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Education Tomorrow

What criteria can one use in order to judge the suitability of the content of education at any given period of time? Only, it would appear on reflection, those which have underlain all teaching of young people at all times in all places; namely judgments upon the effectiveness of their studies in preparing them socially, intellectually and economically for their lives as adults.

In most of the eras of the past, though not, of course in all, changes in the nature of society were sufficiently slow for the demands likely to be made upon the developing adult to be clearly envisaged. So education could be planned with these in view. First, there had to be the full appreciation of the past—the young person had to be steeped in the traditions and customs of the society into which he had been born. Secondly, he had to be helped to envisage the part which he would be expected to play when fully grown. Thirdly, he had to be given the necessary knowledge, and trained in the necesary skills, physical or intellectual, to be able to play that part.

Today, in a period of accelerating change, it is difficult to discern which of the wide range of human capacities will most be called upon in the adult of tomorrow. But, even without the gift of prophesy, we can see that tomorrow's adult, in whatsoever part of the world, will

(a) be subject more to the influences of mass persuasion and suggestion than at most other periods of human history in whatsoever society;

(b) have information thrust at him, almost from the cradle, by organizations which have no concern with his personal good or his fullest development as a sentient being;

(c) have longer hours free from subsistance toil than man, in general, has ever had before;

(d) be thrown into contact with more different races, colours and creeds than ever has been man's lot hitherto;

(e) be continually challenged to deal with the concepts of the infinitely large in space and the infinitely small of the particles constituting the nuclei of atoms.

Accordingly, we have to reshape the curriculum of the first ten or eleven years of schooling so that, at least to some extent, the adults of tomorrow will have been prepared for meeting the problems that they must face.

We may also consider that the time has come to rethink the aims and purposes of universities in relation to the effect of their courses upon the general outlook of their graduates. And, regarding European and British universities, we have to ask, "Is early and intense specialization of the best intellects going to prove a sound policy for the world of the future?" May it not be better to make part of every university course a disciplined examination of the forces shaping the destiny of man?

An attempt somewhat on these lines has been made since 1950 in the first year course at the University of Keele, Staffordshire, and several of the other new universities of England have set out to establish courses less irrelevant to the present and to the future than many of the traditional courses in the fields of letters and the humanities. But the straight-line thinking of the past has been hard to escape from, and it is probably true to say that the progress was more in the minds of the planners than in the realities which they have produced.

So far as the universities of the U.S.A. are concerned, the system of credits does not lend itself to synthesis and the famous early post-war Harvard Report on General Education, great though was its initial impact, has not led to a widespread change in the aims of under-graduate courses.

Thus there is little hope that the leadership for a change in the content of schooling, especially in secondary schooling, will come from the universities. And this reflexion is all the more disturbing since in many countries, and especially in Britain and Western Europe, it is the specialism of the various faculties and departments of the universities which, in the last analysis, perpetuate not only the fragmentation of secondary school studies but, very often, their irrelevance.

However, several channels of hope exist. In Britain the former Colleges of Advanced Technology, now wearing their ermine-edged robes as Technological Universities, and many of the Technical Colleges, now allowed to award degrees of the Council for National Academic Awards, are in the position to devise new courses and need not feel enslaved to the past. Indeed, they would be false to the members of the Robbins Committee that proposed this enfranchisement if they do not create courses which shall be truly relevant to the problems of the future.

Similarly, it is open to the new universities arising in the developing countries, often relieved of subservience to the patterns of the former colonial power by the economic and cultural assistance of other nations, to strike out on lines of their own. And because, very often, their economic and political impotency prevents them from taking sides in ideological conflicts, they should be able to organize courses which are nearer to the objective analysis of situations than can be built up where all-per-

vading affirmations arrange thoughts into definite patterns, like magnetic lines of force fixing the arrangement of scattered iron filings.

But the schools of today dare not wait for the downward seepage of ideas from universities whether overseas or at home. So bold innovations must be made among the schools themselves. And, fortunately, in most countries outside the communist ones, there are large numbers of independent or semi-independent schools where experiments can be initiated. (In some countries, too, there are official experimental schools run on public funds). Moreover, the independent schools have associations which might be led to see the valuable leadership they could give by grouped planning of new syllabuses rather than, as at present, all of them making their own varying, and often ephemeral, experiments.

