



BREAKING THE SHACKLES

A HUMANIST CELEBRATION OF LIBERAL EDUCATION

A Re-evaluation of the current education debate through the lives of Prof. T. H. Huxley and H. G. Wells at Imperial College.

BREAKING THE SHACKLES

*Edited & Introduced
by*

Michael Newman

DEDICATION

This book is dedicated to all those fighting for the human dignity and rights of children, and thereby of all people.

All proceeds from the sale of this book are being donated, by the publishers, to fund a conference for teachers on the creation of an anti-bullying curriculum. Its working framework is expressed by the concluding statement in this book quoting Dr J. Bronowski, from his TV documentary series *The Ascent of Man*.

Anyone interested in contributing to this conference, or attending it, should write to the publishers .

III Supposing system of education to be made afresh what should we do with the average child who is to be not a man of letters nor an artist nor a man of science but who is to work forward to the performance of the duties of an average English citizen

1. Provide for his physical & moral discipline
2. Take care that he learns to read, write, cipher with facility and to draw simple things
3. See that he becomes disciplined in inductive and deductive method
4. See that he knows the stock of common knowledge, natural phenomena, —, —, politics, morals and law

T. H. Huxley's Jottings

Translation:

Supposing system of education to be made afresh what should we do with the average child who is to be not a man of letters nor an artist nor a man of science but who is to work forward to the performance of the duties of an average English citizen.

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BREAKING THE SHACKLES

Preface

A Humanist Celebration of Liberal Education

This book is a celebration and a critical analysis. The irony of the tribute, to an institution that is so heavily criticised by one of its most famous products, should not be lost. The heroes, and there are many, of what is now Imperial College of Science, Technology and Medicine, have fought valiantly for liberal education. Indeed, they may have succeeded in their own teaching and in influencing Kings, governments or commissions, but their enemy, an examination structure and a system of financing, is one that fails to be subdued by any deliberate philosophy. Especially one that promotes teaching for the sake of opening minds rather than training skills and passing on profitable knowledge.

The irony was summed-up, painfully, last year, when, as an alumnus, I was sent a beautiful colour brochure by the college seeking donations. It was commercially selling itself as a producer of engineers, physicists, pest-controllers, business people. The heroes were there; used to help prostitute their institution.

Huxley, a fighter for liberal education for all, for free museums and libraries! His memorial is a magnificent statue in the Natural History Museum, a part of the once great Imperial complex, a museum that now flies in the face of his fight for free education for all by merchandising itself and its contents. And there is H.G. Wells, a student who had to go without food because his weekly grant—a scholarship to encourage bright people into teaching!—ran out before the end of each week, and who so heavily criticised the lack of liberal education at Imperial that they refused to name their library after him! But when you are marketing who respects the past.

This book is a re-assertion of arguments used over one hundred years ago, during the introduction of compulsory schooling. Arguments about access to, and need for, education. The relevance of Wells' and Huxley's lives, and writings, to the present education debate is a tribute to them but an indictment of a system that, after over a century, is still deciding what its purpose is.

It is often said history only repeats itself if people forget the mistakes of the past. I hope this little book will be a reminder of a great tradition, a humanist tradition, that many students, teachers, parents and politicians seem to have overlooked.

I dedicate this work not only to Huxley, the teacher, and Wells, the student, but to all teachers and students, of all ages, who are helping each other to open their minds using the only tools available, that of reason, excited doubt and love—of humanism.

Michael Newman

T. H. HUXLEY



THE TEACHER

T. H. HUXLEY

The Teacher*Liberal Education*

‘In fact there is a chorus of voices, almost distressing in their harmony, raised in favour of the doctrine that education is the great panacea for human troubles, and that, if the country is not shortly to go to the dogs, everybody must be educated.

The politicians tell us, ‘You must educate the masses because they are going to be masters’. The clergy join in the cry for education, for they affirm that people are drifting away from church and chapel into the broadest infidelity. The manufacturers and the capitalists swell the chorus lustily. They declare that ignorance makes bad workmen; that England will soon be unable to turn out cotton goods, or steam engines cheaper than other people; and then, Ichabod! Ichabod! the glory will be departed from us. And a few voices are lifted up in the favour of the doctrine that the masses should be educated because they are men and women with unlimited capacities of being, doing, and suffering, and that it is as true now, as ever it was, that the people perish for lack of knowledge.

A Liberal Education & Where To Find It, 1868

Professor T. H. Huxley

T. H. HUXLEY

The Teacher*Tribute*

‘One does not free a prisoner by merely scraping away the rust from his shackles.’

T.H.Huxley.

‘He (T.H.Huxley) was on the Board to establish schools for children. His motive in every argument, in all the fun and ridicule he indulged in, and in his occasional anger, was the child. He resented the idea that schools were to train either congregations for churches or hands for factories. He was on the Board as a friend of children.’

Benjamin Waugh

‘ . . . he (Huxley) wanted school teaching to lay “a firm foundation for the further knowledge which is needed for the critical examination of the dogmas, whether scientific or anti-scientific, which are presented to the adult mind.” ’

Cyril Bibby

T. H. HUXLEY

The Teacher

Profile

Professor T. H. Huxley was a lecturer at the Normal School of Science. He was promoted to Dean and tried to build the College into the most prestigious in the country. He was a rationalist, believing that there was not enough evidence to suggest that God exists. He coined the term Agnostic for his beliefs. As a scientist and teacher he campaigned for the liberal and technical education of all children. He was a working class hero.

He was on the first education board for London. He advised the King and helped to influence the nature of The Education Act of 1870 that brought compulsory education to this country. As well as being Darwin's bulldog he fought for the rights of children to have an education that would free their minds.

He gave many talks around the country to the recently formed teaching institutions for the working class, called the Mechanics Institutes. He was listened to by hundreds of thousands of people. He fought for compulsory education, for free libraries, for a schooling system free from religious doctrine.

H. G. WELLS



THE STUDENT

H. G. WELLS

The Student

Profile

H. G. Wells won one of the first scholarships to train at the Normal School of Science (now Imperial College) as a teacher. Science education was being seen as vital to the teaching of children. The apprenticeship method of teacher training was seen as insufficient. The country needed good science teachers. To encourage good students to be teachers they awarded scholarships. But Wells only received one guinea a week, which left him without food for the last days of the week many times during his course.

Fired by his enthusiasm for science and teaching by Professor T.H. Huxley he tried to encourage debate and discourse at the college. He gave many controversial debates at the Debating Society, in spite of a rule against political or religious subjects! He also founded and edited a magazine called the *Science Schools Journal*. His preface to the first copy expresses this enthusiasm and also forecasts his disillusionment if the students failed to live up to his expectations.

In several of his books Wells describes his old college and gives the characters some of his own student desires and activities. In *Love and Mr Lewisham* the hero has the aim of being another Huxley and wins a scholarship to train as a teacher at Imperial College. It gives some excellently detailed descriptions of student life. He uses the college, again as a back-drop, to his controversially feminist novel *Anne Veronica*. The wonderfully crafted short story *A Slip Under the Microscope* is about a student failing a practical examination due to his honesty.

Far more controversial were the descriptions of destruction of the college in the short story *Argonauts in the Air* and the first serialisation of *War of the Worlds*. These reflected the anger and criticism he levelled at the college in his autobiography. He felt it betrayed Huxley and liberal education in the name of exams and cramming. Due to these criticisms the college refused to name its library after him!

BREAKING THE SHACKLES

Introduction

A Humanist Celebration of Liberal Education

This book is in four parts. The first is a long examination, with reference to Wells, Huxley and my own experiences at their old college, of the powerful stranglehold technical education has over our present schools and colleges; How this is helping to destroy the humanity of our colleagues, friends and ourselves.

The second is a series of extracts, and a short story, that describe what it was like to be a student at the Normal School of Science and the Royal School of Mines in the 1880's. The issues of the nature of teaching, and its wider effects, are mentioned, as well as references to Wells' student activities at the college and the influence of Professor T. H. Huxley. The third part uses extracts from Wells' autobiography to examine his criticism of the college. It is this criticism that has wide implications for the present fights about our schooling system and its problems. This concludes with a quote from a report by the British Association for the Advancement of Science that involved two eminent men from Imperial and appears to reiterate the very criticisms Wells had made.

The final part sums-up the need for an urgent re-examination of what we do to our children using an extract from Jacob Bronowski's T. V. series the *The Ascent of Man*. When you read his words you should try and picture the old man walking through the gas chambers for the first time, standing in the pond were the human ashes where flushed, kneeling down and scooping them up with his hand. The words he spoke were unscripted and are the most beautiful, and powerful, humanist statement about the problem that faces us—of recognising each other as human.

For those who wish to help, in the continuation of Huxley's and Wells' fight to free our minds, there are addresses at the back of the booklet, for those organisations that are keeping up the struggle. I must emphasise that the contents of this book reflect my personal views and should not be seen to be representative of any of the organisations included.

I would like to express my thanks to the Imperial College Archives, who over the years have helped me in my personal research, especially to Mrs Pingree and to Anne Barrett, who has shown great tolerance of my disorganisation. I would also like to thank the staff of the Biology Department at Imperial College for their encouragement and support of my work as a student. If they had not shown so much kindness I would have totally failed my zoology degree. I am very grateful to a fellow student called Ian House who made possible the struggle against the student intolerance at the college. The librarian at Conway Hall, and Don Liversedge, helped me to find relevant archives on Wells and Huxley.

I hope that those people now at Imperial College, especially the staff, do not take this book as an insult. In many ways I liked the place, especially the staff, who are on the whole friendly and helpful. I hope they see this as a tribute to those teachers who individually care about their students. It is the whole system that I attack, using Imperial as the example.

BREAKING THE SHACKLES

Re-living the Past

A Humanist Celebration of Liberal Education

At Primary school I wrote three projects on my heroes, one was Scott of the Antarctic, the second his son, Peter, the naturalist, and the third H.G. Wells. The cover of the Wells project was a drawing of the Martian tripods, from his novel *War of the Worlds*.

Sixteen years later, I have studied zoology at Wells' old college, the one he destroys in the first serialisation of *War of the Worlds*; I have gone on to teach biology, as Wells did; and I have finally ended up as Information Assistant to an educational charity, a forerunner of which Wells once belonged to. On 25th March 1990 I will speak at Conway Hall, to the South Place Ethical Society, something Wells did as a successful writer and member of the Rationalist Press. The theme of my talk is 'Professor T.H. Huxley and the present education debate'.

This compilation is personal. It may have been written some one hundred years ago, by people I have never met, yet it seems deeply a part of me.

As Wells had done in 1883, I went up to Imperial College in 1982, with the high hopes of opening my mind with science. Like Wells, I found cramming and closed minds. We both, as students, went on to debate, edit, write, campaign and to fail—to re-pass later. This comparison is not of minds but of histories. In some ways, strange as it may appear, I feel I have 're-lived' parts of Wells' life. Not in any spiritual sense, or literally, but through shared experiences across the century.

In re-publishing Wells' writings I am using his words to describe my feelings and thoughts.

At secondary school I read Stephen J. Gould's book, *Ever Since Darwin*, the combination of wit and the contrast of approach—introducing exciting concepts of history and social relevance to biology, especially in terms of the nature of our behaviour—inspired me to give a series of talks to my school. In a boys' Grammar School I stood at the lectern replacing the religious hymns with music from M*A*S*H and Tom Lehrer, and the religious preachings with Darwin. I was called a Marxist and a person with the brain of a snail moving slowly up a wall! Some teachers refused to attend. Most of the pupils ignored the talks or responded with ridicule. I went on to talk about their response, and about education, freedom and democracy.

The school prided itself on selecting the best children, but there was a lack of excited inquiry and reason. Very few students appeared to know, or want to know, why they were at school. Most of them, mainly from middle class backgrounds, accepted they were there to get exams for university entrance or a good job, a very small number did not accept this, could find no reason for being there, and subsequently failed.

When the middle class ethic of studying to gain qualifications is not found in a school there can be major problems of motivation, for what is the point in learning if all you do is fail? The irony of this is that rather than change the nature of schooling, to overcome this problem, we have simply widened the boundaries of assessment to include skills and knowledge no-one can fail!

At an inner city school, that I taught at for a short period, this caused a lot of problems for the middle class staff, some of whom had been so demoralised with the lack of motivation that they had persuaded themselves the pupils were born failures; nothing could be done with them except 'containment'. This was not, I might add, the philosophy of the school, or the Headteacher, who were attempting to create a community in which all were respected.

Because the system of schooling is one that represents a technical education for the job market, and not a liberal one to open peoples' minds to the excitement of knowledge and discovery, it fails to be relevant to many pupils. As a science teacher I was continuously asked why they had to learn about the different topics they were being taught, after all they were not going to be scientists!

Wells in *A Slip Under the Microscope* contrasts the liberal thought of Hill, with his interest in science to help him understand the world—as politics and discussion widen his mind—with the upper class Wedderburn, who would rather have dinner than debate. Wedderburn expresses the middle class desire to get a qualification, for which he is even willing to cheat. Whereas Hill, directed by his desire to improve his mind, cannot corrupt himself and tells the truth, for which he is wrongly accused of cheating. Of course, as Huxley states, most people during this period ‘perish for lack of knowledge’. Today they perish because of the nature of that knowledge.

With the vast number of pupils truanting our schools the answer may not be in changing the law, or making parents responsible, or employing more truancy officers, it may be found in the words of Huxley and Wells. Huxley believed you should teach the children for their own sake, starting with the knowledge they already have, using their own experiences and building upon these by learning using the local environment, and by doing things. To him books were the last resort for a teacher, as stated by Wells in *A Slip Under the Microscope*. This was the essence of liberal education. If we teach them how to expand their own freedoms, and humanity, the question of relevance becomes nonsense.

And yet the industrialists, the employers, the free-marketeers, the promoters of a technically-orientated education are winning. They are winning by controlling the definitions and terminology of the debate. They are winning by controlling the supply of money. They are winning through the effects of the government’s new local school management scheme; turning schools against each other, as competitors in the examination stake’s race. Schools must market themselves by showing how well they produce products for the job market. Liberal education is not only seen as wishy-washy, pie-in-the-sky nonsense, but as totally irrelevant.

