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“Intelligence and Civilisation”:

A Ludwig Mond lecture delivered at the University of Manchester on 23rd October 1936 by

Godfrey H. Thomson.

A reprinting with background and commentary

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Abstract

Here we reprint, and provide background and a commentary on, a recently-rediscovered lecture by Godfrey H. Thomson entitled, “Intelligence and civilisation.” It was delivered at the University of Manchester, UK, on 23rd October, 1936, printed in 1937 in the short-lived *Journal of the University of Manchester* and as a pamphlet in Edinburgh. It was one in the series of lectures supported by the industrialist and philanthropist Ludwig Mond. The lecture is unusually valuable in that it places the theory, testing and practical application of intelligence against the background of the rise of Nazism and its threat to civilisation. The lecture is a candid and accessible ‘confession and contemplation’; the frank thoughts of a person committed to, but critical of, intelligence testing and theory, but convinced of the power and place of intelligence differences in people’s lives and in civilisation. It comes at an important time for Thomson, with regard to three of his major achievements: his Moray House Test series, the Scottish Mental Survey of 1932 (and the Northumbrian testing exercise that preceded it), and the preparation of his book *The Factorial Analysis of Human Ability*. The understanding of the lecture is enhanced by recently-discovered archive materials on Thomson and his circle.

“It is my faith that we must do individual justice. But it is our duty to do so without wrecking civilisation or hindering its progress.... it is necessary to ask about the dependence of civilisation on intelligence and about the relative importance, to civilisation, of intelligence and other qualities.”

(Thomson, 1937a, from the Ludwig Mond lecture)

Godfrey Hilton Thomson

Godfrey Thomson (1881-1955; Figure 1) was a bright boy from a poor background (Thomson, 1952). He began as a pupil teacher in the north of England, studied for a first degree in the UK, and then took a PhD in physics at Strasbourg, then in German Alsace. He was on the staff at Armstrong College, Newcastle (a college of the University of Durham, England) from 1906 to 1925, where he was eventually Professor of Education. He was the Bell Professor of Education and Director of the Moray House [Teacher] Training Centre at the University of Edinburgh from 1925 until 1951. His early psychological research included work on psychophysics (Thomson, 1912). His bent for quantitative analyses involved his suggesting an alternative to Spearman’s general factor in intelligence to explain the positive manifold of correlations among mental tests (Thomson, 1916). He wrote a major work on factor analysis of mental ability (Thomson, 1939a) which ran to five editions. He was closely involved with the Scottish Mental Survey 1932 (Scottish Council for Research in Education, 1933)—providing the test and as chairman of the statistical analysis committee—and was the Chairman of the Scottish Mental Survey 1947 (Scottish Council for Research in Education, 1949). He and his team at Moray House College in Edinburgh produced and distributed hundreds of thousands of mental tests—the Moray House Test series—that were used for selection from primary to secondary school in England (Thomson, 1940; Sutherland, 1984). His later work included intelligence and its relation to fertility (Thomson, 1950). At Moray House, Thomson was also a teacher and a teacher educator. He had a strong interest in the

effectiveness of teaching and the links between teaching and research. The Mond lecture's focus on character and intelligence illustrates this dual concern (Thomson 1936, 1937a).

Thus, Thomson's academic work covers many aspects of intelligence research: theoretical approaches to intelligence, basic psychometric contributions, the construction of mental tests and much practical work based around the application of the tests, large surveys of national intelligence and many other smaller studies, and the part played by intelligence in matters relevant to societies. Yet, even to readers of this journal, Thomson is likely to be a relatively obscure figure. There are a number of reasons for this. Much of his large journal output is very technical; there are many short notes filled with abstruse formulae (e.g. four pieces in *Nature* around the time of the Mond lecture; Thomson, 1935, 1937b, 1938a, 1939b). His huge amount of applied work (Sutherland, 1984, chapter 7) was known mostly to the education authorities rather than the academic community. He once said that he neither wished to make money nor academic "prestige" or "kudos" from his massive production of mental tests (Monroe, 1939; Deary, Lawn, & Bartholomew, 2008). Neither did he; the large sums earned by the tests would have made Thomson wealthy, but they were ploughed back into a trust that he set up and which paid for his researchers to improve the tests. The University of Edinburgh still earns income from this today. He is probably best known, if at all, for his 'bonds' theory of intelligence, which sometimes makes it into general psychology textbooks as a briefly-mentioned alternative to theories like Spearman's and Thurstone's. In Sternberg's (2000) *Handbook of Intelligence*, running to 677 pages, Thomson is mentioned in one sentence. Despite Thomson's deep involvement with intelligence research—covering theory, statistics, test production, and test applications—from 1916 to the early 1950s, there is almost nothing extant that gives an idea of his views on intelligence. His book (Thomson, 1939a) has some substantive writing on his and others' views on intelligence differences, but the bulk of it is

on the statistical issues surrounding factor analysis; it is of largely historical interest because much of it involves problems that no longer existed after the arrival of computers (Bartholomew, Deary, & Lawn, in press). His posthumously-completed and published autobiography (Thomson, 1969) and his entry in *A History of Psychology in Autobiography* (Thomson, 1952) are both useful accounts of his (mostly) academic life, and contain some broader writing about intelligence differences. However, in the research project we are conducting on Scotland's prominence internationally in educational research in the second quarter of the 20th century, we found Thomson to be marked by a lack of archival material (Deary & Lawn, 2008). However, as materials have come to light, the importance of Thomson in national and international research on intelligence and its applications (Deary, Lawn, & Bartholomew, 2008) and the development of the associated statistical techniques (Bartholomew, Deary, & Lawn, in press) has become clearer. Indeed, throughout the 1930s, Spearman was still discussing, in detailed correspondence, Thomson's sampling/bonds theory of intelligence with eminent figures including Cyril Burt (Spearman archive, 1939), A. S. Otis (Spearman archive, 1931-1932), and Harvard statistician E. B. Wilson (Spearman archive, 1931). The rediscovery of his Mond lecture (Thomson, 1936) provides an almost unique insight into Thomson views about intelligence and its place in society generally.

Thomson's Ludwig Mond lecture and its publication

Although the correspondence relating to the Mond lectures prior to 1939 is no longer available, it is possible that Thomson's invitation to give the Mond lecture in 1936 may have stemmed from his friendship with Sir James Duff, who was Professor of Education at Manchester University between 1932 and 1937 and with whom Thomson had collaborated on the Northumberland mental test surveys in the 1920s (Duff & Thomson, 1923-1924). Some information on Ludwig Mond and the lecture series is given in the Appendix.

Unusually, Thomson's Ludwig Mond lecture was published twice. Initially in 1936 it was published locally in Edinburgh as a pamphlet by the now-defunct publishers T. & A. Constable in collaboration with Edinburgh University Press (Thomson, 1936; Figure 2). In 1937, the lecture formed a part of the first issue of the short-lived *Journal of the University of Manchester* (Thomson 1937a; Figure 3). That *Journal* lasted only three issues, from 1937-1939. The two publications are broadly identical in their reproduction of the lecture; however, the Manchester edition is marginally more extensive with several additional explanatory footnotes, an extra sentence of explanation in the second section and a few slight alterations to the ordering of words in sentences or punctuation in order to make the lecture read better. This suggests that the lecture may have been edited prior to publication in Manchester, most likely in collaboration with Thomson himself—one of the additional footnotes refers in the first person to one of Thomson's papers. Thomson tended to keep copies of all his public lectures as either handwritten manuscripts or typescripts, and it will therefore have been a fairly straightforward task for him to look over the lecture and suggest changes. As the Manchester publication represents the most complete version of the lecture, this is the version that is reproduced here.

Why are we reprinting Thomson's Mond lecture?

