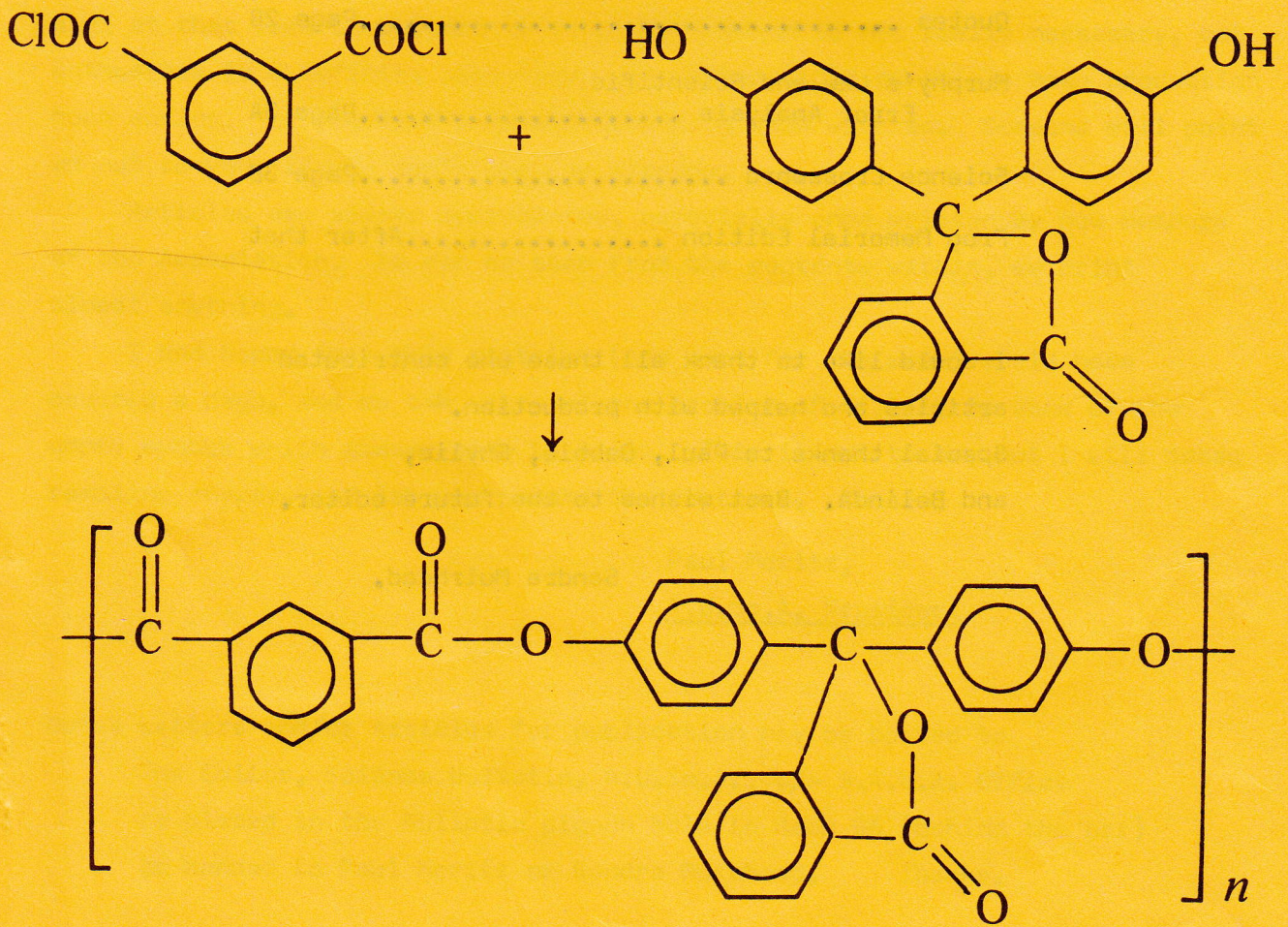


Science Bulletin



THE SCIENCE BULLETIN
Periodical of the Adelaide University Science Association.
February 27th, 1980.

