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WINTER 1968

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CHILD AND MAN

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EDITORIAL

Towards heart's mind

TODAY'S unrest among students and their increasing aversion for science studies are worldwide phenomena. Like modes of dress they even cross the frontier, so marked in other fields, between that half of the world where freedom is avowedly pursued (albeit not always with more than a pragmatic understanding of what the term involves), and the other half in which the state has still a good deal of withering to do before the individual feels secure enough to breathe. Could the unrest and the aversion be in any way linked? Have they a common origin?

On one level the unrest can be seen as stemming from a refusal to be controlled any longer by the adults who are deemed to have caused, or at least to have allowed to happen, two World Wars; to be causing, or at least allowing to happen, sundry regional conflicts (of which the gravest is the war in Vietnam); and to be powerless to avert the outbreak of World War Three.

At a deeper level the unrest of the students is a rebelling against their own sense of powerlessness and inadequacy, and a cursing of the adults, whether parents or teachers, who have been responsible for their alienating and seemingly irrelevant and meaningless upbringing and education. The students in particular, and young people in general, feel their only hope is to seek for themselves for knowledge or experience which truly explains, gives peace, and issues in effective action.

At an even deeper level the unrest derives perhaps from the still almost imperceptible evolutionary trend in humanity as a whole to move beyond the kind of thought and consciousness which has produced the technical richness and the perceptual poverty of the modern world, towards a new and more rational form of that consciousness which our distant forbears clearly possessed, and with which artists in all ages have been imbued.

"'Knowledge'", wrote D. H. Lawrence in *Apropos of Lady Chatterley's Lover*, "has killed the sun, making it a ball of gas with spots; 'knowledge' has killed the moon, it is a dead little earth fretted with extinct craters as with smallpox . . . How, out of all this, are we to get back the grand orbs of the soul's heavens, that fill us with unspeakable joy?" And, he adds, get them back we must, "for they are the world our soul, our greater consciousness, lives in."

The unrest, the revolt, then, is at bottom one against an upbringing, an education, an environment that mostly do nothing or less than nothing to guide one towards the "greater consciousness", towards escape from being the alienated cog. No wonder drugs are so popular—they do at least widen perception; no wonder they seem to have taken the place of alcohol which may loosen the tongue but limits and imprisons consciousness.

As to the aversion from science (the concern of the Dainton and Swann reports published earlier this year by the Department of Education and Science)—to what may it be traced? Is it not merely another manifestation, another facet of the deliberate or involuntary search of the new generation for access to horizons and levels of consciousness and experience wider and deeper (or higher) than those offered by the contemporary sciences? There is an imperious thirst abroad for direct communication or communion with other human beings and with the whole of nature, of the kind that Aldous Huxley described Lawrence (in his preface to Lawrence's *Collected Letters*) as possessing.

Yet science is with us, and has clearly come to stay. Its deliberateness, rationality, clarity are the very hallmarks of mankind's gradual assumption of responsibility for himself and for his environment (which is increasingly including the extra-terrestrial). Is there no way to find beauty in science, and truth in art? Has truth no place in feeling, has rational thought no room for passion? Are we condemned henceforth to schizophrenia?

Waldorf (or Steiner) school teachers believe not. The ways in which they endeavour to marry science and art, to develop in their pupils the "heart's mind" (in Lawrence Durrell's phrase), form the theme of this number of *Child and Man*, and to that theme most of its articles are accordingly devoted.

* * *

Youth, Age and the Two Cultures

JOHN DAVY

THERE is an odd paradox in some current educational discussions. On the one hand, there is growing condemnation of "premature specialization" in the schools. On the other hand, there is much talk of the need for more highly trained specialists to help run an increasingly complex society.

At the same time, there are signs that young people are taking things into their own hands. In the schools in many countries, there is a noticeable "swing from science" or, more precisely, a swing away from the physical sciences like chemistry and physics, into biology, sociology, psychology and the humanities.

And in the universities, there is unrest, in which one element is a rebellion against an academic tradition grown sterile and irrelevant to current needs. This unrest seems to be affecting students on the "arts" side much more than those studying physical sciences and technology.

