



# historical society

## Historical Happenings

### SPARKLETS BULBS

As you probably know, the St John Ambulance Museum has been moved from Arthur Street, Unley, its home since 2004. When, in April 2012, the removalists came to pack and store the many exhibits, there was one item they refused to handle. It was a box of 'SPARKLETS BULBS'. The illustration (*right*) shows the box and its contents. The bulbs certainly look bomb-like, but they are only charged with carbon dioxide.

Carbon dioxide is a gas which comprises 0.04% of the earth's atmosphere. At such a low concentrations it is colourless and odourless. At temperatures below minus 78 degrees Celsius it becomes solid and is known as 'dry ice'. At pressures above 5.1 atmospheres it becomes liquid. Basic physiology teaches that we take our next breath when either our blood oxygen concentration falls below a certain level or our carbon dioxide level rises above a certain point. By far the stronger of these two stimuli is the rising CO2 level. Over-breathing, also known as hyperventilation, can lower our CO2 levels, thus making it possible for us to hold our breath for longer.

Hyperventilating before a prolonged underwater dive is dangerous. If really determined to stay underwater, a swimmer who has been hyperventilating just before diving can override the relatively weak oxygen lack stimulus and become unconscious and then drown. All first aiders should be aware of this danger and should make it known to any swimmer who hyperventilates in preparation for a dive underwater.

Some 80 years ago, the fact that CO2 can stimulate breathing was seized upon by entrepreneurs who designed apparatus to deliver carbon dioxide to patients experiencing difficulty in breathing. In theory that may have sounded just fine, but as you can imagine, some patients were made worse, not better, and this form of treatment has been abandoned.

The Sparklets bulbs shown in the photograph contain 25 grams of liquid carbon dioxide, enough to provide about 12 litres of gas. A bulb can be inserted into a specially designed Sparklets resuscitator (the museum has two types of these). If the handle is wound down, the top of the bulb is punctured and the gas can be directed through a flexible tube to a face mask and thence to the patient. The resuscitator was conceived in the 1930s by Siebe Gorman Ltd. and made by Sparklets Ltd. of London. Previously, similar bulbs had been made for use in soda siphons.

This carbon dioxide treatment was first mentioned in St John first aid manuals in 1938. For good reasons it is not mentioned after 1952. This dramatically illustrates how first aid treatments have changed over the years. One wonders what first aid teachers may advocate in another 50 years!

Reference: From Powder Monkey to Governor, by F. Stewart Hindmarsh, Access Press, 1955.  
Reference: The use of Carbon Dioxide in Resuscitation, David Fahey, St John History, Vol. 10, 2010 - 2011.

**Question: Trees, other plants and algae can convert carbon dioxide into sugars using the energy of sunlight. What is the name of this process?**

The answer will be in the next edition of Open Airways.

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Chairman



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