# Bijlage VWO <br> 2017 

tijdvak 1

Engels

Tekstboekje

## Tekst 1

## Balanced argument

1 David Cameron now accepts that the free movement of peoples within an ever-expanding EU constitutes a problem. A living wage and mass immigration are 1 .

Either curtail immigration, in which case the market will automatically raise unskilled wages, or let business decide how many people to let in. An end to importing cheap labour from within as well as outside the EU has a democratic cost.

As for Labour, it's not too late to pay heed to the free market economist Milton Friedman, who said you can have open borders or you can have the welfare state, but you cannot have both.

## Yugo Kovach

Winterborne Houghton, Dorset
The Sunday Times, 2013

## Tekst 2

## Spotting musical talent

1 Pity the hit-picker for the Decca record label who turned down the Beatles after an audition, choosing Brian Poole and the Tremeloes as the hotter prospect. People who made the wrong call are often remembered for it for eternity and so the guy who saw no future in a Merseyside guitar band has comforting company.

Newly released BBC records reveal that, in 1968, the corporation's talent selection group turned down the artist now known as Sir Elton John as a "dull performer with a thin voice" and David Bowie as "amateurish and out of tune".
$\qquad$ , the BBC chap on the talent selection group who rejected the Rolling Stones as "unsuitable for our purposes" may look foolish historically but, at the time, was probably correct in concluding that Jagger's band was not the sort of thing the corporation wished to see on its screens. Because most talent scouts are primed to seek more of what audiences already want, they are almost bound to reject anything ahead of contemporary taste.

A second issue is that auditions are subject to the performance on the day. At the time they were panned by the BBC panel, Elton John and David Bowie were still closer to being Reginald Dwight and David Jones than what they later became: Bowie, for example, performed Chim-ChimCheree from Mary Poppins, which may not have made the best case. And, crucially, there is human fallibility. Perhaps, at Decca in 1961, either the guy from the label or one of the boys had a bit of a head. To become a success generally requires luck, but to spot one requires even more.


## Mark Lawson

adapted from Guardian Weekly, 2013

Race and the law in Brazil

## The race docket

BRAZIL'S Supreme Court is wrestling with one of the toughest dilemmas in politics: which is preferable, absolute equality before the law or discrimination in favour of disadvantaged races? This is a surprise, for until recently Brazil liked to see itself as a true melting pot.

Like America, it has significant minorities of blacks, indigenous peoples and European immigrants; it even has the world's biggest populations of Japanese outside Japan and Lebanese anywhere. Unlike Americans, Brazilians rarely classify themselves by race. One survey listed 136 sample skin colours. At the last census, $38 \%$ simply said they were mixed.

Although Brazil's races are not separate, they are not equal either. Blacks earn about half as much as whites, and have five years of education, compared with whites' eight. In June Congress passed a "statute of racial equality"; $\quad \mathbf{5}$ it steered clear of positive discrimination.

The trouble is that such policies conflict with Brazil's tradition of legal raceblindness. Since the country abolished slavery in 1888 its laws have been racially neutral. It has had no Jim Crow laws ${ }^{1}$. But nor does it have a legal basis for positive discrimination. Three cases involving such action are before the highest court.

One concerns Rio de Janeiro State University (UERJ), the first big public institution to use racial quotas. In 2002 it began reserving half its places for stateschool graduates, and $40 \%$ of those were for blacks and Indians. The second involves ProUni, a federal programme set up in 2004 to give poor children scholarships to private universities. The aid is tied to the share of blacks and others, making it the first federal programme with a racial component.

The third case, dealing with federal universities, is probably the most important. About 70 universities have introduced schemes to broaden their student intake, from simple quotas to points-based systems that count race as one factor. The court is hearing a case against the University of Brasilia, one of the most prestigious, as a test for the others. This, says Oscar Vilhena Vieira, a lawyer arguing for the quotas, has the widest application and most directly examines whether positive discrimination is constitutional.