Near the end of the last century, as state education became established, schools were paid by their results. Wells was employed as a teacher at Midhurst because the Headteacher realised that within this pupil-teacher there was a potential to win scholarships—one of which was to gain him a place at the Normal School of Science—and therefore prestige and more paying pupils. I was reminded of the strongest indictment against this system by a short newspaper article last year. It reported a pupil taking a

teacher to court for beating him as a result of failing to get a good mark in an exam. It was a private school and the pupil lost the case! George Orwell in his beautifully crafted essay *Such, Such Were the Joys* describes the totalitarian brutality of a school that regularly beat him to obtain scholarships so that the school would have the appropriate exam results to sell itself. He claimed that for the following twenty years he saw himself as a failure due to this torture. Indeed the essay has many similarities with his later novel *1984*.

University was going to be different from my grammar school. Not just cramming for exams but discourse, debate, thought—especially a science college, one with a history including Wells and Huxley.

My father, a retired teacher, has a degree in philosophy, and ensured that argument, sometimes very heated, occurred at every family meal. He helped to encourage within me a sense of respect for critical analysis and questioning. ‘The sleep of reason brings forth monsters’, he would often quote.

Within two months of my arrival at Imperial I had started campaigning. The students’ Unions, of which there was a complicated structure of four, insulted the name of representation. The three constituent Unions, Royal School of Mines Union, City and Guilds Union and Royal College of Science Union, preferred to elect beauty queens, ridicule female students, read obscene and insulting—as well as bad—poetry and help turn the rainforests into paper aeroplanes. The overall Union simply administered student affairs, helping to further the careers of the elected officers, training them in management and media skills. All of the Unions proudly boasted, as the Debating Society did in Wells’ day, that they were non-political and non-religious.

H. G. Wells portrays the relevance of politics to learning science in *Anne Veronica*, as she thinks about why she is at the college. He describes the relevance of class in most of his writings, especially the contrast between the paying students and the poor scholarship ones, like himself. He fought for the inclusion of politics and religion in the Debating Society, being carried out once for blasphemy! These activities are mentioned in *Love and Mr Lewisham*, where he is going to address the society on ‘Socialism’, something Wells actually did.

While I was there, the Royal School of Mines, to which Professor Huxley had been Dean at the end of the last century, organised a foreign students' week for the visiting geologists. A part of this was called 'Hon Porn Night'—the RSMU had an official post called the 'Honorary Pornographer'!

The 'Hon Porn Night' consisted of hard core films, featuring bestiality and sado-masochism, which had been brought, I believe illegally, from abroad, as mementoes of visits to foreign mining colleges.

The fight that ensued to stop the Union organising and profiting from this insulting portrayal of women as victims and 'cunts'—it was not a fight about the individual's right to buy pornography—brought lies and insults from those who defended it. Women were afraid to get up and speak in their own defence, as were gay students—who faced the worst intimidation of all.

Wells' magazine, the *Normal School of Science Journal*, reports that women were fighting at the end of the last century for the right to use the men only smoking room. The present mixed Union bar still proudly displays, on the back wall, a polished brass plaque that states, historically, 'Men Only'. There are drinking clubs still exclusive to the men.

One of the most rewarding things that happened to me, as a student, was to face a meeting of over four hundred students, attracted as a result of a massive leafleting campaign, to hear the public lies of my opponents, and to win! The RSMU supporters fled the room to try to close the meeting before a vote was taken. To see these people, who portrayed such a macho image, who had arrogantly insulted and intimidated anyone they saw as odd or as a potential for a good laugh; to see them flee was exhilarating. The meeting decided that the 'Hon Porn Night' was an insult to all students and should not be allowed to take place. Sadly this was not the end of the matter. The fight went on for some three more years.

Imperial College has its students personally involved in moral and political issues that many people just talk about. Animal experimentation, apartheid, nuclear power and weapons, Star War systems, lack of women in science, world food problems, pest control, pollution were amongst the many problems that students, or their teachers, were actively working in, or refusing to.

Yet for your course, or your research, or a job, these issues must be ignored. The students were too personally involved, they could not risk expressing concern over the ethics. They were pragmatists, studying knowledge and skills for a particular job or to further their career prospects. They were reducing science education to that of technical skills, becoming technicians ready for the *Brave New World* or *1984*. So many times they were to say it was irrelevant to them. As Wells writes in his autobiography the students were proud to ignore politics and religion.

This is being a bit unfair to the individual students; for the funding and examination system, working hand in hand, fail to give students the time to think. Examinations are far more important than ethics or questions about the nature of education. Education, rather than liberating minds, processes them into marketable commodities. Imperial sells itself to industry and government through these products.

In 1887 the Debating Society and Wells' college magazine discuss the problem of 'technical versus liberal education'. Sadly such discourses no longer happen because of lack of time and inclination.

I feel the same anger as Wells expresses in his autobiography and in his description of the destruction of the college in the short story *Argonauts in the Air*. This anger is not, though, directed just at the monopoly of technical education, it is at the consequences.

If knowledge is taught as functional, without reference to its nature, if we are spoon fed 'facts' to repeat in exams, then knowledge becomes absolute; even if one of the 'facts' is that science uses models. Instead of knowledge being a personal discovery it is one accepted, or rejected, on the authority invested in the figure of the teacher. Its relevance to the pupil's humanity, and their freedom, is lost. The importance of critical doubt seen as a waste of time. As a teacher just get them through the exams, there is no time for enquiry. This leads to a people who, for their values, their ethics, are more willing to follow than to examine. This can be hidden in a pluralist society, people can be smug because of the diversity, but all it really means is that there is an illusion of choice; just many more views trying to lead you on.

We interpret the world according to a framework of ideas, concepts, knowledge, within our minds. This is a result of learning. Technical education produces a framework that is only relevant in terms of practical

outcomes, of profitable results. The framework itself is not relevant, it is like a black box.

When the framework is built on unquestioned knowledge; when there is no doubt; when the framework is built on the confusion between human knowledge and what actually might be outside our minds so that our minds' picture of the world is interpreted as the world; then we have, as Jacob Bronowski said, 'absolute knowledge, with no test in reality'.

The consequences of the arrogance absolute knowledge can give are found in our schools as bullying, and in history, as Bronowski's statement from his humanist T.V. documentary *Ascent of Man* makes clear, in Hitler's final solution.

It was expressed to me at Imperial College by the institutionalisation of pornography, by the way I was treated and by a single event that occurred in one of the student dining halls. I was eating my lunch whilst listening to a new acquaintance. He paused and stated that he was gay. The abruptness of the sentence, its unexpectedness, took me aback. Why tell me? He went on to explain that he felt he could talk to me because of my fight for the dignity of women, indeed of people, within the college. He had been afraid to talk to other people. Eventually he had made the tragic mistake of telling his colleagues. Their response made him feel lonely and rejected, too scared to talk openly! The human victims of the power of technical education over our perception of knowledge, and ultimately of ourselves, is its greatest, yet least recognised, indictment.

It does not recognise such criticism because it compartmentalises education, like it does knowledge and skills. Bullying is in one compartment, dealt with 'appropriately' by such things as personal and social education, or personal tutors, or the discipline system within the school.

The National Curriculum is a master plan of compartmentalisation, as well as defining all end results in terms of assessment grades. You can now be assessed on reading a thermometer, or filling a beaker of water!

I attended a national conference, in February 1990, at which the present Education Secretary, McGregor, and the Labour shadow spokesman, Jack Straw, spoke. It was a consultative conference on citizenship in schools. We discussed, in small groups, the definition of citizenship, how could it be taught and assessed. The government wants citizenship as an assessed part

of the time-table. There will soon be published a National Curriculum document on it. A number of people at the conference, including myself, were rather confused.

I went into teaching to help pupils open their minds, to help them become independent, critically analytical, actively enquiring, caring minds. Surely that is a good citizen.

How can any teaching, in any subject, be divorced from citizenship? Surely discussing citizenship in education is, or should be, examining the philosophy and purpose of education. Yet the conference, by its nature and aims, working within a framework defined by technical education, treats citizenship as a compartment, maybe with cross-curricular components but still as a definable subject.

The ultimate grave-yard of liberal education is as an assessed subject, a necessary part of ensuring values and respect for society are not omitted from the National Curriculum.

This is where the frustration can set-in, how can you argue for liberal education when no one will understand you? They all talk and listen in words defined by their technical education up-bringing and by the free market. Huxley and Wells lived in a society which was giving birth to state schooling. The debate was open to their concepts. Huxley was a hero because he fought for the intellectual freedom of the working class. His fight was not won, though his advances have set the standard, making sure that we can recognise there is a battle still to be had. He gave us a major part of the humanist liberal tradition this book celebrates. A tradition that is found amongst the heroes of Imperial College and many other educational institutions, yet one that appears to have lost its meaning.

This booklet is an attempt to put into the current debate the issue of its very framework. We must not argue using the terms of the opponents of liberal education, we must start controlling the definitions of the debate. We must reclaim the heritage Huxley, Wells and Bronowski have left for us.

I have used Imperial College because it is a fine example of technical education at its best, despite the attempts to liberalise it with a Humanities Department and links with music and art colleges. It expresses what is at stake in the present debate: the fight for people's humanity.

WELLS AS STUDENT

Love & Mr. Lewisham

The Career Prevails

There is an interval of two years and a half and the story resumes with a much maturer Mr. Lewisham, indeed no longer a youth, but a man, a legal man, at any rate, of one and twenty years. Its scene is no longer little Whortley embedded among its trees, ruddy banks, parks and common land, but the grey spaciousness of West London.

And it does not resume with Ethel at all. For that promised second letter never reached him, and though he spent many an afternoon during his first few months in London wandering about Clapham, that arid waste of people, the meeting that he longed for never came. Until at last, after the manner of youth, so gloriously recuperative in body, heart, and soul he began to forget.

The quest of a 'crib' had ended in the unexpected fruition of Dunkerley's blue paper. The green-blue certificates had, it seemed, a value beyond mural decoration, and when Lewisham was already despairing of any employment for the rest of his life, came a marvellous blue document from the Education Department promising inconceivable things. He was to go to London and be paid a guinea a week for listening to lectures—lectures beyond his most ambitious dreams! Among the names that swam before his eyes was Huxley—Huxley and then Lockyer! What a chance to get! Is it any wonder that for three memorable years the Career prevailed with him ?

You figure him on his way to the Normal School of Science at the opening of his third year of study there. (They call the place the Royal College of Science in these latter days). He carried in his right hand a shiny black bag, well stuffed with text-books, notes, and apparatus for the

forthcoming session; and in his left was a book that the bag had no place for, a book with gilt edges, and its binding very carefully protected by a brown paper cover.

The lapse of time had asserted itself upon his upper lip in an inaggressive but indisputable moustache, in an added inch or so of stature, and in his less conscious carriage. For he no longer felt that universal attention he believed in at eighteen; it was beginning to dawn on him indeed that quite a number of people were entirely indifferent to the fact of his existence. But if less conscious, his carriage was decidedly more confident—as of one with whom the world goes well.

His costume was—with one exception—a tempered black,—mourning put to hard uses and ‘cutting up rusty’. The mourning was for his mother, who had died more than a year before the date when this story resumes, and had let him property that capitalised at nearly a hundred pounds, a sum which Lewisham hoarded jealously in the Savings Bank, paying only for such essentials as university fees, and the books and instruments his brilliant career as a student demanded. For he was having a brilliant career, after all, in spite of the Whortley check, licking up paper certificates indeed like a devouring flame.

(Surveying him, Madam, your eye would inevitably have fallen to his collar—curiously shiny, a surface like wet gum. Although it has practically nothing to do with this story, I must, I know, dispose of that before I go on, or you will be inattentive. London has its mysteries, but this strange gloss on his linen! ‘Cheap laundresses always make your things blue,’ protests the lady. ‘It ought to have been blue-stained, generously frayed, and loose about the button, fretting his neck. But this gloss . . .’ You would have looked nearer, and finally you would have touched—a charnel-house surface, dank and cool! You see, Madam, the collar was a patent waterproof one. One of those you wash over night with a tooth-brush, and hang on the back of your chair to dry, and there you have it next morning rejuvenesced. It was the only collar he had in the world, it saved threepence a week at least, and that, to a South Kensington ‘science teacher in training,’ living on the guinea a week allowed by a parental but parsimonious government, is a sum to consider. It had come to Lewisham as a great discovery. He had seen it first in a shop

window full of india rubber goods, and it lay at the bottom of a glass bowl in which goldfish drifted discontentedly to and fro. And he told himself that he rather liked that gloss).

But the wearing of a bright red tie would have been unexpected—a bright red tie after the fashion of a South Western railway guard's! The rest of him by no means dandiical, even the vanity of glasses long since abandoned. You would have reflected . . . Where had you seen a crowd—red ties abundant and in some way significant? The truth has to be told. Mr. Lewisham had become a Socialist!

That red tie was indeed but one outward and visible sign of much inward and spiritual development. Lewisham, in spite of the demands of a studious career, had read his Butler's Analogy through by this time, and some other books; he had argued, had had doubts, and called upon God for 'Faith' in the silence of the night—'Faith' to be delivered immediately if Mr. Lewisham's patronage was valued, and which nevertheless was not so delivered . . . And his conception of his destiny in this world was no longer an avenue of examinations to a remote Bar and political eminence 'in the Liberal interest (D.V.)'. He had begun to realise certain aspects of our social order that Whortley did not demonstrate, begun to feel something of the dull stress deepening to absolute wretchedness and pain, which is the colour of so much human life in modern London. One vivid contrast hung in his mind symbolical. On the one hand were the coalies of the Westbourne Park yards, on strike and gaunt and hungry, children begging in the black slush, and starving loungers outside a soup kitchen; and on the other, Westbourne Grove, two streets further, a blazing array of crowded shops, a stirring traffic of cabs and carriages, and such a spate of spending that a tired student in leaky boots and graceless clothes hurrying home was continually impeded in the whirl of skirts and parcels and sweetly pretty womanliness. No doubt the tired student's own inglorious sensations pointed the moral. But that was only one of a perpetually recurring series of vivid approximations.

Lewisham had a strong persuasion, all instinct it may be, that human beings should not be happy while others near them were wretched, and this gay glitter of prosperity had touched him with a sense of crime. He still

believed people were responsible for their own lives; in those days he had still to gauge the possibilities of moral stupidity in himself and his fellow-men. He happened upon *Progress and Poverty* just then, and some casual numbers of the *Commonweal*, and it was only too easy to accept the theory of cunning plotting capitalists and landowners, and faultless, righteous, martyr workers. He became a Socialist forthwith. The necessity to do something at once to manifest the new faith that was in him was naturally urgent. So he went out and (historical moment) bought that red tie!