Then there are in all countries, associations of teachers which have helped in the advance of ideas: outstanding among these must be the French group which, since 1945, has published the powerful reform magazine "Cahiers Pedagogiques."

Then, throughout North America, there are university schools of education which could link up in the establishment of high-level working parties on curriculum reform. Specially selected men and women would need to be released on salary from their respective universities for at least a year to work together (but bringing consultants from all over the world) in establishing principles which could be used as criteria for building curricula which, for the various ages, stages and types of education, would be truly relevant to the future.

And in other parts of the world there are educational organizations which, if the finances were available, might be grouped internationally in high-level working parties on the same quest, namely adapting our present ideas of schooling to meet the challenges of the future. These challenges will be numerous and great, but they will certainly include those listed (a)) to (e) at the beginning of this article. Let us, therefore, take these specific challenges one by one and consider how the content of schooling might be changed to meet them.

Clearly, the most fundamental and most important issue is the defence of the human mind against the ever-increasing concentric pressures of organized and unorganized mass opinion. These pressures are most vividly seen in the great nations where the socialist and capitalist economic theories are represented as for ever antithetical and irreconcilable, namely in the U.S.S.R. and China on the one hand and in the U.S.A. on the other. In the communist countries the control of opinion is by power from above; it is open, clear, constraining and irresistible. In the U.S.A. it is exerted by hidden or disguised forces, but it is none the less effective in achieving its object. In most other countries of the non-communist world the integrity of the human mind on this issue is rather less assailed by mass forces, but the hidden forces are still present and the almost general

suppression of news of constructive developments inside communist countries and the writing up of any item of information which can discredit them are but two examples of the way in which the anti-communist campaign works even in the most liberal countries of western Europe. Unfortunately, this absence of objective reporting on communism plays into the hands of extreme left wing groups and puts haloes around information which they obtain from communist sources. Indeed it causes the build up of illusion which only actual experience of life in communist countries could destroy.

All this makes more difficult the task of the educator. So, if one believes with that great educator of the inter-war years, the late Sir Percy Nunn, that "nothing good enters into the human world except in and through the free activities of individual men and women" then one is committed to defending the minds of children and of adolescents against "principalities, against powers, against the rulers of the darkness of this world," equivalent to those against which St. Paul wrestled nearly two millennia ago.

But *how* can schooling of tomorrow help to protect the individual mind from the ceaseless infringements of its neutrality in the face of fact? And protect it also from the forces which would determine, even from earliest childhood, its answer on matters which lie far beyond its powers of understanding? Firstly, at the early stages of childhood, by returning to the basic means of education which primitive man, where he still exists today, and at all times in the past, has used with success, namely the maximum development of his physical senses: "Get your pupil attentive to all the phenomena of nature," said J. J. Rousseau. "Let him never know anything because you have told it to him, but because he has grasped it himself. Don't teach him science: let him discover it. If ever, in his mind, you subsitute authority for reasoning, then he will cease to reason; he will be only the plaything of the opinion of others."

For nearly two centuries this remarkable expression of insight into the ways in which we have destroyed self-confidence and impeded the development of the independent mind in those we have set out to "educate" has been ignored. We have not realized how, in those whom we have educated most, we have created mental cowardice and lack of self-confidence by our praising them while young for mouthing the second-hand thoughts which they have absorbed from teachers and from books. We have honoured them for being the plaything of other people's minds. Worst of all, we have ourselves, we pedagogues, most of us, been the supreme examples of such playthings.

If the reader considers that this theme of the independent mind has been overplayed, let him turn to the opening chapters of J. K. Galbraith's *The Affluent Society* and read how, as playthings of other minds, the economists contributed to the sufferings of humanity during the depression

and the periods of tragic unemployment of the first forty years of this century.

The world of tomorrow will need independent minds and far more of them than ever before. The foundations of such independence—in those countries where school attendance is compulsory—will be laid—or destroyed—in the first few years of schooling.

Fortunately, Rousseau's approach to learning is now being used in the early stages of education in the best classrooms of many countries of the world and with children four or five years younger than Rousseau had envisaged. It should become universal, and the joy of discovery and of independent work should everywhere make the first years of a child's life at school a period of fascination and great happiness.