The lecture is currently inaccessible; neither the publisher of the pamphlet or the journal in which it appeared now exist. Our judgement is that it is an important statement from an important and under-appreciated intelligence researcher. He gave other lectures that survive in printed form, such as his Galton lecture to the Eugenics Society (Thomson, 1946a) and his presidential address to the British Psychological Society (Thomson, 1946b), but none is so wide-ranging—far beyond his academic remit—and novel as this. It is a rare view of

Thomson painting with a broad brush to non-specialists. Part of what contributed to Thomson's not being remembered in the way that, say, we still remember Spearman, Burt and Thurstone, is that Thomson was self critical about as much as he was critical of others. He tended to look for what could be improved in his own work. He did not push hard for his ideas when he knew there were tenable alternatives. The new collection of archival materials we have gathered on Thomson and other Scottish educational researchers has helped us put this lecture in perspective and to see how it unites topics in which he was interested. The topics are fascinating: he discusses the UK's educational sieve, intelligence's association with progress in civilisation, and the idea of good individual character. The range of social topics, history and opinion presents a range that we have not seen him cover elsewhere. He says relatively little about testing and theories of intelligence. The lecture is about social justices, and intelligence and education being civilising forces, and it is this novelty that gives it its importance. The resounding end to the very first section of the lecture makes it clear that Thomson is raising the flag of intelligence, and intelligence testing, against the rise of fascism in Europe in the mid-1930s.

Themes in the lecture

Intelligence: applications, measurement, and definition

Perhaps ironically for some readers, Thomson introduces intelligence testing as something that brings justice to the then-problem of school selection. It was a time when only a small percentage of people got more than two years of post-primary school education and the places were seen as valuable. The vast majority had no school education after age 14. It was thought by some, including Thomson (Thomson, 1969), that intelligence testing might identify some hidden talent for such places, especially from geographical areas that tended not to be well represented in post-14 education at that time (Duff & Thomson, 1923-1924). He discusses

how civilisation depends on intelligence: he recruits intelligence against the rise of fascism. The state of the world is prominent in his talk. He had done his PhD in German Alsace (in Strasbourg, of which he wrote fondly; Thomson, 1918-1922). A year later, in 1937, his mathematical assistant was Walter Ledermann, some of whose family were Jews still detained in Germany. Thomson (1938b) wrote to Ledermann in November 1938 asking, “How have your people fared in these recent days? I have often felt anxious about them”. Intelligence was controversial then too: early on he talks about intelligence defensively, mentioning “controversies,” “peculiarities” and “difficulties”. To be intelligent, he reckoned, “behaviour has to have the appearance of being directed towards that end in such a way as to achieve it as quickly, as economically, as cleanly as possible.” Intelligence was also “the power of making internal trials... a trained habit of making many, and accepting or rejecting according to the imagined consequences.” He makes guesses at a physiology of intelligence, involving connections. For someone whose scientific credibility is so yoked to testing intelligence, he is surprisingly critical of definitions of intelligence, its units of measurement, and even its distribution. Thirteen years later he defended this ambiguous stance,

I have had for thirty years a very wide experience of making, using, and following up the results of group tests. Few can be more fully aware of their dangers and pitfalls than I am. They are, of course, like all human instruments, far from infallible: but they are less fallible than most other methods of estimating human ability—at any rate, at estimating ability in a comparatively short time, as is often necessary. We must not make the better the enemy of the good. It is a common error of judgment to say (as one can of most things) “this is not perfect”, and then to add “so away with it”. Of course group intelligence tests are not perfect. But in the absence of any better alternative at present, we must use the group tests and their correlations with the numerous social facts we have collected, while bearing

in mind throughout the very many limitations to which these tests are subject.

(Scottish Council for Research in Education, 1949, pp. xiv-xv.)

In discussing measurement issues in intelligence, he uses a thermometer metaphor, as Eysenck (1979/2006, pp. 14-15) did for a very similar purpose. Thomson's conclusion: intelligence tests are useful, and this is good enough in the absence of nothing better. He is careful to be fair to Spearman and Thurstone; his statements about Spearman, especially, cover the range of his contributions and are careful to prevent people making errors about what Spearman claimed. He is polite and clear about their differences, and does not take the opportunity to push his own ideas. Indeed, he almost excuses himself for differing from the others and makes it clear that his idea about the structure of intelligence is just one of a number of alternatives, and that it is based on his assumption that the mind is, "an integrated whole, though with aspects, not a bundle of factors". Perhaps, regarding what it takes to be remembered in science, this even-handed politeness was a near-suicidal trait.

The educational sieve and the educated society

His opinions are interesting in this section, and he brings in facts about his own background which he has mentioned before in international meetings (Monroe, 1931; Deary, Lawn, & Bartholomew, 2008) and his autobiography (Thomson, 1952, 1969). Far from being to preserve a social elite, he states that the aim of those involved in testing in education was, "a desire to give the individual poor boy a chance of getting on in the world." Seventeen years later, in another lecture (Thomson, 1953), he said that his three passions in professional life were educational research, "to know more and more about the world of mathematics" (p. 11) and,

the feeling that I had a moral duty to do everything possible to improve methods of discovering intelligent children who might be overlooked, and guiding them into

forms of higher education likely both to make them happier in their lot, and useful to a society and civilisation which needs them. (p. 11)

He adds the issue of intelligence's distribution and origins, and says about a half or more is inborn: a reasonable estimate even after decades more of accumulated data (Deary, Spinath, & Bates, 2006). He rehearses some factors that prevent clever children entering secondary education, such as family social pressures.

This section of the lecture has a nicely-dissected structure. He asks three questions, which are an interesting mix of the personal and the communal: what is the distribution of intelligence in the population?; does everyone have the opportunity to be educated in line with their intellect?; and how many educated does a modern (then) society need to be run properly?

Thomson also states that educational testers have the, "laudable desire of keeping up the supply of educated persons needed by the community in its administrative services, in its professional classes, and in the ranks of technical workers, is in the background." There was an idea abroad at the time that society needed only a limited proportion of trained intelligences. James Duff—Thomson's ex-colleague from his previous Professorship in Newcastle's Armstrong College—gave a lecture to the UK's Eugenics Society on January 1st 1926 stating such an opinion clearly (Duff, 1926a), and caused the international media to comment (Duff, 1926b). Duff—who was probably closely involved in having Thomson invited to give the Mond Lecture and was most likely in the audience—worried that too many educated people without appropriate jobs to go to could have a destabilising effect on society. Duff (1926b) said, "The trouble is that, for all our bewailing of the lack of present good intelligence, there is really little scope for intelligence, in the world as we know it today, for the ordinary man."

A decade later, and in a similar vein but with the opposite answer, Thomson asks, “how many educated intelligences does a modern community need? Now for my own part I reply to this without hesitation with the answer, as many as it can possibly get.” He did not want to see a “split in the nation between the educated and the uneducated, which means, if not civil war, then a state of disguised warfare.” That is, he anticipated the intellectual apartheid discussed in the Bell Curve (Herrnstein & Murray, 1994). Citing Plato from his classical education he argues against the setting up and danger of two nations: the educated and the uneducated. Thomson was far-seeing in his opinion that the school leaving age should be much higher than even the new age (15) that was to be brought in in Scotland. And next, from the man who produced and distributed many hundreds of thousands of mental tests for the purpose of educational selection in England (Sutherland, 1984), is a remarkable statement: “That is why I regret the forking of the ways in England, at the early age of 11 years, into elementary and secondary education, and why I prefer the American system of one High School for all.” In effect, Thomson saw the necessity for a comprehensive school, something which he also thought was more likely to happen in Scotland than England. It is a radical vision. Thomson’s reputation, for those who are aware of him, has been sullied by association with IQ-type tests which were later seen as elitist tools, restricting entry into secondary school and being divisive in society. Here, the man sometimes known as the architect of a divisive schooling system, through intelligence testing, is advocating a Comprehensive schooling system. Both P. E. Vernon (1962) and Sharp (1997) discuss the fault line of paradox running through Thomson’s life’s work: his massive test industry on the one hand and his wariness of their applications on the other. In the Mond lecture, although his whole academic life is devoted to intelligence testing, he provides a surprising conclusion: “I not only think that every sufficiently intelligent child is entitled to a higher education, but I think it would be in its own

interest for the State to strain every nerve to see that he got it, and got it if possible in a way which would not create social differences based on intelligence, in the same school as his less intelligent comrade.” The changes brought about by comprehensive schooling in the UK, and the huge increase in the proportion of the population attending universities, are in line with Thomson’s egalitarian preferences. Note that, above all else here, is Thomson’s desire to see universally-applied, individual justice in educational opportunity and an end to the separation of children with different levels of intelligence into different educational establishments.

