multiplier = $b;
    }

    public function jsonSerialize() {
        return array_fill(
                        0, $this->multiplier,
                        $this->data);
    }
}

echo json_encode(new myClass(123, 3));
// will print [123,123,123]
```

Native Session Handler Interface

#fail

```
session_set_save_handler(
            array($this, "open"),
            array($this, "close"),
            array($this, "read"),
            array($this, "write"),
            array($this, "destroy"),
            array($this, "gc")
        );
```

```
SessionHandler implements SessionHandlerInterface {

/* Methods */

public int close ( void )
public int destroy ( string $sessionid )
public int gc ( int $maxlifetime )
public int open ( string $save_path , string $sessionid )
public string read ( string $sessionid )
public int write ( string $sessionid , string $sessiondata )
}
```

```
session_set_save_handler(new MySessionHandler);
```

Callable Type-Hint

```php
function doSomething(callable $x) {
    return $x();
}

doSomething(function () { });
doSomething("function_name");
doSomething(['class', 'staticMethodName']);
doSomething([$object, 'methodName']);
doSomething($invokableObject);
```

$this in Anonymous Functions

```php
class foo {
    function test() {
        echo "Foo walks into a bar...";
    }

    function anonFunc() {
        return function() { $this->test(); };
    }
}

class bar {
    public function __construct(foo $o) {
        $a = $o->anonFunc(); $a();
    }
}

new bar(new foo); // prints “Foo walks into a bar...”
```

Initialized High Precision Timer

```php
// < 5.4
$start = microtime(1);

/* your code here */

echo "took: ", (microtime(1) - $start);

// >= 5.4

/* your code here */

echo "took: ",
  (microtime(1) -
      $_SERVER['REQUEST_TIME_FLOAT']);
```

The Big Stuff ...

Traits

a.k.a. Horizontal Reuse

a.k.a. Multiple Inheritance

```php
trait Hello {
    public function hello() {
        return "Hello";
    }
}

trait City {
    public function city($name) {
        return $name;
    }
}

class Welcome {
    use Hello, City;
}

$c = new Welcome();
echo $c->hello(), ' ', $c->city("Mainz");
// prints "Hello Mainz"
```

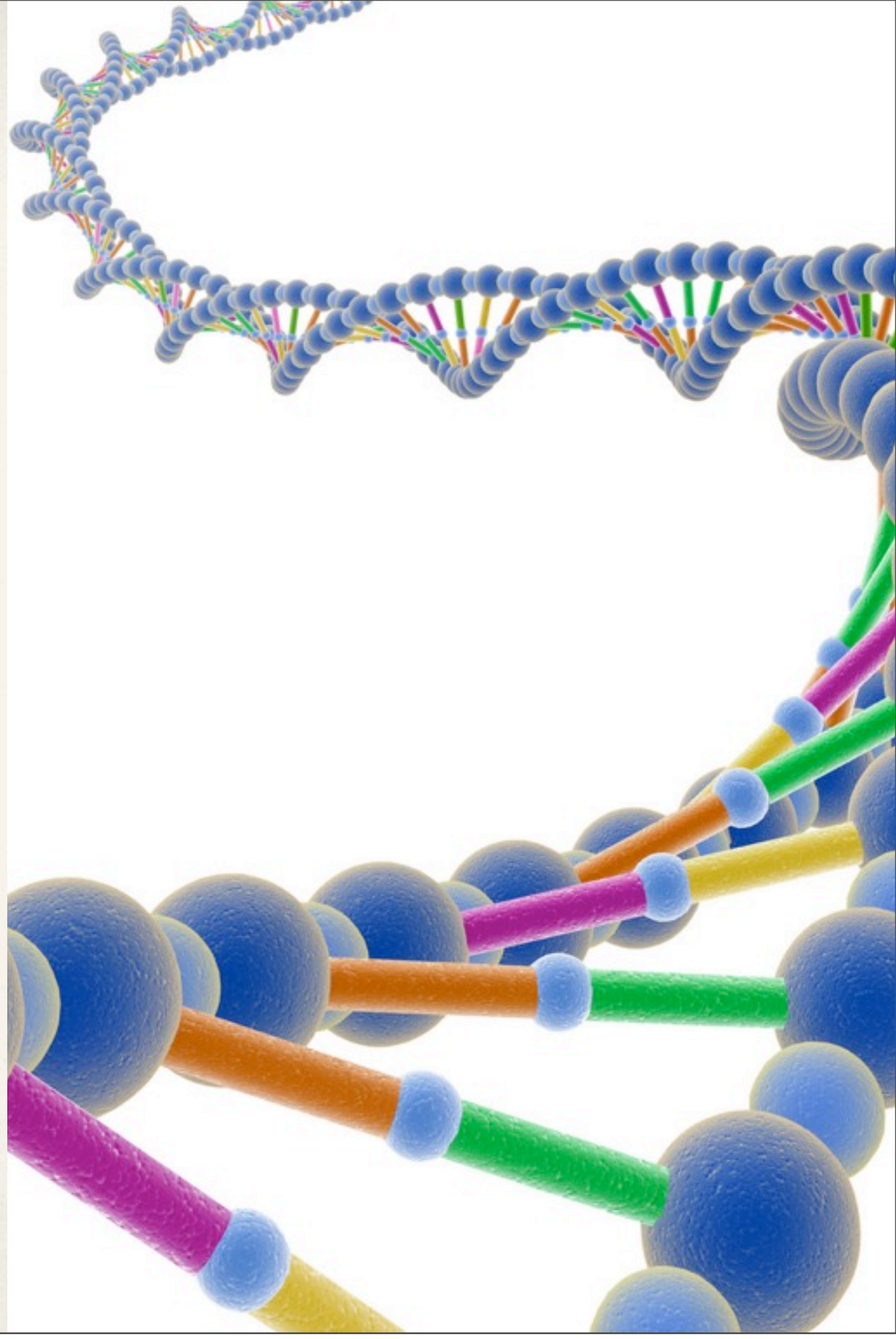
```php
trait Hello {
    public function hello() { return "Hello"; }
}