The independent work approach must, however, be maintained in the later years of childhood and throughout all stages of adolescence in the secondary school. Examinations of the formal written kind, requiring the regurgitation of information, must cease to exist. The out-of-dateness of the average textbook, and its inevitable restrictiveness, must be recognised, and learning must result not from cramming by a teacher, but from the pupil's own synthesis of information from the documentary films, the well-prepared television and sound radio lessons that he will see and hear, and from his consolidating and integrating this accumulation of knowledge and ideas by (a) discussion under the leadership of the teacher, (b) his own follow-up reading in the school library and (c) his activities in laboratory, workshop or at home.

There are several corollaries from all this. First, there must be proper development inside every school, including primary schools as the vitally important beginning, of guidance services to the pupils, whatever their age. The world knows now, as religious minds have long suspected, that the home environment into which a child is born, the influences which bear upon him in infancy and in the nursery years, and the manifold cultural factors of social environment are, for the majority of children, the real determinants of their intellectual development. Guidance services inside the school, working with welfare services outside the school, and bringing about the closest possible liaison between parents and school, are an essential part of any satisfactory educational system. Without this, a considerable proportion of the money spent by nations on education fails to achieve its object, as we can see today from the increasing proportion of juvenile delinquency among some Western nations that spend relatively heavily on their educational system.

Secondly, whilst schools will continue to give internal tests to evaluate teaching techniques and to stimulate the pupil in his self-evaluation, as Sir Griffith Williams, the Chairman of a great examining organization, wrote in 1956, "the function of examinations in the future will be to fit the right pegs into the right holes and for this purpose written examinations . . . are a poor instrument."

Thirdly, every secondary school must have a large library where up to about a third of the pupils, at any one time, may be found at work. They will need the help of trained teacher-librarians but the help should also be sought, on a voluntary travel-expense refund basis, of retired teachers, student alumni of the school, and of cultured persons generally. In the U.S.S.R., retired teachers and student alumni of the school give regular voluntary service to help pupils who need extra assistance. Unless the Western nations have lost the power of evaluation except in terms of money, it should not be difficult to recruit this type of assistance for the school libraries.

But even these will be different, in their content, from the normal library, for the standard tomes and the classics will be poorly represented, whilst up-to-date books of reference over the wide range of studies will be in plentiful supply. Moreover, because the speed of change in the world today is so great that many well-written books are out of date by the time that all the processes of printing and publication have been completed, there will be in the school library a vast array of pamphlet material, reports of committees and of pressure groups, the material which puts forward new ideas, or old ones dressed up in new clothes; material not generally to be found in book shops because the financial return on sale of such material is negligible. This material will be used by pupils in follow-up of discussions with their teachers, after living questions have first been presented by film, radio and television in a challenging fashion.

Yet this working school library of the future will be even more different from any normal school library by virtue of its multilingual collection of daily newspapers and weekly periodicals, ranging from popular scientific and artistic ones to others giving a cross-section of political opinion.

For the secondary school pupils of the future will all be capable of reading, or at least of perusing to advantage magazines in at least one language other than their own. That is because we know now, as we did not know a few years ago, that the proper time for a child to begin to learn a second language lies between the ages of six and nine, and that he should learn it by the "direct" method. Experiments with these age groups, and on these lines, begun in the U.S.A. by Harvard University more than a decade ago, and followed rapidly by others in many countries of the world, sometimes with extensive development of radio lessons, have met with great success. They have shown that such studies, far from holding back the development of linguistic ability in the mother tongue, tend to accelerate it. As a consequence, a powerful wave of enthusiasm for this development in the early years of schooling is sweeping the globe. So, within a few decades almost every ten-year-old child in the world will be able to speak at least one language other than his mother tongue, and others, including many West Africans, will speak two such languages. And almost every child in secondary school will be able to gain scientific and other knowledge through the medium of a language other than his own, with all the expansion of his outlook that this implies.