Intelligence and truth

If what has been discussed above had been the content of Thomson’s lecture, he would have surprised his audience and generations of critics of intelligence testing. His strong views on educational and social justice are not the expected ones from someone at the centre of the intelligence testing movement. Using the tool of the so-called elitists, his wish was for a more fair and broadly-educated society. Next, though, he branches out even further, and takes intelligence into new places, making it relevant to truth, character, and civilisation. Thomson is a humanist—sometimes called a classical humanist—with wide education, and he sees education as based on moral and substantive areas. He chooses to work in Moray House on mental testing because he has this wide view. He is not a technocrat; his aim is a better world. In his coverage of the history of civilisation, he sees intelligence as a driving force for good; the worship of truth is the function of intelligence, and civilisations advance when they worship truth. Of course, in a time that had seen the science-fuelled devastation of The Great War (later known as World War I), and the rise of more highly technically sophisticated armaments in the hands of bellicose nations, Thomson felt obliged to defend the understandable idea that the state of the world was, in fact, the fault of intelligence and education. He refutes this by seeing that it is the power of nationalistic rhetoric to distort the

advances of science that is dangerous; thus he says, “Poets [*implying propagandists generally*] are far more dangerous than scientists.” Ultimately, he is realistic about science, especially the embryonic nature of the social sciences; we are still in Plato’s cave, staring at reflections.

Intelligence and character

Thomson next takes on the objection that good character has been more important to the development of civilisation than intelligence. He had considered intelligence and character together in his early book on educational psychology, written from his 1923-1924 lectures at Teachers College in New York (Thomson, 1924). His conclusion—indeed these are the concluding three sentences of the book—then was,

A certain type of character can almost be guaranteed by a school if it has pupils long enough, but not a level of intelligence. It seems to be the function of the teacher to form character and find out about intelligence. In so far as he can influence the latter, he will do it through the former. (p. 277)

Thomson’s opines in the Mond lecture that “the tendency is for a correlation of intellect with good character.” Although he admits exceptions to this general rule in the next section, his opinion is that, in general, “self-control and tolerance which, in the main, go with intellect, good points of character.” This view is supported by some more recent evidence, if we extend character to include social attitudes. More intelligent people hold more enlightened social attitudes (Deary, Batty, & Gale, 2008). Thomson’s statements here are similar to Lynn’s (1996) identifying intelligence and conscientiousness as the hallmarks of more developed and successful people and nations. Thomson was a man of his times and he uses some old fashioned language, such as when he states that, “civilised man differs from savage and barbarian.” The clearest statement of Thomson’s ideas is in the following extract,

Intellect is, in the main, necessary to character, or at least is its accompaniment....

The intelligence must of course be fed with a good education. I do not mean an education of the character, which invariably means indoctrination with some code or other, but a good intellectual education. The Soul is to be *turned* from the world of becoming to that of being by a true art of education.

Education is what can save people from intelligence applied to bad ends. For Thomson, intelligence, education and law-abidingness go together (cf. Herrnstein & Murray, 1994). It has to be admitted, though, that Thomson's contemporaneous empirical evidence for this—based on the US States and the countries from which the high-scoring testees in the Army Alpha exam originated—is at best weak.

Irrationalism today

Thomson ends with a then-topical and political section. He again goes back to Plato and compares Plato's concern that there might not be enough people of sufficient intelligence to run the society, with his own concern about deprived people of high intelligence who have not been educated toward good character. Thus, the successful society nurtures intelligence, wherever it is found. He ends with two resounding paragraphs. The penultimate one is an appeal to intellect over emotion and unreason in decision-making. He regrets the fact that people in administrations are selected on grounds other than intelligence. He argues forcefully that people can agree only when intellect is the arbiter; if, on the other hand, the arbiter is sentiment or propaganda, this serves only to keep "partisans" together and peoples apart. He mentions how the selection by criteria other than intelligence happens as administrations change in the USA (based on allegiance to political parties), but his main target appears to be the fascist countries in Europe. Thomson had rehearsed these ideas in a lecture given one month earlier at a conference on 'The social sciences: their relations in theory and teaching,'

held from 25th to 27th September, in London, under the auspices of the Institute of Sociology.

Thomson (1937c, p. 145) had stated that,

The movement called Irrationalism has during the last decade attained a strength and volume in some continental countries which is astounding and which is I find not appreciated by many in this country whose reading does not keep them abreast of continental currents of thought. It is associated with vituperation of the *Aufklärung* [enlightenment], with the expulsion from centres of learning of those who serve the intellect, with that *Trahison des clercs* of which Julien Brenda writes [see below]. It seems almost certain that its mainspring is fear, fear of materialism, fear of communism, fear of the loss of vested interests, and fear of those intellectual fanatics who have over-much faith in their own finite reasoning powers.

The final paragraph of the Mond lecture is a small sermon on the civilisation-saving nature of intelligence and its cultivation via education. It is easy to view Thomson as a rarefied statistician, or as an industrial-scale producer and purveyor of mental tests. But the boy whose life was changed by the discovery that he was intelligent never forgot that, and it shaped his life's work (Vernon, 1962). His work at Armstrong College and Moray House had been evangelical and egalitarian, rather than elitist,

The only hope for unity, permanent unity, among mankind is through the rule of intelligence, through the cultivation, by an education proper to each, of the intelligence of all. The schoolmaster is right who considers that his sole business is to lead his pupils to see truth clearly, and who holds that this is in itself character-training, and the only character-training the school may lend itself to, if it is to refrain from serving party or class, colour or race, or prejudice of whatever kind, but is to serve civilisation and all mankind.

Thomson's Ludwig Mond lecture used the concept of human intelligence as a linking force for good in humanity and civilisation. It was book-ended with two affronts to civilisation: the clever individual from a poor background who does not get the education their mental capacity merits; and the madness of fascist states in Europe, destroying civilisation by relegating intelligence while promoting nationalist sentiment and propaganda. P. E. Vernon's (1962) encomium on Thomson's achievements in intelligence and education concluded that, "There can be few men who have devoted all their talents more consistently and more selflessly to the pursuit of an educational ideal" (p. 137). The lecture that follows is a unique look at the landscape behind the ideal.

Thomson's lecture is now printed verbatim. We have preserved the content of his footnotes too. Where we have added explanatory notes to the footnotes, our additions are in square brackets. Where we have added explanations that did not coincide with a footnote, we have given these as additional endnotes.

Intelligence and Civilisation

A Ludwig Mond lecture delivered at the University of Manchester on 23rd October 1936

by Godfrey H. Thomson

1. Introduction

When I was asked to name a subject for this lecture, my first thought was to use the occasion to tell my audience in entirely non-technical terms something of the work which has been done during the past three decades in the endeavour to measure intelligence, to define what it is, and to analyse it into its constituents if that be possible. Something of this I still intend to do, for one cannot well discuss Intelligence and Civilisation without asking oneself what each of them is. But as I thought further over the subject of my lecture I remembered the motives which had first led me to take an interest in the measurement of intelligence and which have continued to keep me at work on it. Those motives arose out of the observation that our educational system, through its secondary school scholarships, often favoured the well-taught or at least well-crammed mediocrity of one school at the expense of the clever boy of another school: for example, favoured the boy from a large and well-staffed suburban elementary school at the expense of a boy from a small and remote country school, where the only teacher had too much on his hands to have time for specialising in scholarship-winning, and where, since there was but one teacher, it was to a great extent a matter of chance whether the child enjoyed good teaching or suffered under bad. In a heterogeneous county like Northumberland, including suburban residential districts, large mining areas, and sparsely populated dales, it had been found that many schools in the latter two types of district simply made no attempt to enter children for secondary school scholarships, well knowing that they had no chance. We introduced intelligence tests in the hope of righting this injustice to the individual, and to an increasing extent by this and by other means it has been in some measure

righted, and the intelligent children have more and more efficiently been selected and assisted to obtain secondary education. The motive was individual.

