The RSC Working in Africa

Amongst the stated aims of the RSC is a commitment to promote chemistry throughout the developing world. The Society, through its Analytical Division, Analytical Chemistry Trust Fund and International Committee, has found a novel and effective way of achieving this by sponsoring VSO (Voluntary Service Overseas) teachers. At present there are two such volunteers in Zimbabwe and one in Ghana. VSO sends people with needed skills to the developing world, funded by a grant from the ODA (Overseas Development Agency), and charitable donations. One scheme it operates is for companies and organisations to sponsor a volunteer. It is this scheme that the RSC is supporting.

The small number of chemistry graduates in Zimbabwe, higher private sector salaries and the unattractiveness of working in remote, rural schools combine to make recruitment of local qualified teachers extremely difficult. Many development agencies are attempting to fill this skills gap.

I have been working at Mashoko High School since September, 1989. The school is situated in south east Zimbabwe, 150 km from Masvingo, the provincial capital. Working in a school a 4-hour bus journey from an urban centre, in such isolated surroundings, was initially daunting. The friendliness, support and self-sufficiency shown by the local community, however, quickly allayed my fears. The school is part of a Mission established in the 1960s. It is relatively well equipped, with piped water during the day from a borehole and electricity produced by a 1953 (!) Rolls Royce generator during the evening. Living conditions at the school are therefore easier than in many other rural Zimbabwean schools.

With approximately 700 pupils Mashoko is a large school, half of the intake being day scholars and the rest boarding. Day scholars come from the communal (peasant) farming area around the school, walking up to 12 km (8 miles) in each direction daily. A boarder's "home place" is further afield and boarders usually come from more affluent backgrounds, their parents usually being employed in the formal sector (teachers, office workers, small landowners, etc.). This mixture of backgrounds makes teaching at Mashoko particularly interesting.

Since the mid-1980s the school has been

one of the 120 nationally teaching to advanced level, reflecting the post-independence expansion in education. Through funding by the Zimbabwe Christian Council a new laboratory block was constructed and equipped for "A" level teaching and courses began in April, 1989.

When I arrived the situation was far from ideal. The building was still under construction, there were no chemicals, inappropriate equipment and few books. In the past year, however, with help from many sources the situation has greatly improved. The laboratory now has water and gas (supplied by bottles). A donation of £300 by the Analytical Chemistry Trust Fund through the Analytical Division and a grant from VSO purchased a weighing balance, and a stock of chemicals is slowly accumulating. Donations from the British Council, Ranfurly Library Service and publishers has helped with text-books. The situation is still far from ideal, and much remains to be done: an adequate learning environment does not exist.

Teaching in Zimbabwe presents many of the same problems experienced in inner-city British Schools, but in a more acute form. Lack of apparatus can be overcome by improvisation using available materials, which is immensely satisfying. This is particularly important with large Lower School classes (45–50), where class sets of equipment are unrealistic. The use of familiar tools also helps to illustrate new concepts more simply, and helps make the science more accessible.

The most serious problem experienced by a teacher in Zimbabwe is language. All examinations (including Shona!) are written in English, a second and unfamiliar language to pupils from rural backgrounds. Those people, like myself, who struggled with school French can only admire the achievement of pupils attempting examinations in a language other than their own, particularly with the limited resources available. Communication is, however, not always possible. After I had taught one class for a month, another teacher overheard a conversation between a pupil and her mother. "We've got a new teacher", she said. "His name's Mr. Archer. I don't know where he came from. He doesn't speak any English. I think he's Portugese!" (Pass the Sodium Cyanide!)

Zimbabwe

Zimbabwe became an independent republic in April, 1980, following the illegally pronounced UDI (Unilateral Declaration of Independence) in 1965, and the Lancaster House Agreement of 1979. This allowed for a non-racial system of government whilst protecting white interests for a 10 year period. The first (non-executive) President, Canaan Banana, and Prime Minister Robert Mugabe were elected the following year.

There was then factional fighting between ZANU (PF) led by Robert Mugabe and Joshua Nkomo's (PF) ZAPU parties. This has subsequently ended following the "Unity Agreement" of 1987 which joined the two parties. The new stability of the country was recently illustrated with the raising of the 25 year State of Emergency in July.

