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**PHILATELY, SCIENCE TEACHING AND THE HISTORY OF SCIENCE A  
COMMENT ON "POSTING SCIENTISTS"**

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- 1 I would like to make a number of comments about the regular feature in *Lab Talk* called "Posting Scientists" written by John Gipps since at least 1986, and perhaps even longer.

Firstly congratulations on such a long and successful series! Some of the points that I will be making are minor criticisms of particular articles, whilst others are really queries about whether teachers use the articles for themselves, for their students, or indeed ignore them altogether. In other words I would like to see some feedback about how, and if, articles on stamp-collecting and science are used by practicing teachers.

Firstly I must make it clear that I personally enjoy these articles, having philately as a hobby and being interested in the history of science and in methods of making science teaching more relevant. The "Posting Scientists" articles certainly combine these concerns, but I would comment that it might be an idea to link them more directly to classroom practice, though that may not be easy in the short space available.

2. To follow up a point in the previous section, could we ask that any teacher who has used any of the "Posting Scientists" materials in their teaching, directly, or as resource materials for students, write to the editor of *Lab Talk* stating which materials were used, how they were used and with what success. Do readers agree with the statement by Schreck (1986) that:

the idea of using postage stamps in teaching chemistry (science) is good pedagogy because it associates the subject matter taught with something in which the student has an acquired interest.

It would also be of interest to know if it is only the historical material that is used or if the philatelic connection is used equally. Some input might give John an indication of what, if any, changes in the materials he writes are needed.

My observations are that philatelic materials are used more commonly in the teaching of science than in the teaching of any other part of the curriculum. The use of stamps in science journals and in promotional materials for science is very common, whereas for other curriculum areas such as Mathematics, English Literature, French, Spanish, German, etc, its use is less common, though there are exceptions: Mathematics (Schaaf, 1975), (Nimian, 1972), French (Wood, 1979), Spanish (Nuessal, 1984), German (Di Napoli, 1980), Physical Education (Langston, 1979). Examples of philatelic materials illustrating science themes in major articles are: Angelo, 1975, Glenn, 1981, Rix, 1987 and Schreck, 1989. Both Sivan, 1981 and Williams, 1990 used stamps as a colourful and eye-catching introduction to their articles. Also stamps on science themes are often used as illustrations on the covers of journals such as *Lab Talk* (Vol 31, No 2) or Bicentennial Australian Studies School Project (Burfitt, 1988) and for science posters such as the Physics and Industry poster produced by the Institute of Physics, London. There are also a large number of articles prepared for philatelists on scientific themes

as a brief glance at British or Australian Philatelic Bulletins will indicate. This leads me to suppose that there may be some common mental predisposition between stamp collectors and scientists, a hypothesis which I expect to be vigorously denied, because it would make it seem that scientists collect information in the same way as philatelists collect stamps. Although this is an extreme way of expressing the issue it may contain more than a grain of truth. At any rate, I noted a tendency for a scientist who had prepared an extremely good article on organic chemistry, illustrated using stamps to see connections in the symbolism on a stamp where none existed (Palmer, in press). If the former hypothesis were correct we might use the medium of stamps to illustrate scientific principles less frequently as probably only a small minority of children will appreciate this medium.

4. What research is there into learning using stamps as a learning aid? As far as I am aware there is very little, but I have come across a comparatively recent thesis by Gray, 1986. Gray's main conclusion for the group of 23 primary children tested at a private school in Victoria was that:

Guided observation of the display of Malaysian stamps (Plate 3.2) improved the participants' observation capacity with regard to the stamps and led them to learn some facts about Malaysia previously unknown to them.

Finally, there was some evidence that the subjects depicted and symbols used on selected postage stamps could be used to ascertain some features of children's ideas in science relevant to the participants.

It is also interesting to note that the tasks given to the children related to the classification of animals (as illustrated by Malaysian postage stamps) rather than a task relating to finding out about the scientists featured on particular stamps, which might be more appropriate to the "Posting Scientists" articles. The investigations that Gray conducted were extremely interesting but they would be of greater value if they were repeated on a larger scale.

