

The Fourteenth John Snow Memorial Lecture*

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My father was born in 1871 and the expectation of life then was 40 years. His fourth and youngest son was born in 1910 and the expectation of life today for a man is 70 years; this is perhaps fortuitous as otherwise, at the age of nearly 62, I should not be available to deliver the John Snow Memorial Lecture.

The only reason I have for stating the obvious is to recall to mind the fantastic speed of change today, and to remind all of us of the debt we owe to the amazing body of men, chemists, scientists, researchers, inventors, etc, who peopled this land throughout the nineteenth century.

That the expectation of life is nearly doubled in a single generation is not something that has just happened; it has been made to happen, that the main diseases that proved fatal before the age of 45 are now virtually no more, and that modern diseases are more to do with ageing than anything else, is not a coincidence; it is the result of the genius and quality of people who have preceded us.

Dalton and Snow as men of their time

John Dalton, the meteorologist, chemist and researcher who discovered the atomic theory and opened up a new world for mankind, was one such man of genius and John Snow was another. Their lives overlapped slightly; Dalton died in Manchester in 1844 and John Snow, born in 1813, died when 45 years of age in 1858. They had a number of things in common. They were both self-educated, leaving school at 12 and 14 years respectively. They both left their birthplace in their early twenties, and spent the rest of their lives in the cities of their adoption. Dalton in Manchester, to teach, and Snow in London to be amongst the teaching hospitals. They were both grounded in chemistry.

Their claim to fame is not that they amassed great fortunes, for they were never rich (indeed, those that have amassed fortunes are mainly remembered for their charitable munificence and not for the work they did, or their contribution to society), but because of the contribution they made to the health and happiness of people the world over, the majority of whom never heard the names of Dalton or Snow. They both

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were persevering and painstaking in all their work; they both gave all their waking time to the pursuit of knowledge in their respective fields; they both pressed hard against the barrier of knowledge with relentless logic and succeeded in pushing it back.

The qualities and character of John Snow

Today then, we gather together to pay our respects and express again on behalf of humanity our grateful thanks to John Snow, a man of quality who in a short life span did so much for so many.

This is his memorial lecture and I am privileged indeed to be invited to give it but being the Chairman of the Governors of Guy's Hospital no more qualifies me to speak on medical matters than my honorary legal degrees qualify me to practice law. I want rather then to discuss the qualities that Snow possessed and, if possible, to draw some lesson and some inspiration from them.

This country, and indeed the world, is desperately in need of men of the quality of John Snow. It needs men whose personal ambitions are not overriding, but who still have pride in achievement. John Snow was not an arrogant man and when Sir James Shuttleworth, while addressing the Manchester School of Medicine, credited others for the discovery of the dissemination of cholera, the reply by John Snow was the epitome of moderation. His firm adherence to facts and the importance of the record came out in the choice of words he used in his correction.

He said that the correction he was making was not 'in the way of complaint; but as my researches respecting cholera were conducted with great labour, and very much to the detriment of my more immediate interests, I feel it a duty not to allow the credit of them to pass from me by a mere mistake'. This made the point respectfully, and put the record straight.

John Snow and his critics

Snow was not without his detractors. There were many people who devoutly believed that pain was God sent. The religious of the day preached fire and damnation. People that interfered with pain were thwarting God's will. Even such a distinguished man as a Guy's surgeon, Mr Bransby Cooper, denounced the use of ether and expressed his belief that pain 'was a premonitory condition, no doubt fitting parts, the subject of lesions, to reparatory action', and therefore he should feel averse to the prevention of it.

Some of the clergy opposed the alleviation or prevention of pain during childbirth but both these prejudices were swept away by two unique events concerning John Snow. In 1853 he administered chloroform to Queen Victoria at the birth of Prince Leopold and, in Lambeth Palace, similarly anaesthetized the daughter of the Archbishop of Canterbury at her confinement. Four years later it was scarcely a news item when, at the birth of Princess Beatrice, John Snow attended and administered to Queen Victoria once again but it was not on this occasion that Queen Victoria said—'We are not amused'—it is said that she expressed herself 'much gratified' with the effect of the chloroform. Nothing more was heard from the clergy either about the curse of Eve, 'In sorrow shalt those bring forth children'.

Snow and the surgeons

These detractors did not alter John Snow's course of action one little bit; narrow-

mindfulness in others did not affect his own broad approach. He had seen and knew enough about the problems of surgery in that day and age never to be shifted one iota from the pursuit of his determined intention, to give the surgeons the time they needed to successfully perform surgical operations. Snow's work broadened the area of their work and widened their horizons. Their then limits were set by the endurance of the patient and the agonizing pain, and care and accuracy under these conditions had often to be sacrificed to speed. By steadily pursuing his goal, his eyes fixed upon the distant scene of ultimate good, the work of John Snow increased the scope of surgery so that today several hours on the operating table is not a rarity.