But as the years have gone on, the other side of the old problem of the individual and the community has also never been far from my mind, and I have asked myself, as I have also often enough been asked by others, whether we are doing the right thing both for the individual and the community when we thus take pains, through the medium of our educational system, to direct children of different degrees of intelligence into different types of school.

Tonight I want to discuss this. It is my faith that we must do individual justice. But it is our duty to do so without wrecking civilisation or hindering its progress, if we can choose between methods. For anyone who hopes, as I do, that furthering the education of intelligent children also furthers civilisation, it is necessary to ask about the dependence of civilisation on intelligence and about the relative importance, to civilisation, of intelligence and other qualities. We have seen in the years since the Great War a remarkable movement away from a belief in intelligence, in more than one European nation; a movement which can find nothing worse to say about a man than that he is a late-comer of the century of the Illumination¹; a movement which preaches Irrationalism and decries the Reason; and those of us who feel opposed to that retrograde movement have a duty laid upon us to show how much civilisation has owed to intelligence.

¹ Krieck calls Herbart “der Spätling der Aufklärung”, a remark which I confess appears to me an undeserved compliment to Herbart, but was not so intended. [Krieck was a Nazi educational philosopher. ‘der Aufklärung’ = the Enlightenment.]

2. Intelligence

I turn first, however, to the definition and measurement of intelligence, a province where also there have been controversies, though not such soul-shaking controversies as are likely to split the world to its foundations. It is one of the peculiarities of the idea of intelligence, and has often been made a reproach to those of us engaged in endeavouring to measure and analyse it, that it is difficult to define. Some of the difficulties are, I think, due to trying to define “intelligence,” and diminish when we confine ourselves to defining “intelligent” behaviour or thought. The noun intelligence tends to invoke the idea of some entity called intelligence, whereas the adjective intelligent, more correctly, merely calls attention to an attribute of behaviour – for sooner or later thought finds issue in behaviour, especially if we include speaking and writing under behaviour – and although we cannot define intelligent behaviour briefly, we can enumerate some of its symptoms.

Before there can be intelligent behaviour there must be some purpose to be achieved (though it may be a very general and vague purpose and only become clearer as the events succeed one another), and the behaviour has to have the appearance of being directed towards that end in such a way as to achieve it as quickly, as economically, as cleanly as possible. By cleanly I mean that the behaviour, in solving the given problem, must not unnecessarily create others, though it will lead on, through this problem, to others beyond. By economically I mean not merely of time or of energy, but in the sense of solving simultaneously many similar problems and not leaving the work to be done afresh on each occasion.

We do not call behaviour intelligent if it has been learned by training—in the sense of rewarding certain overt actions and punishing others until the desired set of actions comes to be exclusively performed—as by a performing seal, or an indoctrinated partisan. Here I come

upon a distinction which is very important for me, for in a certain sense I think that almost all our behaviour is due to training by reward and punishment, and yet I do not think that almost all our behaviour is unintelligent—though it would not, alas, be altogether hopeless to defend that thesis in the world of today. The difference is that I do not call a piece of behaviour intelligent until some at least of the trial and error involved is done inside us, by means of images or words or some kind of proxy for the actual behaviour. When a chicken is shut up in a simple maze and supplied with a motive for escape (loneliness will do) it does ultimately escape, by the process of running hither and thither until it chances to escape. If it is repeatedly shut in the maze under the same circumstances as regards motivation, it will in time come to take the correct path, without any digressions into blind alleys. But its action is not then to be called intelligent. On the other hand, when the unpractised townsman is faced with the unfamiliar task of driving a flock of sheep along a road, we call his action intelligent if on seeing an opening in the hedge some little distance ahead he sends a boy to guard it until the sheep are past. It would have been unintelligent to let the sheep first go in and then drive them out. It is intelligent to see them first go in in the mind's eye, and take steps to prevent it. Actual behaviour has been short-circuited by internal thinking. On a higher level the problem confronting the man may be more and more difficult, but the principle is the same – imaginary or symbolic behaviour replaces actual, and to the extent that he is capable of this, the man is potentially intelligent.

An example from a more abstract province of thought may illuminate what I mean by internal trial and error. I may satisfy myself by actual individual trials in repeated instances that the sum of the series of consecutive odd numbers beginning with unity is always a perfect square; thus 1, 3, 5, 7 give 16, the square of 4. I shall probably do the earlier examples in my head, but the later ones on paper. Human curiosity will make me want to see this remarkable fact

more as a whole, want to prove it, as we say. In endeavouring to do so I shall again carry out plenty of trial and error, both in my head and on paper, the latter mainly to complete trials suggested and begun mentally. The algebraist, from his training, will at an early stage be led to reverse the series and add it to itself, and thus see that every pair of terms gives the same result, whence he will soon arrive at a proof. The Greek mathematicians saw the same truth in a more direct fashion by thinking of each square number as a square of dots, each of which squares is made into the next larger by adding an L-shaped row of dots along the west and along the south side of the preceding square, which new set of dots will clearly be the next odd number. Thus the square 2×2 is enlarged to 3×3 by adding an L of 5 dots (2 on the west, 2 on the south, and one in the corner – it is the one in the corner which makes it odd); this 3×3 square is increased to 4×4 by adding an L of 7 dots, and so on. The modern accountant would probably see, in his special way, that the average of consecutive odd numbers is equal to the number of them.

This is of course very incomplete, but time forbids me to illustrate and to delimit further. I will only add that if to the power of making internal trials we add a trained habit of making many, and accepting or rejecting according to the imagined consequences, we have, I think, got the major parts of the definition of intelligence in action; and I will add also that I think this power and habit mainly dependent, on its physiological side, on the actual number of elementary connections which the nervous system can make, and has practised making.

Whatever this intelligence is, there have been those during the present century who have ventured to endeavour to “measure” it. When philosophically examined the measurement turns out to be no more than an ordering of magnitudes, even if it is that; but then still deeper philosophical examination might, and I think would, show that the same can be said of

physical measurements.² The “unit” used has been either the amount by which an average child grows in intelligence in one year, or the statistical unit of the standard deviation of the intelligences of a number of children all of the same age. In the first case, it is a mere assumption that the mental growth from 5 to 6, say, is equal to the mental growth from 6 to 7. Indeed everything points to this not being so. In the second case there is similarly no guarantee that the standard deviation remains constant from year to year, in real mental units. In late years there have been some heroic attempts, notably that of Thurstone³, to arrive at an absolute zero and true mental unit of intelligence, attempts which depend in the main on the assumption that intelligence, if measured in real mental units, should be Gaussian in distribution; but they are not very convincing.

Yet in spite of the absence of a universally recognised definition of intelligence, and in spite of the very unsatisfactory foundations of its system of units, the measurement of intelligence has become more and more practicable and practised. Perhaps an analogy with the measurement of temperature will show how this can be. In the ordinary thermometer we have an instrument with a quite arbitrary zero, and which shows in actual fact the expansion of mercury in units marked on a glass tube. There is grave difficulty in believing that the change in our feelings of warmth is the same when the thermometer rises from 6° to 7° as when it rises from 66° to 67°. We have no guarantee that the mental units bear any fixed ratio to the mercury units. And I defy anyone to define what temperature is, in the mental sense, any more easily than he can define intelligence. Yet we find thermometers in practice very useful.

Finally, before turning away from this very sketchy account of the measurement of intelligence, I may be permitted to note the pioneering work of Spearman in trying to base the

² See *The Essentials of Mental Measurement*, by Brown and Thomson, end of Chapter I.

³ *Journal of Educational Psychology*, Oct 1925 and Nov 1929.

whole study on the one hand on experimental researches followed by mathematical deductions, and on explicitly stated “noegenetic” principles on the other. As it is well known that I have opposed some of the views of Spearman, perhaps too I may be allowed to delimit the extent of my disagreement⁴. Spearman, having noted empirically a certain relationship between the correlation coefficients of scores in mental tests, based upon this a theory of Two Factors—to which later a number of auxiliary Group Factors were added—the principal factor being “g”, usually identified with intelligence, though Spearman himself is careful to avoid naming it except by a letter. The analysis of human ability into these factors can be carried out by methods devised by Spearman and his school, or by other methods, mathematically but not philosophically different, devised by Kelley, Hotelling, Thurstone and others. My opposition is based on the fact that the analysis is not unique, but that innumerable alternative analyses are possible, all fulfilling the experimental conditions; and further, that among these alternatives is one which is intrinsically more probable than the others, an analysis not into large discrete factors but into innumerable bonds grouped in intermingled ramifications, the mind in my view being an integrated whole, though with aspects, not a bundle of factors. But it is impossible to do more than mention this controversy here. I must turn to the intelligence as we roughly estimate it by our actual examinations and tests, and to the way in which our educational system in England acts as a selective agency in furthering the higher education of the more intelligent.