The problem facing those in favour of quotas is not only Brazil's preference for racially blind laws, but also the practicalities. In a melting pot, who is black? The problems facing their opponents are that blacks are clearly disadvantaged; that the programmes seem to work (black enrolment shot up at UERJ after quotas came in) and that the constitution does permit positive discrimination for some, like the disabled. Why not blacks? That is for the court to answer.

The Economist, 2010
noot 1 Jim Crow laws were laws in the United States that legalised racial segregation.

# Clinical trials on trial 

Osagie K. Obasogie

A GREAT deal of scientific research especially in medicine - relies on human subjects. Protecting volunteers has been a prominent social and legal issue since the 1950s, when the world recoiled from the horrors of Nazi medicine.

We have come a long way since then, but it pays to remember that the Nazis did not have a monopoly on atrocities committed in the name of science. One of the worst cases of human subject abuse was perpetrated by American scientists who, between
 1932 and 1972, misled hundreds of black people with syphilis in Tuskegee, Alabama, by deliberately leaving them untreated to enable researchers to study the progression of the disease.

Tuskegee wasn't an isolated incident. Historian Susan Reverby of Wellesley College in Massachusetts recently uncovered another appalling ethical breach. In the 1940s, researchers from the US Public Health Service deliberately infected Guatemalan patients, prisoners and soldiers with syphilis to test whether penicillin was an effective treatment. In a paper to appear in the Journal of Policy History, she describes how in some cases infected prostitutes were paid to have sex with prisoners. This breach happened at almost the same time as Nazi doctors were on trial at Nuremberg for similar abuses.

Reverby's revelation led the US to issue formal apologies to the victims and the Guatemalan government. It also prompted President Barack Obama to instruct his Bioethics Commission to turn its focus away from synthetic biology and take a fresh look at the protection of human subjects, so as to "assure that current rules... protect people from harm or unethical treatment". Obama should be applauded. $\qquad$ 10 if he and the commission review the rules without examining the broader context in which human research occurs, they may vastly underestimate the depth of the problem. Particularly troublesome is the extent to which research on human subjects increasingly targets vulnerable people.

This is seen most clearly in clinical trials. The pharmaceutical industry spends billions of dollars each year testing experimental drugs, with a significant portion of this cost stemming from recruiting and retaining human volunteers.

Subjects for research are in high demand. A 2005 Bloomberg Markets report showed that the pharmaceutical industry conducted 36,839 clinical trials between 2001 and 2004 - six times more than in a similar period starting in 1981. This
rapid expansion is causing demand for human subjects to outpace supply. To meet the need for more bodies while keeping costs down, the industry is resorting to extreme measures, and the most vulnerable members of society are in the crosshairs. science and medicine is not over speculative technologies such as synthetic biology. Rather, it concerns the more basic question of how we treat each other. With an entire research industry becoming increasingly dependent upon vulnerable populations to test experimental treatments, not enough thought has been given to issues of justice. We are not back in Tuskegee territory yet, but this approach to recruiting human subjects may give rise to outcomes that are similarly pernicious.

Obama should be commended for instructing his Bioethics Commission to look into ways to prevent further human subject abuses, but its mandate must go beyond checking the rules. $\mathbf{1 4}$, the commission must examine a deeper question: is it ever ethical to ask the most vulnerable members of our society to give their bodies to science?
adapted from NewScientist, 2011

# Britain's Brussels Syndrome 

ROGER COHEN

LONDON The basic tenet of The Daily Mail is that Britain is not what it was (true enough, it isn't) and that it would go a long way toward recovering its gritty greatness without wind farms, safety obsessions, green lunacy, overregulation and - above all - the European Union with its meddling bureaucrats. hits every chauvinistic British button with eerie precision. Its mix of sex, celebrities, scandal and Brussels-baiting has something of the yucky addictiveness of the Kardashians. The paper boasts a weekday circulation of almost 1.6 million, rising to close to 2.5 million on Saturdays. It also has a wildly successful Web site, Mail Online - but that's another story.