‘Blood colour, please,’ said Lewisham meekly to the young lady at the counter.

‘*What* colour?’ said the young lady at the counter, sharply.

‘A bright scarlet, please,’ said Lewisham, blushing. And he spent the best part of the evening and much of his temper in finding out how to tie this into a neat bow. It was a plunge into novel handicraft—for previously he had been accustomed to made-up ties.

So it was that Lewisham proclaimed the Social Revolution. The first time that symbol went abroad a string of stalwart policemen were walking in single file along the Brompton Road. In the opposite direction marched Lewisham. He began to hum. He passed the policemen with a significant eye and humming the *Marseillaise*.

But that was months ago, and by this time the red tie was a thing of use and wont.

He turned out of the Exhibition Road through a gateway of wrought iron, and entered the hall of the Normal School. The hall was crowded with students carrying books, bags, and boxes of instruments, students standing and chattering, students reading the framed and glazed notices of the Debating Society, students buying note-books, pencils, rubber, or drawing pins from the privileged stationer. There was a strong representation of new hands, the paying students, youths and young men in black coats and silk hats or tweed suits, the scholar contingent, youngsters of Lewisham’s class, raw, shabby, discordant, grotesquely ill-dressed and awe-stricken; one Lewisham noticed with a sailor’s peaked cap gold-decorated, and one with mittens and very genteel grey kid gloves; and Grummett the perennial Official of the Books was busy among them.

‘Der Zozialist!’ said a wit.

Lewisham pretended not to hear and blushed vividly.

He often wished he did not blush quite so much, seeing he was a man of one and twenty. He looked studiously away from the Debating Society notice-board, whereon ‘G. L. Lewisham on Socialism’ was announced for the next Friday, and struggled through the hall to where the Book awaited his signature. Presently he was hailed by name, and then again. He could not get to the Book for a minute or so, because of the hand-shaking and clumsy friendly jests of his fellow-‘men’.

He was pointed out to a raw hand, by the raw hand’s experienced fellow-townsmen, as ‘that beast Lewisham—awful swat’. He was second last year on the year’s work. Frightful mugger. But all these swats have a touch of the beastly prig. Exams—Debating Society—more Exams. Don’t seem to have ever heard of being alive. Never goes near a Music Hall from one year’s end to the other.’

Lewisham heard a shrill whistle, made a run for the lift and caught it just on the point of departure. The lift was unlit and full of black shadows; only the sapper who conducted it was distinct. As Lewisham peered doubtfully at the dim faces near him, a girl’s voice addressed him by name.

‘Is that you, Miss Heydinger?’ He answered. ‘I didn’t see. I hope you have had a pleasant vacation.’

LADY IN THE LAB

Anne Veronica

Biology

January found Ann Veronica a student in the biological laboratory of the Central Imperial College that towers up from among the back streets in the angle between Euston Road and Great Portland Street. She was working very steadily at the Advanced Course in Comparative Anatomy, wonderfully relieved to have her mind engaged upon one methodically developing theme in the place of the discursive uncertainties of the previous two months, and doing her utmost to keep right in the back of her mind and out of sight the facts, firstly, that she had achieved this haven of satisfactory activity by incurring a debt to Ramage of forty pounds, and, secondly, that her present position was necessarily temporary and her outlook quite uncertain.

The biological laboratory had an atmosphere that was all its own. It was at the top of the building, and looked clear over a clustering mass of inferior buildings towards Regent's Park. It was long and narrow, a well-lit, well-ventilated, quiet gallery of small tables and sinks, pervaded by a thin smell of methylated spirit and of a mitigated and sterilised organic decay. Along the inner side was a wonderfully arranged series of displayed specimens that Russell himself had prepared. The supreme effect for Ann Veronica was its surpassing relevance; it made every other atmosphere she knew seem discursive and confused. The whole place and everything in it aimed at one thing—to illustrate, to elaborate, to criticise and illuminate, and make ever plainer and plainer the significance of animal and vegetable structure. It dealt from floor to ceiling and end to end with the Theory of the Forms of Life; the very duster by the blackboard was there to do its share in that work, the very washers in the taps; the room was more simply concentrated in aim

even than a church. To that, perhaps, a large part of its satisfyingness was due. Contrasted with the confused movements and presences of a Fabian meeting, or the inexplicable enthusiasm behind the suffrage demand, with the speeches that were partly egotistical displays, partly artful manoeuvre, and partly incoherent cries for unsoundly formulated ends, compared with the comings and goings of audiences and supporters that were like the eddy-driven drift of paper in the street, this long, quiet, methodical chamber shone like a star seen through clouds.

Day after day for a measured hour in the lecture theatre, with elaborate power and patience, Russell pieced together difficulty and suggestion, instance and counter-instance, in the elaborate construction of the family tree of life. And then the students went into the long laboratory and followed out these facts in almost living tissue with microscope and scalpel, probe and microtome, and the utmost of their skill and care, making now and then a raid into the compact museum of illustration next door, in which specimens and models and directions stood in disciplined ranks under the direction of the demonstrator Capes. There was a couple of blackboards at each end of the aisle of tables, and at these Capes, with quick and nervous speech that contrasted vividly with Russell's slow, definitive articulation, directed the dissection and made illuminating comments on the structures under examination. Then he would come along the laboratory, sitting down by each student in turn, checking the work and discussing its difficulties, and answering questions arising out of Russell's lecture.

Ann Veronica had come to the Imperial College obsessed by the great figure of Russell, by the part he had played in the Darwinian controversies and by the resolute effect of the grim-lipped, yellow, leonine face beneath the mane of silvery hair. Capes was rather a discovery. Capes was something superadded. Russell burned like a beacon, but Capes illuminated by darting flashes and threw light, even if it was but momentary light, into a hundred corners that Russell left steadfastly in the shade.

Capes was an exceptionally fair man of two or three-and-thirty, so ruddily blond that it was a mercy he had escaped light eyelashes, and with a minor but by no means contemptible reputation of his own. He talked at the

blackboard in a pleasant, very slightly lisping voice with a curious spontaneity, and was sometimes very clumsy in his exposition, and sometime very vivid. He dissected rather awkwardly and hurriedly, but, on the whole, effectively, and drew with an impatient directness that made up in significance what it lacked in precision. Across the blackboard the coloured chalks flew like flights of variously-tinted rockets as diagram after diagram flickered into being.

There happened that year to be an unusual proportion of girls and women in the advanced laboratory, perhaps because the class as a whole was an exceptionally small one. It numbered nine, and four of these were women students. As a consequence of its small size, it was possible to get along with the work on a much easier and more colloquial footing than a larger class would have permitted. And a custom had grown up of a general tea at four o'clock, under the auspices of a Miss Garvice, a tall and graceful girl of distinguished intellectual incompetence, in whom the hostess instinct seemed to be abnormally developed.

Capes would come to these teas; he evidently liked to come, and he would appear in the doorway of the preparation-room, a pleasing note of shyness in his manner, hovering for an invitation.

From the first, Ann Veronica found him an exceptionally interesting man. To begin with, he struck her as being the most variable person she had ever encountered. At times he was brilliant and masterful, talked round and over every one, and would have been domineering if he had not been extraordinarily kindly; at times he was almost monosyllabic, and defeated Miss Garvice's most skillful attempts to draw him out. Sometimes he was obviously irritable and uncomfortable and unfortunate in his efforts to seem at ease. And sometimes he overflowed with a peculiarly malignant wit that played, with devastating effect, upon any topics that had the courage to face it. Ann Veronica's experiences of men had been among more stable types—Teddy, who was always absurd; her father, who was always authoritative and sentimental; Manning, who was always Manning. And most of the others she had met had, she felt, the same steadfastness. Goopes, she was sure, was always high-browed and slow and Socratic. And Ramage too—about Ramage there would always be that air of avidity, that

air of knowledge and inquiry, the mixture of things in his talk that were rather good with things that were rather poor. But one could not count with any confidence upon Capes.

The five men students were a mixed company. There was a very white-faced youngster of eighteen who brushed back his hair exactly in Russell's manner, and was disposed to be uncomfortably silent when he was near her, and to whom she felt it was only Christian kindness to be consistently pleasant; and a lax young man of five-and-twenty in navy blue, who mingled Marx and Bebel with the more orthodox gods of the biological pantheon. There was a short, red-faced, resolute youth, who inherited an authoritative attitude upon bacteriology from his father; a Japanese student of unassuming manners who drew beautifully and had an imperfect knowledge of English; and a dark, unwashed Scotchman with complicated spectacles, who would come every morning as a sort of volunteer supplementary demonstrator, look very closely at her work and her, tell her that her dissections were 'fairish', or 'very fairish indeed', or 'high above the normal female standard', hover as if for some outbreak of passionate gratitude, and with admiring retrospects that made the faceted spectacles gleam like diamonds, return to his own place.

The women, Ann Veronica thought, were not quite so interesting as the men. There were two school mistresses, one of whom—Miss Klegg—might have been a first cousin to Miss Miniver, she had so many Miniver traits; there was a preoccupied girl whose name Ann Veronica never learned, but who worked remarkably well; and Miss Garvice, who began by attracting her very greatly—she moved so beautifully—and ended by giving her the impression that moving beautifully was the beginning and end of her being.

The next few weeks were a time of the very liveliest thought and growth for Ann Veronica. The crowding impressions of the previous weeks seemed to run together directly her mind left the chaotic search for employment and came into touch again with a coherent and systematic development of ideas. The advanced work at the Central Imperial College was in the closest touch with living interests and current controversies; it drew its illustrations and material from Russell's two great researches—upon the relation of the brachiopods to the echinodermata, and upon the secondary and tertiary

mammalian and pseudo-mammalian factors in the free larval forms of various marine organisms. Moreover, a vigorous fire of mutual criticism was going on now between the Imperial College and the Cambridge Mendelians and echoed in—the lectures. From beginning to end it was first-hand stuff.

But the influence of the science radiated far beyond its own special field—beyond those beautiful but highly technical problems with which we do not propose for a moment to trouble the naturally terrified reader. Biology is an extraordinarily digestive science. It throws out a number of broad experimental generalisations, and then sets out to bring into harmony or relation with these an infinitely multifarious collection of phenomena. The little streaks upon the germinating area of an egg, the nervous movements of an impatient horse, the trick of a calculating boy, the senses of a fish, the fungus at the root of a garden flower, and the slime upon a sea-wet rock—ten thousand such things bear their witness and are illuminated. And not only did these tentacular generalisations gather all the facts of natural history and comparative anatomy together, but they seemed always stretching out further and further into a world of interests that lay altogether outside their legitimate bounds

It came to Ann Veronica one night after a long talk with Miss Miniver, as a sudden remarkable thing, as a grotesque, novel aspect, that this slowly elaborating biological scheme had something more than an academic interest for herself. And not only so, but that it was, after all, a more systematic and particular method of examining just the same questions that underlay the discussions of the Fabian Society, the talk of the West Central Arts Club, the chatter of the . . .

STUDENT'S DILEMMA

The Complete Short Stories

Slip Under The Microscope

Outside the laboratory windows was a watery-grey fog, and within a close warmth and the yellow light of the greenshaded gas lamps that stood two to each table down its narrow length. On each table stood a couple of glass jars containing the mangled vestiges of the crayfish, mussels, frogs, and guineapigs upon which the students had been working, and down the side of the room, facing the windows, were shelves bearing bleached dissections in spirits, surmounted by a row of beautifully executed anatomical drawings in whitewood frames and overhanging a row of cubical lockers. All the doors of the laboratory were panelled with black board, and on these were the half erased diagrams of the previous day's work. The laboratory was empty, save for the demonstrator, who sat near the preparation-room door, and silent, save for a low, continuous murmur, and the clicking of the rocker microtome at which he was working. But scattered about the room were traces of numerous students: hand-bags, polished boxes of instruments, in one place a large drawing covered by newspapers, and in another a prettily bound copy of *News from Nowhere*, a book oddly at variance with its surroundings. These things had been put down hastily as the students had arrived and hurried at once to secure their seats in the adjacent lecture theatre. Deadened by the closed door, the measured accents of the professor sounded as a featureless muttering.

Presently, faint through the closed windows came the sound of the Oratory clock striking the hour of eleven. The clicking of the microtome ceased, and the demonstrator looked at his watch, rose, thrust his hands into his pockets, and walked slowly down the laboratory towards the lecture

theatre door. He stood listening for a moment, and then his eye fell on the little volume by William Morris. He picked it up, glanced at the title, smiled, opened it, looked at the name on the fly-leaf, ran the leaves through with his hand, and put it down. Almost immediately the even murmur of the lecturer ceased, there was a sudden burst of pencils rattling on the desks in the lecture theatre, a stirring, a scraping of feet, and a number of voices speaking together. Then a firm footfall approached the door, which began to open, and stood ajar as some indistinctly heard question arrested the newcomer.

The demonstrator turned, walked slowly back past the microtome, and left the laboratory by the preparation-room door. As he did so, first one, and then several students carrying notebooks entered the laboratory from the lecture theatre, and distributed themselves among the little tables, or stood in a group about the doorway. They were an exceptionally heterogeneous assembly, for while Oxford and Cambridge still recoil from the blushing prospect of mixed classes, the College of Science anticipated America in the matter years ago—mixed socially too, for the prestige of the College is high, and its scholarships, free of any age limit, dredge deeper even than do those of the Scotch universities. The class numbered one-and-twenty, but some remained in the theatre questioning the professor, copying the blackboard diagrams before they were washed off, or examining the special specimens he had produced to illustrate the day's teaching. Of the nine who had come into the laboratory three were girls, one of whom, a little fair woman wearing spectacles and dressed in greyish-green, was peering out of the window at the fog, while the other two, both wholesome-looking, plain-faced schoolgirls, unrolled and put on the brown holland aprons they wore while dissecting. Of the men, two went down the laboratory to their places, one a pallid, dark-bearded man, who had once been a tailor; the other a pleasant-featured, ruddy young man of twenty, dressed in a well-fitting brown suit, young Wedderburn, the son of Wedderburn the eye specialist. The others formed a little knot near the theatre door. One of these, a dwarfed, spectacled figure with a hunch back, sat on a bent wood stool; two others, one a short, dark youngster and the other a flaxen-haired, reddish-complexioned young man, stood leaning side by side against the slate sink, while the fourth stood

facing them, and maintained the larger share of the conversation.