trait City {
    public function city($name) { return $name; }
}

trait Greeting {
    use Hello, City;

    public function greeting($name) {
        echo $this->hello(), ' ', $this->city($name);
    }
}

class Welcome { use Greeting; }

(new Welcome())->greeting("Mainz");
// prints "Hello Mainz"
```

```php
trait Hello {
    private function hello($city) {
        echo "Hello " , $city;
    }
}

class Welcome {
    use Hello {
        hello as public;
    }
}

(new Welcome())->hello("Mainz");
// prints "Hello Mainz"
```

```php
trait Who {
    public function msg($name) { return $name; }
}

trait Hello {
    private function msg() { return "Hello"; }
}

class Welcome {
    use Who, Hello {
        hello::msg as public hi;
        Who::msg insteadof Hello;
    }
}

$w = new Welcome();

echo $w->hi(), ' ', $w->msg("Mainz");
// prints "Hello Mainz"
```

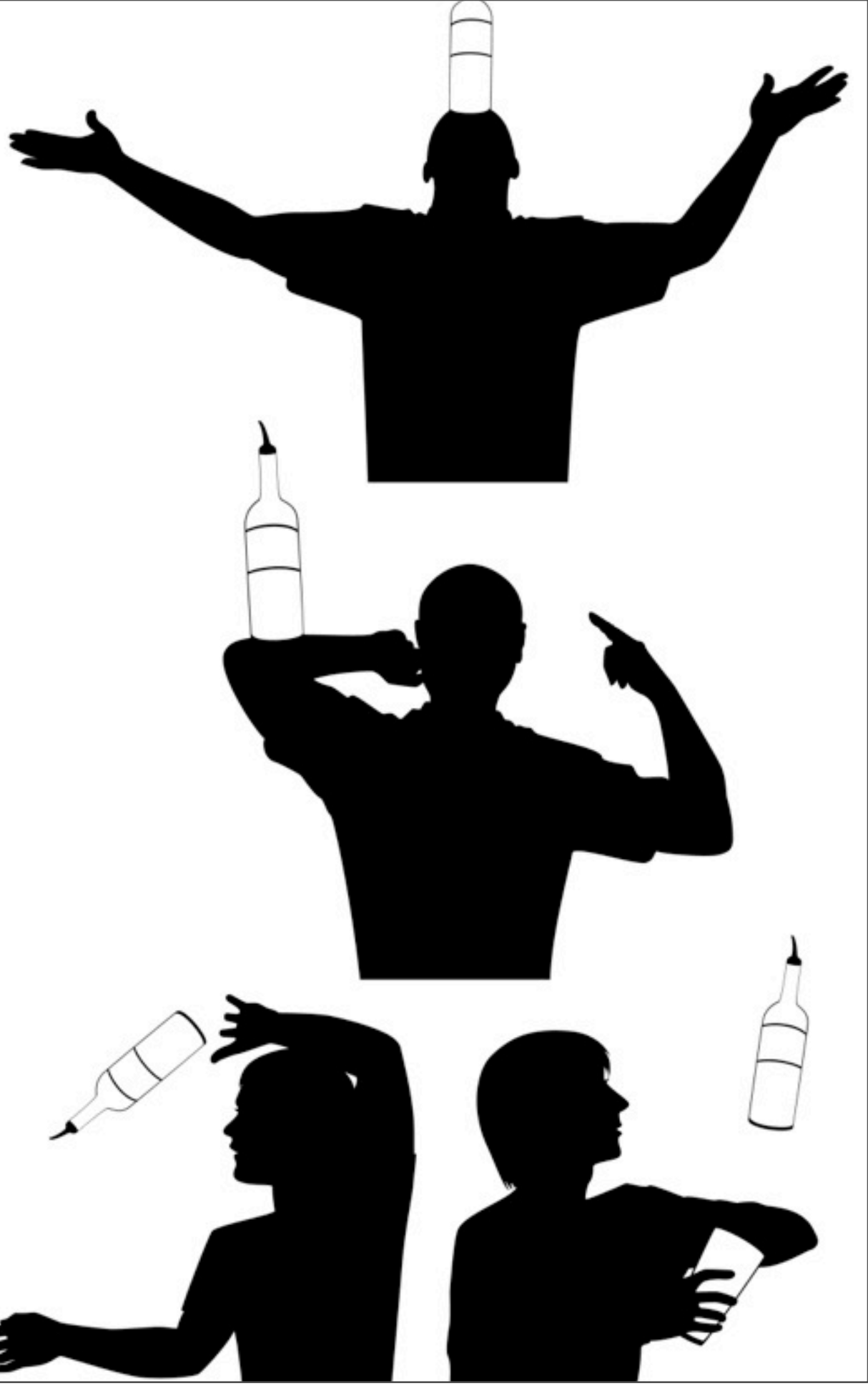
Identifying Traits

The consequence of the “copy & paste” implementation of traits, makes them a little hard to detect.



```php
trait Hello {
    public function hi() { return 'Hello'; }
}

class Welcome {
    use Hello { hello::hi as public hello; }
}

$rc = new ReflectionClass('Welcome');
if (!$rc->isTrait()) {
    echo $rc->getTraitNames()[0]; // prints "Hello"

    echo $rc->getTraitAliases()['hello'];
    // prints "hello::hi"

    foreach ($rc->getTraits() as $v) {
        echo $v->getMethods()[0]->class, ' ',
             $v->getMethods()[0]->name;
        // prints "hello hi"
    }
}
```

Built-in CLI Web-Server



```
ilia@s3 ~ $ php -S localhost:8080 -t /tmp/web router.php

PHP 5.4.0RC8-dev Development Server started at Sat Feb 11 12:17:50 2012

Listening on localhost:8080
Document root is /tmp/web

Press Ctrl-C to quit.

[Sat Feb 11 12:18:26 2012] 127.0.0.1:45018 [200]: /logo.png
[Sat Feb 11 12:18:33 2012] 127.0.0.1:45021 [200]: /index.php
```

Basic Request Router