We are witnessing, in fact, a kind of polarization of C. P. Snow's "Two Cultures" taking shape as actual social events. In Britain, early specialization virtually enforces this polarization in early adolescence, when children have to decide whether, for examination purposes at least, they are to pursue arts or science.

Mathematics plays a particularly decisive role, since if it is dropped at an elementary level, the way into the physical sciences (and increasingly into biology as well) is barred for ever. However, there are some grounds for thinking that the choice is affected by several other factors, some of which emerge in an absorbing study by a Cambridge psychologist, Dr. Liam Hudson (see *Contrary Imaginations*—Penguin books).

He became interested in the response of sixth-form grammar school boys to two types of tests, one a more or less conventional I.Q. test, demanding quick and accurate logic, the other a test first devised in America based on "open-ended" questions (such as "how many uses can you think of for a brick?"). The latter are scored on the fluency, variety and originality of the responses.

Hudson found that in general, boys studying the sciences scored high on I.Q. tests, but less high on the more imaginative "open-ended" tests, while the arts students' scores tended to be the other

way round. As often happens with psychological and sociological research, this is not a very surprising result. But it underlines some important questions.

Questioning the boys, Hudson built up a picture of their general attitudes to scientists and arts men. The former they expected to be conventional and worthy characters, but somewhat inhibited and colourless, while the arts men were expected to be both more glamorous and more feckless (more prone, for example, to get into debt). Here again, the boys seemed merely to be reflecting popular stereotypes.

What was interesting, though, was that boys studying arts and sciences *agreed* about these assessments. In other words, the boys studying sciences were expecting to lead a hard-working but dull life, while the arts boys were expecting more colour and glamour.

This led Hudson to speculate that these boys make their choices for rather deeper psychological reasons: that the science student may hope to find a certain security in the certainties of science, whose impersonality may help him to cope with a considerable vulnerability to the stresses and strains of relationships with human beings. He takes refuge from people in things.

The arts man, on the other hand, may perceive the compelling logic and discipline of science as a trap, and look for escape in a more anarchic world of human relationships and "self realisation". He takes refuge from things in people.

Hudson calls these two groups "convergers" (who do well in I.Q. tests) and "divergers" (whose strength is in "open-ended" tests). While some boys were extreme convergers or divergers (and there were also odd men out, convergers in arts, divergers in science), most occupied a range of middle territory. But the effect of early specialization is to force a division willy-nilly, so that perhaps from as early as fourteen, boys who have chosen science find themselves increasingly exercising only their "convergent" faculties, and identifying themselves with an image of a disciplined but dry way of life.

The experience of those who choose arts may be somewhat different: trying to escape from what they fear to be an austere and confining way of life and thinking, they arrive at university where they may often find an academic approach not much different from that in the science faculties. Not surprisingly, many of them become rebellious.

What is striking about the current rebellion is not that it is directed against the university authorities, or the Establishment or the older generation—there is nothing very new in this. But it also often seems to include rebellion against a technocratic society, against the Other Culture as a whole.

Not long ago, science was being hailed as an enlightener and

liberator, the enemy of tradition, the ally of radicals hoping to make the world a better place. But now, civilisation based on scientific technology is becoming increasingly identified with power and tyranny—frightening military power, threatening social power. Controlled, managed, driven to a mindless pursuit of affluence and "growth", the individual in the rat race grows increasingly lonely, parched and desperate within.

Not surprisingly, many look for some form of escape, perhaps aided by drugs. Very often this seems linked to an urgent feeling that one must make the most of being young, while experience is still vivid and full of life, before the "shades of the prison house" close in—jobs, fixed hours, failing powers.

I have come to feel that in a curious way, the dilemmas of science have become linked with the problem of growing old. It is undoubtedly possible for growing old to be a purely negative process of becoming stiff, autocratic, stale in mind and body. Similarly, science can be pursued entirely in the spirit of "convergence", as a matter of logic and technique, as an exercise of power over nature which is without imagination, beauty or a sympathetic perception of real human needs. This is science grown sclerotic, autocratic, sterile.