TABLE OF CONTENTS

NON - EditorialPage 1A

90th Committee and Officers
of A.U.Sc.A.Page 1B

A Consideration of Eutrophication
in the Mt. Bold catchment area.....Page 2A

QuotesPage 2B

Murphy's Law and Scientific
Error AnalysisPage 3A

Science CrosswordPage 3B

Frog Memorial EditionAfter that

I would like to thank all those who contributed
articles and helped with production.
Special thanks to Paul, Debbie, Shylie,
and Belinda. Best wishes to the future editor.

Sandra Muirhead.

NON-EDITORIAL

If I told you that I was writing an editorial for a magazine that does not have an editor, you would say that I was crazy. Well people have been telling me that for years, but as I am not Editor this cannot be an Editorial.

The first thing to mention is that this is a double issue of the 'Science Bulletin', because, due to circumstances beyond our control, the 'Frog Memorial Edition' due last October was not ready until November. Thus, it is included at the back of this issue, resulting in twice as much stimulating reading as usual (Ho, hum).

There is no discernable theme to this, the o-week 1980 edition of the Bulletin, mainly because at the time of writing this, I have no idea what is going to be included, due to a lack of discernable articles. It could be that everyone's creative urges have been exhausted on the 'Galactic Roadmap'. (Idea!! Why not use some of the left over articles from the Roadmap?)

I should point out that, at the moment, the 'Science Bulletin' is put together by the Bulletin Standing Committee, and a few assorted hangers-on, without the coordination of an editor. However, anyone with the urge to have a go at that task is welcome to try. Experience is not really necessary, but enthusiasm is a definite advantage. An editor would certainly make production much easier. If you feel interested, have a talk with me. Someone will point me out to you, if you don't know me already.

Articles are always appreciated, especially ones written by new members of the Association. As can be seen from the contents within, we print almost anything.

I had hoped that this diatribe (new word for the week) would have covered a page, and so take care of the problem of filling up some of the empty spaces which always seem to arise. This is not to be, but I will cease rambling anyway, and let you peruse the contents. Cheers.

Paul Moritz,

A.U.Sc.A. President.

Note: Letters and/or articles for publication may be posted to
The Editor, Science Bulletin, A.U.Sc.A., c/- S.A.U.A. Office
or placed in the Bulletin pigeon hole in Room S6 (behind the bar)
or handed to Paul Moritz or Sandra Muirhead. Thanks.

90th COMMITTEE AND OFFICERS OF THE ADELAIDE UNIVERSITY SCIENCE ASSOCIATION (A.U.Sc.A.), 1980.

Executive

President.....Paul Moritz
Vice President.....John Edwards
Hon. Secretary.....Mark Newton
Hon. Treasurer.....Kees Elferink
Hon. Asst. Secretary....Sandra Muirhead
Hon. Asst. Treasurer.....Chris Bagley

Other Committee Members

Robin Michael Marlin (Immediate Past President, A.U.Sc.A.)
Robyn Dick
Catherine Hawkins
Ulrik John
Cynthia Roberts
Richard Smith
Kathleen Soole
Helen Zowtyj

Officers

Films Officer.....Simon Maddocks
Morals Officer.....Therese Coleman
Publicity Officer.....Kees Elferink
Records Officer.....Catherine Hawkins
Stunts Officers.....John Edwards
Robin Marlin
Simon Maddocks
Talks Officer.....Bronwyn Treloar
Loyal Leaders of the
Official Opposition....Roman Orszanski
Andy Eberhard

Adelaide University Book Exchange Standing Committee

Chairman.....Roman Orszanski
Secretary.....Therese Coleman
Treasurer....Catherine Sampson
Gofor.....Kathleen Soole

Bulletin Standing Committee

Christopher Bagley
Therese Coleman
Sandra Muirhead

NOTE: The next committee meeting will be held on Wednesday, March 12, at 7.30 p.m. in the South Dining Room, Level Four, Union House. All members are invited and welcome to come. At this meeting three first year members will be elected as first year representatives and be co-opted to the committee. Highlights of this meeting will be the first morals report of 1980, and the Orientation Camp Report. Note also that there is a vacant position on the Adelaide University Book Exchange Standing Committee, and the position of Bulletin Editor is yet to be filled.

