Science and Technology
科技
Materials science
材料科学
Don't slag it off
废渣别融掉
How to make bricks out of industrial waste
怎样用工业废渣制造砖块
BUILDING houses and offices out of toxic waste sounds like a pretty eccentric idea.
用有毒废料建造住房和办公室的点子听起来真怪。
Yet it may become commonplace if Ana Andres of the University of Cantabria in Spain has her way.
但是如果西班牙坎塔布里亚大学的 Ana Andres 成功的话，这项技术就会广泛应用。
For Dr Andres and her colleagues suggest, in Industrial & Engineering Chemistry Research, that the humble brick need not be made of pure clay.
Ana Andres 博士和她的同事们在《工业与工程化学研究》中提出，一般的砖不需要全用粘土烧制。
Instead, up to 30% of its weight could be slag—the toxic gunk left over when steel is made.
反而，高达 30%的重量可以是矿渣，这是一种在制钢过程中产生的有毒废料。
Waelz slag, to give its technical name, is composed mainly of silica but is also undesirably rich in poisonous metals like lead and zinc.
学名是威尔兹的废渣主要由硅土组成，也不可避免的含有诸如铅和锌之类的有毒金属。
Getting rid of it safely is thus a problem. Getting rid of it usefully might sound like a miracle.
如何安全的去除这些金属是一个问题。能够去除听起来就是个奇迹。
But that is what Dr Andres proposes.
但这正是 Andres 博士打算解决的。
A series of experiments she has conducted over the past three years suggests this is not only possible but will make bricks cheaper and more environmentally friendly.
再过去的三年中，她所做的一系列实验表明，安全去除有毒物质不仅可行，还可以降低制砖成本，更加环保。
Her research started after she read of previous work which had shown that many ceramics suffer no loss of integrity when the clay used to make them is mixed with other materials, and that the molecular structure of some ceramics acts to trap atoms of toxic heavy metals.
一些研究表明，在用于烧制的粘土中添加了其他材料后，陶瓷整体的性质没有减弱，一些陶瓷的分子结构捕捉有毒重的金属原子，读到这些后，博士开始了她的研究。
She wondered whether these things might be true of brick clay and Waelz slag, and she began experimenting.
她想知道这些原理对制砖粘土和威尔兹废料是否同样适用，她开始实验。
The answer, she found, was that they are.
发现答案是，同样适用。
Bricks show no loss of useful mechanical properties even when 20-30% of their content is slag. Nor do they leak.
就算 20-30%的是废料，砖的力学性能也没有降低。有毒物质也没有泄露。
To check that, Dr Andres and her team ground their bricks into powder and soaked them in water,

shook them in special machines for days at a time, and even tried to dissolve them in nitric acid.
为了验证这一点，博士和她的科研小组将砖头打成粉末，浸泡在水里，在特殊装置里几天不停地摇晃，甚至在硝酸中溶解粉末。
The pollutants stayed resolutely put.
污染物没有一丝一毫泄露。
Moreover, adding slag to the clay reduced by a third the amount of carbon dioxide each brick released during its manufacture, because wood pulp is added to clay before it is fired, and less clay means less pulp is needed.
而且，通过在砖头中增加废料，可以在制砖的过程中减少三分之一的二氧化碳排放，因为添加在粘土中的木浆没有经过燃烧，粘土越少，需要的木浆越少。
The cost, too, fell, because slag is free, whereas clay costs money.
成本也有所降低，因为废料是免费的，只有粘土需要用钱购买。
There is, of course, the problem of customers.
当然，消费者是个问题。
Whether people will be willing to live and work in structures that double as waste dumps is moot.
人们是否愿意住在工作在砖头含有有毒物质，但面积增加一倍的建筑物中还不得而知。
But for those who want to make an eco-point, what better way could there be than, literally, to build their green credentials?
但是对于那些想做点对生态有益的人，说实话，什么会比建造环保建筑这一绿色证明更好的方式呢？