

## The Two Cultures

*C.P.Snow*

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The supposedly impenetrable barrier that separates the humanities from the sciences is still a topic that is often referred to, sometimes in terms of regret sometimes in terms of celebration. One camp views the other as technical, narrow, not to say blinkered, unable to address the existential questions in life; while the opposing camp dismisses the first as snobbishly effete and ineffective, not to say irrelevant. The issue permeates the discussions of what constitute true science, how the educational system should be organised and what education should really be all about. It engenders resentments and jealousies. Why are obscure poets discussed at lengths on the cultural pages, while scientific ideas are never presented as such, only their occasional practical ramifications, reducing their proponents to service-engineers, glorified car-mechanics and plumbers. Occasionally conciliatory voices are raised. True, the two camps are very distinct, but they do complement each other, and much would be gained would their respective proponents listen to each other. But vapid presentations to the effect that the point of one camp is to understand while the other to explain; or that one is concerned with verbal skills the other with quantitative ones, do little to explicate, let alone bridge the gap. In almost all of those contentious discussions, especially if the proponent belongs to the science camp, there is a reference to C.P.Snow and his coinage of 'the two cultures', and his resentment that ignorance of Shakespeare invites scorn, but an ignorance of the Second Law of Thermodynamics shows refinement. One may thus be tempted to suspect that the so often quoted essay by Snow, originally delivered as a Reed lecture back in 1959, will discuss the issue at some depths. A reader, who takes the trouble, and nowadays with the original delivery reprinted, replete with an afterword by Snow four years later, this is easily accomplished, is bound to become very disappointed. Snow's lecture promises much in the beginning but delivers almost nothing. The catch-phrase 'the two cultures' really did catch on, but this must be, as Snow concedes in his afterword, to the 'Zeitgeist'. The idea was simply in the air, and anyone, who at the appropriate occasion seized it and clothed it in words, however ineptly, was bound to make a stir. And it did make a stir, as the repercussions which are still with us more than forty years later, testify to; and it caused at its time much bitter recrimination, not so much against the concept as such, as that would be vindicated by the very recrimination it engendered, but against the tone and general drift of Snow's argument.

C.P.Snow was the proverbial clever boy that rose from a humble background through modest educational avenues to reach the pinnacle of scientific study at Cambridge at the heedful days of the early 30's. Snow initially did distinguish himself, but his scientific career soon got derailed, and instead he embarked on a career as a novelist, blessed with the luck of having his first efforts generally notified and critically acclaimed. Snow later became a consultant to the government, especially intrigued by the working of power behind scenes, the theme incidentally of most of his novelistic projects; showered with the customary honors and eventually becoming sir Charles and ending up with a peerage.

Claiming, as he did in his lecture, that he belonged to both camps, he should have been in the excellent position of bridging the gap, and explicating strength and weaknesses of both; but if so he showed little if any inclination for such a task. Much as he was a failed scientist, retaining a strong admiration for the quest he had failed to accomplish; he was also a mediocre novelist, if competent and above all productive. He earned his controversy in intellectual circles as an uncritical proponent of meritocracy, and a belief in material progress, which now may appear naive, but which still is in most influential circles unreflectively embraced. The theme of Snow's lecture is not really about the gap between two cultures and how it could manifest itself in social interaction (one naturally thinks of high table at Cambridge) and educational policy, but about our moral obligation to ameliorate suffering, to reduce the gap not between the humanists and the scientists but between the poor and the rich. To come to terms with the fact that although the fate of man as an individual is tragic, ending with the solitary confrontation with personal death, it does not mean that the fate of mankind as such is. The road to achieve this is through Science, and those who wed themselves to the the scientific project, inevitably become the men and women of the future, while those, like the literary coterie of Modernists, who scorn the road to material progress, resent the event of the industrial revolution, doom themselves to irrelevance and historical obscurity. This is, not unsurprisingly, what earned Snow such abuse from certain circles. His message was simple, one would almost say banal, and the sophisticated intellectual naturally identified the crudeness and simplicity of his language with a corresponding crudeness and simplicity of his thinking.

Thus Snow is not concerned with extolling the intellectual virtues and sophistication of theoretical physical ideas and how they may have revolutionized our thinking and approach to philosophy, nor is he concerned with those ideas being integrated into literature and shows only marginal interest in those being included into the generally accepted consensus of what constitute a well-rounded education ('Bildung'). His view is the practical, and he starts almost to resent as much the pure scientists disparagement of the applied, not to mention their contempt for the mere engineer, as the literary intellectuals snobbish ignorance of science. He embarks on a rather elementary analysis of the educational systems in England, USA and the U.S.S.R. respectively, opposing the early specialization of the English system against the more general one of the States and the Soviet Union, as well as its focus on a narrow elite. Clearly his sympathies are with that of the Russians, although he finds the demands they make on their student as they grow older maybe somewhat excessive. He also praises the American system, noting that after a soft beginning in their educational system, they really put their Ph.D. students to work. His presentation is clearly marked by the times. U.S.S.R is not seen as the Evil Empire, it is instead viewed as very dynamic, definitely belonging to the camp of the Rich world, and much more unsentimental than the West in following the only road to material progress and its commitment to a scientific education is seen as more realistic. Although delivered during the Cold War, he nevertheless envisions the future as one of co-operation between USSR and the USA, and views Mao's China with great hope<sup>1</sup>. Clearly Snow, in spite of his comfortable integration with the establishment, retains his youthful enthusiasm for the left, incidentally typical of

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<sup>1</sup> The knowledgeable reader may recall his book 'Red Star over China'

the circles he must have moved in during his Cambridge days<sup>2</sup>.