Practising scientists themselves know well that the picture of science as a purely logical activity is an extremely misleading one. In fact, science always begins from some form of hypothesis, an essentially *imaginative* act. Someone perceives a problem where none was seen before, or conceives a theory. Once the imaginative deed is done, the scientist will try to deduce its logical consequences and test these by experiment. But science begins from wonder, invention, surprise, speculation, all "divergent" qualities.

In this wonderment is the "youth" of science—and drawing a hypothesis down into the realm of rigorous experiment is a kind of ageing process. And just as a human being can lose all childlike qualities in growing up, so can science. It can become cold, without reverence, even brutal. Thus young people may be right to feel a similar threat from an older generation grown set in its way, and a science grown tyrannous, wielding power without human understanding.

There are human beings, though, who do not lose their childhood capacities but transform them. Possibly the most precious capacity an older person can develop is the ability to perceive the talents, needs and deepest impulses of others, especially in those younger than himself, so that he can help them find a positive expression. This is perhaps the essence of that all-too-rare and even unfashionable quality called wisdom.

Perhaps it is not too far-fetched to imagine a use and practice

of science which can "mature" in this sense, in which the imaginative well-springs are valued and cultivated as assiduously as the rigorous logic. And then, when new discoveries come to be used, their application will start from a true and wise perception of real human needs.

If this picture has any validity, then we should ask why both human beings, and our scientific culture, are at present finding the greatest difficulty in growing old fruitfully. I think we should look for the answer in the childhood of both. The 11-plus examination and all the conventional ambitions of education have focussed on the nurture of the rigorous intellect, the "convergent" faculties of quick accuracy and logic. The popular image of science has gone strongly in the same direction, and early specialization has enhanced this by channeling "convergers" into the sciences at 14 to 15, while frightening the "divergers" away.

There are many signs now of change. The 11-plus is becoming gradually discredited. There is a growing outcry against premature specialization. At the same time, scientists have increasingly come to recognize the role of the imaginative faculties in the practice of science, and the need for a vivid and compassionate social imagination in the application of its results. These trends need all possible support in educational practice, so that science teaching becomes imbued with a sense of wonder and imaginative excitement in which a poetic and a scientific apprehension of nature can be fused rather than separated.

Such teaching can perhaps help young people to become not only better scientists, but can educate "humanists" who can respect, appreciate and use the marvellously clear disciplines of the sciences.

Even this, though, is not enough. For education is all too easily thought of as something that mainly concerns the young, which shapes them for the adult world. But a person of 35, already ancient in the teenager's eyes, still has half his life before him. Whether he then truly matures, or merely withers slowly, must surely be deeply affected by what he has experienced during the first half of his life, and quite centrally by his education in childhood.

Thus an effort to heal the gulf between the "two cultures" and the aspects of human nature to which they at present appeal, is needed not merely to stop the "swing from science" or to promote a more humane use of technology. It is needed so that maturity may become fruitful, not sterile, and so that the old may be capable of recognizing and welcoming the deepest ideals and impulses of the young, instead of standing, as so often happens today, rigidly and uncomprehendingly in their way.

From beauty to truth in mathematics

Affluence is a poor spur

R. A. JARMAN

"TWINKLE, twinkle, little star, how I wonder what you are." Trite, but the search for truth in any branch of knowledge always begins with a sense of wonder. Nowhere is this more evident than in the child and the teacher counts upon it as his greatest helper.

But wonder dawns most brightly in the presence of the beautiful, for here there is immediate awareness of a harmony, created, one often feels, by considerable inner effort on the part of some being or beings, and whose source lies deeper than physical or psychological levels.

To anyone willing to engage in mathematical activity and then gradually to penetrate to its foundations a sublime beauty is revealed. This is no less true of the so-called "modern mathematics" than of the more classical kind. It is unfortunate that the introductory work presented in many modern textbooks is little short of treason to the true spirit of mathematics.