3. The Educational Sieve

England has always had a scholarship system designed to assist clever poor boys to obtain a higher education culminating in a university degree. The system has been recently described,

⁴ See my paper “On Complete Families of Correlation Coefficients, etc.,” *British Journal of Psychology*, July 1935.

in its historical aspect, by Sir Michael Sadler in a scholarly and well-documented essay.⁵ Since the Balfour Education Act of 1902 this system has been enormously broadened, in its lower reaches, by the institution of Free or Special Places in Secondary Schools for both boys and girls, awarded on an examination held usually within six months of the child's eleventh birthday. About 40 per cent of the children in our English Secondary Schools thus pay no fee, or only a very small fee. (The others, called fee-payers, pay usually about £9 per annum, which is about one-third of the running costs.) The object of thus assisting clever children to a secondary education, leading perhaps to still higher education, is not often explicitly stated. The actual motive of many who share in furthering the movement, whether by their votes as constituents, their actions as Town or County Councillors, their contributions to the force of public opinion, or in any other way direct or indirect, is mainly, I think, a desire to give the individual poor boy a chance of getting on in the world. The equally laudable desire of keeping up the supply of educated persons needed by the community in its administrative services, in its professional classes, and in the ranks of technical workers, is in the background. It is a motive often stated by pious benefactors, but not, I think, very prominent in the minds of administrators or of those who take an active part in the public life of our cities and counties. They tend to view the matter as giving the individual his chance, not as assisting the community by providing it with trained intelligences. Indeed there are not wanting those who openly state that the community is getting more trained intelligences than it can deal with. These are undoubtedly taking a communal view, and presumably would wish to reduce the provision of higher education, at least of higher academic education, to conform with their notion of the community need. They might, however, desire on the other hand to increase the provision of technical schools and to facilitate the vocational education of clever boys who could be directed into engineering or textiles or shipbuilding or what not. The main

⁵ *Essays on Examinations*, Macmillan, 1936. [This is one of the reports of the English committee of the International Examinations Inquiry (see Deary, Lawn, Bartholomew, 2008).]

motive of such views is the communal one. True, those who hold them might and probably would claim that John Doe and Richard Roe would be far happier as mechanics in overalls than as clerks in white collars or teachers in black gowns, but their main motive is communal.

The first problem on which we have stumbled is then the question whether every sufficiently intelligent child is entitled to a higher education, or whether the State has a right to set a limit, if it can only use a certain number of such educated intelligences. Three subsidiary questions bound up with the main problem are: (1) How many educated intelligences does the modern community need, and in particular how many university graduates can it absorb? (2) To what extent does each sufficiently intelligent child at present actually have the opportunity to proceed to higher education, or to speak definitely, to attend a secondary school? (3) What is the distribution of intelligence among mankind, and is intelligence an inborn or an acquired quality?

Obviously we cannot debate at length all the questions which arise, and the third of these I shall dismiss arbitrarily by giving the view of most psychologists that individuals, at birth, do differ considerably in potential intelligence, and that the actual differences of intelligence observable in adults are, to at least one-half of their extent and frequency and perhaps more than one-half, due to these inborn differences. The scatter of intelligence among children of 10 years of chronological age is such that about one-quarter of them are mentally 11 years of age and more, and ten per cent of them are mentally 12 years of age and more. Something like three per cent of them are 13 years and more old mentally, and a few of these three per cent will even exceed 14, 15, 16 or 17 years of mental age, although their chronological age is only 10. In short, the scatter is very great, and is certainly in part innate.

Do those children who are sufficiently intelligent all have the opportunity of secondary education? The answer to this is certainly no, whatever boundary we assign to the intelligence necessary to profit by a secondary education. Fifteen years ago, in the course of some extensive experiments in Northumberland, I took occasion to remark that were the secondary school population to be suddenly annihilated it could at once be replaced, intelligence quotient for intelligence quotient, from the children who had remained in elementary schools or had gone to work in the mines or elsewhere. But it could not be replaced twice. In other words, in Northumberland in 1921 only about half the children with the requisite intelligence actually entered secondary schools. There has been a very considerable advance since that date in Northumberland. But in the main the statement is still approximately true for the country as a whole, and it has been in particular verified for London by a recent research by Gray and Moshinsky.⁶ Something like one-half of even the most intelligent children—indeed more than half, if Gray and Moshinsky are right—are denied the opportunity of secondary school education. It must not be too hastily assumed that they are denied it by hard-hearted Local Education Authorities who do not supply a sufficiency of free secondary school places. There are certainly other reasons: for the category of children who do not enter secondary schools includes substantial numbers of the very highest ranks of intelligence, who undoubtedly could win free places if they tried, and many of whom indeed have won free places but have not accepted them. Denial of opportunity arises from other factors of our social system; from the desire of parents that the children should go to work at once; from the fact—an unfortunate fact I think—that a secondary schoolboy cannot usually be apprenticed to a trade, since that, in many trades, must be done before the age of sixteen; from the need for a boy to enter his father's shop or business as soon as possible; from the boy's own distaste for further bookish study and his natural desire to get to "a man's work"; and so on.

⁶ *The Sociological Review*, April 1935.

The situation in Scotland is different. Proportionately to population, more than twice as many children enter secondary schools in Scotland as in England. The wastage however is very great, and by 16 years of age the numerical difference has almost disappeared. The Scottish children who leave a secondary school early have obviously had the opportunity of a higher education, in the sense that a place in school was open to them. It should be added that after 16 years of age the Scottish superiority in numbers reappears, owing to the exit from English school after the First School Certificate examination, not held in Scotland. There is only one examination in Scotland, taken on an average at 17½. Exactly twice as many Scots as English (proportionately to population) proceed to a university.

In England, then, only about one-half of those children who are intelligent enough to profit by it go to a secondary school, but the factors which deny this opportunity to the others are at least as much sociological as educational. The best way in which our educational administrators could help to prevent this denial would be by offering more alternative courses in the secondary schools, and by endeavouring to arrange with trade that years in a secondary school (including years in academic courses) should count as part apprenticeship, or at least that apprenticeship should not be denied to a secondary school boy because he has passed the usual age.

But we have still to face the chief of our three subsidiary questions, viz., how many educated intelligences does a modern community need? Now for my own part I reply to this without hesitation with the answer, as many as it can possibly get. It all depends on what is meant by the word "need". A modern nation can in a certain sense get along with fewer university graduates than England turns out today, and might be embarrassed by an over-supply, as is

said to be the case in some countries, and even in our own country by some. But there seems to me to be a far greater danger in turning out too few than too many. Not only would those services which require university graduates be starved (among which services we in Scotland count the elementary branch of the teaching profession). There would also be the split in the nation between the educated and the uneducated, which means, if not civil war, then a state of disguised warfare. We are about to raise the school age to 15 in three years' time. It is my own opinion that, if we are to survive, we shall have to raise it a great deal further than that during the coming few decades, or at least raise, if not the compulsory school age, then at least the age up to which free education can be claimed if it is desired. It is not generally realised in this country that in most American States of the Union, in addition to the compulsory school age, there is such a permissive school age, usually 21, embodied either in the State's constitution or in its laws. One of the results of the depression of four years ago was that the "children" of 18 and 19 years of age who had finished High School in America simply declined to leave, and the headmasters were embarrassed by large classes of ex-pupils; the schools in fact began to grow unofficial Junior Colleges on top of their orthodox structure.