The last person was named Hill. He was a sturdily built young fellow, of the same age as Wedderburn; he had a white face, dark grey eyes, hair of an indeterminate colour, and prominent, irregular features. He talked rather louder than was needful, and thrust his hands deeply into his pockets. His collar was frayed and blue with the starch of a careless laundress, his clothes were evidently readymade, and there was a patch on the side of his boot near the toe. And as he talked or listened to the others, he glanced now and again towards the lecture theatre door. They were discussing the depressing peroration of the lecture they had just heard, the last lecture it was in the introductory course in zoology. 'From ovum to ovum is the goal of the higher vertebrata,' the lecturer had said in his melancholy tones, and so had neatly rounded off the sketch of comparative anatomy he had been developing. The spectacled hunchback had repeated it with noisy appreciation, had tossed it towards the fair-haired student with an evident provocation, and had started one of those vague, rambling discussions on generalities so unaccountably dear to the student mind all the world over.

'That is our goal, perhaps—I admit it, as far as science goes,' said the fair-haired student, rising to the challenge. 'But there are things above science.'

'Science,' said Hill confidently, 'is systematic knowledge. Ideas that don't come into the system—must anyhow—be loose ideas.' He was not quite sure whether that was a clever saying or a fatuity until his hearers took it seriously.

'The thing I cannot understand,' said the hunchback, at large, 'is whether Hill is a materialist or not.'

'There is one thing above matter,' said Hill promptly, feeling he made a better point this time, aware, too, of someone in the doorway behind him, and raising his voice a trifle for her benefit, 'and that is, the delusion that there is something above matter.'

'So we have your gospel at last,' said the fair student. 'It's all a delusion, is it? All our aspirations to lead something more than dogs' lives, all our work for anything beyond ourselves. But see how inconsistent you are. Your socialism, for instance. Why do you trouble about the interests of the race?'

Why do you concern yourself about the beggar in the gutter? Why are you bothering yourself to lend that book’—he indicated William Morris by a movement of the head—‘to everyone in the lab?’

‘Girl,’ said the hunchback indistinctly, and glanced guiltily over his shoulder.

The girl in brown, with the brown eyes, had come into the laboratory, and stood on the other side of the table behind him, with her rolled-up apron in one hand, looking over her shoulder, listening to the discussion. She did not notice the hunchback, because she was glancing from Hill to his interlocutor. Hill’s consciousness of her presence betrayed itself to her only in his studious ignoring of the fact; but she understood that, and it pleased her. ‘I see no reason,’ said he, ‘why a man should live like a brute because he knows of nothing beyond matter, and does not expect to exist a hundred years hence.’

‘Why shouldn’t he?’ said the fair-haired student.

‘Why should he?’ said Hill.

‘What inducement has he?’

‘That’s the way with all you religious people. It’s all a business of inducements. Cannot a man seek after righteousness for righteousness’ sake?’

There was a pause. The fair man answered, with a kind of vocal padding, ‘But—you see—inducement—when I said inducement,’ to gain time. And then the hunchback came to his rescue and inserted a question. He was a terrible person in the debating society with his questions, and they invariably took one form—a demand for a definition. ‘What’s your definition of righteousness?’ said the hunchback at this stage.

Hill experienced a sudden loss of complacency at this question, but even as it was asked, relief came in the person of Brooks, the laboratory attendant, who entered by the preparation-room door, carrying a number of freshly killed guineapigs by their hind legs. ‘This is the last batch of material this session,’ said the youngster who had not previously spoken. Brooks advanced up the laboratory, smacking down a couple of guineapigs at each table. The rest of the class, scenting the prey from afar, came crowding in by the lecture theatre door, and the discussion perished abruptly as the

students who were not already in their places hurried to them to secure the choice of a specimen. There was a noise of keys rattling on split rings as lockers were opened and dissecting instruments taken out. Hill was already standing by his table, and his box of scalpels was sticking out of his pocket. The girl in brown came a step towards him, and leaning over his table said softly, 'Did you see that I returned your book, Mr. Hill?'

During the whole scene she and the book had been vividly present in his consciousness; but he made a clumsy pretence of looking at the book and seeing it for the first time. 'Oh yes,' he said, taking it up. 'I see. Did you like it?'

'I want to ask you some questions about it—some time.'

'Certainly,' said Hill. 'I shall be glad.' He stopped awkwardly, 'You liked it?' he said.

'It's a wonderful book. Only some things I don't understand.'

Then suddenly the laboratory was hushed by a curious braying noise. It was the demonstrator. He was at the blackboard ready to begin the day's instruction, and it was his custom to demand silence by a sound midway between the 'Er' of common intercourse and the blast of a trumpet. The girl in brown slipped back to her place: it was immediately in front of Hill's, and Hill, forgetting her forthwith, took a notebook out of the drawer of his table, turned over its leaves hastily, drew a stumpy pencil from his pocket, and prepared to make a copious note of the coming demonstration. For demonstrations and lectures are the sacred text of the College students. Books, saving only the Professor's own, you may—it is even expedient to—ignore.

Hill was the son of a Landport cobbler, and had been hooked by a chance blue paper the authorities had thrown out to the Landport Technical College. He kept himself in London on his allowance of a guinea a week, and found that, with proper care, this also covered his clothing allowance, an occasional waterproof collar, that is; and ink and needles and cotton and suchlike necessaries for a man about town. This was his first year and his first session, but the brown old man in Landport had already got himself detested in many public-houses by boasting of his son, 'the Professor'. Hill was a vigorous youngster, with a serene contempt for the clergy of all

denominations, and a fine ambition to reconstruct the world. He regarded his scholarship as a brilliant opportunity. He had begun to read at seven, and had read steadily whatever came in his way, good or bad, since then. His worldly experience had been limited to the island of Portsea, and acquired chiefly in the wholesale boot factory in which he had worked by day, after passing the seventh standard of the Board school. He had a considerable gift of speech, as the College Debating Society, which met amidst the crushing machines and mine models in the metallurgical theatre downstairs, already recognised—recognised by a violent battering of desks whenever he rose. And he was just at that fine emotional age when life opens at the end of a narrow pass like a broad valley at one's feet, full of the promise of wonderful discoveries and tremendous achievements. And his own limitations, save that he knew that he knew neither Latin nor French, were all unknown to him.

At first his interest had been divided pretty equally between his biological work at the College and social and theological theorising, an employment which he took in deadly earnest. Of a night, when the big museum library was not open, he would sit on the bed of his room in Chelsea with his coat and a muffler on, and write out the lecture notes and revise his dissection memoranda until Thorpe called him out by a whistle—the landlady objected to open the door to attic visitors—and then the two would go prowling about the shadowy, shiny, gas-lit streets, talking, very much in the fashion of the sample just given, of the God Idea and Righteousness and Carlyle and the Reorganisation of Society. And in the midst of it all, Hill, arguing not only for Thorpe but for the casual passer-by, would lose the thread of his argument glancing at some pretty painted face that looked meaningfully at him as he passed. Science and Righteousness! But once or twice lately there had been signs that a third interest was creeping into his life, and he had found his attention wandering from the fate of the mesoblastic somites or the probable meaning of the blastopore, to the thought of the girl with the brown eyes who sat at the table before him.

She was a paying student; she descended inconceivable social altitudes to speak to him. At the thought of the education she must have had, and the accomplishments she must possess, the soul of Hill became abject within

him. She had spoken to him first over a difficulty about the alisphenoid of a rabbit's skull, and he had found that, in biology at least, he had no reason for self-abasement. And from that, after the manner of young people starting from any starting-point, they got to generalities, and while Hill attacked her upon the question of socialism, some instinct told him to spare her a direct assault upon her religion—she was gathering resolution to undertake what she told herself was his aesthetic education. She was a year or two older than he, though the thought never occurred to him. The loan of *News from Nowhere* was the beginning of a series of cross loans. Upon some absurd first principle of his, Hill had never 'wasted time' upon poetry, and it seemed an appalling deficiency to her. One day in the lunch hour, when she chanced upon him alone in the little museum where the skeletons were arranged, shamefully eating the bun that constituted his mid-day meal, she retreated, and returned to lend him, with a slightly furtive air, a volume of Browning. He stood sideways towards her and took the book rather clumsily, because he was holding the bun in the other hand. And in the retrospect his voice lacked the cheerful clearness he could have wished.

That occurred after the examination in comparative anatomy, on the day before the College turned out its students and was carefully locked up by the officials for the Christmas holidays. The excitement of cramming for the first trial of strength had for a little while dominated Hill to the exclusion of his other interests. In the forecasts of the result in which every one indulged he was surprised to find that no one regarded him as a possible competitor for the Harvey Commemoration Medal, of which this and the two subsequent examinations disposed. It was about this time that Wedderburn, who so far had lived inconspicuously on the uttermost margin of Hill's perceptions, began to take on the appearance of an obstacle. By a mutual agreement, the nocturnal prowlings with Thorpe ceased for the three weeks before the examination, and his landlady pointed out that she really could not supply so much lamp oil at the price. He walked to and fro from the College with little slips of mnemonics in his hand, lists of crayfish appendages, rabbits' skull-bones, and vertebrate nerves, for example, and became a positive nuisance to foot passengers in the opposite direction.

But, by a natural reaction, poetry and the girl with the brown eyes ruled

the Christmas holiday. The pending results of the examination became such a secondary consideration that Hill marvelled at his father's excitement. Even had he wished it, there was no comparative anatomy to read in Landport, and he was too poor to buy books, but the stock of poets in the library was extensive, and Hill's attack was magnificently sustained. He saturated himself with the fluent numbers of Longfellow and Tennyson, and fortified himself with Shakespeare; found a kindred soul in Pope and a master in Shelley, and heard and fled the siren voices of Eliza Cook and Mrs. Hemans. But he read no more Browning, because he hoped for the loan of other volumes from Miss Haysman when he returned to London.

He walked from his lodgings to the College with that volume of Browning in his shiny black bag, and his mind teeming with the finest general propositions about poetry. Indeed, he framed first this little speech and then that with which to grace the return. The morning was an exceptionally pleasant one for London; there was a clear hard frost and undeniable blue in the sky, a thin haze softened every outline, and warm shafts of sunlight struck between the house blocks and turned the sunny side of the street to amber and gold. In the hall of the College he pulled off his glove and signed his name with fingers so stiff with cold that the characteristic dash under the signature he cultivated became a quivering line. He imagined Miss Haysman about him everywhere. He turned at the staircase, and there, below, he saw a crowd struggling at the foot of the notice-board. This, possibly, was the biology list. He forgot Browning and Miss Haysman for the moment, and joined the scrimmage. And at last, with his cheek flattened against the sleeve of the man on the step above him, he read the list—

CLASS I

H. J. Somers Wedderburn
William Hill

and thereafter followed a second class that is outside our present sympathies. It was characteristic that he did not trouble to look for Thorpe

on the physics list, but backed out of the struggle at once, and in a curious emotional state between pride over common second-class humanity and acute disappointment at Wedderburn's success, went on his way upstairs. At the top, as he was hanging up his coat in the passage, the zoological demonstrator, a young man from Oxford, who secretly regarded him as a blatant 'mugger' of the very worst type, offered his heartiest congratulations.

At the laboratory door Hill stopped for a second to get his breath, and then entered. He looked straight up the laboratory and saw all five girl students grouped in their places, and Wedderburn, the once retiring Wedderburn, leaning rather gracefully against the window, playing with the blind tassel and talking apparently to the five of them. Now, Hill could talk bravely enough and even overbearingly to one girl, but this business of standing at ease and appreciating, fencing, and returning quick remarks round a group was, he knew, altogether beyond him. Coming up the staircase his feelings for Wedderburn had been generous, a certain admiration perhaps, a willingness to shake his hand conspicuously and heartily as one who had fought but the first round. But before Christmas Wedderburn had never gone up to that end of the room to talk. In a flash Hill's mist of vague excitement condensed abruptly to a vivid dislike of Wedderburn. Possibly his expression changed. As he came up to his place, Wedderburn nodded carelessly to him, and the others glanced round. Miss Haysman looked at him and away again, the faintest touch of her eyes. 'I can't agree with you, Mr. Wedderburn,' she said.

'I must congratulate you on your first class, Mr. Hill,' said the spectacled girl in green, turning round and beaming at him.

'It's nothing,' said Hill, staring at Wedderburn and Miss Haysman talking together, and eager to hear what they talked about.

'We poor folks in the second class don't think so,' said the girl in spectacles.

What was it Wedderburn was saying? Something about William Morris? Hill did not answer the girl in spectacles, and the smile died out of his face. He could not hear, and failed to see how he could 'cut in.' Confound Wedderburn! He sat down, opened his bag, hesitated whether to return the volume of Browning forthwith, in the sight of all, and instead drew out his

new notebooks for the short course in elementary botany that was now beginning, and which would terminate in February. As he did so, a fat heavy man with a white face and pale grey eyes—Bindon, the professor of botany, who came up from Kew for January and February—came in by the lecture theatre door, and passed, rubbing his hands together and smiling, in silent affability down the laboratory.

In the subsequent six weeks Hill experienced some very rapid and curiously complex emotional developments. For the most part he had Wedderburn in focus—a fact that Miss Haysman never suspected. She told Hill (for in the comparative privacy of the museum she talked a good deal to him of socialism and Browning and general propositions) that she had met Wedderburn at the house of some people she knew, and ‘he’s inherited his cleverness; for his father, you know, is the great eye specialist.’