There is an over-anxiety to plunge straight into technical applications. So set theory can appear as a by product of public opinion polls. The majesty of geometrical transformations can so easily be lost by ignoring the movements which give birth to them and attending solely to the correspondence and its symbolic expression between two or more configurations. It can be likened to glancing through the frames of a strip cartoon, spotting the connexions, but ignoring what is happening between the events.

Modern mathematics can also strike pupils merely as a game to be played according to precise rules, sharpening the intellect and training it in strategy and wilefulness, but otherwise only obliquely related to what really matters in life and having nothing to say to their hearts. The chief spur to the pupil is so often the prospect of passing an exam which will open the door leading to the spoils of our affluent society.

Treason, stratagems and spoils always come on the scene in consequence of the lack Shakespeare so tellingly observed. For it is equally true that no one can know or be active within the real spirit of mathematics who has no music in his soul. Regular participation in choral singing or instrumental music groups ought to be obligatory in the training of a mathematics teacher. Not that this is

the music in soul which is meant, but it is closely related and is a powerful stimulant.

Just as with other subjects, the first step when introducing a new topic in mathematics to a class should be the stimulation of wonder for the pure phenomenon. With the youngest children the teacher can discuss where "oneness", "twoness" and "threeness" are in the world. "Twoness", something itself invisible, appears in connexion with ears, hands, parents; "oneness" with the sun, the heart; "sevenness" with the days of the week, the rainbow, and so on, and children can expand such examples to great lengths.

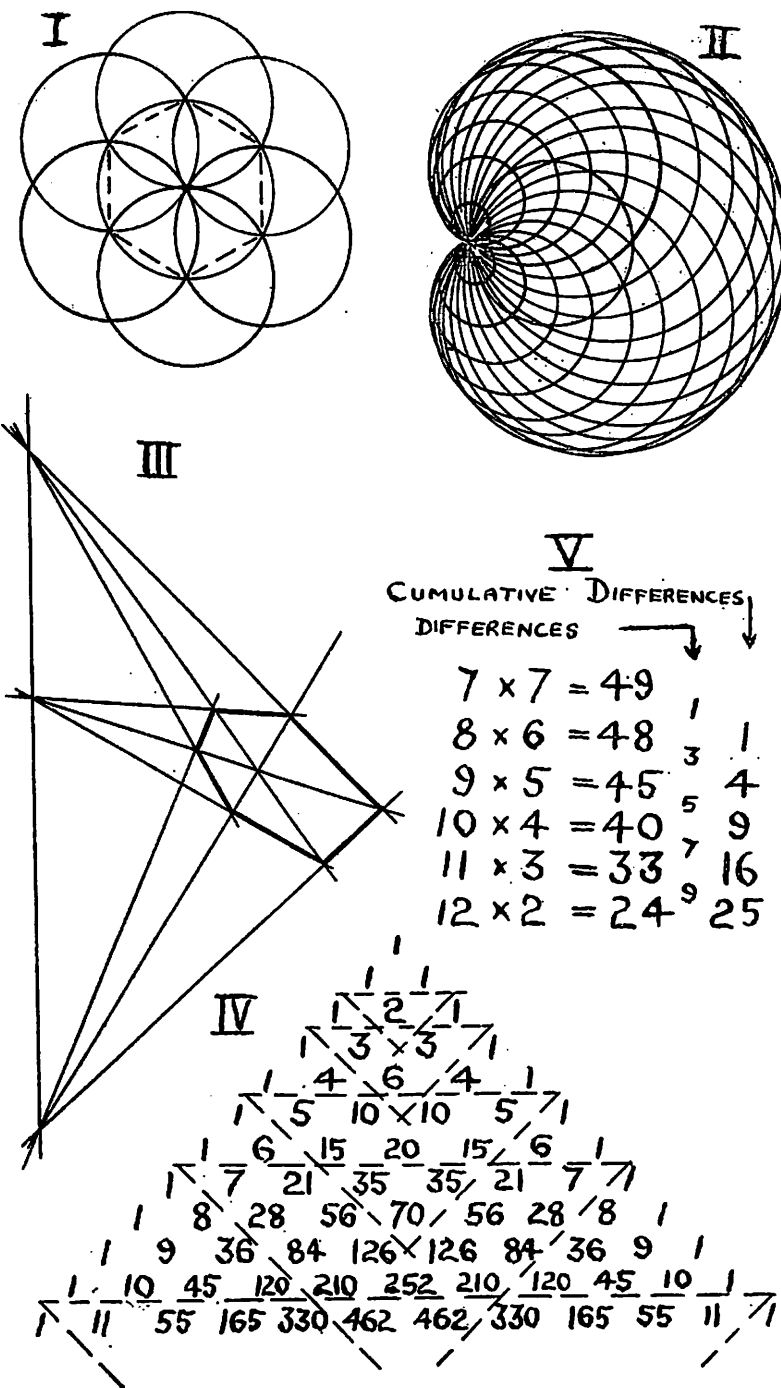
The feeling of enthusiasm generated by wonder can be led into practical activity. The will of the rhythmically active child, especially in his hands, brings to him the experience of the phenomenon, be it in counting, multiplication tables, solving equations or geometrical constructions. The third step is the discovery of a new truth. The thought activity is awakened by the will. The pupil's discovery may, for instance, be that of the commutative law—three fives make the same as five threes—or of a geometrical proposition.

