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Integrating Poetry In Science Teaching

POON KUM HENG

Why Poetry In Science?

One talks about using the 'scientific eyes' to study nature. However, it is common that such an objective approach to nature may not be very natural to beginning science students in school, who very often respond spontaneously to his observation first with a subjective and affective approach in admiration, awe or just wonder. He is more likely at this stage to feel for what he sees rather than think about them objectively as a 'third party'.

To mature as a science student often implies the relinquishing of such subjective and spontaneous feelings about what is studied while the acquisition of the spirit of objectivity is being inculcated.

In the attempt to provide a wholesome and balanced curriculum to our school students, arts students are also required to take science subjects and science students arts and humanities subjects. Science teachers are thus presented with new opportunities to present scientific knowledge in an integrative way; one of which is to include poetry in science lessons. When the two seemingly unrelated subjects are integrated, it will help to bridge the often existing gap between a science teacher and the arts students. It will also help the more 'science oriented' to be more balanced in his intellectual maturation.

An Example

The poem "To a Butterfly" by William Wordsworth (one of the selected poems from Hall, 1967) was tried out in an A-level biology lecture for about 250 students. It was used at the end of the topic in insect physiology for review and reinforcement. Some general points on the 'scientific' approach were also included.
Many other examples are easily available for use at different levels, at different developmental stages of many other topics.

**THE POEM**

**TO A BUTTERFLY**

I've watched you now a full half-hour,
Self-poised upon that yellow flower;
And, little Butterfly! indeed
I know not if you sleep or feed.
How motionless! - not frozen seas
More motionless! - and then
What joys awaits you, when the breeze
Hath found you out among the trees,
And calls you forth again!

This plot of orchard ground is ours;
My trees they are, my Sister's flowers;
Here rest your wings when they are weary;
Here lodge as a sanctuary!
Come often to us, fear no wrong;
Sit near us on the bough!
We'll talk of sunshine and of song,
And summer days, when we were young;
Sweet childish days, that were as long
As twenty days are now.

**WILLIAM WORDSWORTH**
The Procedure

The procedure taken was:

1. The poem was projected with an overhead projector and recited at the end of the topic.

2. Students were asked to search for relevant points in insect physiology (especially points that had just been elaborated in the topic), and these points were highlighted on the transparency.

3. Students were asked to annotate on an overlay transparency: either explaining in detail the scientifically relevant points covered or correcting any points that are not scientifically true.

4. The teacher discussed the above points, emphasising the scientific facts and concepts, using it as an interesting way for review and reinforcement of the topic.

5. The overlay was removed, and the poem recited again, emphasising the affective part of the poem; i.e. its poetic beauty.

The Product

The annotations are given in parentheses and the key words and phrases underlined. In the actual presentation, the key words were simply circled and the annotations written besides them on the overlay transparency, thus not affecting the poem's original layout.

TO A BUTTERFLY
(Classification: Lepidoptera, Insecta, Arthropoda)

I've watched (only with 'scientific eyes'? – thus missing the sense of beauty!) you now a full half-hour,
Self-poised upon that yellow (yellow to man, not to insects) flower (the 'rice-bowl' of pollen and nectar feeders)
And, little Butterfly (insects do not grow after reaching the adult stage – it will stay little throughout its life)! indeed

I know not if you sleet, or feed (just check if the characteristic 'tongue', i.e. glossa, is rolled up or extended).

How motionless (referring to what is externally visible, such as the wings, the legs, the antennae, the body; the internal organs such as the heart would still be moving)! – not frozen seas

More motionless (it is not possible to be more motionless; it can only be less active)! – and then

What joys awaits you. (Are butterflies capable of being joyful or sad)? when the breeze

Hath found you out (no, it does not specifically find you, it simply blows at you) among the trees,

And calls you forth (no, it does not call you either but simply forces you to fly and drift in the air current) again!

This plot of orchard ground is ours (yes, referring not only to the poet and Dorothy his sister, but to all individuals in the ecosystem);

My trees they are, my Sister's flowers (whose Butterfly am I? ecologically speaking we are all each other's);

Here rest your wings (two pairs, hooked to become apparently one pair for better flight control, bright colours come from scales, wing beat frequency is slow: 2 to 4 beats per second) when they are weary (it is the indirect wing-muscles that get fatigued, not the wings, which are dead structures);

Here lodge as a sanctuary!

Come often to us (it will, to the flower, not necessarily to man), fear no wrong (flowers are predicatable, which will feed it, but man, who tends to behave erratically, might catch it for no reason);

Sit (an impossible posture for the butterfly and other insects due to their characteristic anatomy which are very different from animals that can 'sit') near us on the bough!.

We'll talk of sunshine (not as a romantic theme, but as the ultimate source of energy for food production through photosynthesis) and of song (insects do not hear sound waves, but would sense air vibrations with their numerous bristles and their antennae),
And **summer days** (busy season of growth for temperate insects), **when we were young** (i.e. when the butterflies were caterpillars and the poet a child);

**Sweet childish days** (when the caterpillars busily chewing plant tissues to fully exploit the resources available for survival, and the poet enjoying his innocent and care free days), **that were as long**

**As twenty days are now.**

**William Wordsworth**

(instead, V.B. Wigglesworth, an entomologist, should be noted)

**Evaluation**

The experience was a refreshing one for both the students and the teacher. The students were amused in the beginning when such an approach was used, and laughter was heard whenever a 'twist' to the poet's original meaning was given. On the other hand, they took to this 're-view' rather seriously when elaboration on the relevant scientific points were given. When it was recited again at the end, a complex integration of expressions of both amusement and enlightenment were seen on the face of many students.

Of course in such a short 'experiment', it was possible that some would probably not take to it well; they were perhaps the very ones that needed them more in order that knowledge, be it scientific or not, could be enjoyed fully when different perspectives were given.

It is hoped that such a seemingly unconventional practice, of bringing together two different, and to many even two opposing fields in a lesson, would help our students appreciate their distinct roles in the development of human intellect and emotion and learn to enjoy both of them. The intention is not to distort or adulterate the poem. 'The poet is not writing as a scientist.' (Richards, 1970, p.33). This should be stressed, when the poem is recited.

For those who are interested to think further on the topic, I.A. Richard's (op.cit.) discussion on it would be rewarding reading.
References
