

# US turns away foreign graduate students

Data released on 7 September, according to a news item in *Nature* for 16 September, indicate that the number of foreign graduate students admitted to leading research institutions in the US has declined precipitously this year. The effect is attributed to changes in the method of issuing visas resulting from the terrorist threats since the incidents on 11 September 2001. There has been a 19 per cent fall in the number of foreign students admitted to graduate programmes in the life sciences and a 17 per cent fall in those of the physical and earth sciences. The largest effects

have been seen in admissions from China, India and South Korea.

Academics and administrators have complained for several years that the security procedures on which the US insists have made an impact on its ability to attract students from round the world. Strict immigration rules are partly to blame, since under these students are required to undergo security checks with more than one US agency, with inevitably long delays of visits.

In the shadow of the US presidential election, promises were made that steps would be

taken to ensure a welcome for foreign students in the US, but at the moment the international office at the National Academy of Sciences admits that an average of more than 100 complaints monthly are being made from scientists who are experiencing delays in being accepted by institutions. At the same time tough economic conditions in some states, including California, have prompted reductions in study applications not only from foreign students but also from domestic students, whose enrolment rate has fallen by 5 per cent.

## Tackling the perplexing problems of cleaning lacquered masterpieces

Furniture made and decorated in the Far East is often treated by lacquering and its conservation and preservation in museums for many years poses problems of cleaning.

The basic lacquer used for Japanese works of art contains urushiol, a catechol derived from the sap of the tree *Rhus verniciiflua*, which is hardened by the enzyme laccase. The lacquer is initially hard and resistant to moisture and organic solvents, but if exposed to low humidity conditions it loses some water and becomes brittle and susceptible to attack by water and atmospheric oxygen.

In *Chemistry World* for September, Sarah Houlton has described some of the problems faced by museum conservators when called upon to clean objects with a lacquer finish, with special reference to the Mazarin chest, made in Japan 350 years ago and now in the collection of the Victoria and Albert Museum in London. Degradation caused by prolonged exposure to light means that application of tap water can blanch the surface and diminish the characteristic gloss of the lacquer.



- detail of Mazarin chest -

Photodamaged lacquer becomes more polar, and attracts more polar dirt, requiring in turn increasingly polar solvents to remove soiling from the hydrophilic surface. The application of a varnish layer to restore the surface has the effect of bringing yellowing with age, and the use of solvents to remove the varnish may damage the lacquer layer beneath the surface.

If removal of a surface stain is required, a polar solvent should be applied. If there are penetrating cracks in the lacquer layer the cleaning solvent may be trapped within them, and this may bring discoloration or even delamination.

Hydrocarbons usually do not damage lacquer, and they are effective in removing waxes and oils.

Nevertheless, lacquering is a complex process, involving the application and drying of many thin layers. Typically, inorganic pigments such as mercuric sulphide or iron oxide are added at some stage to provide a pattern, and these must not be disturbed in the cleaning process.

## The benefits of learning a language other than one's mother tongue

There is a deplorable tendency nowadays to neglect the wider value of what are called the arts and the humanities in our educational programmes in favour of concentrating on what will give an individual better commercial or bureaucratic skills.

Certainly we need to give children the equipment to calculate and express ideas, but much more than this is required to produce a cultured and educated person who can make moral and political choices rather than be bulldozed into following the direction indicated by dictatorial self-seekers. Accordingly, the study of languages and literatures is dismissed as a waste of time and energy, but it is nothing of the sort.

A group of neuroscientists from London and Rome has described in *Nature* for 14

October how proficiency in a second language and the age at which it is acquired have a profound effect on brain development. It is accepted that humans have the ability to learn more than one language, and it now appears that practising this faculty not only affects the function of the brain but also its structure.

Healthy right-handed English and Italian bilingual individuals were studied and comparisons made with monolinguals who have had little or no exposure to a second language. Early bilinguals included individuals who had learnt a second European language before the age of five and had practised it regularly since, and late bilinguals had learned a second European language between the ages of 10 and 15 and practised it regularly for at

least five years. All subjects were native English speakers of comparable level of education.

In bilinguals the density of grey matter in the inferior parietal cortex was greater than in monolinguals, particularly in the left hemisphere, and there were no other significant differences in either grey or white matter. Neuropsychological tests showed that proficiency in a second language correlated negatively with age at the time of learning and positively with grey matter density in the left inferior parietal region. This region corresponds to that activated by verbal fluency tasks. Evidently the human brain changes structurally in response to environmental demands, including those of language and communication.