A CONSIDERATION OF EUTROPHICATION IN THE MT. BOLD CATCHMENT AREA.

By Jenny Millhouse.

One fine October day last year, the Botany III class set out in a mini bus to investigate the input of inorganic nutrients which contribute to eutrophication in Mount Bold reservoir. In other words they set out to determine where the inorganic ions which lead to high algal growth in the reservoir actually enter the water of the Mt. Bold catchment area. The nutrients investigated were inorganic phosphorus, nitrogen, and "other elements" which include iron, magnesium, and silicon. Testing for nutrient levels was done on a biological basis by adding an inoculum of an algal species to the filtered water, allowing it to grow for one week and then measuring the increase in algal concentration. (Results were standardised as "doublings per week".)

The Mount Bold catchment area includes a large section of the Adelaide Hills, bounded by Mount Torrens and Lobethal to the north, Mount Lofty, Lenswood, and Heathfield to the west, Inverbrackie and Echunga to the east and Mt. Bold itself to the south. Land use within this area is highly varied, ranging from market gardens around Summertown and Uradla, through residential areas around Aldgate and Bridgewater, to grazing on improved and unimproved pasture from Charleston to Echunga along the Onkaparinga River, and undisturbed eucalypt forest near the reservoir itself.

Water samples were taken from 15 different sites including creeks which feed the Onkaparinga as well as from the river itself and also the reservoir and one site below the dam wall. It was intended that a sample should be taken at Holgraves weir immediately above Mt. Bold, but due to lack of time (attributed to an extended lunch enjoying the attractions of Hahndorf) we were unable to make this sampling.

The assay system was simple. To the filtered stock we added an inoculum of the green algae, *Scenedesmus*, as well as known amounts of phosphate and nitrate where this was applicable. The theory here is that of if one component, say nitrate, was low, but phosphate was high (comparatively speaking), then an increase in algal growth is expected for the addition of nitrate, compared with no addition. This level should be about the same as for the addition of both nitrate and phosphate, whereas the control (without addition) should be about the same as for the phosphate only addition. In this case it could be said that nitrate levels limited growth and that phosphate may contribute to eutrophication.

Measurements of growth were made by fluorescent readings, since the chlorophyll (green colouring) of algae will fluoresce at the appropriate wavelength and the degree of fluorescence is proportional to the density of the population. This measurement was converted to doublings per week for comparison (i.e. how many generations can occur in one week under the conditions of incubation?)

$$\text{Doublings per week} = \frac{\log_{10} \left(\frac{\text{fluorescence } t=1 \text{ week}}{\text{fluorescence } t=0} \right)}{\log_{10} 2}$$

The results we obtained were somewhat complicated, however some features did stand out. The water from Cox's Creek in the market gardening area near Uradla sustained the highest rate of algal growth (without any additions of phosphate or nitrate). This was followed by the water from below Mt. Bold and then Mt. Bold itself, with doublings per week of 4.06, 3.58, and 3.08 respectively. Additions of nitrate and phosphate caused slightly higher rates of growth for these waters although effects were more marked where growth rates for the water samples was low (eg. Lenswood Creek, no additions doubling per week 1.84, and phosphate and nitrate added, 3.44 doublings per week).

It was found that nitrate was more often limiting growth potential than phosphate except for Cox's Creek where phosphate was limiting. In many cases on the Onkaparinga River, both nutrients were effective in increasing growth potential, indicating a range of nutrient requirements for these areas' algae.

All water samples were capable of sustaining fairly high growth rates and thus could be considered eutrophic, but to ascertain just where the major supply of nutrients comes from would require some knowledge of relative water contributions from each area. For example Cox's Creek is highest in nutrients of all tributaries to the river. However there is not a significant increase in nutrients after its confluence with the river.

Mount Bold catchment area is divided into two zones in which land use is strictly controlled. Zone A is the natural scrub land surrounding the reservoir which is intended as a "buffer zone", that is an area where water impurities are removed or diluted before entry into Mt. Bold. Zone B is available for farming although there are restrictions on the range of uses the land may be put to, for example pigs are not allowed but extensive fertilization is permitted. If this two zone system were to work as planned, nutrient levels in the reservoir should be lower than in the river before zone A. Unfortunately the lack of a sample at Holgraves wier prevents any testing of the buffer action of zone A and high nutrient levels in the Mount Bold could be due to natural up-welling of water and sediments in the reservoir which occurs during the winter months and recycles nutrients which have sedimented down during summer.