My concern here is not with The Mail's journalistic brilliance - no paper is more maddeningly readable - but with what its obsessions say about where Britain is headed with its acute Brussels Syndrome. The Mail wants Britain out of the 28 -nation European Union. So does the only daily that outsells it, The Sun. For both papers, Europe is a sort of Soviet Union-lite with plans to regulate everything from female quotas in boardrooms to your doctor's hours. This is a nation where the agenda of the mass circulation tabloids weighs heavy.

$\qquad$ , the E.U. is a tough sell these days. It is dominated by Germany, a nation uneasy about dominance. It includes France, a nation that has turned malaise into a fetish. Its southern littoral is an economic horror show. Its more than 500 million citizens feel underconsulted and overpatronized.

It is a divided club, with 17 members in the euro zone and 11 members outside. Inside the euro zone, the agony of the euro has demanded a federalizing push - the currency's salvation but also the direction many non-euro-zone countries (chiefly Britain) do not want to go. As for the Union's great achievements, like say, peace on a borderless continent, they are oh-so 20thcentury.

Yet none of this quite explains the revulsion served up by The Mail. The other day there was this headline: "I was born a British citizen, and want to die as one. But unless our gutless leaders stand up to Brussels, I won't be able to."

The article was about a possible plan - the verb "may" is a favorite when it comes to sinister E.U. aims that seldom materialize - to stamp the Union flag on British birth certificates. It was signed Stephen Glover. Glover! I worked with him
in the 20th century at Oxford on the university magazine, Isis. He seemed a reasonable, affable chap. Well, I thought, if Glover now lives in fear of being gouged of his inner Briton by Brussels apparatchiks ${ }^{1)}$, perhaps the danger is real.

Visions of that blue-and-gold E.U. flag smothering this sceptered isle and its vestigial grit loomed before dissipating: It's all complete nonsense, of course. Britain, a member for 40 years now, needs the E.U. and vice versa. About half of British exports go to the Union. Millions of jobs are tied to it. Foreign investors choose Britain because of its access to the single European market. Parts of Britain's growing auto industry would leave if Britain exited. The United States would be very grumpy. Banks that have made the City Europe's financial hub would find a Britain outside the E.U. "much less attractive" and migrate over time, as the co-C.E.O.'s of Goldman Sachs International put it in The Times of London.

And what of all the Britons who take for granted their right to retire in the Dordogne, or the more than 2.3 million people from the E.U. making the British economy tick from city to farm? Dame Helen Alexander, the chancellor of Southampton University, said: "Anyone who comes here knows we need to be part of something powerful in the world, not some tiny little country in the corner."

Not so, insists Nigel Farage, the leader of the thriving U.K. Independence Party (UKIP), who tells me The Mail underestimates the ghastly truth ("75 percent of our life is governed from the E.U."), compares a supranational Europe to Yugoslavia, mocks Prime Minister David Cameron's Conservative Party ("They used to talk enterprise and success, now they talk gay marriage and wind farms"), and declares Britain in Europe "a square peg in a round hole."
"Nobody wants it," he declares.
We will see. Cameron has called for an in-or-out referendum, likely in 2017, in part as a tactic to head off UKIP.

21 , as The Mail rails on, Union Jacks multiply over Britain, with its royal baby, Olympic triumphs and the rest. They fly over a nation that has never looked so European. Malaise-weary French people find work. So do Poles and Italians. What The Mail hates is not Brussels, but this Britain. Nations have shot themselves in the foot before out of some vague anger. It could well happen here. Britain will exit Europe sans return ticket - in which case I plan to exit Britain on the same terms.
adapted from International Herald Tribune, 2013
noot 1 apparatchik: an official or bureaucrat of the Russian Communist Party or Russian government

## The nanny state

|ACKIE BAPTISTE'S working day begins at seven o'clock, when she goes to a council house, drags someone else's children out of bed and packs them off to school. The social worker is not a woman to be trifled with. "They might tell me to F-off, but it's only words," she shrugs. Sometimes she films the desperate attempts of a mother to control her brood, then plays the recording back, offering tips on how to do it right. She attends parent-teacher meetings, appointments with doctors and counselling for alcoholism and domestic violence, all the while holding the hands of her adult charges. In a typical week she will see the same family five or six times, as part of Westminster council's Family Recovery Programme. She is part of a growing movement, and the product of a remarkable political consensus.