The country has a population of 9 million (100 000 of whom are white). Fifty per cent. are below the age of 15, and considerable concern therefore exists over population growth. Eighty per cent. of the people live in rural areas, working almost exclusively as subsistence peasant farmers. The main crop is maize, which is dried and ground to produce the staple food mealie-meal. There is also a substantial, successful, commercial farming sector which earns valuable foreign exchange growing cash crops.

The country is fortunate to be richly endowed with relatively fertile soils and mineral deposits. As is typical of this region it does, however, suffer from water shortages. To counter this over 7000 dams have been constructed and utilised for the production of hydroelectric power, irrigation schemes and urban water supplies. Most rural inhabitants collect water from boreholes or streams.

The elevation and inland position of the country enable the climate to be cooler and drier than the tropics, but considerable regional differences exist. The geography of the country comprises a central highveld plateau (above 1200 m), middle and lowveld (below 300 m). Generally, the lowveld is hotter and drier.

Zimbabwe has a growing tourist industry and is a fascinating country to visit. The spectacular mountain scenery of the Eastern Highlands and Matopos Park (south of Bulawayo) contrast with the dry, flat plains of the Hwange National Park, which affords some of the best game viewing in Africa. The country has a rich history, with many ancient ruins such as those at Great Zimbabwe and cave paintings in areas like Matopos. At Victoria Falls, known locally as "Mosi Oa Tunya" (the smoke that thunders), the Zambesi River spreads over 2 km and plummets over 100 m into the gorge below, one of the natural wonders of the world.

A Day in the Life . . .

My alarm wakes me at 5.45 a.m.: I fumble for the radio through the "mozzy" net and doze listening to the BBC World Service as the sun rises over the surrounding hills. The water begins running after I leave, so I wash in a bucket and grab a banana, guava or whatever local fruit is in season for breakfast. (Zim cornflakes taste more like cardboard than cardboard does!)

Teachers' houses are only a few minutes walk from school and I generally arrive at about 6.30 a.m., half an hour before lessons begin, to acclimatise to the day. Assembly is held twice a week and comprises a rendition of the National Anthem, bible reading, prayers and announcements. (I catch a few minutes extra sleep.) Morning lessons are from 7 to 12.40, with a 20 min break, and afternoon classes are from 2 to 3.20. The day is spent conventionally teaching, marking, preparing work and wading through piles of paperwork, which is *so* essential for effective teaching! During the summer (November to February) afternoon temperatures regularly reach 38 °C. "It's too hot to work!" the pupils exclaim (and how do they think I feel?).

The final bell rarely brings an end to the day's exertions. Extracurricular activities play an important part in school life in Zimbabwe as in Britain, Science Clubs, athletics and football training being good ways to meet pupils in a less formal environment than the classroom. Football is an obsession, the reputation and prestige of a school resting on the success of its first team. Matches are fiercely contested and refereeing a challenge. Fortunately, I experience less problems than local staff, with players and spectators uncomfortable disputing decisions in English. (Have you ever tried arguing in a foreign language?)

The sun sets quickly around 6.00 p.m. as I prepare dinner. The local dish is "sadza" (although I am unsure why it is eaten with such relish). This is a thick dough made from ground maize. The evenings I spend working, writing to or visiting friends, or occasionally visiting the bottle store. The lights go off at 10, by which time I am usually asleep. Not such a different day from that experienced by teachers all over Britain.

A Big Day for a Small School

When I arrived back at school from the biology field trip, I was somewhat alarmed to discover that the football pitch had been turned into a heliport and was littered with army landrovers, whilst the hospital roof was occupied by troops! Fortunately it did not take long to discover what was happening. The mission was buzzing with the news that President Mugabe was visiting the following day.

I was somewhat relieved when I was told that the programme involved a tour of provincial hospitals, so I proceeded as normally as possible with the day's work. At 10 a.m., three men from the President's Office walked into mine, and to my horror announced that his itinerary had changed and he would now be visiting the laboratory in 45 minutes! Frantically I rushed around and half an hour later anxious form six students sat poised behind burettes to perform a redox titration: attractive (but above all) safe, chemistry.