I have just said that I fear a split in the nation between the more educated and the less educated. This does seem to me to be a very real danger. It is the danger of Plato's "two nations" in another form. "Such a state is not one, but two states, the one of poor, the other of rich men; and they are living in the same spot and always conspiring against one another" (*Republic*, 551D, Jowett). Substitute "elementary scholars" for poor, and "secondary scholars" for rich men, and you have a dichotomy every whit as dangerous.

That is why I regret the forking of the ways in England, at the early age of 11 years, into elementary and secondary education, and why I prefer the American system of one High

School for all. I know that a common reply to this is to point to the lower standards prevalent in American High School and College education, and to attribute these to the dilution of talent which occurs when the less intelligent are mixed with the more intelligent in one school. But while admitting the lower American standards I do not attribute them to this cause. For in Scotland, where I think no one can complain of lower standards, there is also a very considerable approach to the common secondary school. I have already said that more than twice as many enter, one reason being that entry is by qualification, not by competition. In theory at least, and in most parts of the country in practice as well, every child who passes the qualifying examination, at whatever age, is entitled to free secondary education; and more than three-quarters of the child population do qualify. If only one-quarter enter secondary schools, that is caused by other reasons, regrettable, but not so likely to engender bitterness: as the long distances which necessarily separate secondary schools in the sparsely populated Highlands and Islands, or family reasons, or the provision of “Advanced Divisions” which (at least in the cities) give as good an education as the secondary school though with a different bias – in some places, and this is in my eyes best, they are in the same block of buildings and under the same headmaster as the academic secondary school.

But although I think of the common High School as the ideal, I am practical-minded enough to know that England will not open her present secondary schools to make them common High Schools, and I look therefore to the generous development of the free Central or Senior Schools to perform this function. But this will only be if these schools are made more equal to secondary schools in the amount of money spent on their buildings, playing fields, equipment, and teachers, and if it becomes somehow possible, without chaining them to examinations, to reach a university through them, which will probably come through admission to faculties of commerce and of applied science, as the German *Realschule* got its first footing in the

university, and as the product of the French *Ecole primaire supérieure* can get in by the doorway called "P.C.N."

In answering the subsidiary questions I have, I imagine, betrayed my opinion on the problem itself. I not only think that every sufficiently intelligent child is entitled to a higher education, but I think it would be in its own interest for the State to strain every nerve to see that he got it, and got it if possible in a way which would not create social differences based on intelligence, in the same school as his less intelligent comrade.

4. Intelligence and Truth

For the history of the advance of civilisation has been the history of the conquest of the world by intelligence. The most astonishing example is of course the rapid advance during the sixth, fifth and fourth centuries B.C. in Greece, when not only the beginnings of our modern science were made, but the beginnings of our ideas of government, of economics, and of philosophy. Many factors no doubt contributed. The city-states of Greece were in sheltered valleys separated by mountains, or on islands. But these valleys were not so sheltered as to be immune from trouble and war. The Greek civilisation grew first and mainly in Ionia, where their new and vigorous race came up against earlier civilisations and learned from Persia and from Babylon; or in Argos, where their first-comers found a Minoan civilisation. But history shows plainly enough that although there is something in this, yet it is not an infallible recipe for progress to bring vigorous primitive races up against an older civilisation. No, clearly the main cause must lie in the intelligence of the Greeks. Terman of California has estimated the intelligence quotients of great men of a more recent past. I wonder at what level he would place Thales of Miletus, Herakleitos of Ephesus, Pythagoras of Samos and Kroton, Socrates, Plato, Aristotle.

Nor are the troubles of civilisation today caused by over-much intelligence or over-much education, but by over-little. It is not because intelligence has made travel quicker, has made it possible for one man to speak to millions scattered over the whole globe, has made production easily catch up to and far surpass the geometrical increase of population which scared Malthus. It is not because we have too many scientists and too few poets. Poets are far more dangerous than scientists. I heard and admired and was much moved by Mr. Baldwin's Cambridge address to the Congress of Universities of the Empire: but on reflection I did not agree with it. Rather do I think with M. Julien Benda in *La Trahison des Clercs* when he says: "Ce qui étonnera surtout l'histoire dans ce mouvement des clercs, c'est avec quelle perfection ils l'ont exécuté. Ils ont exhorté les peuples à se sentir dans ce qui les fait le plus distincts, dans leurs poètes plutôt que dans leurs savants, la poésie étant infiniment plus nationale, plus séparante, comme ils l'ont bien su voir, que les produits de la pure intelligence."⁷ Scientists have unwillingly and sometimes unwittingly supplied warring mankind with means of destruction, but they have not preached the doctrine. Civilisation has advanced just as much as it has worshipped truth, and has been rewarded by finding that beauty and the graces follow in its train; and the worship of truth is the function of intelligence. You may expostulate that the science of the nineteenth century brought ugliness and destroyed beauty. But that, we may surely hope, was only a passing phase due to the velocity of change, and the very fact emphasises still more urgently the need of trained intelligences to understand this changing world and to guide it aright. Take for example finance, capitalism, money. Men of

⁷ Edition Grasset, p.102. [Translation: 'What will be retained in the history of that agitation from the clerks (or, members or 'le clerge' who are the priests) is with what perfection they executed it. They exhorted the populations to appeal to what make them the most distinctive, to their poets rather than their scientists, poetry being infinitively more national, more dividing/distinctive, as they well understood it, than the fruits of pure cogitations.' Julien Benda (1867-1956) was a French philosopher and novelist and used the phrase 'trahison des clercs' to describe the betrayal of intellectual values by the right wing. It indicates generally, the dangers when academics are too closely associated with political interests, because that undermines their independence which is needed for open public discussion. *Trahison des Clercs* was published in 1927 and an English version, translated by Richard Aldington, appeared in 1928 under the title, *The Great Betrayal*.]

affairs have to grapple with their mysteries as well as they can, like the doctors of the Dark Ages fighting disease, heroically but blindly. What is wanted is knowledge, classified, generalised, tested; and with understanding will come the cure. Intelligence has in the past made striking steps forward in this matter of finance; the invention of metal money, of drafts on distant treasuries, of joint stock companies, limited liability, cheques, and so on. We ourselves have lived through a period of experimenting with money, with commodity dollars and registered marks and what not. Intelligence, which *is* experiment, but experiment done as much as possible inside the mind, will find the solution, and *only* intelligence: and unless it does so, the graces will have to beg their bread or earn it in misery and in sin. And it will only find the solution if it works for the sake of the truth only, not for any party or country or cause. Despite M. Charles Maurras, *L'avenir de l'Intelligence* [see endnote 1] is not to be the servitor of nationalism, and scientists and philosophers must not commit that *Trahison des Clercs* which M. Julien Benda so bitterly and brilliantly bewails.

In passing, I may note a contradiction between pragmatism, for which in many respects I have a regard, and this belief that intelligence must serve truth only; for to the pragmatist truth does not exist waiting to be found, but is in the making. Pragmatism judges entirely by consequences, and would therefore judge intellectual work by its practical results, judging the eminence of a physicist by the application of his studies. Most men of science however chafe at the public demand for results, and believe that intelligence, in the persons of its most exclusive devotees, must serve no lower master than truth. Plato's philosopher came back into the Cave. In actual practice there are those who see the true Forms, and make no attempt to return to the Cave, and those middlemen who cannot themselves explore outside the Cave, but can go to the boundary Wall and learn at second-hand from the pioneers outside, returning

then to apply their knowledge within the Cave itself. This in physical science. In ethics and morality, which Plato had most in mind, I doubt if anyone has ever been over the Wall.

