Citation for Mark Dry

In the middle ages, in the days before science as we know it really began, people in Europe called alchemists invested a lot of time and energy in the search for something which might, inter alia, transmute base metals into gold and also prolong life indefinitely. The magic something which would achieve these two goals was known as the philosopher's stone. Despite the fact that Isaac Newton and others such as Roger Bacon and Tycho Brahe studied alchemy seriously it declined with the birth of modern chemistry at the beginning of the 18th. century. And yet one wonders if alchemy is quite as dead as some would like to suppose. Quite apart from the creative work on alchemy undertaken by Carl Jung in the 20th. century, the track record of the Chemical Engineer Mark Dry, who stands before us today, suggests that he might actually have found the philosopher's stone.

Consider first the matter of prolonging life. Mark Dry published his first serious scientific paper in 1959 in *Discussions of the Faraday Society*. Ten years (& 8 articles) later in 1969 he published a paper, in the Journal of Catalysis, on the role of alkali in the Fischer-Tropsch process. Which process, for the non-chemical engineers present, is all about squeezing oil out of coal (or gas). Eight years (& 7 articles) later, in 1977, came an article in *Information Chimie* assessing recent progress and future prospects of the F-T process. Ten years (& 10 articles) after that, in 1987, came "The Fischer-Tropsch synthesis as a source of raw materials for the chemical industry". Another ten years (& 12 articles) later,in 1997, came one of his many collaborative, highly technical, papers in the journal, *Studies in Surface Science and Catalysis*. Eight years (& 11 articles) after that came, in 2005, an up to the minute report on the stability of nano-crystals with a thermodynamic analysis of oxidation and re-reduction of cobalt in water/hydrogen mixtures in the *Journal of Physical Chemistry*. Along the way during this highly productive decade, when most normal mortals would choose to enjoy a well-earned retirement, Mark Dry wrote an overview, which only he could have done, of the Fischer-Tropsch Process:1950-2000. This paper has earned the accolade for the most frequently cited paper from *Catalysis Today* (which circulates to over 5000 institutes around the world) over the years 2001-2006. When one reflects that many scientists have done their best work before they are 30, certainly by the time they are 50, the fact that Mark Dry has been publishing right at the cutting edge of his scientific-engineering discipline for over 45 years, well into his seventies, and that he shows no signs whatever of slowing down is an astonishing achievement.

But there is a second reason for suspecting that Mark Dry may have discovered the philosopher's stone. Beyond the prolongation of life, there is the matter of transmutation. In medieval times right up to the first third of the 20th. century gold was the primary substance after which all men lusted and for which they were prepared to undergo almost any hardships including, like the Portuguese in the 15th. century, find a way down Africa in search of Prester John. But the development of the combustion engine---of motor cars and aeroplanes--- and the harsh facts of the first and second world wars changed all that. Oil replaced gold as the substance which all countries had to have. Quite apart from its military significance it has become quite simply the oxygen without which any modern economy would rapidly die. Oil is the gold of our time.

And the man who has done more than anybody else alive to transmute base materials---in this case coal and gas---into oil is Mark Dry. It is an astonishing story.

In 1925 the Director of the Kaiser Wilhelm Institute for Coal Research in the Ruhr, Dr. Franz Fischer published the authorised English translation of his pioneering work about The Conversion of Coal into Oils on which he had been working for the previous decade ever since the gathering clouds of the first world war had alerted both Britain and Germany to the strategic significance of oil, especially for those countries that did not have any to pump up from underground. Fischer's work, together with that of his collaborator Dr. Hans Tropsch, was to lead to the development of a catalytic synthesis which has become the foundation of the process whereby oil may be extracted from coal. This was further refined during the war using Helmut Pichler's work under Franz Fischer which made possible the use of iron, instead of cobalt, as a catalyst. After the war, however, the German oil-from-coal plants were closed down whilst the Americans tried to set up similar processes in the United States. But they failed to master the technology required to do so.

Meanwhile at the other end of the world a number of surprising things were happening.

1.A leading South African mining house, Anglovaal, had somehow acquired the patent for the Fischer-Tropsch conversion process & gave it, as a gift, to the South African government in 1948.

2. At the beginning of the 1950s SASOL was set up with the specific objective of extracting oil from coal and retained Helmut Pichler as a consultant. And…

3. In 1956 SASOL recruited a brilliant young scientist, born in Riversdale, who had recently obtained his first degree from Rhodes University and then on to do a PhD at Bristol University, as one of their budding young experts to develop the catalysts they needed to use in the plants they were designing to make oil from coal. This young fellow was Mark Dry. And the rest is history.

For under Mark Dry, SASOL was to develop the capacity, at SASOL I, II & III to extract oil more efficiently from coal and [subsequently at Mossgas] from gas, than anywhere else on earth. In the days when oil seemed abundant and cost somewhere between 10 and 15 dollars a barrel dull-witted economists (like myself) were wont to argue that SASOL was wasting the tax-payer's money in a search for expensive independence. But the break-even point for oil from coal or gas is somewhere in the region of $30 a barrel. So that as the world, with its 21st. century oil-scarcity, heads for $100 a barrel and more, the capacity to transmute coal and gas [whose proven deposits are far far greater than oil] is indeed to possess the philosopher's stone. SASOL, these days, apologises for making so much money. Thanks to Mark Dry, it is now manufacturing its own gold.

The work of the five giants of chemical engineering, Fischer, Tropsch, Pichler, Schulz & Dry, has bought the modern world some vital breathing space. When the oil-fields of the world, including Africa, run dry sometime during this century as all current indications suggest strongly that they will, the global economy will still be able to run. Thanks in no small measure to the life-work of Mark Dry. But if he could rub his philosopher's stone and live for another 100 years, there is still a big problem to be solved. How to ensure that the CO_2 produced in the burning of coal, including in the Fischer-Tropsch process, can be absorbed in such a way as to prevent it contributing still further to global warming. There is a task for Mark Dry's own students. For faithful to the tradition in which he himself was trained Mark Dry is even now, in his mid-seventies, teaching students here at UCT. And so life does indeed go on.

Vice-Chancellor, I have the honour to invite you to admit to the degree of Doctor of Science in Engineering, honoris causa, Mark Dry.