‘My father is a cobbler,’ said Hill, quite irrelevantly, and perceived the want of dignity even as he said it. But the gleam of jealousy did not offend her. She conceived herself the fundamental source of it. He suffered bitterly from a sense of Wedderburn’s unfairness, and a realisation of his own handicap. Here was this Wedderburn had picked up a prominent man for a father, and instead of his losing so many marks on the score of that advantage, it was counted to him for righteousness! And while Hill had to introduce himself and talk to Miss Haysman clumsily over mangled guineapigs in the laboratory, this Wedderburn, in some backstairs way, had access to her social altitudes, and could converse in a polished argot that Hill understood perhaps, but felt incapable of speaking. Not, of course, that he wanted to. Then it seemed to Hill that for Wedderburn to come there day after day with cuffs unfrayed, neatly tailored, precisely barbered, quietly perfect, was in itself an ill-bred, sneering sort of proceeding. Moreover, it was a stealthy thing for Wedderburn to behave insignificantly for a space, to mock modesty, to lead Hill to fancy that he himself was beyond dispute the man of the year, and then suddenly to dart in front of him, and incontinently to swell up in this fashion. In addition to these things, Wedderburn displayed an increasing disposition to join in any conversational grouping that included Miss Haysman; and would venture, and indeed seek occasion, to pass opinions derogatory to socialism and

atheism. He goaded Hill to incivilities by neat, shallow, and exceedingly effective personalities about the socialist leaders, until Hill hated Bernard Shaw's graceful egotisms, William Morris's limited editions and luxurious wall-papers, and Walter Crane's charmingly absurd ideal working men, about as much as he hated Wedderburn. The dissertations in the laboratory, that had been his glory in the previous term, became a danger, degenerated into inglorious tussles with Wedderburn, and Hill kept to them only out of an obscure perception that his honour was involved. In the debating society Hill knew quite clearly that, to a thunderous accompaniment of banged desks, he could have pulverised Wedderburn. Only Wedderburn never attended the debating society to be pulverised, because—nauseous affectation!—he dined late.

You must not imagine that these things presented themselves in quite such a crude form to Hill's perception. Hill was a born generaliser. Wedderburn to him was not so much an individual obstacle as a type, the salient angle of a class. The economic theories that, after infinite ferment, had shaped themselves in Hill's mind, became abruptly concrete at the contact. The world became full of easy mannered, graceful, gracefully-dressed, conversationally dexterous, finally shallow Wedderburn's, Bishops Wedderburn, Wedderburn M.P.'s, Professors Wedderburn, Wedderburn landlords, all with finger-bowl shibboleths and epigrammatic cities of refuge from a sturdy debater. And everyone ill-clothed or ill-dressed, from the cobbler to the cab-runner, was, to Hill's imagination, a man and a brother, a fellow-sufferer. So that he became, as it were, a champion of the fallen and oppressed, albeit to outward seeming only a self-assertive, ill-mannered young man, and an unsuccessful champion at that. Again and again a skirmish over the afternoon tea that the girl students had inaugurated left Hill with flushed cheeks and a tattered temper, and the debating society noticed a new quality of sarcastic bitterness in his speeches.

You will understand now how it was necessary, if only in the interests of humanity, that Hill should demolish Wedderburn in the forthcoming examination and outshine him in the eyes of Miss Haysman; and you will perceive, too, how Miss Haysman fell into some common feminine misconceptions. The Hill-Wedderburn quarrel, for in his unostentatious

way Wedderburn reciprocated Hill's illveiled rivalry, became a tribute to her indefinable charm; she was the Queen of Beauty in a tournament of scalpels and stumpy pencils. To her confidential friend's secret annoyance, it even troubled her conscience, for she was a good girl, and painfully aware, through Ruskin and contemporary fiction, how entirely men's activities are determined by women's attitudes. And if Hill never by any chance mentioned the topic of love to her, she only credited him with the finer modesty for that omission.

So the time came on for the second examination, and Hill's increasing pallor confirmed the general rumour that he was working hard. In the aerated bread shop near South Kensington Station you would see him, breaking his bun and sipping his milk with his eyes intent upon a paper of closely written notes. In his bedroom there were propositions about buds and stems round his looking-glass, a diagram to catch his eye, if soap should chance to spare it, above his washing basin. He missed several meetings of the debating society, but he found the chance encounters, with Miss Haysman in the spacious ways of the adjacent art museum, or in the little museum at the top of the College, or in the College corridors, more frequent and very restful. In particular, they used to meet in a little gallery full of wrought-iron chests and gates near the art library, and there Hill used to talk, under the gentle stimulus of her flattering attention, of Browning and his personal ambitions. A characteristic she found remarkable in him was his freedom from avarice. He contemplated quite calmly the prospect of living all his life on an income below a hundred pounds a year. But he was determined to be famous, to make, recognisably in his own proper person, the world a better place to live in. He took Bradlaugh and John Burns for his leaders and models, poor, even impecunious, great men. But Miss Haysman thought that such lives were deficient on the aesthetic side, by which, though she did not know it, she meant good wall-paper and upholstery, pretty books, tasteful clothes, concerts, and meals nicely cooked and respectfully served.

At last came the day of the second examination, and the professor of botany, a fussy, conscientious man, rearranged all the tables in a long narrow laboratory to prevent copying, and put his demonstrator on a chair

on a table (where he felt, he said, like a Hindu god), to see all the cheating, and stuck a notice outside the door, 'Door closed', for no earthly reason that any human being could discover. And all the morning from ten till one the quill of Wedderburn shrieked defiance at Hill's, and the quills of the others chased their leaders in a tireless pack, and so also it was in the afternoon. Wedderburn was a little quieter than usual, and Hill's face was hot all day, and his overcoat bulged with textbooks and notebooks against the last moment's revision. And the next day, in the morning and in the afternoon, was the practical examination, when sections had to be cut and slides identified. In the morning Hill was depressed because he knew he had cut a thick section, and in the afternoon came the mysterious slip.

It was just the kind of thing that the botanical professor was always doing. Like the income tax, it offered a premium to the cheat. It was a preparation under the microscope, a little glass slip, held in its place on the stage of the instrument by light steel clips, and the inscription set forth that the slip was not to be moved. Each student was to go in turn to it, sketch it, write in his book of answers what he considered it to be, and return to his place. Now, to move such a slip is a thing one can do by a chance movement of the finger, and in a fraction of a second. The professor's reason for decreeing that the slip should not be moved depended on the fact that the object he wanted identified was characteristic of a certain tree stem. In the position in which it was placed it was a difficult thing to recognise, but once the slip was moved so as to bring other parts of the preparation into view, its nature was obvious enough.

Hill came to this, flushed from a contest with staining reagents, sat down on the little stool before the microscope, turned the mirror to get the best light, and then, out of sheer habit, shifted the slip. At once he remembered the prohibition, and, with an almost continuous motion of his hands, moved it back, and sat paralysed with astonishment at his action.

Then, slowly, he turned his head. The professor was out of the room; the demonstrator sat aloft on his impromptu rostrum, reading the *Q. Jour. Mi. Sa.*; the rest of the examinees were busy, and with their backs to him. Should he own up to the accident now? He knew quite clearly what the thing was. It was a lenticel, a characteristic preparation from the elder-tree. His eyes

roved over his intent fellow-students and Wedderburn suddenly glanced over his shoulder at him with a queer expression in his eyes. The mental excitement that had kept Hill at an abnormal pitch of vigour these two days gave way to a curious nervous tension. His book of answers was beside him. He did not write down what the thing was, but with one eye at the microscope he began making a hasty sketch of it. His mind was full of this grotesque puzzle in ethics that had suddenly been sprung upon him. Should he identify it? or should he leave this question unanswered? In that case Wedderburn would probably come out first in the second result. How could he tell now whether he might not have identified the thing without shifting it? It was possible that Wedderburn had failed to recognise it, of course. Suppose Wedderburn too had shifted the slide? He looked up at the clock. There were fifteen minutes in which to make up his mind. He gathered up his book of answers and the coloured pencils he used in illustrating his replies and walked back to his seat.

He read through his manuscript, and then sat thinking and gnawing his knuckle. It would look queer now if he owned up. He must beat Wedderburn. He forgot the examples of those starchy gentlemen, John Bums and Bradlaugh. Besides, he reflected, the glimpse of the rest of the slip he had had was after all quite accidental, forced upon him by chance, a kind of providential revelation rather than an unfair advantage. It was not nearly so dishonest to avail himself of that as it was of Broome, who believed in the efficacy of prayer, to pray daily for a first-class. 'Five minutes more,' said the demonstrator, folding up his paper and becoming observant. Hill watched the clock hands until two minutes remained; then he opened the book of answers, and, with hot ears and an affectation of ease, gave his drawing of the lenticel its name.

When the second pass list appeared, the previous positions of Wedderburn and Hill were reversed, and the spectacled girl in green, who knew the demonstrator in private life (where he was practically human), said that in the result of the two examinations taken together Hill had the advantage of a mark—167 to 166 out of a possible 200. Everyone admired Hill in a way, though the suspicion of 'mugging' clung to him. But Hill was to find congratulations and Miss Haysman's enhanced opinion of him,

and even the decided decline in the crest of Wedderburn, tainted by an unhappy memory. He felt a remarkable access of energy at first, and the note of a democracy marching to triumph returned to his debating society speeches; he worked at his comparative anatomy with tremendous zeal and effect, and he went on with his aesthetic education. But through it all, a vivid little picture was continually coming before his mind's eye—of a sneakish person manipulating a slide.

No human being had witnessed the act, and he was cocksure that no higher power existed to see it; but for all that it worried him. Memories are not dead things, but alive; they dwindle in disuse, but they harden and develop in all sorts of queer ways if they are being continually fretted. Curiously enough, though at the time he perceived clearly that the shifting was accidental, as the days wore on his memory became confused about it, until at last he was not sure—although he assured himself that he *was* sure—whether the movement had been absolutely involuntary. Then it is possible that Hill's dietary was conducive to morbid conscientiousness; a breakfast frequently eaten in a hurry, a midday bun, and, at such hours after five as chanced to be convenient, such meat as his means determined, usually in a chop-house in a back street off the Brompton Road. Occasionally he treated himself to threepenny or ninepenny classics, and they usually represented a suppression of potatoes or chops. It is indisputable that outbreaks of self-abasement and emotional revival have a distinct relation to periods of scarcity. But apart from this influence on the feelings, there was in Hill a distinct aversion to falsity that the blasphemous Landport cobbler had inculcated by strap and tongue from his earliest years. Of one fact about professed atheists I am convinced; they may be—they usually are—fools, void of subtlety, revilers of holy institutions, brutal speakers, and mischievous knaves, but they lie with difficulty. If it were not so, if they had the faintest grasp of the idea of compromise, they would simply be liberal churchmen. And, moreover, this memory poisoned his regard for Miss Haysman. For she now so evidently preferred him to Wedderburn that he felt sure he cared for her, and began reciprocating her attentions by timid marks of personal regard; at one time he even bought a bunch of violets, carried it about in his pocket, and produced it with a stumbling explanation, withered

and dead, in the gallery of old iron. It poisoned, too, the denunciation of capitalist dishonesty that had been one of his life's pleasures. And, lastly, it poisoned his triumph in Wedderburn. Previously he had been Wedderburn's superior in his own eyes, and had raged simply at a want of recognition. Now he began to fret at the darker suspicion of positive inferiority. He fancied he found justifications for his position in Browning, but they vanished on analysis. At last—moved, curiously, enough, by exactly the same motive forces that had resulted in his dishonesty—he went to Professor Bindon, and made a clean breast of the whole affair. As Hill was a paid student, Professor Bindon did not ask him to sit down, and he stood before the professor's desk as he made his confession.

'It's a curious story,' said Professor Bindon, slowly realising how the thing reflected on himself, and then letting his anger rise,—'A most remarkable story. I can't understand your doing it, and I can't understand this avowal. You're a type of student—Cambridge men would never dream—I suppose I ought to have thought—Why did you cheat?'

'I didn't cheat,' said Hill.

'But you have just been telling me you did.'

'I thought I explained—'

'Either you cheated or you did not cheat—'

'I said my motion was involuntary.'

'I am not a metaphysician, I am a servant of science—of fact. You were told not to move the slip. You did move the slip. If that is not cheating—'

'If I was a cheat,' said Hill, with the note of hysterics in his voice, 'should I come here and tell you?'

'Your repentance, of course, does you credit,' said Professor Bindon, 'but it does not alter the original facts.'

'No, sir,' said Hill, giving in in utter self-abasement.

'Even now you cause an enormous amount of trouble. The examination list will have to be revised.'

'I suppose so, sir.'

'Suppose so? Of course it must be revised. And I don't see how I can conscientiously pass you.'

'Not pass me?' said Hill. 'Fail me?'

‘It’s the rule in all examinations. Or where should we be? What else did you expect? You don’t want to shirk the consequences of your own acts?’

‘I thought, perhaps—’ said Hill. And then, ‘Fail me? I thought, as I told you, you would simply deduct the marks given for that slip.’

‘Impossible!’ said Bindon. ‘Besides, it would still leave you above Wedderburn. Deduct only the marks—Preposterous! The Departmental Regulations distinctly say—’

‘But it’s my own admission, sir.’

‘The Regulations say nothing whatever of the manner in which the matter comes to light. They simply provide——’

‘It will ruin me. If I fail this examination, they won’t renew my scholarship.’

‘You should have thought of that before.’

‘But, sir, consider all my circumstances—’

‘I cannot consider anything. Professors in this College are machines. The Regulations will not even let us recommend our students for appointments. I am a machine, and you have worked me. I have to do—’

‘It’s very hard, sir.’

‘Possibly it is.’

‘If I am to be failed this examination, I might as well go home at once.’

‘That is as you think proper.’ Bindon’s voice softened a little; he perceived he had been unjust, and, provided he did not contradict himself, he was disposed to amelioration. ‘As a private person,’ he said, ‘I think this confession of yours goes far to mitigate your offense. But you have set the machinery in motion, and now it must take its course. I—I am really sorry you gave way.’

A wave of emotion prevented Hill from answering. Suddenly, very vividly, he saw the heavily-lined face of the old Landport cobbler, his father. ‘Good God! What a fool I have been!’ he said hotly and abruptly.

‘I hope,’ said Bindon, ‘that it will be a lesson to you.’

But, curiously enough, they were not thinking of quite the same indiscretion.

There was a pause.

‘I would like a day to think, sir, and then I will let you know—about

going home, I mean,' said Hill, moving towards the door.

The next day Hill's place was vacant. The spectacled girl in green was, as usual, first with the news. Wedderburn and Miss Haysman were talking of a performance of *The Meistersingers* when she came up to them.

'Have you heard?' she said.

'Heard what?'

'There was cheating in the examination.'

'Cheating!' said Wedderburn, with his face suddenly hot. How?'

'That slide—'

'Moved? Never!'