Let us take geometrical examples first. With the introduction of compasses to ten-year-old children, wonder is stimulated by drawing the seven-circle pattern shown in figure I. No matter where you start, it always works—the same radius for all seven, three circles each time through six of the centres and six circles through the middle one. The teacher's presentation can stimulate the children to draw the figure again and again in different sizes and then elaborate and develop it with more circles. Then the children themselves will discover that the secrets of right angles, equilateral triangles and hexagons, the bisection of angles and so on are all found from contemplating the results of their drawing activity.

Later on the laws of the limaçon-cardioid family can be discovered by a further elaboration and metamorphosis of this figure. The cardioid envelope (figure II) is formed by a moving circle whose centre moves on a fixed circle but whose circumference still passes through a fixed point which is now on the fixed circle. It is the movement which is all essential.

All form is frozen movement. Whenever thought discovers something new, it is through stepping out of a movement in which we are ourselves engaged, bringing it momentarily to rest and perceiving the arrested form.

Yet another metamorphosis, i.e. change of form-producing movement, of figure I is seen in figure III, drawn quite independently of any measurement. It can be used as a basis of projective geometry for older boys and girls in exactly the same way as figure I for ten-year-olds. The hexagon here is a shadow thrown from the perfect



hexagon of figure I, yet its construction is simple and independent of the shadow idea.

Applying mathematics is a fourth step. The truths won from the third (contemplative) step can be put to service but it is a mistake always to want to apply knowledge immediately to technology. The history of mathematics demonstrates that almost all its important discoveries were made without any reference to their application—in most cases applications were neither found nor even conceived until centuries later. Socrates' desire that the subject be pursued in the spirit of a philosopher rather than of a shopkeeper was not just aimed against human acquisitiveness. It is the only way in which mathematical progress can be made.

None the less it is essential that the teacher show his pupils really practical applications of the mathematics taught, when the moment is ripe. The wonders of Pythagoras' theorem—all the drawing, cardboard-cutting and making of movable models with wires or string which lead to its recognition—are enhanced when it is applied to engineering structures or vector navigational problems. On the other hand, harm can be done by applying equations to situations of no practical worth when simple arithmetic can reach the answer more speedily anyway.

If no really practical problem is apposite at a certain stage (this is not entirely true even of simple equations) it is far better for the teacher to tell his pupils that the practical value will be evident when they have developed algebra to a further level. Otherwise the radiance of the original wonder will be lost, like a cloud coming over the sun.

There is a more popular appreciation of beauty in geometrical as against arithmetical or algebraical form and metamorphosis. But the beauty to be found in the numerical is related to beauty in the measurable or extendible just as poetry is related to painting.

Fourteen-year-old boys and girls in a Steiner school have a main lesson period in permutations, combinations and the binomial theorem. A central event in this main lesson period is the construction and contemplation of Pascal's triangle, of which the first dozen rows are shown in figure IV. Apart from the repeated number ones in the sides of the pyramid every number is obtained by adding together the two numbers immediately above to the left and right of it.