The implications of all this for the teachers are far-reaching, especially for the teacher in the secondary school. Since he will no longer be condemned to cram his reluctant pupils for their regurgitative examinations, he will not have to pour out, day by day and year by year, the same old information in the same old way. Instead, in his field of special study, whatever it may be, he will need to be not very far behind the advancing frontiers and to be learning continually from his University confreres. Of course, it will not be possible for him to teach more than perhaps 12 or 15 lessons per week when he is responsible for planning films and selecting the right radio and television programmes, and preparing himself widely at the same time for all the penetrating questions which will come from his pupils in the follow-up discussions. This will *not* mean an increase in the number of teachers: indeed, a decrease is desirable so that the profession shall be restricted to those who really are gifted for this work. During many of the school hours during which, on the existing system, teachers would be subjecting their captive audiences to the usual round of chalk and talk, the pupils of the future, often in groups of one hundred or two hundred at a time, with only one or two teachers present, will be learning from films or televised lessons. At other times they will be working on their own with teaching machines, or in language laboratories, or with videotape recordings of lectures and science demonstrations in carrels, such as have been developed in a number of places and pioneered at Grand Valley State College, Grand Rapids, Michigan. At present such aids do not bring about much economy of staffing, but technical advances are so rapid that we must expect this to take place.

Because of all this provision of books, periodicals and modern teaching aids, the school day, for the older pupils, will be longer and tomorrow there will be a higher proportion of older pupils in the schools. But there will be corresponding reduction in the hours of private study at home. This will be a great advantage to those many gifted pupils whose home conditions have not been conducive to study or thought. This longer school day might seem to imply longer hours per week for teachers, but this will not be the case, because all the control of the instruments for projection, for radio, for television, language laboratories, teaching machines and the like will be in the hands of skilled technicians. And, in addition, trained technicians will be available for all science laboratories, so that the teacher can devote himself fully to those effects upon the minds, outlook and characters of his pupils for which he is employed.

His relationship with the pupils will have changed, too. No longer will he be the main source of information: he will be the leader of a team of eager minds, trying to probe into the many problems of the world of their future adult life, a world so complicated, so bustling, so noisy, so crowded that the life of today may seem almost medieval in its stability.

Somehow, too, the teacher of tomorrow has to help his pupils, especially those without a religious background, to establish and maintain values "as touchstones by which questions of taste and morals are to be tested."

But he has also to meet challenge (b) and to assist his pupils to select, from all the information thrown at them by the mass media, that which is significant; he must show them how to penetrate the disguises of salesmanship and, in the Western World, where vast international financial tie-ups underlie the most innocent-looking enterprises, he must keep them aware of the deep currents circulating beneath the economic surface on which they live.

The challenge (c) regarding the proper use of leisure must also have a revolutionary effect upon school life, because no mere "stepping-up" of what is going on at present will suffice. The abolition of the written examination, which we have already postulated, will release, in a large proportion of pupils, creative abilities which have been smothered, atrophied or consciously suppressed by the doctrine that schooling and the acquisition of information are synonymous and have the same boundaries.

As the leading workers in the study of creativity have shown, the conditioning of teachers by examinations is such that they usually fail to recognize creativity when they meet it. Here is a relevant query from Guilford, of the University of Southern California, a pioneer in this field:

> And which children should be regarded as gifted? The current answer, at least in many places, is the student with a high I.Q. and with high grades (the two indicators usually strongly correlated). Such children may be those who please their teachers most because they learn rapidly under conditions that call for uniformity of thinking and acting within a group. The more creative child, who may be higher in divergent-thinking abilities and not so high in cognitive abilities emphasized in present tests and examinations, may be a source of annoyance and not recognized as gifted. And how many children who are potential composers or artists, who are very high in concrete intelligence but not so high in academic intelligence, are missed when the "gifted child" is selected.[1]

Studies regarding creativity in children have been proceeding fast and widely in the last few years. As a consequence we may expect that within a decade such passages as that quoted above will have had effect upon many of the teachers of some of the more advanced countries. So we shall expect more opportunities to be provided, on the school premises, for creative drives to find expression.