'It was. That slide that we weren't to move—'

'Nonsense!' said Wedderburn. 'Why! How could they find out? Who do they say—?'

'It was Mr. Hill.'

'**Hill!**

'Mr. Hill!'

'Not—surely not the immaculate Hill?' said Wedderburn, recovering.

'I don't believe it,' said Miss Haysman. 'How do you know?'

'**I didn't,**' said the girl in spectacles. 'But I know it now for a fact. Mr. Hill went and confessed to Professor Bindon himself.'

'By Jove!' said Wedderburn. 'Him of all people. But I am always inclined to distrust these philanthropists-on-principle'—

'Are you quite sure?' said Miss Haysman, with a catch in her breath.

'Quite. It's dreadful, isn't it? But, you know, what can you expect? His father is a cobbler.'

Then Miss Haysman astonished the girl in spectacles.

'I don't care. I will not believe it,' she said, flushing darkly under her warm-tinted skin. 'I will not believe it until he has told me so himself—face to face. I would scarcely believe it then,' and abruptly she turned her back on the girl in spectacles, and walked to her own place.

'It's true, all the same,' said the girl in spectacles, peering and smiling at Wedderburn.

But Wedderburn did not answer her. She was indeed one of those people who seem destined to make unanswered remarks.



H. G. Wells
At his desk

H. G. WELLS

Autobiography

The Good Days

The day when I walked from my lodging in Westbourne Park across Kensington Gardens to the Normal School of Science, signed on at the entrance to that burly red-brick and terra-cotta building and went up by the lift to the biological laboratory was one of the great days of my life. All my science hitherto had been second-hand or third or fourth hand; I had read about it, crammed textbooks, passed written examinations with a sense of being a long way off from the concrete facts and still further off from the living observations, thoughts, qualifications and first-hand theorising that constitute the scientific reality. Hitherto I had had only the insufficient printed statements, often very badly and carelessly written, of the textbooks, eked out by a few perplexing diagrams and woodcuts. Now by a conspiracy of happy accidents I had got right through to contact with all that I had been just hearing about. Here were microscopes, dissections, models, diagrams close to the objects they elucidated, specimens, museums, ready answers to questions, explanations, discussions. Here I was under the shadow of Huxley, the acutest observer, the ablest generaliser, the great teacher, the most lucid and valiant of controversialists. I had been assigned to his course in Elementary Biology and afterwards I was to go on with Zoology under him.

In a very carefully done short story, *A Slip under the Microscope (Yellow Book, 1893)* and in an equally careful novel, *Love and Mr. Lewisham (1900)* I have rendered something of the physical and social atmosphere of that early biological laboratory. These descriptions were written so much nearer to the actual experience than I am now, that I will not even attempt

to parody them here, and it seems hardly fair to quote them. But I must try, however unsuccessfully, to convey something of my realisation of an extraordinary mental enlargement as my mind passed from the printed sciences within book covers to these intimate real things and then radiated outward to a realisation that the synthesis of the sciences composed a vital interpretation of the world.

In those days both sides of descriptive biology, botany and zoology, were in a parallel phase; they were passing on from mere classification to morphology and phylogeny. Comparative physiology and genetics had still to come within the scope of the ordinary biological student. It was perhaps inevitable that they should wait upon the establishment and confirmation of the phylogenetic tree, the family tree of life, before they in their turn could take the centre of the stage. The phylogeny of the invertebrata was still in a state of wild generalisation, vegetable morphology concerned itself with an elaborate demonstration of the progressive subordination of the oophore to the sporophore, and even the fact of evolution as such was still not universally conceded. The mechanism of evolution remained therefore a field for almost irresponsible speculation. Weismann and his denial of the inheritance of acquired characteristics was in the ascendant. Our chief discipline was a rigorous analysis of vertebrate structure, vertebrate embryology and the succession of vertebrate forms in time. We felt our particular task was the determination of the relationship of groups by the acutest possible criticism of structure. The available fossil evidence was not a tithe of what has been unearthed to-day; the embryological material also fell far short of contemporary resources; but we had the same excitement of continual discoveries, confirming or correcting our conclusions, widening our outlook and filling up new patches of the great jig-saw puzzle, that the biological student still experiences. The study of zoology in this phase was an acute, delicate, rigorous and sweepingly magnificent series of exercises. It was a grammar of form and a criticism of fact. That year I spent in Huxley's class was, beyond all question, the most educational year of my life. It left me under that urgency for coherence and consistency, that repugnance from haphazard assumptions and arbitrary statements, which is the essential distinction of the educated from the uneducated mind.

I worked very hard indeed throughout that first year. The scene of my labours was the upper floor of the Normal School, the Royal College of Science[†] as it is called to-day, a floor long since applied to other uses. There was a long laboratory with windows giving upon the art schools, equipped with deal tables, sinks and taps and, facing the windows, shelves of preparations surmounted by diagrams and drawings of dissections. On the tables were our microscopes, reagents, dissecting dishes or dissected animals as the case might be. In our notebooks we fixed our knowledge. On the doors were blackboards where the demonstrator, G. B. Howes afterwards Professor Howes, a marvellously swift draughtsman, would draw in coloured chalks for our instruction. He was a white-faced, black bearded, nervous man, a sort of Svengali in glasses; swift and vivid, never still, in the completest contrast with the powerful deliberation of the master. Huxley himself lectured in the little lecture theatre adjacent to the laboratory, a square room, surrounded by black shelves bearing mammalian skeletons and skulls displayed to show their homologies, a series of wax models of a developing chick, and similar material. As I knew Huxley he was a yellow-faced, square-faced old man, with bright little brown eyes, lurking as it were in caves under his heavy grey eyebrows, and a mane of grey hair brushed back from his wall of forehead. He lectured in a clear firm voice without hurry and without delay, turning to the blackboard behind him to sketch some diagram, and always dusting the chalk from his fingers rather fastidiously before he resumed. He fell ill presently, and after some delay, Howes, uneasy, irritable, brilliant, took his place, lecturing and drawing breathlessly and leaving the blackboard a smother of graceful coloured lines. At the back of the auditorium were curtains, giving upon a museum devoted to the invertebrata. I was told that while Huxley lectured Charles Darwin had been wont at times to come through those very curtains from the gallery behind and sit and listen until his friend and ally had done. In my time Darwin had been dead for only a year or so (he died in 1882).

† It is now the upper floor of the Henry Cole Wing of the Victoria & Albert Museum.

These two were very great men. They thought boldly, carefully and simply, they spoke and wrote fearlessly and, plainly, they lived modestly and decently; they were mighty intellectual liberators. It is a pity that so many of the younger scientific workers of to-day, ignorant of the conditions of mental life in the early nineteenth century and standing for the most part on the ground won, cleared and prepared for them by these giants, find a perverse pleasure in belittling them. In a thousand respects their work was incomplete and tentative and any little Mr. Whippersnapper who chooses to use the vastly greater resources of to-day against them can find statements made by them that were insufficient or slightly erroneous, and theoretical suggestions that have been abandoned and disproved, and he can catch a bit of personal publicity from the pulpit or the reactionary press by saying that Darwin has been discredited or Huxley superseded. Great joy for Mr. (and Mrs.) Whippersnapper it is, naturally enough, to realise that he knows clearly things that Darwin never heard of, and is able to tatter some hypothesis of Huxley's. Little men will stand on the shoulders of giants to the end of time and small birds foul the nests in which they were hatched. Darwin and Huxley knew about one per cent—of the facts about variation and mutation that are accessible to Mr. Whippersnapper. That does not alter the fundamental magnificence of Darwin's and Huxley's achievement. They put the fact of organic evolution upon an impregnable base of proof and demonstration so that even the Roman Catholic controversialists at last ceased to vociferate, after the fashion of Bishop Wilberforce of the Anglican Church on a memorable occasion, 'Yah! Sons of apes! You *look* it,' and discovered instead that the Church had always known all about Evolution and the place of man in Nature, just as it had always known all about the place of the solar system in space. Only it had said nothing about these things, because it was wiser so. Darwin and Huxley, in their place and measure, belong to the same aristocracy as Plato and Aristotle and Galileo, and they will ultimately dominate the priestly and orthodox mind as surely, because there is a response, however reluctant, masked and stifled, in every human soul to rightness and a firmly stated truth.

This biological course of Huxley's was purely and strictly scientific in its character. It kept no other end in view but the increase and the scrutiny and

perfection of the knowledge within its scope. I never heard or thought of practical applications or business uses for what we were unfolding in that year's work, and yet the economic and hygienic benefits that have flowed from biological work in the past forty years have been immense. But these aspects were negligible by the standards of our study. For a year I went shabby and grew shabbier, I was under-fed and not very well housed, and it did not matter to me in the least because of the vision of life that was growing in my mind. I worked exhaustively and spent an even happier year than the one I had had at Midhurst. I was rather handicapped by the irregularity and unsoundness of my general education, but nevertheless I was one of the three who made up the first class in the examinations in zoology which tested our work.

A first-class in the Normal School meant over 80 per cent of the possible marks and the two others who took first-classes were Martin Woodward, a scion of a well-known family of biologists, who was afterwards drowned while dredging for marine zoological material on the west coast of Scotland, and A. V. Jennings, the son of a London private schoolmaster, for whom I formed a considerable friendship. All the rest of the class tailed down through a second class to failure.

Jennings was the only close associate I made in that first year. He was a year or so older than I, a slender grey-clad, red-faced young man with close curly black hair; he had had a sound classical education, and if he had not read as discursively as I he had read much more thoroughly. He was a well-trained student. He liked the strain of blasphemy and irreverence I had evolved for familiar conversational use, it startled him into appreciative chuckles, and once we had surmounted the obstacle of my shyness of sincere discussion, we got through an immense amount of talking about religious, political and scientific ideas. I learnt a great deal from him and polished much crudity and prejudice off my mind against his. For the first time in my life I was coming into touch at South Kensington with minds as lively as, or livelier than, my own and much better equipped, minds interested as much as I was interested in the significance of life. They saved me to a large extent from developing a shell of defensive reserve about my self conceit.

Once or twice Jennings showed a personal concern for me that still glows bright in my memory. The ‘Teachers in Training’ at the Normal School were paid a maintenance allowance of a guinea weekly, which even in those days was rather insufficient. After I had paid for my lodgings, breakfasts and so forth, I was left with only a shilling or two for a week of midday meals. Pay day was Wednesday and not infrequently my money had run out before Monday or Tuesday and then I ate nothing in the nine-hour interval between the breakfast and the high-tea I had at my lodgings. Jennings noted this and noted that I was getting perceptibly thinner and flimsier, and almost by force he carried me off to a chop house and stood me an exemplary square meal, meat, two vegetables, a glass of beer, jam-roll pudding and a bit of cheese; a memorable fraternal feast. He wanted to repeat this hospitality but I resisted. I had a stupid sort of pride about unrequited benefits or I know he would have done this frequently. ‘This makes competition fairer,’ Jennings insisted.

At the end of this invigorating year I had had a vague hope that I should be able to go right on with zoological work but there were no facilities for research available. I cared so much for the subject then that I think I could have sailed away to very sound and useful work in it. I could have built up the full equipment of a professor of zoology upon the basis I had secured, if I had been free to take my own where I could find it. I should have filled up my gaps. I am convinced that for college and university education, keenly interested students—and after all they are the only students worth a rap; the others ought not to be there—should have much more freedom to move about and choose their own courses and teachers than is generally conceded them. However, my first year’s performance had impressed the board of selection sufficiently to secure my reappointment as a Teacher in Training for a second and afterwards for a third year in other departments of the school where there were vacancies to be filled.

PROFESSOR GUTHRIE AND THE SCIENCE OF PHYSICS
(1885—1886)

Unfortunately for me there was only one Huxley in the Normal School of Science and the course into which I was now thrown had none of the stimulation and enlargement of that opening year. The process of interest and curiosity was broken, and my mind was unable to turn itself with any energy to the new work that was put before it. It suffered from disruption and shock. I found myself almost at once at cross purposes with my new professors and instructors.

I can see now much more clearly than I did at the time what it was that turned me abruptly from the extravagantly greedy and industrious learner I was in my first year, to the facetious, discontented, restless and tiresome rebel I now became. It is a phase of my life I am only now getting into perspective and seeing as a logical part of a whole.

There were extraordinary faults and inconsistencies in the teaching machinery that had got hold of me. I had no idea of these faults and inconsistencies when I blundered against them, I understood scarcely anything either of the clumsiness of the educational forces to which I was reacting or of the nature of my own reactions; and it was altogether too much for my intelligence and will to get anything but perplexity and a series of partial frustrations and humiliations from the encounters that now lay before me. I am not complaining. Perplexity, frustration, humiliation and waste of energy are the common lot of human beings in a phase of blindly changing conditions, and what is exceptional in my story is not the clumsy struggling that now began but the previous luck of release and encouragement at Midhurst and under Huxley, that bright run of luck between 1883 and 1885 which had invigorated and given me self-confidence and a mulish persistence in the direction in which my feet were set.

The Normal School of Science and Royal School of Mines, to give it the full title it bore in these days, stood with an air of immense purposefulness four-square upon Exhibition Road. When I first took my fragile, unkempt self and my small black bag through its portals, I had a feeling of having come at last under definite guidance and protection. I felt as I think a



J. H. Huxley
1874

civilised young citizen ought to feel towards his state education. If I worked hard, did what I was told and followed the regulations, then I thought I should be given the fullest opportunity to develop whatever fine possibilities were in me and also that I should be used to the best advantage for the world and myself. I thought that the Normal School of Science knew what it meant to do with me. It was only after my first year that it dawned upon me that the Normal School of Science, like most other things in the sliding, slipping civilisation of the time, was quite unaware even of what it meant to do with itself. It was an educational miscellany. It had been hastily compiled. Only that big red-brick and terra-cotta building, in which it was then assembled, held it together.

It was a product of the irregular and convulsive thrusts made by the embryonic modern world-state in its unconscious efforts to free itself from the aristocratic national system of eighteenth-century Europe. Throughout the nineteenth century, one far-reaching dislocation after another had emphasised the growing need for a general education of the population and for a new type of education based upon the enlightenment due to scientific discovery and a widening range of experience. Already in the 1850s Huxley was hammering away at the importance of biology in education. The drive of this need was resisted by the established religions, the ruling aristocracies and whatever remained over of the 'scholarly' mediaeval universities. The new educational organisations essential to the proper working of the new order, had to grow against these resistances and were greatly delayed, dwarfed, distorted and crippled in the process.