5. In the article (Gipps, 1988b), the author chooses as one of the scientists being described, Galileo Galilei I think that in this case Gipps has made an error, albeit a very commonly made error, regarding Galileo's discovery of the isochronic motion of the pendulum. Gipps claims that Galileo's discovery was inspired by the swinging lamp in the cathedral at Pisa. Similar claims are made by a variety of school text books, for example Brandes(1979):

One day, while Galileo was in the cathedral, he noticed a lamp swinging too and fro. He noted that the swinging grew less and less as it died down, but the time of each swing remained the same. There were no watches in those days, so he timed the length of each swing by his heart beat. The swing was as regular as the beat of his pulse. It occurred to him that if the pulse could time a swinging object, then a swinging object could time a pulse. The result of this reflection was the pulsimeter, the first instrument for the use of doctors in taking the pulse of a patient. It was the first known mechanical device made to help a doctor treat the human body.

The purpose of this is to show children how they too can be real scientists, like Galileo, by making and interpreting observations. It is an excellent moral tale but it seems that it is entirely untrue, as is pointed out by a recent article (Matthews, 1989). He states that at the time Galileo was supposed to have observed the swinging chandelier at Pisa was not installed until after Galileo's death, though presumably he could have observed some other swinging lamp. I do not like the idea of using history that is known to be untrue to teach children to be good scientists. For that purpose we need good history!

There is so much about Galileo that is fascinating and also relevant to science teaching that it must have been extremely difficult to squeeze Galileo's contributions to science

in a standard thirty lines. In my view anyway Galileo is well worth an article on his own.

6. It is perhaps, the most recent "Posting Scientists" (Gipps, 1990) that has decided me to write to the editor; it is not that what John has written is incorrect, but rather that there are a number of interesting points that have recently come to light, particularly about Gay-Lussac. The brief histories of Berthollet and Berzelius certainly give the flavour of the lives of these two early chemists though I would suggest further references for anyone interested in greater detail. For Berthollet, his links with the British dying industry are very thoroughly explored in Musson and Robinson (1989), whilst Berzelius's life story is interestingly told in Greenaway (1979). Perhaps it is interesting to note that Rix (1987) in his history of chemistry on postage stamps mentions Berzelius twice and takes almost two paragraphs to describe Berzelius's contribution to chemistry, much more space than was given to his contemporaries; this could be taken as an indication of the importance that one science historian gives to his work.

I have recently become aware of perhaps a minor but thought-provoking discovery about the work of Gay-Lussac and Jacques Charles on the expansion of gases; standard works on the history of science (Singer, 1959, p.343) say that Gay-Lussac indicated that Charles was the first to discover the law of gaseous expansion which is why most science textbooks written in English refer to Charles Law. Crosland (1978) in a brief description of Gay-Lussac's life and work considers that Charles Law should more properly be called Gay-Lussac's Law, as Charles had obtained discordant experimental results which were not published. Spurgin in three articles (Spurgin, 1987) (Spurgin, 1989) (Spurgin, 1990) carefully points that Gay-Lussac did know about Charles' experiments and acknowledged seeing his apparatus, but he appears to have done this in order to forestall any suggestion that Charles be given credit for the discovery of the laws of gaseous expansion. Unfortunately his acknowledgement of Charles was misconstrued by Tait, which has resulted in Charles being unjustifiably being given credit. There are a number of other interesting connections here, but perhaps the most common error is the fact that some physics teaching still includes the experiment of comparing the expansion of air with that of a mercury thermometer. As Spurgin, (1989) explains this is senseless in that in the real world mercury thermometers are checked against gas thermometers.

7. John was criticised for failing to include many women scientists a couple of years ago (Gipps, 1988a) and since that time none have been mentioned. I had planned to join the chorus of criticism but prior to doing that I tried to find some examples of women scientists portrayed on stamps. To the reader who has not tried to do this I must point out that it is not easy. The problem is not that there are no women scientists, but rather there are very few whose names appear to be known to the postal authorities of the world. For both male and female scientists stamps seem to duplicate the very well known names many times over. There are perhaps two alternative ways of tackling this problem. The first is to study the stamp catalogue very carefully; having done this, I can enclose a list of nine names with catalogue references for John's consideration, but they are not well known names. Or alternatively, offer a ten dollar prize for each instance given by a student and you might well get a much fuller list. The second way is to suggest that a number of well known female Australian scientists are honoured on Australian stamps. The postal authorities are said to welcome suggestions.
8. Finally, could I suggest that The Science Teachers Association of Victoria consider publishing a book of all the scientists John has described in "Posting Scientists" I would prefer it in a little more detail, but in any case I think it would be a useful resource for the teaching of science through the history of science with good quality stamp illustrations acting as motivators for students.

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