

“How long will it be before Malta, whose land measures a mere 27×14 km at its longest and widest parts, runs out of natural fresh-water to irrigate her fast diminishing agricultural land?”

In, Tropical Agriculture Association UK, *Newsletter*,
pp 25–29, June 2001. 40pp, ISSN 0954-6790



Fresh Water and Crops in Malta (February 2001)

Tina Bone

I could not refuse a very kind offer from Dr Sylvia Haslam (a leading international authority on rivers and their vegetation, and lecturer at the Universities of Cambridge and Malta) to stay with her in Malta for a week in February this year, with the opportunity to accompany her on a field trip or two. For all this, my grateful thanks.

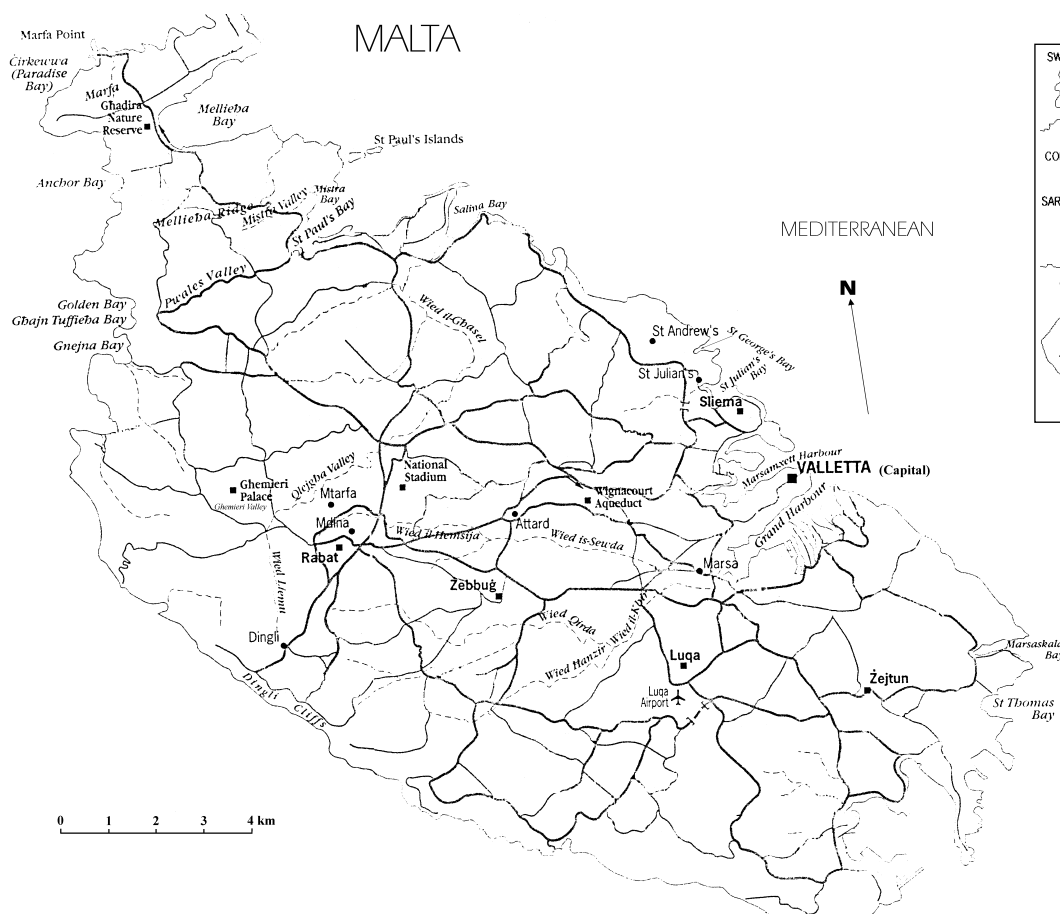
As this was my very first visit to Malta, I decided to keep a diary. Of course, most of the writings would not make appropriate reading here, but I have picked out some notes and photographs, which may be of interest to TAA members. The names of places visited have been omitted intentionally (although some town names are mentioned to broadly indicate the areas visited) as this article is intended to give an outline view only of the island as perceived by a first-time lay-visitor, not to provide statistical analysis.