The powers in possession conceded the practical necessity for technical and scientific instruction long before they would admit the might and value of the new scientific knowledge. Just as these conservative forces permitted elementary education to appear only on the understanding that it was to be a useful training of inferiors and no more, so they sanctioned the growth of science colleges only on condition that their technical usefulness was recognised as their sole justification.

The great group of schools at South Kensington which is now known as the Imperial College of Science and Technology, grew therefore out of an entirely technical school born of the base panic evoked in England by the

revelation of continental industrial revival at the Great Exhibition of 1851. The initial institution was situated in the Museum of Practical Geology (note the minatory implication of that 'Practical') in Jermyn Street, and its original title was 'The Government School of Mines and Science applied to the Arts.' To this a chemical school, a lecturer on mineralogy and, later on, physical laboratories were added; it was transferred to South Kensington bit by bit, and upon it a Normal School, to train teachers for the science classes that were being spread belatedly over the country, was rather incongruously imposed (1873 and 1881). It has continued to expand and absorb ever since. It is to-day, a huge fungoid assemblage of buildings and schools without visible centre, guiding purpose or directive brain. It has become a constituent of that still vaster, still more conspicuously acephalic monster, the University of London.

The thumby wisdom of the practical man, with a conception of life based on immediate needs, unanalysed motives and headlong assumptions, and with an innate fear of free and searching thought, is still manifest at a hundred points in the structure and working of this great aggregation. The struggle to blend technical equipment with a carefully cherished illiteracy, an intact oafishness about fundamental things, has been well sustained. South Kensington will still tell you proudly 'we are not literary' and explain almost anxiously that the last thing it wants to impart is a liberal education. The ideal output of the Imperial College remains a swarm of mechanical, electrical and chemical business smarties, guaranteed to have no capacity for social leadership, constructive combination or original thought. There is an ineradicable tendency in sound technology to go on to purely scientific interest and breadth of social thought, the higher centres will keep on breaking through, and South Kensington, in spite of itself, does a great deal of real University work and makes men of many of its technicians. But so far the recognition of this tendency in any organised form has been successfully resisted.

Happily for me it happened that the vigorous, persistent far-reaching and philosophical mind of Huxley had become very influential with the Department of Science and Art in the sixties and seventies and particularly at South Kensington, and he had been able not only to establish that general

scientific survey, physiography, as a 'subject' in the evening class curriculum throughout the country, but he had had also a practically free hand to teach the science of life in his own fashion in the Normal School. This freedom involved, however, a similar freedom for the other professor with whom he was associated and they too without any consultation with their fellows, developed their courses according to their own capacities and their ideas of what was required of them.

Now Professor Guthrie, the Professor of Physics, into whose course I toppled from the top floor to the ground floor of the Normal School building, was a man of very different texture from the Dean. He appeared as a dull, slow, distraught, heavily bearded man with a general effect of never having fully awakened to the universe about him. He seemed very old to me but as a matter of fact he was fifty two. It was only after some years that I learnt what it was that made him then so slow and heavy. He was ill, within a year of his death, a still unsuspected cancer in his throat was dragging at his vitality, unknown to anyone. This greatly enhanced the leaden atmosphere of his teaching.

But quite apart from that he was not an inspiring teacher. The biological course from which I came had been a vivid, sustained attempt to see life clearly and to see it whole, to see into it, to see its inter-connexions, to find out, so far as terms were available, what it was, where it came from, what it was doing and where it was going. And, I take it, the task of a properly conceived elementary course in Physics, would be to do the same thing with non-living matter, to establish a fruitful description of phenomena, to clear up our common terminology, dating mostly from mediaeval times, about space, time, force, resistance, to explore the material universe with theory and experiment and so to bring us at last to the real living edge of the subject, the line of open questions on the verge of the unknown.

WELLS' EXPECTATION
OF THE SCIENCE STUDENT

SCIENCE SCHOOLS
JOURNAL

*Conducted by Students of the Normal School of Science and
Royal School of Mines, South Kensington.*

VOLUME I.

1887-1888.

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SCIENCE SCHOOLS JOURNAL

Preface

To The Average Man

NUMBER 1

1887

It was, in a more learned and less educated age than this present, the law that literary eruptions should be preceded by a sonorous dedication, by a moving appeal to some eminent person whereby his judgment might be distorted or overthrown, and the fiery flood of poetry, or scoriacious shower of facts, or dense vapourous arguments, came upon him while disorganised and helpless.

This phenomenon of a dedication is imagined by many not to occur in the current epoch, save as an aborted, a complimentary, thing; but this is an error of some bigness. It is true the dedication is no longer, in many cases, a distinctly separable part, but it is equally true that it vigorously survives in the main portion of the Preface non always prefixed to papyrean perpetrations. Why this modification has occurred is easily explained.

This Land has, unfortunately, become in spirit, democratic, whereas it *was* utterly aristocratic.

The appeal for favour has no longer to be made to Eminencies, but to the Average Flat, and has undergone much adaptation. The eminent love open flattery, while with the vulgar an elevated confidence is more effectual. The dedication has become a prefatory dedication; no longer is it 'De profundis,' but 'Attendite, popule.' Nevertheless, the adamantine foundation, the fundamental, characteristic, dishonest object of the disarmament of justice, immutable remaineth. The Author no longer, with sheet and candle, bewails his frailties, but, like Cleopatra in the presence of Caesar, garbed in the thinnest veil of modesty conceivable,

poses to suggest unprecedented gifts: yet the guilty consciousness is there still.

We merely mention these facts. We do not contemplate such an introduction to you, O Excellent Average Man; for we know full well you feel as superior to the vulgar herd as we do, and are confident of awakening a twang of sympathy in that Catholic Diapason, your mind, without such artifice. What we would here say is merely a dry indication of why this paper is established.

The personnel of the Normal School of Science and Royal School of Mines is emphatically *recherché*. Every May the myriads of science students in the British Isles undergo gravimetric sorting. The noblest specimens reach this building.

Here, from north, south, east, and west, are gathered minds specially capable of acquiring, retaining, and displaying systematic knowledge. Clearness of perception, imagination, and order are alike the mental requirements of the scientist and the writer. We may, therefore, reasonably expect that our pages will be filled with right opinion well expressed.

If not, it seems to us that some such absurd explanation as these which follow will have to be accepted:—

That our fellow-students have no time for writing, which implies that they are committing to memory classified facts without opportunity for exercise in the re-sorting and displaying thereof; that, like athletes who, professing to train, merely eat, they are fraudulently cramming; or, that they are incapable of writing, which (as above hinted) condemns the whole magnificent examination fabric of the Science and Art Department.

It is thus hard for us to imagine how anyone can deny that this periodical will contain great things.

Anticipating therefore, your entire satisfaction, we would here record our sense of obligation to the compositor for his valuable aid in setting up our Magazine; to the boy who brought round the proofs for us to look at; to the compiler of 'Nuttall's Dictionary', to whom we owe much, if not all, of our material; to the young lady (next door) who is practising 'Scales,' and to whom is due much of the praise for the euphony of this introduction; and to the four fellow-students who, at a great sacrifice, refrained from offering us

advice as to our duties. Less conventional and more sincere thanks must be expressed to those who have contributed matter to this issue. We hope that the number of the contributors to No. 2 will be greatly increased, and shall be glad to receive help of this sort from all quarters.

I conceal from every eye beneath this calm, hopeful, even proud, exterior, the devastation of the furies, the fierce, ceaseless assault of fear, remorse, and despair. Like the Roman sentinel at Pompeii, or, better, like a responsible public official before an election.

H. G. Wells

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H. G. WELLS

Autobiography

The Bad Days

. . . exasperating was that we were pressed along this training in recognition—at a pace that made it disastrous to follow any incidental hares our own curiosity might start for us. Again I reiterate my profound persuasion that for successful science teaching the rule should be stimulation and a maximum of available information, with a minimum of prescription.

Among other frustrated and crumpled enquires I remember the flash of excitement I found in crystallography. I learnt that in various series of minerals, the felspar group for example, there were subtle changes in the crystalline axis with changes of chemical composition. There were fluctuations in colour and crystalline form through most of the main mineral groups. What laws lurked in these fluctuations and why?

For petrography the school was at that date exceptionally well equipped. Every student had the use of a petrographical microscope, with polarising prisms, and we examined a long series of representative rock sections. It would be difficult to exaggerate the beauty and fascination of some of these

They let one into the very heart of those specimen chunks of rock one found so boring in a drawer, they lit them up with a blaze of glorious colour. One saw the jumbled crystals thrust against each other, distorted by unknown pressures, clouded and stained by obscure infiltrations. In many there were odd inclusions of other crystalline substances, and still more entrancingly enigmatical there were often hollows in these crystals (although they had been formed under enormous pressures) and in these hollows there were drops of fluid and bubbles of gas. It was not simply an astounding

loveliness, it was, one felt, a profoundly significant loveliness that these sections revealed. They were telling in this bright clear and glowing fashion, of tensions, solutions, releases, the steady creeping of molecule past molecule, age after age. And in their interpretation lay the history and understanding of the Earth as a whole. But the geological course was not out to pursue significance. It would tolerate no loitering for such discursive purposes. Each day brought its drawer of specimens, its tale of slides. That was and is my indictment of all that teaching.

I may perhaps be evolving all this adverse criticism of the courses of science at South Kensington in an unconscious attempt to solace myself for my manifest want of success there as a serious student, after my first year. The reader is better able than I am to judge of that. There can be no doubt of my failure—which led to some painful subsequent years. But when all possible allowance has been made for such a bias on my part, the facts remain that Professor Judd bored me cruelly and that in his course just as in the physics course, my discontent preceded and did not arise out of my failures.

Since those days I have given a reasonable amount of attention to pedagogics and social organisation generally. I find it more and more remarkable that the old Normal School and Royal School of Mines, the present Imperial College of Science and Technology, although an important part of its work still consists in preparing teachers of science, has never had, has not now and never seems likely to have, any chair, lecturer or course in educational science and method. Much less is there any study of social, economic and political science, any enquiry as to objectives, or any attempt to point, control and co-ordinate the teaching in the various departments. To the ruling intelligences of South Kensington a course in geology is just a course in geology. When you have gone through a course, any course, then you *know* geology. Isn't that useful for mining and metallurgy? Both Guthrie and Judd were amateurs in science teaching, and neither of them had sound ideas of how to inveigle students into their subjects. And there was in the organisation no supervising pedagogic philosopher with the knowledge and authority to tell them as much.

The Imperial College, I realise in the retrospect, was and still is in fact not a college but a sprawl of laboratories and classrooms. Whatever ideas of

purpose wrestled together in its beginnings are now forgotten. It has no firm idea of what it is and what it is supposed to do. That is to say it has no philosophy. It has no philosophical organisation, no social idea, no rationalised goal, to hold it together . . . I do not see how we can hope to arrest and control the disastrous sprawling of the world's affairs, until we have first pulled the philosophical and educational sprawl together.

I had come up to South Kensington persuaded that I should learn everything. I found myself at South Kensington lost and dismayed at the multitudinous inconsecutiveness of everything.

Judd had a disposition very common in conscientious teachers, to over-control his students. He wanted to mess about with their minds. Huxley gave us his science, but he did not watch us digesting it. He was watching his science. Judd insisted not merely on our learning but learning precisely in his fashion. We had to make note-books, after his heart. We had to draw and paint and write down our facts just as a Judd would have done. We had to go at his pace and in his footsteps. We had to send in satisfactory notebooks at the end. If not we lost marks in the final examination. To be lopped and sketched to the mental proportion of Judd in this fashion was almost as agonising as being a victim to Og, King of Bashan.

I made an effort to do what was required of me but an irresistible boredom wrapped me about and bore me down. The habit I had acquired during the physics course of vanishing from my place in the laboratory and resorting to the Education Library or the Dyce and Foster Reading Room presently returned with enhanced strength.

The still favourable opinion of the board of selection kept me at the geological course, elementary and advanced, for an academic year and a half. By that time my career as a science student was in ruins, and that favourable opinion had evaporated. The path to research was closed to me for ever. Academically I had gone to the bad. I had become notoriously unruly. I got a second class at the end of 1886, but I failed the final examination in geology in 1887.

But I carried something out of that geological course nevertheless, for when, after various vicissitudes I presented myself to the London University examiners in 1890 for my B.Sc. degree, I had still enough geology to supplement my first class honours in zoology by taking the first place in

second class honours in geology. I doubt if I had read very much in the interim. I think Professor Judd must have mingled considerations of discipline with his estimate of any progress in that final test which killed my scientific career.

This criticism of the large indeterminateness of the educational bulks and thrusts through which my brain dodged its way, is the outcome of a life's experience. Such, I now realise, were the conditions about me. But at the time I had no grasp of the huge movements and changes that were going on in the world. I had no idea of how the Normal School or the Education Office or the teaching of science in any form had come about; I did not understand the conflicting forces that had made that teaching as good and as bad as it was, nor what it was had whipped me up out of servitude to be a learner, and was now rather alarmingly losing interest in me. I had been exalted at first and then I was puzzled and dismayed. I acquit myself of blame now much more completely than I acquitted myself at the time. Deep down in me a profound humiliation at my want of outstanding success in physics and geology struggled against the immense self-conceit I had brought up with me from Midhurst. My mind had to find compensating reassurance to save me from the conviction of entire inferiority. It found that reassurance in petty achievements and triumphs in other directions. Blasphemy and the bold and successful discussion of general ideas had already proved very sustaining to my self-respect in the drapery emporium. I now found the pose of a philosophical desperado a very present help against my depression under the teaching of Guthrie and Judd.

The startled guffaws of Jennings had already persuaded me that I was something of a wit, and my rather unconventional contributions to the discussions in the Debating Society were also fairly successful and attracted one or two appreciative friends. There were three men, Taylor and Porter and E. H. Smith in that early group, of whom I have lost sight; there were also my life-long friends, A. T. Simmons and William Burton, Elizabeth Healey and A. M. Davies. We loitered in the corridors, made groups in the teashop at lunch-time, lent each other books and papers and developed each other's conversational powers.