Although this study is far from being complete, it does suggest some important points for further investigation. If we (the community) want to keep our water as pure as possible (eliminating algal contamination which may be poisoners as in the case of blue-green algae, as well as eliminating "chemical" pollution) we should ask ourselves; should the Mt. Bold catchment area be, as well as considering to what extent the activities of farming contribute to increased nutrients in Mt. Bold, and do these nutrient effects cause harmful algal growth in our water supply?

QUOTES

The Botany professor gave a new junior colleague just one piece of advice: "On field trips, my boy, always walk well in front of your students, so that you can trample on any specimens you don't recognise."

Instructions written inside the front cover of a textbook: "If found by person, return in mail; if found by male, return in person."

" - Marcel Marceau.

"The sea is looked to as a future source of fuel. For a start, it would help if we could just recover all the oil that has been spilled into it".

-Bill Vaughan

Sign on an elevator door in a hotel in Pakistan; "We are so sorry but lift not working so for the time being you are unbearable".

Sign outside a shattered greengrocer's shop in Belfast; "More open than usual."

A lady wanted to take her cat to the vet's so she hunted around for a box to put it in. Finally she found a carton left over from Christmas time. She arrived at the vet's and placed the box bearing the words 'Deep Frozen Turkey' in front of him. He took one look and said "I'm sorry, Madam, but I don't think there's much that I can do about this one."

MURPHY'S LAW AND SCIENTIFIC ERROR ANALYSIS.

Anyone having read the 'Galactic Roadmap', or having some experience in the scientific realm, will no doubt have encountered Murphy's Law. This relatively new empirical law is named after a Captain Murphy who was employed by N.A.S.A. during the American space programme. To the scientist, uncertainty and error are almost close friends. What follows are a few useful maxims and rules which may be invoked at times by the experimental scientist.

Murphy's Law: "If anything can go wrong, it will."

O'Toole's Commentary on Murphy's Law: "Murphy was an optimist."

And to complete the Irish trio, Finagle's First Law: "If it works, something has gone wrong."

Two other principles, almost being corollaries of each other are Fett's Law of the Lab: "Never replicate a successful experiment.", and Wyzowski's Law: "No experiment is reproducible."

Jenkinson, the supreme optimist, proclaimed, "It won't work!"

For students about to embark on a scientific career, Cahn's Axiom may be useful: "When all else fails, read the instructions.", while Jane's Law provides advice to the more experienced: "The man who can smile when things go wrong has found someone else to blame it on."

One particularly poignant piece of advice is Meskimen's Law: "There is never time to do it right, but there is always time to do it again." (So true, speaks the voice of experience.)

Moving into the nether regions of Computing Science, two postulates bear repeating. They are; Shaw's Principle: "Build a system that any fool can use and only a fool will want to use it." and Lubarsky's Law of Cybernetic Engineering: "There's always one more bug."

Let it be noted at this point, that it is not recommended practice to invoke one of these principles in a Physics I practical.

As a final point, may I include one of the most commonly encountered laws, that is; Cole's Law: "Thinly sliced cabbage!"

P. Moritz.

Reference: A. Bloch - "Murphy's Law and Other Reasons Why Things Go Wrong",
Magnum Books, 1977.