St Julian's

On the first morning, I walked into the town, crossed the busy main road at the bottom of the hill (Sliema to the right, St George's Bay to the left), crossed some

waste land next to a 'dirt' football pitch surrounded by a high breeze-block wall and chain-link fencing, stepping between the magnificent wild golden crown daisies growing in abundance, and trying not to trample the mingling clumps of delicate lemon-yellow cape sorrel.

The azure blue sea was ahead of me as I walked amongst very built-up streets (schools, municipal buildings, old forts, terraced flats and single dwellings) interspersed with waste ground waiting to be developed. Nearly all the single (older) dwellings had gardens, and all appeared to have the same plants growing in them—a fig tree (bare in February), a large 'exotic' prickly pear (I learned that 'exotic' means brought in from other places, in this case from tropical America), an almond tree (I was amazed to see all seasons' growth at the same time: some trees were in flower, some had green leaved shoots, some had green almonds, and others had ripe fruits ready to be harvested. Dr Haslam confirmed that this 'rotation' of almonds was intentional—and also of figs and carobs), potatoes, broad beans, and fennel. Every



spare wall had a leafless grape vine growing against it, some looked very ancient with the main stem measuring some 20 cm across. Even wire fencing (including barbed wire) had vines like old and fraying twisted grey ropes interlaced along them. In most cases, the trees and vines looked very neglected (i.e. no sign of recent pruning), so I suspect that these were not now grown to feed the hungry.

Not a sign of any surface freshwater—not even a tiny garden pond.

Field trip: Chadwick Lakes (fresh water)

Background

Two centuries ago Malta oozed fresh water from springs and marshes, and rivers flowed. Today very little natural freshwater remains, but Malta's dry river valleys provide the evidence of a more watery past. Over the centuries water has been removed by land drainage (the marshes were thought to cause illness), and by abstraction. In the 1890s a series of dams, Chadwick Lakes, designed and built by an Englishman, Mr O Chadwick, were constructed along the Qlejgha Valley to capture water for agricultural purposes. Now redundant, they are considered part of Malta's natural heritage. Built over natural springs,

the lakes have clay linings to hold the all-year spring flow and the winter rains. The valley floor is mostly *Globigerina* limestone, and the hills above are Coralline limestone with some fertile terraced fields and new urban development.

The Lakes

From 'home base' at St Julian's, after a rather bumpy 20-minute car ride over the pitted Maltese roads, we turned down a dirt track where, in two hundred yards or so, we stopped on a bridge. Each side of us below were two 'ponds'. Our driver exclaimed: 'This is it!'. Although I was surprised at the small size of the 'lakes', as we walked along the system I quickly began to appreciate the beauty of the long, narrow and winding scene comprising two small lakes at the head, several 'dams' (over which water cascaded some times), a poplar wood with a carpet of greenery and flowers below, eucalyptus (another 'exotic') wood, and fabulous limestone rocks arching up one side or other of the river bank where spates had gnawed and gouged out weird and wonderful shapes over the centuries—it was difficult to imagine the horrendous power of such rushing waters when a lot of the water course was bone dry—and February is purported to be the wettest month of the year! (see Figs. 1a,b,c).



Fig. 1a. Upper (and larger) Lake.



Fig. 1b. Poplar wood.



Fig. 1c. Dam.

Several stone walls were dotted along the whole length of the river system, many with mounds of prickly pear lazily stretched out over them. Being extremely heavy, the mass of green pads had caused the wall to collapse in several places. No attempt had been made to repair this forced dilapidation.

Since the early 1980s, Dr Haslam has monitored the 'state' of Chadwick Lakes. She pointed out to me the

way different plants react to different kinds of pollution, some indicators being leaves too big, or yellowed, or tiny, and the absence of some species which, in previous years, had been abundant. Until recently pollution had been mainly due to agricultural run-off (e.g. abundant use of manure and fertilisers). A new urban settlement had sprung up near Mtarfa which had led to new and more harmful pollution

entering the Chadwick Lakes system—household waste and general ‘urban’ and road run-off (see Figs. 2, 3 and 4). (It is worth mentioning that untreated sewage has been a pollutant in some areas. Malta has no municipal sewage treatment infrastructure; all sewage flows directly into the sea.)