Curiously enough, though I remember the Debating Society very vividly,

I do not remember anything of the speeches I made. I did make speeches because my friends remember them and say they were amusing. The meetings were held in an underground lecture theatre used by the mining school. It was lit by a gas jet or so. The lecturers' platform and the students' benches were surrounded by big models of strata, ore crushers and the like which receded into a profound obscurity, and austere diagrams of unknown significance hung behind the chairman. The usual formula was a paper, for half an hour or so, a reply and then promiscuous discussion. Those who lacked the courage to speak, interjected observations, made sudden outcries or hammered the desks. The desks indeed were hammered until the ink jumped out of the pots. We were supposed to avoid religion and politics; the rest of the universe was at our mercy.

I objected to this taboo of religion and politics. I maintained that these were primary matters, best beaten out in the primary stage of life. I did all I could to weaken and infringe those taboos, sailing as close to the wind as possible, and one or two serious-minded fellow students began to look out for me with an ever ready cry of 'Or-der.' One evening somebody read an essay on *Superstitions* and cited among others the thirteen superstitions. I took up the origin of that. 'A certain itinerant preacher whom I am not permitted to name in this gathering,' I began, 'had twelve disciples . . .'

The opposition was up in arms forthwith and we had a lovely dispute that lasted for the better part of an hour. I maintained that the phrase 'itinerant preacher', was an exact and proper description of the founder of Christianity as indeed it was. But the vocabulary of the ordinary Englishman is sticky with stereotyped phrasing and half dried secondary associations. It seemed that 'itinerant preacher' connoted a very low type of minister in some dissenting bodies. So much the worse, I said, for the dissenting bodies. The sense of the meeting was against me. Even my close friends looked grave and reproachful. I was asked to withdraw the expression. I protested that it was based on information derived from the New Testament, 'a most respectable compilation'. This did not mend matters. Apparently they could not have it that the New Testament was 'respectable' or 'compiled'. I was warned by the chair and persisted in my insistence upon the proper meaning of words.

I was carried out struggling. To be carried out of an assembly in full fight

had recently been made splendid by Charles Bradlaugh . . .

We subsidised students, were paid every Wednesday by a clerk with a cash-box and a portfolio, at whose tone when calling out our names we saw fit to take offense. Mockery and ironical applause having failed to mend his manners, a tumult ensued and developed to such riotous behaviour that he fled to the registrar, professed to fear a raid on his tin box of sovereigns, and refused to proceed without police protection.

VISIONS OF DESTRUCTION

Complete Short Stories

Argonauts of the Air

The machine went slanting upward, travelling with an enormous speed still, but losing momentum every moment. The land ran away underneath with diminishing speed.

‘*Now!*’ said Woodhouse at last, and with a violent effort Monson wrenched over the wheel and altered the angle of the wings. The machine seemed to hang for half a minute motionless in mid-air, and then he saw the hazy blue house-covered hills of Kilburn and Hampstead jump up before his eyes and rise steadily, until the little sunlit dome of the Albert Hall appeared through his windows. For a moment he scarcely understood the meaning of this upward rush of the horizon, but as the nearer and nearer houses came into view, he realised what he had done. He had turned the wings over too far, and they were swooping steeply downward towards the Thames.

The thought, the question, the realisation were all the business of a second of time. ‘Too much!’ gasped Woodhouse. Monson brought the wheel half-way back with a jerk, and forthwith the Kilburn and Hampstead ridge dropped again to the lower edge of his windows. They had been a thousand feet above Coombe and Malden station; fifty seconds after they whizzed, at a frightful pace, not eighty feet above the East Putney station, on the Metropolitan District line, to the screaming astonishment of a platform full of people. Monson flung up the vans against the air, and over Fulham they rushed up their atmospheric switchback again, steeply—too steeply. The ‘buses went floundering across the Fulham Road, the people yelled.

Then down again, too steeply still, and the distant trees and houses about Primrose hill leapt up across Monson's window, and then suddenly he saw straight before him the greenery of Kensington Gardens and the towers of the Imperial Institute. They were driving straight down upon South Kensington. The pinnacles of the Natural History Museum rushed up into view. There came one fatal second of swift thought, a moment of hesitation. Should he try and clear the towers, or swerve eastward?

He made a hesitating attempt to release the right wing, left the catch half released, and gave a frantic clutch at the wheel.

The nose of the machine seemed to leap up before him. The wheel pressed his hand with irresistible force, and jerked itself out of his control.

Woodhouse, sitting crouched together, gave a hoarse cry, and sprang up towards Monson. 'Too far!' he cried, and then he was clinging to the gunwale for dear life, and Monson had been jerked clean overhead, and was falling backwards upon him.

So swiftly had the thing happened that barely a quarter of the people going to and fro in Hyde Park, and Brompton Road, and the Exhibition Road saw anything of the aerial catastrophe. A distant winged shape had appeared above the clustering houses to the south, had fallen and risen, growing larger as it did so; had swooped swiftly down towards the Imperial Institute, a broad spread of flying wings, had swept round in a quarter circle, dashed eastward, and then suddenly sprang vertically into the air. A black object shot out of it, and came spinning downward. A man! Two men clutching each other! They came whirling down, separated as they struck the roof of the Students' Club, and bounded off into the green bushes on its southward side.

For perhaps half a minute, the pointed stem of the big machine still pierced vertically upward, the screw spinning desperately. For one brief instant, that yet seemed an age to all who watched, it had hung motionless in mid-air. Then a spout of yellow flame licked up its length from the stern engine, and swift, swifter, swifter, and flaring like a rocket, it rushed down upon the solid mass of masonry which was formerly the Royal College of Science. The big screw of white and gold touched the parapet, and crumpled up like wet linen. Then the blazing spindle-shaped body smashed and

splintered, smashing and splintering in its fall, upon the north-westward angle of the building.

But the crash, the flame of blazing paraffin that shot heavenward from the shattered engines of the machine, the crushed horrors that were found in the garden beyond the Students' Club, the masses of yellow parapet and red brick that fell headlong into the roadway, the running to and fro of people like ants in a broken ant-hill, the galloping of fire-engines, the gathering of crowds—all these things do not belong to this story, which was written only to tell how the first of all successful flying-machines was launched and flew. Though he failed, and failed disastrously, the record of Monson's work remains—a sufficient monument—to guide the next of that band of gallant experimentalists who will sooner or later master this great problem of flying. And between Worcester Park and Malden there still stands that portentous avenue of iron-work, rusting now, and dangerous here and there, to witness to the first desperate struggle for man's right of way through the air.

THE COMPLETE SCIENTIST

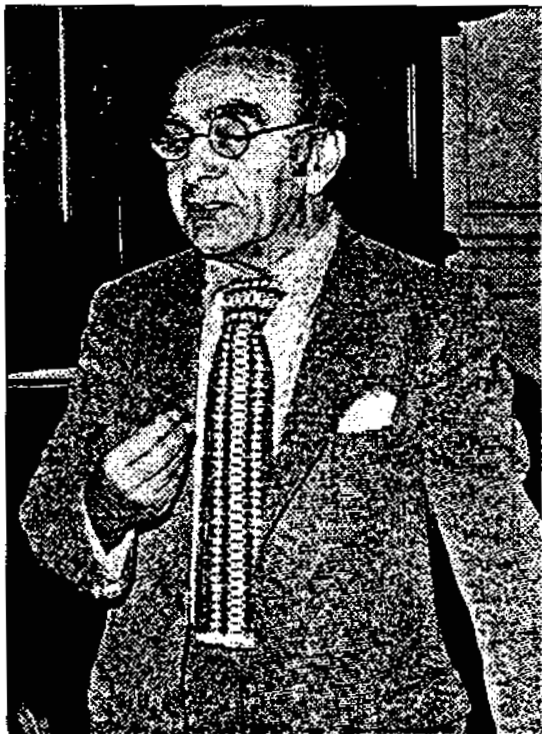
British Association Report

Wells Endorsed

A report drafted by a sub-committee of the British Association for the Advancement of Science in 1960 under the presidency of Professor Blackett and under the chairmanship of Sir Patrick Linstead, FRS, Rector of Imperial College.

‘Nevertheless, witnesses endorsed the criticism frequently made that the graduate scientist or technologist too often displays a narrowness of view and interests, is unable to relate his own work to that of his colleagues or theirs to his, or is not as effective as he should be as a member of a team because of his inability to communicate thoughts and feelings. This is not to say that the criticism is applied to every student . . . applied to a minority substantial enough to call for a review of present policy and method.’

JACOB BRONOWSKI



at a
British Humanist Association Conference

THE ASCENT OF MAN

Jacob Bronowski

There are two parts to the human dilemma. One is the belief that the ends justifies the means. That push-button philosophy, that deliberate deafness to suffering, has become the monster in the war machine. The other is the betrayal of the human spirit; the assertion of dogma that closes the mind, and turns a nation, a civilisation, into a regiment of ghosts—obedient ghosts, or tortured ghosts.

It is said that science will de-humanize people and turn them into numbers. That is false, tragically false. Remember the concentration camp and the crematorium at Auschwitz. This is where people were turned into numbers. Into this pond were flushed the ashes of some four million people. And that was not done by gas. It was done by arrogance. It was done by dogma. It was done by ignorance. When people believe they have absolute knowledge, with no test in reality, this is how they behave. This is what men do when they aspire to the knowledge of gods.

Science is a very human form of knowledge. We are always at the brink of the known, we always feel forward for what is to be hoped. Every judgement in science stands on the edge of error, and is personal. Science is a tribute to what we can know although we are fallible. In the end the words were said by Oliver Cromwell: 'I beseech you, in the bowels of Christ, think it possible you may be mistaken'.

I owe it as a student to my friend Leo Szilard, I owe it as a human being to the many members of my family who died at Auschwitz, to stand here by the pond as a survivor and a witness. We have to cure ourselves of the itch for absolute knowledge and power. We have to close the distance between the push-button order and the human act. We have to touch people.

HUMANIST ASSOCIATIONS

BRITISH HUMANIST ASSOCIATION

The BHA is concerned with moral issues from a non-religious viewpoint and with the achievement of a more open, just and caring society. It is not anti-religious as such, but seeks to put an alternative moral view of current personal and social issues.

The BHA was formed during the 1960s by the Ethical Union and the Rationalist Press Association, two freethought organisations going back to the 1890s, as an umbrella organisation for the whole humanist movement; but the complexities of charity law and other complications prevented this, so in 1966 it became an independent organisation and absorbed the Ethical Union, developed its own unique character as a positive campaigning body, and in 1981 was recognised as a non-religious charity.

13 Prince of Wales Terrace,
London W8 5PG
01-937 2341

NATIONAL SECULAR SOCIETY

The NSS is the leading militant organisation in the freethought movement, acting as a sort of trade union for unbelievers in the face of religious privilege and superstitious survival.

The *NSS* was founded by Charles Bradlaugh (before he embarked on his parliamentary career as a radical Liberal) to unite the various secular societies which had developed from the Owenite and Chartist movements, and during the late nineteenth century it was the main freethought organisation in the country. At first it attracted mainly self-educated working-class people, and it still retains some of its traditional forthright and down-to-earth character as the most militant element in the humanist movement.

702 Holloway Road,
London N1 3NL
01-272 1266

THE
SOUTH PLACE MAGAZINE:
A MONTHLY RECORD
OF THE WORK OF
The South Place Ethical Society.

Vol. I., No. 9.

DECEMBER, 1895.

2d. Monthly;

3s. 6d. Annually, post free

SUNDAY MORNING DISCOURSES.

HUXLEY.

On October 27th Mr. Conway gave a memorial discourse on "Huxley," from whose writings the lessons were read. He began by referring to the Liberal Thinkers' Congress which gathered at South Place on June 13th and 14th, 1878. Of the Association then formed Professor Huxley was made

Courtesy of South Place Ethical Society

HUMANIST ASSOCIATIONS

RATIONALIST PRESS ASSOCIATION

The RPA's particular contribution to the humanist movement is as a publishing organisation, producing magazines, books, pamphlets and leaflets on all subjects of interest to the general cause of freethought.

The RPA was formed in 1899 by a group of free thinkers led by Charles Albert Watts (whose own printing and publishing business belonged to a line going back to Richard Carlile in 1817) after fourteen years' work to establish a permanent organisation for the regular publication of freethought literature. Watts had already been publishing an annual collection of essays from 1884 (which continued until 1980) and a magazine from 1885 (which continues today), and during the twentieth century the best-known work of the RPA was several series of popular publications—especially the Cheap Reprints (50 titles, 1902–1912) and the Thinker's Library (140 titles, 1929–1951).

88 Islington High Street,
London N1 8EW

SOUTH PLACE ETHICAL SOCIETY

SPES is a cultural social organisation whose chief objects are the study and dissemination of ethical principles, the cultivation of a rational and humane way of life, and the advancement of education in fields relevant to these objects.

SPES derives from a radical religious congregation formed in East London in 1793. In 1817 it became a leading Unitarian Chapel under its third minister, William Johnson Fox, and in 1824 it moved to South Place in Finsbury. In 1929 it moved once more, to the larger, purpose-built Conway Hall in Bloomsbury. From 1864, under its most eminent minister, Moncure Conway, it gradually abandoned theism, and in 1888 it became an Ethical Society under Stanton Coit.

Conway Hall,
25 Red Lion Square,
London WC1R 4RL

BIBLIOGRAPHY

Huxley's handwriting, unpublished, from Imperial College Archives.

'Liberal Education and Where to Find it' from a collection of Prof. T.H. Huxley's essays called *Science and Education*, was published by Macmillan beginning of this century, no longer in print.

Love and Mr Lewisham a novel by H.G. Wells.

Anne Veronica a novel by H.G. Wells.

'A Slip Under the Microscope' a short story by Wells from a collection of his works called *The Complete Short Stories of H.G. Wells*.

Normal School of Science Journal founded by Wells, published by the students, copies held in the Imperial College Archives. The present college magazine *Phoenix* claims to have originated from the publication.

Experiment in Autobiography by H.G. Wells, extracts from first of two volumes.

'Argonauts of the Air' a short story by Wells from *The Complete Short Stories of H.G. Wells*.

British Association for the Advancement of Science Report called *The Complete Scientist*.

Ascent of Man book based on the BBC TV series, written by Jacob Bronowski.

An article on Huxley from the *South Place News*, newspaper of the South Place Ethical Society, from their archives.