The state has long meddled with poor families. In his autobiography, Charlie Chaplin recalls that on entering a London workhouse, he and his brother Sydney were sent off to the children's wing while his mother went to the women's wing, a separation that had been routine since the Poor Law of 1834. There were still several thousand children living in such places when the last ones were abolished in the 1940s and Britain began building a comprehensive welfare state. In the decades since, the government has acquired many more children, though it houses them differently. There are currently 66,000 children in care, meaning they have been removed (voluntarily or otherwise) from their biological parents. The majority are shuffled between short-term placements with foster families.

This is where the new scheme comes in. For although taking children from their parents may sometimes be the least bad thing to do, the government is, in aggregate, a deadbeat, feckless parent. Children who have been in care are 50 times more likely to go to prison than those who have not, according to calculations by Policy Exchange, a think-tank. They are also 66 times more likely to see their own children taken into care. This is not for lack of money: the average bill for taking a child under the state's wing is $£ 38,000(\$ 61,400)$ per year. Better, then, to employ a latter-day Mary Poppins to nanny a family into staying together.

Parents who are at risk of losing their children, their liberty and their housing can choose to enroll in Westminster's programme. Most of those eligible have decided to do so. "We say: 'Those people over there want to take your house and your child away. We want to

work with you to make sure that does not happen'," explains Natasha Bishopp, who is in charge of the scheme. Each family signs a contract. If its terms are broken, the council does what it would have done anyway. So far that has happened to just $15 \%$ of the 210 contracts signed since 2008.

Part of the reason for this success, Ms Bishopp argues, is that people who are constantly pestered by the government's agencies tend to experience its sanctions either as empty threats or as sudden and mystifying. The contract helps overcome that, as does embodying the state in the form of a single, smiling individual. Gail Porter, who runs similar schemes for Lancashire Council, reports one of the families her team works with had previously received visits from 21 separate agencies. The results of these programmes and others like them have encouraged the government to launch a national Troubled Families Programme. Central government will provide $£ 4,000$ per family and local authorities a further $£ 6,000$ in the hope of improving the lives of 120,000 families during the next three years.

This points to an interesting situation in British politics. For all that Labour likes to paint the Tories as a heartless bunch intent on slashing welfare and the Conservatives retort that Labour would trap the poor on state benefits for ever, the two parties have $\underline{\mathbf{2 8}}$ to help the poorest and most dysfunctional families.

For Conservatives, the promise of keeping families together trumps traditional concerns about an interfering state. Tories also like the programme's focus on teaching people how to take responsibility for their own lives, and its promise of saving money in the long term. The party that rails against the nanny state has come to embrace state nannying. Ms Baptiste thus enjoys cross-party support for her afternoon task: taking a pair of Marigold gloves from her bag and helping one of her families to tidy up its messy flat.
adapted from The Economist, 2012

The following text is the beginning of the first chapter of We Need to Talk About Kevin, by Lionel Shriver.

I'm unsure why one trifling incident this afternoon has moved me to write to you. But since we've been separated, I may most miss coming home to deliver the narrative curiosities of my day, the way a cat might lay mice at your feet: the small, humble offerings that couples proffer after foraging in separate backyards. Were you still installed in my kitchen, slathering crunchy peanut butter on Branola though it was almost time for dinner, I'd no sooner have put down the bags, one leaking a clear viscous drool, than this little story would come tumbling out, even before I chided that we're having pasta tonight so would you please not eat that whole sandwich. from Katmandu. But no one wants to hear stories from abroad, really, and I could detect from your telltale politeness that you privately preferred anecdotal trinkets from closer to home: an eccentric encounter with a toll collector on the George Washington Bridge, say. Marvels from the mundane helped to ratify your view that all my foreign travel was a kind of cheating. My souvenirs - a packet of slightly stale Belgian waffles, the British expression for "piffle" (codswallop!) - were artificially imbued with magic by mere dint of distance. Like those baubles the Japanese exchange - in a box in a bag, in a box in a bag - the sheen of my offerings from far afield was all packaging. What a more considerable achievement, to root around in the untransubstantiated rubbish of plain old New York state and scrounge a moment of piquancy from a trip to the Nyack Grand Union ${ }^{1)}$.