Fig. 2, River Bed (1994): lush and proper vegetation (although river bed dry).



Fig. 3, Run-off pipes, situated just above Fig. 2 (2001): four pipes with outfall running down the rocks into the ‘watering’ hole at the bottom and on into the river system.



Fig. 4, River Bed (2001): Same place as Fig. 2 (close-up), lush vegetation gone, different (pollution-tolerant) species growing in turbid water.

Goats and sheep (for meat and dairy products) used to walk this trail all the time and would drink from the watering hole shown in Fig. 3. All other livestock (pigs and cattle) is kept indoors. I never saw a pig or a cow while I was there, but I heard pigs being slaughtered and caught a whiff of cow with the odd ‘moo’ on several occasions whilst on my travels. The livestock are housed in stone, windowless buildings, placed behind stone walls, usually on the edge of fields in which fodder crops grow. So it was wonderful to see a herd of goats and sheep walk passed us as we surveyed the river valley beyond the Chadwick Lakes (see Fig. 5)



Fig. 5, apparently a rare sight—Goats and sheep with shepherd(s) walking along the river valley.

Field trip: southern, western and eastern areas

Another field trip covering several river valleys to the east of the island proved disappointing for Dr Haslam, as pollution appeared to be much worse than had been recorded during her visit several years before. Although there was some (rain) water in some of the beds, most of it was polluted. In 2000 the rainfall had been minimal, leaving stagnant pools where normally some water would be running. As well as (illegal) outfalls from pig farms and agricultural run-off, a concrete ‘run’ had been laid from a main road so that lorries could back down the ramp and dump their waste directly into the river bed.

The south west coast of Malta has wider, fertile river valleys than the northern and eastern sides of the island. Although in the valley bottom the fields are flat, they are still small and separated by (mini) stone walls. As the fields progress up the valley sides, they become smaller and the stone walls become more substantial to hold each terrace.

Fig. 6 shows a wide cultivated valley, with all fields in use. The usual crops are potatoes, onions, cauliflowers, cabbages, kohlrabi, artichokes and carrots. This photograph was taken by Dr Haslam in April 1987. Note the prickly pear hedge on the left (edible

fruits, and the ‘leaves’ for animal fodder) and water retainer front left, fig trees in the foreground on the terrace below, and trees down the left-hand side and across the middle. In Malta’s hot and windy Mediterranean climate, trees and shrubs grow well by the retaining walls and provide shade. Tree crops include: carob, fig, olive, pistachio and pomegranate. On my many walks through the towns, villages and open countryside, I noticed a lack of citrus trees. But a refreshing sight in many of the tiny gardens sandwiched between tall buildings in the towns were individual lemon and orange trees, heavily laden with fruit. (Upon further investigation, I discovered that citrus groves have to be officially registered!)



Fig. 6 (1987), Dry cultivated valley, near Dingli.

Figs. 7a,b illustrate some agricultural aspects in February 2001. Fig. 7a shows a barley field, just pre-ear, a fallow field ready for sowing, and a field full of very luscious potato plants (harvest in April, probably for export to Holland). Apparently, one year recently so many potatoes were exported that the locals had to put up with a potato shortage. This is a typical farming village community, with its own church (there are 365 churches on Malta, one for each day of the year!). Note the cane growing mid-left (much used for fencing and matting, etc.), this being the only indicator that there might be some fresh water



Fig. 7a, typical farming village community.

around, although (with one exception) close inspection of the cane stands I visited revealed none. (Of course, cane roots go deep into the soil, probably up to 2 m, so this is probably where the water is.)

Further along the south western coast (Fig. 7b) some fields are still worked in the fertile valley bottom, although up the sides many look unused and neglected, others contain barley fodder for the invisible bovines. The glinting rows of polythene cloches were bringing on courgettes, some were already in flower. Note the prickly pear hedge left centre, and the cane right centre. Vines (clipped to their winter stance) are growing above the plant-covered terrace wall on the left, and on the right next to the road is a river bed. The route of this river has been periodically altered to provide extra fields or to make way for roads. Many springs had historically run down both sides of the valley and into the main river, but all were now dry. Across the road on the right (out of camera shot) were several terraces separated by high (c. 6ft) retaining stone walls, with a fence of cane protecting successive fields of brassica and beans and potatoes from the wind.