Discoveries in abundance can be made by contemplating this array of numbers and the pupils' wonder grows ever stronger as they do so. For example, each dotted triangle contains a set of numbers having the property of being divisible by the number in its top corners—but this only works when such a number is prime.

From such a contemplation the whole theory of combination

formulae and the binomial theorem develop. It is what a Goethean would call a primary phenomenon. From the dotted triangles spring Venn diagrams and the intersection of sets.

Another array for younger children to contemplate is given in figure V. Again they become aware of that inner harmony which the beautiful ever demands. From it there can spring the truth that $(a + b)(a - b) = a^2 - b^2$.

In conclusion we may consider the question which the writer was asked to answer in this article. "In what ways do Steiner schools lead their students to find not only truth but beauty in mathematics?"

The answer is that truth in mathematics — in its real, most spiritual and effective sense — may only be found by discovering beauty first. Wonder generates feelings of enthusiasm. This fires the will to do number work or geometrical construction. In turn this will activity awakens the thinking which finds the truths. In applying truths to the world in which we live, the pupil who has been led consciously to them via beauty will not forget what he owes to the latter. He will endeavour to marry the beautiful to the technical in his work in the world.

* * *

MEMORIES OF CHILDHOOD

Blackbird's song in April, hedgerows full of may,
Apple blossom shining against a sky of blue;
Church bells from Elmdon pealing in the evening,
Carried on the south wind—west wind too.

Pigeons all the summer through, crooning in the fir trees,
Leaves hanging listless in the long, hot days—
Wild rose and chicory, and nightjars in the evening,
A yellow moon rising in the soft summer haze.

Golden September days full of warmth and wonder,
Great yellow stubble fields stretching to the sky;
Blackberries and partridges and mushrooms in the meadow,
So shall I remember them—remember till I die.

Winds in the winter-time moaning through the windows,
Oh if I could only remember what they say—
Many lives and long ago in some Northern country
I lay and listened to them as I do today.

R.B.

Finding truth in art, beauty in science

EILEEN HUTCHINS

THE attitude towards music, painting and rhythmical movement as school subjects has very much changed during the last 50 years. A few decades ago these were not part of the normal curriculum but were extras for pupils particularly gifted or for those not capable of academic work. Today most educationalists have come to the view that the arts play an essential part in education. But they are now too often regarded as opportunities for self-expression rather than as studies with their own necessary disciplines. And in general there is little connexion between them and the standard school subjects.

In a Rudolf Steiner school all branches of knowledge are regarded as different aspects of one essential theme—the relationship of man as a spiritual being with the surrounding world. History, geography, physics, maths, chemistry, and so on are all studies in pursuit of this basic understanding. Literature, music and art cannot be kept in separate compartments. Children need to express their thoughts and feelings about history through drama and pictorial art; arithmetic and geometry are essentially related to rhythm and form; chemistry requires an imaginative observation comparable to that of a poet. But if these relationships are to be truly developed, then the arts cannot be regarded merely as safety valves for pupils to express their subjective feelings.

There are laws of colour as objective as those of mathematics. Early in their school life children begin to realize the qualities of colours. A red snake upon a green field leaps into life, while a blue one almost disappears. A yellow flower shines against a blue sky, but loses its brilliance among green leaves.

In physics lessons, when pupils are about twelve, they learn to observe complementary colours. It is for them an almost magical experience when, after looking intently at a bright scarlet disc, they turn their gaze to a white background and become aware of the delicate jade-green after-image. Later, in the upper school, their attention is drawn to the way in which leading artists use complementary colours. Exercises in copying some of the paintings of Turner or the Impressionists can alternate with their own experiments in colour contrasts.

Forms and patterns also have their objective qualities. In the

younger classes a great deal of attention is given to movement. Marching in a straight line has a different effect upon children from making circles or moving through spirals and lemniscates. The regular performing of certain patterns has a harmonizing influence on those who are restless and unconcentrated; walking backwards and becoming aware of dimensions in space strengthen the will and the memory. Drawing of forms and completing of symmetrical designs and mirror pictures are also of value. For the slow, dreamy child, sharp, angular figures bring awake consciousness; for the precocious one, flowing, rounded forms have a tranquilizing effect.