Leadership, research and education

How one could wish that in these days leaders in politics, the trade unions and business would ignore the cries of the militant anti's! How much longer must we have to endure leaders who fail to give leadership because they prefer to follow the pressures from below? The function of a leader, once elected, is to give a positive lead and not wait to hear the baying of the hounds and then himself join in the hunt. It is doubtful if any worthwhile achievement would have been accomplished if first one had to have the acquiescence of the popular public opinion poll. I believe the Research Councils were correct when they stoutly defended their right to decide upon the direction of fundamental research.

It does not come to many to be able to see so clearly ahead as John Snow, but this is the spirit our education system should inculcate into young people. We need minds that are lively, energetic, imaginative and full of the spirit of adventure. Minds like that of John Snow who saw real purpose in his thinking. His was the type of mind that not only revelled in the triumph of accomplishment but got supreme satisfaction out of contributing to the public good.

Personal ambition is not to be despised except when it is enveloped in personal aggrandizement and vain self glory. Too many who sit in the seats of the mighty appear to suffer from the latter. The determination of John Snow was not the determination of dogged obstinacy but the determination of the logic of the chemist. It is this clear thinking, so much required in our everyday affairs that might well have changed the recent tripartite talks between Government, Trade Unions and Business, which ended in such lamentable failure.

Snow and the environment

John Snow's claim to fame lies not solely in his successful work in anaesthesia but additionally in the work he did in the discovery of the cause of cholera. Here we can see, in studying his life, how his early environment had a profound influence upon him for, at the impressionable age of twenty, he was sent to Killingworth colliery, where there was an outbreak of cholera.

He saw at Killingworth the squalor and unsanitary conditions in which people lived. At that time little was known of that dreaded disease. What was its cause? How did it spread? It remained a virulent killer, and something of a mystery until seventeen years later, Snow proved that the disease was water borne. When in 1854 a terrific outbreak of cholera commenced in London in the Broad Street, Golden Square area, the reaction of John Snow was prompt; it was to present himself to the vestrymen of

St James's and advise them to padlock the pump handle of the Broad Street pump. The introduction of clean, piped water supplies and the provision of the water carriage sewage system eliminated the recurring plagues of cholera.

If Snow had lived longer, or if subsequently we could have had a few men of his foresight and knowledge and determination on local authorities, I wonder if today we would be still polluting our rivers and the seas around our coasts by pouring untreated sewage, millions of gallons a day, into them. When danger passes how easy it is to become complacent, and do nothing once again. Only in these latter years has the nation been aroused to the scourge of the industrial revolution. Only now have we begun to take notice of our environment.

Rivers like open sewers abound and the dereliction of the land will be with us until the end of the century at the present rate of reinstatement. We still have millions of houses unfit for habitation in which families are still being born. There are three million dwellings with no inside lavatory and two million with no fixed bath, and yet another million are overcrowded. We still have primary schools in which young children are being taught, where facilities for washing and toilets are rudely primitive. A nation that can boast a television set in almost every home and a car outside three-quarters of them, can scarcely say that it has not the resources to right these conditions speedily.

Snow's forthrightness did not end when he demonstrated the importance of a clean water supply and the need for dealing with human effluent so that contamination was impossible, for he knew the importance of ensuring an environment that was wholly hygienic. He knew the dangers of over-crowding, squalor, dirt, lack of sanitation, ventilation and warmth, malnutrition and inadequate clothing.

If men like Snow had had the authority of a Prime Minister at the time, we would undoubtedly have entered the twentieth century with a clean bill. Instead the danger of cholera having passed, industry went on polluting right through the rest of that century and through the best part of this.

Snow's time as an era of momentous change

The chemists and researchers of the nineteenth century let in the strong sunlight of learning and enabled science and applied physics to influence the professions, and especially medicine.

The work of men like John Snow was the real break-through. For thousands of years mankind had borne and endured all the ills that man is heir to but men like Dalton and Snow and Lister kindled a flame of knowledge that lit the way to the greatest changes the world has ever seen in such a short time.

For all the centuries, the slow evolution of man took its leisurely pace, so leisurely indeed that progress could scarcely be measured in a man's lifetime, but, with the break-through of the nineteenth century, came the beginning of the rapid advance, and a speed of change which shocks and confuses us all. This speed of change cannot now be slowed, even if it were desirable to do so, and it is bearing humanity forward on a torrent at a break-neck speed.

We have got so used to the speed of change, let us pause to consider it. Alvin Toffler in his book *Future Shock*, puts the speed of change in this way; if the last 50,000 years of man's existence were divided into life-times of approximately 62 years

each, there have been about 800 such life-times; of these 800, fully 650 were spent in caves; only during the last seventy life-times has it been possible to communicate effectively from one life-time to another—as writing made it possible to do; only during the last six life-times did masses of men ever see a printed word; only during the last four has it been possible to measure time with any precision; only in the last two has anyone anywhere used an electric motor, and the overwhelming majority of all the material goods we use in daily life to-day, have been developed within the present, the 800th, life-time.