Indeed, school life of the future must include, on the timetable, at least four or five hours per week devoted to freely chosen activities in which help and leadership is available, but no restriction or compulsion. In the U.S.S.R., the attempt is made to provide adequate outlets through the "Circles" for hobbies in schools and in the Pioneer Palaces. But the much more attractive design and equipment of Western schools make these buildings the natural and proper place for activities which are an essential part of education. Western schools have, perhaps, for the leisure of the future, something to learn from the U.S.S.R. in the very widespread

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[1]J. P. Guilford, "Parameters and Categories of Talent," *The Yearbook of Education* (The Gifted Child) 1962, pp. 123-124.

development of scientific hobby groups of all kinds, not least those in astronomy, geology, every aspect of nature study, and archaeology as well. The ideal for the future, which will put the working man, thanks to automation, very much in the position of the "free man" of ancient Greece, must be similar to the Greek ideal. As Marrou has shown us, for the Greeks of Hellenistic time, personal culture was:

> The most precious of all good things given to mortal man. That is why, moreover, we find upon so many funeral monuments, on epitaphs, on bas-reliefs, on statues, a recall of the intellectual culture of the dead. Whether that was at the express wish of the dead person, or as a result of the initiative of the next-of-kin, these persons are shown to us as men of letters, as orators, as philosophers, as artists, as women musicians and so on.
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> These monuments do not necessarily belong, as had hitherto been supposed, to people who were intellectuals by profession, writers, artists, or lecturers: we know today that they were, in most cases, dedicated to people whose livelihood was gained in quite different fields; they were merchants, soldiers, doctors. But, whatever they were, all had wished to have recorded on their tombs one sole thing; that they had been initiated into the science of the Muses, that they had had access to that incomparable treasure—the culture of the mind. . . . So to them the cultured life appeared as a reflection upon earth, as an advance taste of, the happy life of those souls favoured with immortality.[2]

If not too high, this may seem an appropriate ideal for the secondary schools of tomorrow—some two thousand years later—to hold before the eyes of their pupils.

But in practice they have, in addition, to achieve something far more difficult—to give to the majority of their pupils such a delight in study, such a burning desire to understand what is happening around them, in human society, in particular, that life-long study, vocational, scientific, political and cultural, will be taken for granted. Indeed, the intricately complicated life of tomorrow can be controlled for the good of mankind only if a sufficiently large proportion of men and women are prepared to devote, without material reward, a great deal of their free time to understanding what is happening around the world and to helping to create, in their various fields of interest, a worthy and balanced public opinion. The creation of such an attitude to the responsibilities, not merely of national citizenship, but of World citizenship, must be an important part of the work of the secondary schools of tomorrow. Without it, there will be no future for which to educate.

It is not merely in "general" secondary education that this interest in the life of the community must be engendered, for all aspects of *technical* education will also play their part. Indeed, in some countries, the civic studies which form a compulsory part of all technical courses, are in both method and content, far in advance of those in the traditional secondary schools. Such technical colleges are already fulfilling the prophesies of Condorcet, who wrote:

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[2]H. I. Marrou, *Histoire de l'Education dans l'Antiquité* (Paris: Editions du Seuil, 1955).

> We shall prove that, by a suitable choice of syllabus and of methods of education we can teach the citizen everything that he needs to know . . .; to know his rights and be able to exercise them; to be acquainted with his duties and fulfil them satisfactorily; to judge his own and other men's actions according to his own lights and to be a stranger to none of the high and delicate feelings that honour human nature; not to be in a state of blind dependence upon those to whom he must entrust his affairs of the exercise of his rights; to be in a proper condition to choose and supervise them.[3]

But this happy state of affairs is far from universal in technical education, and, in some Western countries, the International aspect of citizenship training in technical education is particularly neglected.

This leads us to challenge (d), that of the pupil's frequent, and perhaps close, contact with other races, colours and creeds in his adult life in the day after tomorrow. If the primary schools teach their little children along the lines suggested by Rousseau, and common now, one is pleased to say, in many countries of the world, then no seeds of racial or religious prejudice will have been sown. We know, today, that there is no *natural "colour bar"* among small children: such a malevolent attitude has to be taught by adults. But, in the secondary school, the *intellectual* basis of tolerance has to be taught, and for this there can be no better approach than the anthropological and the evolutionary. To form the mental picture of this strange biped struggling through long aeons of time in his battle with the other animals and the vicissitudes of his environment, semi-arctic or tropical as it might be, reaching at last a stage when moral principles begin to emerge and at long length a stage when religion evolves from the animistic to the spiritual, is to lay the foundations for tolerance and understanding. The pupil can then grasp how each race is, to a large extent, the product of its geographical environment and its climate and, in its outlook, the prisoner of its history. We cannot see things through French eyes if we are born in England and grow up there; and an Arab girl brought up in a strict Moslem home, especially if she has been subjected to the cruel circumsection operation about the age of ten years, cannot really understand the outlook of an American Methodist girl student of the same age. So secondary school pupils need to learn how greatly we are all conditioned, and how little our minds are truly free. And anthropology, the study of man, is the ideal vehicle for this learning. We have not yet found a way of presenting this science to adolescents—but we must, and that will be one of the achievements of the schools of tomorrow. And Unesco, with its departments of both Education and Science, will no doubt play its part in universalizing this approach.