The President duly arrived and I was

introduced by the Headmaster and showed him around the laboratory. He spent some time talking to terrified pupils about their studies and aspirations for the future before moving on. He was a likeable, informed man, whose informal manner put all at ease. This visit to the small community will be talked about for years to come.

Second Report to the RSC Analytical Division, from the Sponsored VSO Teacher at Mashoko High School

Since my first report in January, 1990, steady progress has been made towards establishing a viable environment for teaching "A" level chemistry. As I outlined, when I arrived in September, 1989, the required facilities to teach advanced level science were not in place. As I approach the end of my first year I feel satisfied that this is no longer the case. Although many limitations do still exist, and represent a handicap to the students, they no longer prevent an adequate learning environment.

The science laboratories are now equipped with water and gas, and so most experiments essential to a good understanding of the subject (or more realistically, ability to pass the practical exam) are possible. There is still no electricity supply, which, although limiting the scope of practical work, presents a more serious problem in physics.

The issue of electricity supply is a complex one. The laboratory is fully wired, but without most sockets. ZESA (Zimbabwe Electricity Supply Authority) are promising mains supply in the "near future", but this will involve upgrading the entire mission wiring at a huge cost (ZS200 000 or about £50 000). As such, the school is unwilling to complete work on the laboratories when additional work may need to be carried out when a mains supply becomes available. I foresee this frustrating situation existing for some time.

The most pressing teaching problem continues to be the availability of chemicals. This is a national problem, with no internal producers and suppliers receiving insufficient foreign exchange allocation to import. As such, goods are simply not available in the country. Importing goods into Zimbabwe is a nightmare, as after initially overcoming exchange regulations and then import controls it can still take a disproportionate amount of time and effort. Through informal discussions I am aware that the Ministry recognises the problem, but again does not envisage any immediate improvements.

Thanks to the donation of £300 from the Analytical Division and a grant equivalent to £275 from VSO, I have been able to purchase an electronic weighing balance (Ohaus CT200). This was necessary to meet the requirements of the examination syllabus, and being both battery and mains powered can be used now and when mains supply becomes available. The balance arrived 7 months after its original expected date, illustrating the problems of importing goods. The school has been extremely fortunate to receive donations of books from the British Council, publishers, Ranfurly Library and Beit Trust (a Zimbabwe church charity) for a range of subjects and levels. My subject is particularly well resourced, and although I hope to buy some better text-books this is not an essential improvement.

My timetable this year is quite heavy, with twenty 40 min lessons at "A" level and twelve to Form 1s. Despite this, I have managed to involve myself in a range of extracurricular activities, coaching the athletics and football teams and refereeing a number of matches. On the initiative of the Form 5s I have also established a new Senior Science Club. We have toured the local hospital, received guest speakers and been able to extend the scope of the narrow science syllabus through problem solving, practicals and discussions. I hope in the future to extend the range of activities to include industrial visits and entry into schools' science competitions.

Outside of my school activities I have also helped with a number of VSO organised events. In March I co-ordinated the Annual Science Workshop, attended by 40 VSO teachers and colleagues. The day included a presentation by the Curriculum Development Unit of the Ministry, demonstrations of improvised apparatus and discussions of common problems and possible solutions. It was generally agreed to be both useful and interesting.

At the end of this month I am administering the Induction Course for the new VSO arrivals. The course, which lasts a week, involves language tutoring, subject briefings and speakers–discussions on various aspects of life and living in Zimbabwe. I am also working on the Christmas Conference organising committee.

My future plans involve fitting a fume cupboard in the laboratory and continuing to expand the stock of chemicals in the department. I also hope to raise funds in order to buy equipment to assist with practical work in the Lower School. On a more personal level I hope to improve my Shona, which should help me to integrate better within the local community.

Through this report may I once again express my thanks to the RSC Analytical Division for their continued support of VSO and my personal projects. Your posters now cover every wall of the laboratory and make for an improved and pleasant learning and teaching environment.

Communications between Mashoko and the outside world continue to be poor (and unlikely to improve significantly). I will, however, always strive to inform and update you of the school's development.

G. T. Archer