This is a stark portrayal of the speed of change which is fashioning and re-fashioning our lives, but particularly those of the younger generation; for them the change must indeed be bewildering, and is probably one of the causes of unease and unrest that permeates so many of them today. Their learning becomes more difficult, more specialist and in some subjects the curriculum with which they started at University is changed before their course is through.

Lord James, Vice Chancellor of the University of York says, 'I took my first degree in chemistry at Oxford in 1931. Looking at the questions asked in chemistry exams at Oxford today,' he continues, 'I realize that not only can I not do them, but that I never could have done them, since at least two-thirds of the questions involved knowledge that did not exist when I graduated'.

Dr Robert Hilliam, the top educational broadcasting specialist for the Federal Communications Commission, says, 'At the rate at which knowledge is growing, by the time the child born today graduates from College, the amount of knowledge in the world will be four times as great. By the time that same child is 50 years old, it will be thirty-two times as great and 97% of everything known in the world will have been learned since the time he was born.'

In the field of chemistry prior to Gutenberg (c1400–68), only eleven chemical elements were known. Antimony, the twelfth, was discovered at about the time he was working on his invention of printing. It was fully 200 years since the eleventh, arsenic, had been discovered. Had the same rate of discovery continued, we would by now have added only two or three additional elements to the periodic table since Gutenberg. Instead, in the 450 years after his time, some seventy additional elements were discovered and, since 1900, we have been isolating the remaining elements, not at a rate of one every two centuries, but of one every 3 years. Knowledge is no longer only power as Francis Bacon once told us. To-day knowledge is change.

It was literally centuries between the time Paracelsus discovered ether and the use of ether for anaesthesia by John Snow. The first English patent for a typewriter was issued in 1714, but before typewriters became commercially available, a century and a half had to pass. In 1836 a machine was invented that mowed, threshed, tied straw into sheaves and poured grain into sacks, but it was not until the 1930s that such a combine was marketed.

For thousands of years since the camel caravan of 6000 B.C. the fastest man could travel was the speed of a camel or a horse. In 1825, just less than a century and a half ago, the top speed of the steam locomotive was some 13 miles per hour; 55 years later the steam locomotive reached 100 miles per hour. It had taken the human race the whole of civilization to reach that speed, yet a half century on, the airborne man in 1938 was moving along at 400 miles per hour, 20 years later speed had doubled to 800 miles per hour and, by the 1960s, rocket planes approached speeds of 4000 miles per hour and men in space capsules travelled at 18,000 miles per hour.

The future

Humanity today has within it the power to provide high living standards for all its inhabitants. Those who cry, 'woe! The world is over-populated', and propagate the Malthusian theory have their heads in the sand. Seventy per cent of the world is covered by the seas and underneath the seas lies the land and in that land and under it lies wealth untold, which science will enable man to exploit. We need not fear that our resources will be insufficient; if we have any fears it will be that our resources are not used to the best advantage. Yes! The world can be a good place in which to live, if we so will it, if we can learn to live in peace and live together and if our outlook on the world is similar to the outlook of John Snow and men like him.

Humanity also has the power to destroy itself, to poison the atmosphere in which it lives and to end it all in a whimper.

The means to provide high living standards and to destroy everything have been achieved in three generations; men like Snow who started it all in the last century were only concerned with good; there was no place in their mind that discovery would ever be used for evil. We shall therefore fail the trust of men like Snow, who handed to our generation the key to nature's treasure chest, if we neglect to turn all the benefits of the genius of man to the good of mankind, wherever it may be but, to accomplish these things, we need the stimulation of the mind of a Snow and with it, his courage and determination.

Mankind will not inherit the earth if it follows the path of a selfish society, an affluent society which becomes a more self-centred and greedy society, a society in which violence and crime and drugs and permissiveness, with all its dangers, grows at an alarming rate. We shall only produce and reap the harvest of the Snows of this world if the quality of people now and tomorrow equals the quality of the man we honour today.

Conclusion

I began to set down what these qualities were, but ceased to do so when researching more into the life of Snow. I came across an extract from Sir Benjamin Ward Richardson's memoirs of John Snow published a year after Snow's death. This put what I was seeking so much more clearly than I could contemplate, and had the advantage of being written by one who knew him—a fellow student.

I conclude therefore with this quotation, because it is the personification of a great man whose marked qualities are so much required today in every field of endeavour, and especially in those who are the leaders of men in any and every field. We are indebted to Mr Joshua Parsons who was a fellow student of Snow's in 1836 at the Hunterian School of Medicine. He wrote to Sir Benjamin Richardson as follows:

'Snow was not particularly quick of apprehension, or ready in invention, he had always kept in the foreground by his indomitable perseverance and determination in following up whatever line of investigation was open to him. The object of this steady pursuit with him was always truth; the naked truth for its own sake, was what he sought and loved. No consideration of honour or profit seemed to have power to bias his opinions on any subjects.'

How many living today will deserve that epitaph and have earned it?