Moreover, out of this common background of man's struggle against harsh nature, against himself with his inherited instinctive drives, making him selfish, aggressive and fearful, there emerges the picture of man co-operating with man: the International Labour Office, the Common Market,

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[3]Marquis de Condorcet, *Sketch of an Historical Picture of the Progress of the Human Mind* (London: Weidenfeld and Nicolson, 1955), p. 182.

the World Health Organization, the Food and Agriculture Organization, and so on. But beyond these, when the primary school pupils of today are approaching middle age, there must lie a much more integrated world, in which the racial and political balance will be vastly different from anything most of us can now conceive. For, in 30 years time, for every 5 human beings from Europe, the U.S.S.R., North, Central and South America and from Africa, there will be 8 people in, or from, Asia, and at least 3 of these will be Chinese—and educated! So, if the western secondary schools of tomorrow do not prepare their pupils to understand something of the history and culture of the Far East, they will scarcely be able, as adults, to play their part in creating the harmonious co-operating world which is the only alternative to a global holocaust.

There remains challenge (e): the understanding of, or at least the grappling with, the concepts of the infinitely large and the infinitely small. The effect of nuclear bombs is something which most of us cannot really envisage, because multiplying anything that we can handle by the factor of one million is an operation which we cannot truly conceive, however glibly we may use the words. Yet this is the minimum factor which can be used to compare a nuclear bomb explosion with that of the biggest known chemical bomb. At the other end of the nuclear bomb operation we are unable to conceive, in any meaningful way, radiation particles a million times smaller than the smallest object we have ever seen under the microscope, but which can go on being emitted from nuclear fall-out for decades, and all that time destroy human life. President Johnson, in a broadcast to the American people by television and radio on January 21st 1964, tried to make the atomic stock piles of the U.S. and the U.S.S.R. meaningful by saying that the existing nuclear explosive power of the two countries was equivalent to that of 10 tons of T.N.T. for every man, woman and child on the face of the earth. Today, it is doubtless even more.

Problems like this, dealing with vast numbers outside human experience, are going to be commonplace for the adults of the day after tomorrow. When the adults of today were children, the moon, at a quarter of a million miles away, was considered to be rather inaccessible: the children of tomorrow may be planning a trip around it. Clearly, the science teachers of tomorrow will have a difficult problem, for humanity will require them to give to the majority of the adults of the day after tomorrow some capacity much greater than that possessed by most adults of today, of forming meaningful concepts concerning such things as distances which are measured in thousands of light years and of sub--atomic particles of great variety setting up a complicated pattern within the infinitesimally small nuclei of atoms. If the science teachers of tomorrow cannot achieve something of this kind then there is the danger that the physicists of the future will become the international witch doctors of the 1990's, speaking their own mumbo jumbo, performing their own miracles and bringing order by fear into an otherwise disorderly world.

On the other hand, with the development of the New Mathematics, the science teachers of tomorrow, in co-operation with the teacher of mathematics, may be able to give an aesthetic quality to the mysteries of time and space and energy. The great astronomer of an earlier generation, Sir James Jeans, wrote:

> To my mind, the laws which nature obeys are less suggestive of those which a machine obeys in its motion than those which a musician obeys in writing a fugue. . . . And if the "true essence of substance" is for ever unknowable. . . . then the universe can be best pictured, although still very imperfectly and inadequately, as consisting of pure thought, the thought of what, for want of a wider word, we must describe as a mathematical thinker.[4]

If the scientific and mathematical struggles of the minds of the teachers and the pupils in the secondary schools of tomorrow bring them to this sort of reverent approach to the Universe, it will make easier the solution of their daily problems in the relations of human beings to one another.

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[4]Sir James Jeans, *The Mysterious Universe* (Cambridge University Press, 1930), p.. 136.