The ideas and beliefs that Snow chooses to present may strike us as crude and naive, yet they had a long pedigree and intrinsic strength and consequently prevailed and did carry the day. The blessings of unrestricted trade, as manifested in so called globalization, is, if not universally praised, at least an uncritically assumed tenant of the thinking of those who exercise power at whatever level of practical implementation. Also, the idea that the past was a lost Eden, has been incontrovertibly revealed as a sentimental myth, whose proponents are seen at best as irresponsible fools. Yet concomitant to this consensus there is a growing sense of emptiness, usually expressed as a critique of the so called consumer society, a phenomenon constituting a natural topic for existential reflection. But the tension between practical optimism and individual spiritual despair is certainly nothing new to this age, but has been with us since times immeorial. Furthermore it has little if anything to do with the opposition of the two cultures, but ignores not only such artificial boundaries, but also those of individuals, thus being not so much a contentious issue between warring camps, as presenting in the hearts and minds of sensitive individuals, an irresoluble conflict.

The division between the exalted activities of thought and reflection and the menial tasks of manual labour and trade has been with us since the emergence of stratified societies and documented through the concomitant rise of recorded history. The traditional art for an intellectual to practice has been rhetorics and the traditional source of erudition the study of the classics. Scientific curiosity came to the fore during the 17th century and launched the Enlightenment in the century to follow, with Newtonian mechanics as both the guiding paradigm as well as ultimate goal for all systematic inquiry into not only nature but also man, who became more and more seen as being part of the former. With the 19th century, and maybe not surprisingly contemporary with the Industrial revolution, science started also to have a palpable influence on the lives of ordinary men, as it started to become enmeshed in manial activity. Also at this time scientific geniuses started to appear among the lower social strata of the population. This did not, as may be mistakenly assumed, seed ideas of egalitarianism, but on the contrary an exaltation of invidual merit, whose intrinsic worth was seen to transcend the arbitrariness of social conventions, leading to the inexorable dismantling of inherited priviliges, a process that inspire few opponents nowadays. The inroad of science into the higher educational curriculum took part at the end of the 19th century, and it was on this wave that people like Snow rode. The thumbnail sketch presented above, would certainly be one which Snow, with his somewhat parochial English perspective, at least as articulated in his lecture, would have subscribed to. But of course reality does not fit comfortably with sweeping generalities like those above, however tempting they may be to formulate. Humboldt in Berlin inaugurated, what can be seen, as the modern university focused on research and education, already at the beginning of the 19th century; and the 'grand ecoles' in France stem from the end of the 18th; still it is true that in many countries and national cultures there was an opposition against the eroding of classical erudition, and indeed as it has been tradionally

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<sup>2</sup> The western intellectual infatuation with the extreme left, is associated with the 30's and with what is succinctly refered to as 1968. One may note that it illustrates one of Marx most quoted maxims, namely that history repeats itself, first appearing as a tragedy, than reoccurring as a farce

defined, it eventually more or less disappeared in the school-system in most countries, thereby vindicating the original apprehensions. Also the notion of Science differs between different cultural spheres. In Anglo-Saxon countries Science is confined to the systematic study of nature using 'hard methods' addressing what in principal and ideally is 'falsifiable'<sup>3</sup>. While in German 'Wissenschaft' includes any systematic inquiry, leading to a number of oxymoromic combinations, which has resulted into a battle of what should properly count as science and the scientific method, which seems not as active in Anglo-Saxon countries for reasons that may be no deeper than that of terminology.

The controversy between the humanities and the sciences is primarily an Academic concern and it has little significance outside that circle. As a controversy it has the potential to be with us for a very long time, as it is both irresoluble and the stakes are piled up high, involving both self-esteem and its concomitant shadow - that of anxiety. The scientist secure in his knowledge of doing solid things, nevertheless feels an anxiety of not really measuring up as far as sophistication is concerned; the humanist proud of the subtlety and versatility of his verbal skills, nevertheless anxious that the words he produces with such love and elegance, may signify nothing at all. There are many examples of scientists that follow literary careers, some of them (as Snow incidentally exemplified) with great success; while there are few if any examples of humanists taking up successfully a scientific career. The scientist can proudly announce that we are better, not only can we do science, but we can beat the literary people at their own game, often commanding a greater skill in exercising those very faculties the humanist think they have a unique claim to. Does this not mean that scientists, at least potentially are more intellectually powerful? To this the humanist may counter, that while this may be quite true, one should not forget that scientists who embark on such a dual career, usually consider their scientific work as work and vocation for which they display undeniable talent, but to their literary occupation they may bring their true love and see it as offering the true fulfilment of their deepest dreams; so while the scientists may be smarter and more capable, as a discipline that of the humanities is superior to that of Science, involving not just the intellect of a man, but his very soul as well<sup>4</sup>. Clearly, like with the notorious nature versus nurture debate, it can go on for ever, involving vague but powerful concepts and at every turn of the road evading anything that can be falsifiable.