These exercises lay the foundation for a sound understanding of geometry. What children have experienced in their limbs comes to consciousness in their thoughts in later years.

The gift of expression in language is no less an art than music or painting. But now that the teaching of English is becoming freer from the formal disciplines of grammar and sentence structure there is a general uncertainty about how it should be taught. It is taken for granted that children should learn to express themselves, but the teacher is warned against providing the material to be expressed, for this would be preconditioning the minds of the pupils.

A good example of the general bewilderment is illustrated in "The Uses of English", Herbert Muller's report of the Anglo-American conference at Dartmouth College.

One possible approach is the inter-relating of the teaching of English language with other subjects. In their scientific studies pupils are taught to observe accurately. This training can be further developed in their exercises in writing. They can be led to describe the scenes and activities around them. The first essential is that details should be accurately recorded. Vague descriptions can be shown as of no value. Clearly observed characteristics of individual plants, animals or scenes are required.

The second stage in the art of describing is the inter-relating of details around a central motive such as the mood of a particular autumn day, the impression of a storm, the way in which the outer characteristics of an animal reveal its nature, and so on. The subject matter of botany and zoology lessons is approached from another angle.

Pupils can at the same time be introduced to the work of authors who have written of similar themes. In this connexion the poems of Robert Frost are especially suitable, as his faithful observations lead to a heightened sensitivity and awareness of the relationship between man and nature.

As it is often a hard struggle to get pupils to be willing to

express themselves, teachers are sometimes led to encourage the writing of horror stories and science fiction, or to arrange debates where personal views are aired. Though these methods may be justified as a first stage, there is a danger of establishing the assumption that language exists merely to express one's own opinions. We need to confirm that language is a medium of understanding and that this is impossible without a regard for truth.

A sense for the right use of words can be awakened by connecting language with history. Pupils are interested to discover the different qualities of words of Old English origin from those of French or Latin. They enjoy finding expressions which English pioneers have borrowed from countries all over the world. They can appreciate searching for synonyms and sensing the varied shades of meaning in their use.

Speech exercises can bring awareness of the qualities of sound. Alliterative phrases using "s" and "r" are stimulating and invigorating; those with "m" and "l" are calming and lulling. Pupils find pleasure in making their own examples and trying these out in various rhythms. They can be brought to realize that deep feeling lifts language on to another level than that of our everyday commonplace conversation. The expressions of blessing and cursing, of prayer and of grief, have their own grandeur.

Today a sense for the truth of imaginative knowledge has to a great extent been lost. Yet it is only in this light that the value of legend and literature can be known. They reveal more profoundly than history the aims and ideals of a race or civilisation. Pre-Christian myths resemble the stories of the Old Testament; they tell in imaginative form of man's loss of an ancient wisdom and union with nature and his development of independent consciousness.

Children themselves go through a similar stage and, if the stories are brought to them at the right age, they derive strength from the tragedy and courage of man's struggle to find his true being. In the upper school they learn to relate these great themes to the changing consciousness of man through the ages and to follow his development from a narrow tribal religious life to the Christian conception of world brotherhood, and his emergence from the guidance of a priestly cult to the sense of individual responsibility.

Today the teaching of scientific subjects has tended to become abstract and divorced from human values; the arts have become experimental and chaotic. They need to be reunited in the light of a truer understanding of man.

Examination Syllabuses and student power

Who is to cut out the dead wood

R. LISSAU

IN our last issue "Comment" had something to say about the deliberations of the Schools Council concerning the future of the sixth form. A number of issues had to be mullied over. A-level grades had turned out to be crotchety predictors of achievement at university; doubts had arisen about "studying in depth", the current euphemism for specialization; and more and more comprehensive schools found the purely academic character of the traditional sixth form incompatible with their wider and more creative activities.