5. Intelligence and Character

And this remark brings me to the objection perhaps most commonly and immediately voiced in opposition to the doctrine I am preaching, the objection that in world-progress character has counted for more than intelligence. But here I have another heresy to confess to. I think that intelligence and character are positively correlated. Although a keen and well-trained intellect does not necessarily mean a good character; although there have been criminals of genius, and many good men of only moderate intelligence; yet the tendency is for a correlation of intellect with good character. It is in intellect that man differs most from the beasts of the field. It is in the use of intellect that civilised man differs from savage and barbarian. And just as bestiality and savagery are bad traits in character, so are the self-control and tolerance which, in the main, go with intellect, good points of character. If we think there has been progress in the evolutionary scale at all, then that progress has, up to the present, culminated in man: and man is essentially more *rational* than any other animal, as he is more praiseworthy in character. Men have bad characters. But it is also in man that the highest traits of good character are found, and they are associated, broadly and secularly, though not individually and definitely, with intellectual advance. Intellect is, in the main, necessary to character, or at least is its accompaniment. And although in my haste I called this belief a heresy, was I not mistaken in thus naming it? Is it not “more universally admitted than any other fact about him”⁸ that Socrates held the doctrine that “badness is, in the last resort, a form of ignorance” and that the reason, not the feelings, must govern. The intelligence must of course be fed with a good education. I do not mean an education of the character, which

⁸ Burnet *Thales to Plato*, p.168

invariably means indoctrination with some code or other, but a good intellectual education.⁹

The Soul is to be *turned* from the world of becoming to that of being by a true art of education. “And whereas the other so-called virtues of the soul seem to be akin to bodily qualities, for even when they are not originally innate they can be implanted later by habit and exercise, the virtue of wisdom more than anything else contains a divine element which always remains, and by this conversion is rendered useful and profitable; or, on the other hand, hurtful and useless.” And the way to turn such misused intelligence from ethically bad to ethically good paths is to introduce it, through a suitable and graduated education, to things which the intellect recognises as worthy of its steel, to difficult and abstract things; though what is difficult and abstract will of course depend upon the individual mind, and vary with it.

Luckily it is possible to refer those who demand experimental evidence to what is almost an objective proof of the positive correlation of character with either intelligence or education or both, in Bagley’s book *Determinism in Education*¹⁰ [see endnote 2]. This work was not written with that object; it had a polemical aim, directed against the doctrine that intelligence is entirely a matter of heredity and is measurable with fatal exactness at an early age, after which the child’s intellectual rank among mankind is fixed by an immutable doom, an extreme doctrine which Bagley had no difficulty in confuting, and which is probably held by no psychologist, though Bagley was no doubt justified in saying that the public misunderstood psychologists to say this. In the course of his enquiries, however, Bagley in effect proved my heretical assertion that intelligence and character go together. He first showed that intelligence and education go together, using as data the same array of facts as his opponents, namely the scores of nearly two million soldiers of the American army of 1917 and 1918 in an intelligence test, the “Army Alpha” Test. For the most intelligent soldiers came from those

⁹ See the *Republic*, 518 E and 519 A, Jowett’s translation.

¹⁰ Baltimore, 1925.

States in the Union, and in the case of immigrants from those foreign countries, which had in their boyhood the best educational systems. His opponents said that was because intelligent populations insist on good schools; Bagley, that good schools make intelligent populations. For our purpose the difference is immaterial. For he next went on to show that those States with the best showing in the intelligence tests (and also the best schools) were best in any of the ways in which one can objectively measure goodness of character in a community, for example had less crime of this or that sort. As I say, it is immaterial to me whether this is due to education or to intelligence, since Bagley shows that they go together; the only point of importance is that intelligence, education, and law-abiding go together, all three.

6. Irrationalism Today

It is true that Plato anticipated a scanty supply of persons endowed with the highest intelligence and also with exceptional reliability and steadiness of character. That is only natural. We must recognise with him further that reliability is often found apart from the highest intelligence, and that the latter is tempted to be impatient and unsteady. Discrepancies there will be, and yet these are not incompatible with a general tendency. I cannot really think that,—in such a state as his, and with such a first education, music and gymnastic learned in play and without compulsion, amidst scenes and objects of good taste, and with literature purged of its baser elements—he could seriously anticipate the occurrence of men, intelligent enough to have become true guardians, among his third class, kept there by lack of character, men who would have been a serious source of trouble and revolution. Nor I think need we, if we are at equal pains to give an equally good education to all. The way in which revolution *will* come to his city is, he thinks, through a neglect of the laws of eugenics, which will cause a scarcity of the highly gifted: and the less gifted then necessarily coming to power will

esteem education too lightly. The things really essential to the state are, a good first education to everyone, and a sufficient supply of the highly gifted, intellectually.

It seems then to be an extremely short-sighted policy of certain communities today to decry intelligence to such an extent as they do, to expel from their posts of office in the community and even drive away from the country intelligent men, not only because they hold opposed political views (that is perhaps understandable though I think wrong) but because they are neutral, because they are not active partisans of the governing political party. This seems incredibly stupid whether it is done by American party machines after a new election, or by dictatorships in Europe, and will surely revenge itself. The only province in which it can be confidently asserted that competent men who understand the problems will agree with one another is in matters of the intellect, where though there are different hypotheses in conflict at the boundary of knowledge, there is an ever-growing settled country of full agreement, and an undisputed referee, agreement with facts and with the laws of thought. In all other matters men disagree, or are brought to an agreement only by training, propaganda, sentimental appeal, factors which separate masses of mankind as much as they weld together partisans.

The only hope for unity, permanent unity, among mankind is through the rule of intelligence, through the cultivation, by an education proper to each, of the intelligence of all. The schoolmaster is right who considers that his sole business is to lead his pupils to see truth clearly, and who holds that this is in itself character-training, and the only character-training the school may lend itself to, if it is to refrain from serving party or class, colour or race, or prejudice of whatever kind, but is to serve civilisation and all mankind.

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Endnotes

1. Maurras was a conservative thinker of the far Right in France between the World Wars I and II, leading a group called Action Francaise. *L'avenir de l'Intelligence* (translation: 'The Future of Intelligence', published 1905) was a political tract, a "prophetic warning about the menace posed to intellectuals by the anticlerical banker regime of France" (Torrens, 1974). It called for the restoration of 'French intelligence', which had been debased by the revolutionaries, the romantics and late 19th century writers who 'prostituted' themselves for monetary gain.

2. Bagley was a professor at Teachers College, New York. Thomson would have met him during his year there in 1923-1924. Bagley was against progressive education and Deweyan pragmatism. Bagley disputed the fatalism implicit in mental testing, saying that once calculated a child's fate was effectively sealed. He argued instead that intercourse with environment played as important a part as heredity with a strong positive correlation between the two, such that improvements in environment produce a gain in intelligence. An article discussing the effect of cultural and social environment on intelligence test scores, including mention of Bagley's book and ideas, had appeared in the *Scottish Educational Journal* (SEJ) two weeks prior to Thomson's Mond lecture (Anonymous, 1936). The SEJ was published by the school teachers' trade union—the Educational Institute of Scotland—part of whose members' dues were used to fund the Scottish Council for Research in Education.

Figure captions

Figure 1

Godfrey Hilton Thomson (1881-1955), painted by Robert Westwater in 1950. (Photograph by I. Deary.)

Figure 2

Title page of the Edinburgh-printed pamphlet of Godfrey Thomson's Mond lecture.

Figure 3

Cover of the *Journal of the University of Manchester* in which Godfrey Thomson's Mond lecture is reprinted. This copy belonged to Thomson's son Hector.