To make the debate more specific, one may fruitfully ask where mathematics fit into this. In many ways mathematics is neither fowl nor fish. Most people would include mathematics among science, in fact they would think of mathematics as the very distillation of what is the working principle of science, namely what is vulgarly referred to as quantification. But within mathematics there is a similar, although far less acrimonious and more fruitful, opposition of the pure versus the applied. Mathematics has a respectably long pedigree and can trace its intellectual roots to the Old Greeks and hence to antiquity.

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<sup>3</sup> One may speculate whether this was a result of an intentional policy of the Royal Society to restrict membership

<sup>4</sup> One should also keep in mind that to every scientists that pursues a literary career there may be hundreds of scientists that pursue literature as a very serious hobby, and in fact may in many cases exhibit an erudition rivalling those of accomplished humanists. Thus it is misleading to think in terms of a mutual ignorance, it seems to be rather asymmetrical

Thus, to return to the narrow English view, mathematics was a fit subject for a gentleman to study in mid-19th century, and many of those who succeeded very well also did very well in the classics. One may be tempted to see in this a high degree of correlation between the two subjects, which may appear to be quite surprising<sup>5</sup>, on the other hand it may reflect nothing more than a natural inclination to study. Mathematics does in many profound ways differ from science, the most notable being its very freedom as to the choice of inquiry. Mathematics can, in a way really no other field of endeavor is remotely capable of, create its own subjects of study. Snow makes a passing reference to the surprising simultaneous and independent emergence of Non-Euclidean geometry at the beginning of the 19th century<sup>6</sup> and refers to it, somewhat naively, as the most abstract and esoteric mathematical subject. This freedom is both a strength and a weakness. Excessive freedom can as well stunt the imagination as stimulate it, and the lack of direction of mathematical research can easily direct lost souls into unfruitful dead-ends. Science is nowadays often Big Science, leading to a hierachial organisation, and the launching of extensive and expensive projects, into which many scientists can be employed given well-defined tasks to perform. Apart from the case of statisticians (a category only half-heartedly included in mathematics) that is not an option for a mathematician, who instead works as an artisan, peddling his own wares. Thus not only the first-class mathematician is required to have a broad mathematical culture and thus view his subject as an intellectual enterprise not just as a technical. Thus upon a mathematician is imposed the demand to do truly original work, something that for any serious and sensitive individual can be inhibitating, not to say paralysing and sometimes lead to the mathematical equivalent of a writers block. This social and intellectual position makes the situation of a mathematician more like that of somebody working in the humanities than in the sciences. On the other hand, the undeniable connection with Science brings with it benefits, not the least of them being the reassurance that the accomplishments of a mathematicians fit into a larger web and are always solid as facts if not always useful as such.

Snow, as is often pointed out, does not speak of mutual antagonism, but of mutual ignorance, something that can be disputed; but in fact there is nowadays a rather pointed antagonism, not between the two camps as wholes, but between scientists on one hand, and so called Post-Modernists on the other. The latter claim that the scientists do not have any claim on absolute truth, which incidentally those have never claimed, but that reality is an evasive, not to say illusory concept, and truth is in fact highly relative, depending on your point of view. Ironically such an attitude ultimately stems from science itself, drawing on the wider philosophical ramifications of relativity theory, quantum mechanics and its puzzling dependence upon the observer (the celebrated Heisenberg uncertainty principle), the theory of falsification and non-verifiability (the most notable proponent being Popper), concluding that reality is ultimately a chimera. Such an attitude, apart

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<sup>5</sup> Gauss, arguably one of the greatest mathematical geniuses that ever was, is reported to have wavered initially between studying Classical languages and mathematics, the former choice being something to outrage his down-to-earth father even more than the latter; and Hamilton, a local Irish genius, was a linguistic prodigy

<sup>6</sup> The mathematically educated reader immediately calls forth the names of Bolyai, Lobachevsky and of course Gauss

from being ultimately self-contradictory, rests on a profound misunderstanding of what those theories really mean in a technical sense, and here we can really speak about the dangers of ignorance. It is tempting to couch this in Freudian terms and speak about 'penis-envy' and the desire to castrate in a big way in order to compensate.

October 18, 2003 **Ulf Persson:** *Prof.em, Chalmers U.of Tech., Göteborg Sweden* ulfp@chalmers.se