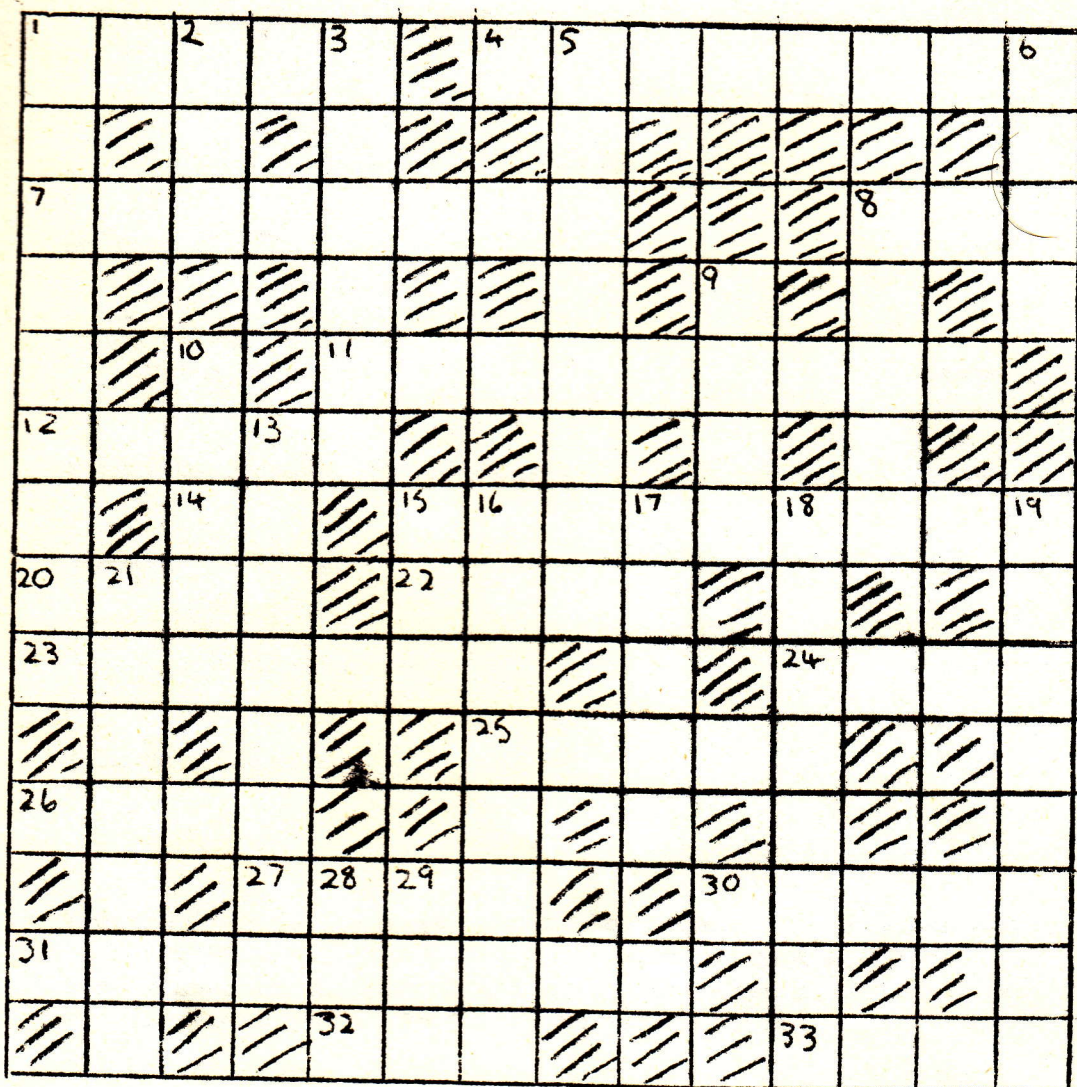
Some thoughts as we begin our academic year;

"The only place where success comes before work is in the dictionary."

"The best way to solve problems is not to create them."

"Even if you are on the right track you will get run over if you sit there."

SCIENCE CROSSWORD



ACROSS

1. an extra
4. absorbs gas
7. symbol for whole word
8. ancient Jap. currency
11. gradual change
12. straight rod
14. Radium
15. without loss or gain of heat
20. nobleman
22. small glass bottle
23. mollusc
24. Italian boy's name
25. pert. to moon
26. end of thermometer.
27. flaccid
30. for walking high
31. raising
32. estimated time of arrival
33. close

DOWN

1. where Moses was found
2. wooden peg
3. privy seal
5. flower
6. trig. function
8. ermine
9. stump of tree
10. Australian river
13. might not work
15. Australian early p.m.
16. double vision
17. by oneself
18. crumbed (Fr., two words)
19. covered arcade
21. clerk
28. H₂O
29. Municipal Tramways Trust