```
if (preg_match('!\.php$!', $_SERVER["REQUEST_URI"])) {
    require basename($_SERVER["REQUEST_URI"]);
} else if (strpos($_SERVER["REQUEST_URI"], '.')) {
    return false; // serve the requested file as-is.
} else {
    Framework::Router($_SERVER["REQUEST_URI"]);
}
```

Notes & Disclaimers

- Brand new, so **use with caution**
- Default index file is “index.php”
- No support for source highlighting via “.phps” (for now)
- Intended for Development, NOT for production.
- No SSL support

Performance Improvements

Lots of improvements

- Replaced zend_function.pass_rest_by_reference by ZEND_ACC_PASS_REST_BY_REFERENCE in zend_function.fn_flags.
- Replaced zend_function.return_reference by ZEND_ACC_RETURN_REFERENCE in zend_function.fn_flags.
- Removed zend_arg_info.required_num_args as it was only needed for internal functions. Now the first arg_info for internal functions (which has special meaning) is represented by zend_internal_function_info structure.
- Moved zend_op_array.size, size_var, size_literal, current_brk_cont, backpatch_count into CG(context) as they are used only during compilation.
- Moved zend_op_array.start_op into EG(start_op) as it's used only for 'interactive' execution of single top-level op-array.
- Replaced zend_op_array.done_pass_two by ZEND_ACC_DONE_PASS_TWO in zend_op_array.fn_flags.
- op_array.vars array is trimmed (reallocated) during pass_two.
- Replaced zend_class_entry.constants_updated by ZEND_ACC_CONSTANTS_UPDATED in zend_class_entry.ce_flags.
- Reduced the size of zend_class_entry by sharing the same memory space by different information for internal and user classes. See zend_class_entry.info union.
- Reduced size of temp_variable.
- Changed the structure of op_array.opcodes. The constant values are moved from opcode operands into a separate literal table.
- Inlined most probable code-paths for arithmetic operations directly into executor.
- Eliminated unnecessary iterations during request startup/shutdown.
- Changed $GLOBALS into a JIT autoglobal, so it's initialized only if used. (this may affect opcode caches!)
- Improved performance of @ (silence) operator.
- Simplified string offset reading. $str[1][0] is now a legal construct.
- Added caches to eliminate repeatable run-time bindings of functions, classes, constants, methods and properties.
- Added concept of interned strings. All strings constants known at compile time are allocated in a single copy and never changed.
- Added an optimization which saves memory and emalloc/efree calls for empty HashTables.
- ZEND_RECV now always has IS_CV as its result.
- ZEND_CATCH now has to be used only with constant class names.
- ZEND_FETCH_DIM_? may fetch array and dimension operands in different order.
- Simplified ZEND_FETCH_*_R operations. They can't be used with the EXT_TYPE_UNUSED flag any more. This is a very rare and useless case.
- ZEND_FREE might be required after them instead.
- Split ZEND_RETURN into two new instructions ZEND_RETURN and ZEND_RETURN_BY_REF.
- Optimized access to global constants using values with pre-calculated hash_values from the literals table.
- Optimized access to static properties using executor specialization.
- A constant class name may be used as a direct operand of ZEND_FETCH_* instruction without previous ZEND_FETCH_CLASS.
- zend_stack and zend_ptr_stack allocation is delayed until actual usage.
- Zend Signal Handling

Lies, Damn Lies & Statistics

- 5.4 is the fastest PHP version yet!
- On average real-life applications are 5-20% faster
- Static benchmarks show 15-20% speed improvement
- Memory usage reduced at least 25% in most real-life applications

Cleanup ...

False Security "Features"

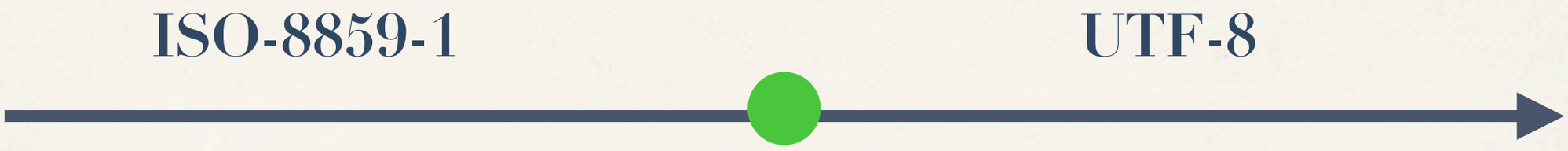
- Safe Mode
  - Not really "safe" and caused many problems
- Magic Quotes
  - Poor mechanism for securing SQL data

Welcome to 2012

- Register Globals & Register long arrays (HTTP_GET_VARS)
- y2k_compliance option for cookies
- Allow-call-time pass reference [foo(&$bar)]
- import_request_variables() function
- Session extension's bug compatibility options
- SQLite 2 extension (replaced with SQLite 3)

Backwards Compatibility Breaks

Internal entities functions



Consequences For:

- Input Processing (GET / POST / default_charset INI)
- Data Storage (Database charset)
- Output (htmlspecialchars / htmlentities)

Removed “Features”

- Time-zone guessing code, now defaults to UTC

- break $foo; and continue $bar
- Setting of Timezones via putenv(“TZ=…”)
- define_syslog_variables() (use pre-defined constants)

Thanks for Listening

Please leave feedback
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