Fig. 7b, Courgettes under polythene cloches, and vines. Close rotation of crops produces all-year-round harvests; cloches and greenhouses speed up growth of courgettes, melons, aubergines, tomatoes and cucumbers.

Near the National Stadium (below Mdina to the east) a vineyard stretches as far as the eye can see. The modest-looking estate residence seen in the distance was, after a half-hour walk down the side of the vineyard, actually a huge villa. The vines were planted in neatly clipped rows about ten feet apart. The fruit from these vines produces local wines (I purchased some: La Vellette vin rouge (1999), Marsovin Winery, Marsa, Malta—very nice). This was the only large expanse of vines I came across on my travels (both walking and by car), although, as mentioned above, there were several small fields of vines dotted about (see Fig. 7b).



'Round-up'

Fig. 8 shows the beautiful river valley near St Julian's which runs to the sea. Note the trees which have been planted along the sides of the valley in pursuance of the age-old practice of shooting and trapping migrating birds, and the neglected terraced fields and their retaining walls. Only a tiny percentage of the terraces is still farmed. The valley floor is completely dry.



Fig. 8, Valley near St Julians.

From my short stay, I surmise that Malta's natural surface water has disappeared. It was rather strange to see dry river beds everywhere. I am reliably informed by Dr Haslam that there are still a few natural springs, but these are below ground or well hidden, and their waters are mainly used at source. The few wells I saw in people's gardens (both in the villages and in the towns) may be ornamental, but can also be for real—every dwelling is supposed to have a cistern (disguised as wells?). Boreholes have been sunk by both the Water Services and by farmers, primarily for mains supply, but also for the farmer's own use, who may supplement his income by selling it. Every house has a water tank on its roof, not to catch the rain fall as I thought, but to keep a water supply available to the inhabitants when the Water Services turns the mains supply off, as apparently happens quite often and without warning! Locals may drink tap water; but most Maltese and all visitors are encouraged to drink bottled water only. Half the mains supply is now reverse osmosis, available to farmers for irrigation if they are willing to pay for it.

On the outside, traditional farming in Malta appears to be flourishing in areas which have not yet been swallowed up by surging urban development. I suspect, however, that the quality of the soil could deteriorate rapidly because of over-cultivation (Malta's warm climate allows abundant harvest all year) were it not for the over-use of fertilisers. The

price to be paid for this over-use is the resultant pollution leaching into the aquifer and poisoning the remaining water.

I read with interest in Air Malta's in-flight magazine (February 2001) that Malta's sister island, Gozo (c. 14 × 6 km), still has many natural springs, wells and reservoirs. About 45 hectares are intensively farmed and 7.5 hectares are covered by greenhouses. The island boasts self-sufficiency in milk, pork, poultry, rabbit meat and eggs; it also boasts locally produced honey. Farmers in Gozo have made extremely good use of their limited resources, have increased exports of high-value agricultural crops with the resulting improved income. As we flew over Gozo, I could see that she was a much 'greener' island than Malta—no urban sprawl here (but I suspect this will begin to happen soon!). But no obvious expanse of surface freshwater either!

- I pose the question: **How long will it be before Malta, whose land measures a mere 27 × 14 km at its longest and widest parts, runs out of natural freshwater to irrigate her fast diminishing agricultural land?**



From the Editor...

A first in photographs.

Members will see photographs in the *Newsletter* for the first time. I ask myself, 'Why have we waited so long?' We all use photographs and other graphics to reinforce our lecture presentations, so why have we shied away from their use with the written word? Tina Bone, who does the design and desktop publishing of our *Newsletter*, has used photographs to good effect to illustrate her paper on Malta. Readers will agree that they give a better understanding of the local Maltese situation rather than what we visualize in our own minds.

I encourage those of you who will be making presentations at TAA meetings and offering articles for publication in the *Newsletter* to use photographs where appropriate. Moreover, they will make turning the pages a pleasure!

Note: Good quality black and white or colour photographs can only be used if sent to the Editor in hard copy (sae for return). Please do not send in digital format.