Which is just where my story takes place. I seem finally to be learning what you were always trying to teach me, that my own country is as exotic and even as perilous as Algeria. I was in the dairy aisle and didn't need much; I wouldn't. I never eat pasta these days, without you to dispatch most of the bowl. I do miss your gusto.

It's still difficult for me to venture into public. You would think, in a country that so famously has "no sense of history", as Europeans claim, that I might cash in on America's famous amnesia. No such luck. No one in this "community" shows any signs of forgetting, after a year and eight months - to the day. So I have to steel myself when provisions run low. Oh, for the clerks at the 7-Eleven on Hopewell Street my novelty has worn off, and I can pick up a quart of milk without glares. But our regular Grand Union remains a gauntlet.

I always feel furtive there. To compensate, I force my back straight, my shoulders square. I see now what they mean by "holding your head high", and I am sometimes surprised by how much interior transformation
a ramrod posture can afford. When I stand physically proud, I feel a small measure less mortified. feet away, a fellow shopper's frazzled black hair went white at the roots for a good inch, while its curl held only at the ends: an old permanent grown out. Her lavender top and matching skirt may have once been stylish, but now the blouse bound under the arms and the peplum served to emphasize heavy hips. The outfit needed pressing, and the padded shoulders bore the faint stripe of fading from a wire hanger. Something from the nether regions of the closet, I concluded, what you reach for when everything else is filthy or on the floor. As the woman's head tilted towards the processed cheese, I caught the crease of a double chin.

Don't try to guess; you'd never recognize her from that portrait. She was so neurotically svelte, sharply cornered, and glossy as if commercially gift wrapped. Though it may be more romantic to picture the bereaved as gaunt, I imagine you can grieve as efficiently with chocolates as with tap water. Besides there are women who keep themselves sleek and smartly turned out less to please a spouse than to keep up with a daughter, and thanks to us, she lacks that incentive these days.

It was Mary Woolford. I'm not proud of this, but I couldn't face her. I reeled. My hands went clammy as I fumbled with the carton, checking that the eggs were whole. I rearranged my features into those of a shopper who had just remembered something in the next aisle over and managed to place the eggs on the child-seat without turning. Scuttling off on this pretense of mission, I left the cart behind, because the wheels squeaked. I caught my breath in soup.

I should have been prepared, and often am - girded, guarded, often to no purpose as it turns out. But I can't clank out the door in full armor to run every silly errand, and besides, how can Mary harm me now? She has tried her damnedest; she's taken me to court. Still, I could not tame my heartbeat, nor return to dairy right away, even once I realized that I'd left that embroidered bag from Egypt, with my wallet, in the cart. Which is the only reason I didn't abandon the Grand Union altogether. I eventually had to skulk back to my bag, and so I meditated on Campbell's asparagus and cheese, thinking aimlessly how Warhol would be appalled by the redesign.
noot 1 Grand Union: an American supermarket chain

The James Bond question

## Shaken, stirred and confused

 when he appeared in "Casino Royale" published in 1953. These two cultural ambassadors have been linked ever since, both conveying an obliging view of Britishness in a changing world. So it is fitting that special agent 007 celebrates his jubilee wrapped in a Union Jack. "Skyfall", the latest instalment of the longest-running cinema franchise, is the most overtly patriotic Bond film yet.