Figure 1

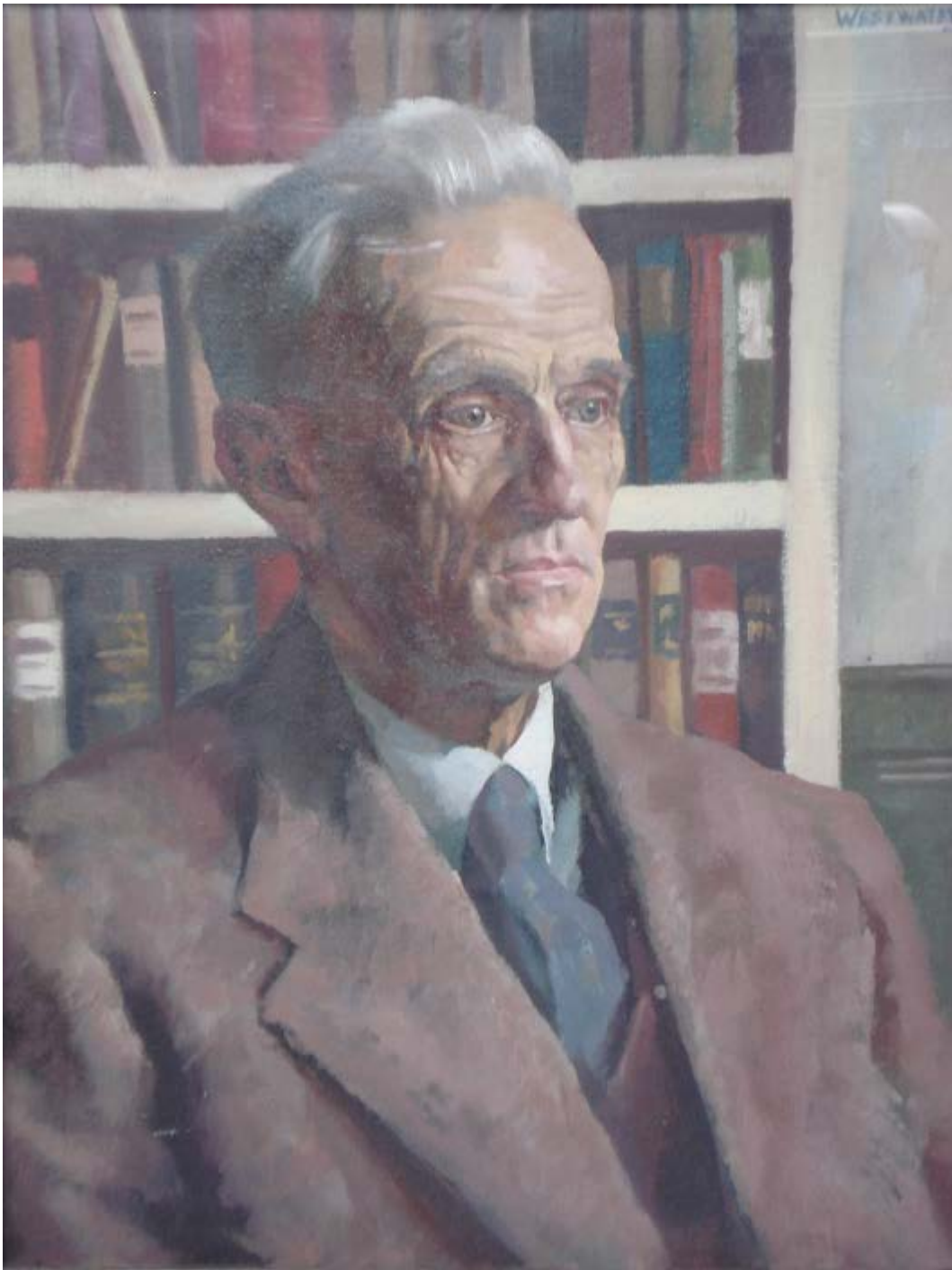


Figure 2

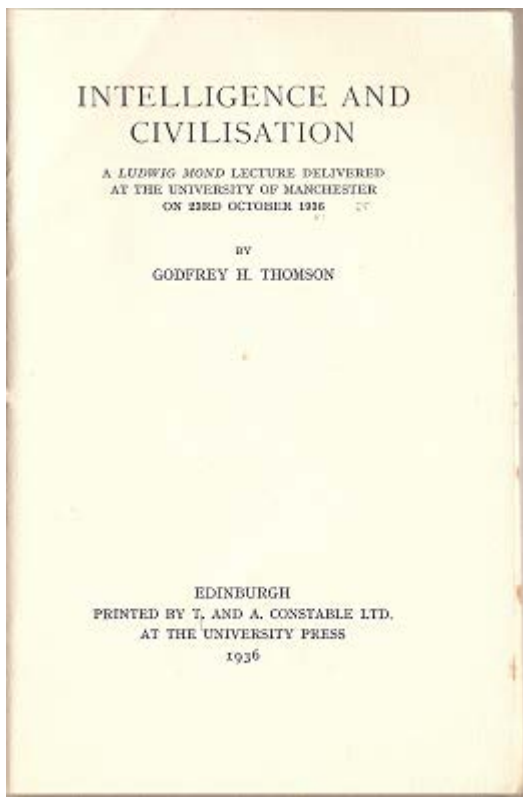
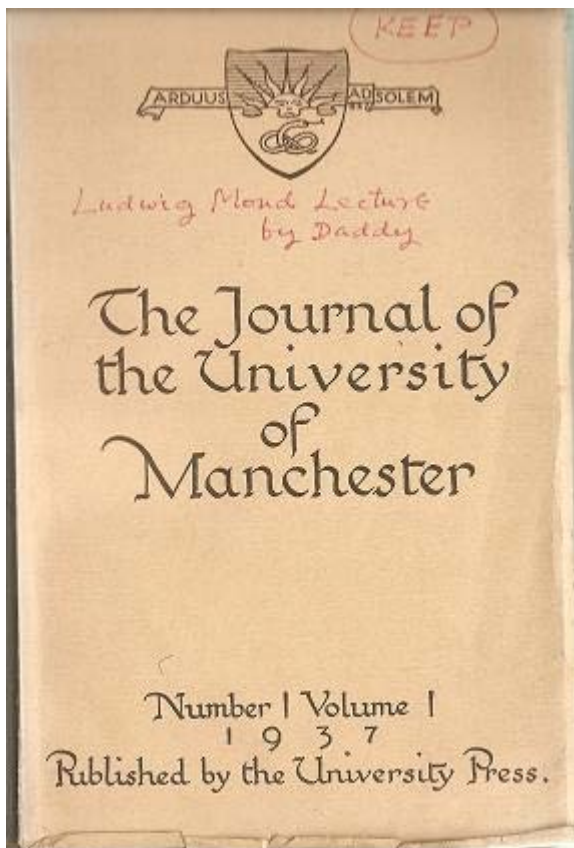


Figure 3



Appendix

Ludwig Mond and the Mond lectures

Ludwig Mond was an industrial chemist born of Jewish descent in 1839 in Kassel, Germany. After studying chemistry at Marburg under the supervision of Prof Hermann Kolbe & at Heidelberg under Prof Robert Bunsen, Mond moved to the UK in 1862. He entered into partnership with Sir John Tomlinson Brunner, founding the great chemical manufacturing firm of Brunner, Mond & Co. Mond's interest in the production of ammonia led him, in 1879, to experiments in the economical utilisation of fuel and to the system of making producer-gas, which came to be known as Mond gas. Later, in 1889, Mond's experiments with his assistant Carl Langer led to the coining of the term 'fuel cell', by which they attempted to use air and coal gas to generate electricity. Through this process Mond discovered a new chemical compound, nickel carbonyl, described to the Chemical Society in 1890.

Mond was a generous contributor to the purposes of scientific research, his most notable contribution being the founding in 1896 of the Royal Society's Davy-Faraday Research Laboratory, which Mond founded, endowed and housed. In 1926 his son Alfred was instrumental in the merger of Brunner-Mond with three other British chemical companies to form the international giant, Imperial Chemical Industries (ICI), becoming its first chairman. On her death in 1923, his wife Frida Mond bequeathed money to Manchester University to set up the Ludwig Mond lectures in memory of her husband. The Mond lectures covered a wide range of topics including scientific subjects, arts and public affairs and occurred annually, delivered by two or three guest lecturers. Many of the foremost thinkers of the time were invited to give the lecture by the Ludwig Mond Lectures Committee, including Sir Edward Mellanby, Lord McNair, T. S. Eliot, T. H. Pear, John F. Fulton (the first American to be invited) and William McDougall. In 1936 there are records of two Mond lectures taking

place, the first on March 16th by William Macbride Childs on “The justification of Universities” and the second on October 23rd by Sir Godfrey Thomson entitled “Intelligence and Civilisation”. It is no surprise that Sir Godfrey was invited to give this lecture, given his growing stature in the field of intelligence testing both in Scotland and the world.

In recent years the Mond lectureship has taken on a different form more related to Ludwig Mond’s own career. In 1981 ICI, through an endowment to the Royal Society of Chemistry, established the Ludwig Mond Lectureship. This is a biennial award given in the area of inorganic chemistry with an associated prize of £500 and a medal, and the lecture is held in different locations across the UK.