Played for the third time by a thuggish Daniel Craig, this Bond spends much of the film meditating on the sense of duty and love of country that inspired his work as a licensed killer, although it is unclear which country that is. Against a backdrop of a push for independence in Scotland, the half-Scottish Bond (his mother was apparently Swiss) careers among the thoroughly British imagery of fast Land Rovers, crushed German cars and the motif of a noble, if comical, English bulldog.

The plot hurls Bond to Istanbul and Shanghai in pursuit of a computer disk bearing identities of secret agents. But most of the action takes place on home turf, with sweeping views of London and a chase on the London Underground. Asked to respond to the term "country" in a wordassociation test, Bond promptly replies "England". Yet the film's climactic stand-off takes place in Bond's childhood home in rural Scotland, where he lived until he was orphaned. Gazing at this verdant countryside (after a long drive "back in time" in his vintage Aston Martin), Bond sighs wistfully. original novels presented Bond as an aspirational, thoroughly English figure, who emerged from the post-war rubble with refined tastes and bold courage. Yet this post-imperial relic underwent a transformation when he made his big-screen debut 50 years ago. Brought to life by the Scottish Sir Sean Connery, Bond suddenly became Scottish too - elegant and classless, but also a roving outsider. The brogue softened Bond's imperial English inheritance, making him fit for a mass market, says James Chapman, a professor of film studies at the University of Leicester.

Fleming was so inspired by Sir Sean's performance that he retrofitted Bond's Scottish back-story into later books. An Englishman, Fleming enjoyed his own Scottish heritage (a grandfather), according to Ben Macintyre, who has written a biography of the novelist.

The reference to this cross-border heritage in "Skyfall" feels pointed. Bond seems moved by his complicated birthright, while his tough old boss M, played by a queenly Dame Judi Dench, more 36 cites a great English poet as her inspiration. In a potent scene before a parliamentary committee, Dame Judi summons Tennyson's restless Ulysses: "That which we are, we are." A fine sentiment. If only Mr Bond were so sure about the answer.

The Economist, 2012


## On the scent of wine that never goes off

1 WINES could be prevented from going off after scientists discovered an additive that prevents oxidation. The researchers added chelation compounds that bind with metals to inhibit oxidation. Gal Kreitman, a doctoral candidate in food science at Penn State University in the United States, said: "Oxidation has several bad effects on wine, such as discolouration and a loss of aroma. It can cause browning, as well as the loss of fruity characteristics, something that is much more noticeable in white wines."

Oxygen usually enters wine through the cork and interacts with metals, particularly iron, setting off a chain reaction that changes compounds that add particular and often disagreeable tastes and smells to the drink, according to the researchers, whose findings were published in the Journal of Agricultural and Food Chemistry.

Winemakers have previously attempted to control oxidation in the wine by stripping out the metals, which are acquired through the soil and from the grape. However, Mr Kreitman said those processes were impractical and expensive. He added: "Unfortunately, the process to remove the metals can strip colour and flavor compounds from the wine and processes like ion exchange can end up making the wine taste more salty." He said further research would be needed to find chelators that are food safe and approved for use by winemakers.
adapted from The Daily Telegraph, 2013

## Alpha male seeks lower stress level

## From Prof Mike Robinson

Sir, It is inferred that alpha male baboons have higher stress levels than beta males because of the conflicts to maintain the highest rank ("Alpha baboons feel the strain", FT.com, July 30).

I am an alpha male with ambitions to become a lower-stress beta. My stress levels arise because I actively seek conflict. Not just academically, as in attacking flawed hypotheses. I notice any opportunity for conflict - a closed right of way, a misleadingly advertised product

My alpha status is a result of conflict-seeking. Conflict is not thrust upon me as a result of my alpha status.

This observation, of course, may not generalise to baboons.

## Mike Robinson,

 Kingston-upon-Thames, Surrey, UKFinancial Times, 2011

## Tekst 11

## Not just gesture politics?

1 SOME of the sheen has come off the belief that online activism can change the world. The social-media revolutions of the Arab Spring and the antics of hacktivist group Anonymous in opposing online censorship have diffused into "slacktivism" - changing a profile picture, or reposting a status update, to show support for a favoured cause.

The suspicion is that such feel-good actions boost self-esteem but achieve precious little else. Some critics say such easy acts $\mathbf{4 1}$ if they replace more meaningful action, such as donating to a charity or volunteering time and labour. Are people right to be worried?

Perhaps, but the picture is complex. It seems that those signing up to online petitions are more willing to donate to a cause related to the petition, but give smaller amounts than non-signatories would.
adapted from NewScientist, 2013

## Earth Observation Scientists, Ecosystem Modellers, Plymouth, Devon, UK

Plymouth Marine Laboratory (PML) is looking to appoint six enthusiastic and highly motivated, experienced individuals. PML is recognised internationally as a dynamic, highly innovative, independent and impartial deliverer of scientific research and advice on the marine environment.

## EARTH OBSERVATION SCIENTISTS

Ref: PML38212
You are invited to apply for one of three posts as Earth Observation Scientist to join the PML Remote Sensing Group.

Two posts will be involved in marine Earth observation research: the first will investigate open ocean and coastal bio-geochemical cycles, and the second will investigate atmosphereocean gas exchange, both globally and in the Arctic.

The third post will work in the recently funded NERC GloboLakes consortium project and focus on lake water quality algorithms, production and analysis of a global time series of MERIS lakes data and the exploitation of the new ESA Sentinel 2 and 3 missions for lake observation.

## Eligibility:

For the scientist grade you will have a PhD or have a minimum of three years postgraduate research experience and experience with publishing research in scientific journals. For the senior scientist grade you additionally will have started generating commissioned research income to support your own area of research, as well as a track record in publications. Relevant experience in remote sensing, image processing, bio-optics or the specified science areas would be advantageous.

You will be numerate and possess good experience in analysing and handling large datasets with appropriate skills in computer programming in a Linux environment for quantitative Earth observation research.


## ECOSYSTEM MODELLERS

Ref PML38312

You are invited to apply for one of three posts as an Ecosystem Modeller. You will join one of the largest and most energetic marine ecosystem modelling groups in the world and work on the development and application of marine hydrodynamic/ecosystem models, investigating the impacts of climate change and multiple stressors on marine ecosystems.

We are looking for people with relevant expertise to work in the following areas:

1) Higher trophic level modelling (Zooplankton and above);
2) Biogeochemical modelling at global scales;
$3)$ Benthic ecosystem modelling.
We are looking to appoint at both senior scientist and scientist level. The objective of these posts is to underpin a strategic expansion of the group with an emphasis on modelling the whole marine ecosystem including the links to man. PML has a well-developed system of coupled hydrodynamic marine ecosystem models based on ERSEM (European Regional Seas Ecosystem Model) and NEMO. You will be expected to maintain and raise the profile of the PML Modelling Group by publishing in peer reviewed journals and presenting work at high profile conferences.

## Eligibility:

You will have a background in numerical modelling or marine science, along with a PhD or a minimum of three years postgraduate research experience. In particular, we are interested in individuals who have experience in the modelling of fish and higher trophic levels, benthic ecosystems and marine biogeochemistry at global scales. Programming and computer skills will be a definite advantage, as would experience of NEMO/FVCOM hydrodynamic models, marine ecosystem models, and parallel computing.

## Permanent positions:

The successful applicants will be appointed to grade and salary range commensurate with skills and experience.
Scientist grade: $£ 28,066-£ 33,206$
Senior scientist grade:
£34,931-£40,044

## How to apply:

For information and an application form please contact: Mrs E Matthews, Human Resources Group, PML, Plymouth, PL1 3DH, UK.
T: +44 (0)1752 633100;
E: vacancies@pml.ac.uk.
Quoting the relevant reference number:
PML38212 or PML38312
Application deadline 1200hrs
31st August 2012;
interviews w/c 24th September 2012, for a start as soon as possible.

NewScientist, 2012