The Schools Council interviewed pupils and staff of sixth forms in about 150 schools and then made their own suggestions. The second of these was published in December 1967 as the Schools Council's *Working Paper 16*. It would reduce the number of A levels to two and institute four to six elective subjects which would be taken for a term or two and be internally examined. The nature of these elective courses would reflect the abilities of the staff and the inclinations of the pupils.

In the following few months so many things happened that it is doubtful whether these suggestions will ever be put into practice. As the decisions which eventually will have to be made will profoundly influence the character of the school life of a whole generation it may not seem superfluous to discuss some of the facts and pressures which the Schools Council will have to consider.

The reaction to *Working Paper 16* was largely negative. The Cambridge University Recorder condemned it outright. Cambridge was well served, it declared, by the present arrangements and did not want any change. But if there had to be a change, then it should be to something like the Scottish procedure where four or five subjects are examined at a standard somewhat below A level. If the Schools Council's proposals were adopted standards were bound to fall and an extra year at university would be necessary. And where would the money and the teaching staff for it come from?

The Headmasters' Association did not like *Working Paper 16* any more than Cambridge did. They thought it would lead to a more obnoxious specialization in the two A level subjects, while

performance in the elective courses could hardly be assessed on a national scale.

Then Dr. Dainton arrived on the scene with his report on the swing from science. As he pointed out, the number of A level science students is rising only very slowly, and the number of arts students about six times as fast. Universities, instead of *selecting* candidates for their science departments have increasingly to *recruit* them. The same relative decline in science candidates is found in Europe and in the United States.

The recommendations of the Dainton report include ending early specialization, making compulsory mathematics throughout the school, university science courses for candidates who have previously done little or no science, a broadly based sixth form, discussion in class of the function and status of science and technology in society, better mathematics teaching in the formative years of the lower school, and more relevant syllabuses in physics and mathematics.

In a subsequent speech at Brighton, Dr. Dainton, himself a vice-chancellor, attacked the stranglehold which universities have over the schools. Let the schools develop their sixth forms, he thundered, as they like. If future university candidates have less specialized knowledge, universities need only cut out the dead wood in their own courses. Instead of adding another year to the ordinary science courses, let them produce fewer specialists, of which there are too many anyway, and instead see that there are more general science graduates, for whom there is a real need.

In the welter of battle cries a few points stand out clearly. What is at stake is the future of two outstanding characteristics of the traditional English public and grammar schools: early specialization and the academically orientated sixth form. The cry is heard, for instance in leaders in *The Times Educational Supplement*, that the "new sixth" of the comprehensive schools cannot be combined with its traditional namesake. This would mean segregation at some stage of their careers of the academically promising from the rest of their contemporaries, and poses another question: do we prefer an intellectual elite or a socially well-integrated society?

Whatever decision emerges, it will come about, not on "objective, science-based" grounds, but as the result of a social choice, of a value judgment. We shall have particular kinds of schools, sixth forms and examinations because certain men and women think them right. The fiction that education is a science or based on science cannot be maintained when real issues are at stake. These must be decided by the insight and goodwill of individual people.

In the course of the spring, 1968, a further voice was added to this discussion, that of an articulate minority of students. They questioned the value of set examinations as against assessment throughout the whole length of a course, and revolted against a system in which the schools produce university candidates and the universities in their turn make the necessary fodder for the industrial and administrative establishments. A revolt against conditioning. A revolt for education as education. If this voice were to be given due weight it could clinch the issue. Then the immediate future would see the end of specialization in school and an exciting reorganization of the sixth form. It would also mean one more step towards realization of Steiner's educational principles on a national scale.

So much for the future. At present the tussle lies between two bodies, the Schools Council, which started the whole thing, and the Standing Conference on University Entrance. In their declaration of March, 1968, the latter body welcomed the aims of the Schools Council, but doubted the validity of their suggestions. The two bodies seem to have seen eye to eye on a policy of variety, experiment and gradualism. They visualize an experimental period of three years at the end of which there might still be no radical change. According to an article in the *Guardian* in July, 1968, they might in the end opt for a "Scottish" solution: four to five A levels for university candidates, two to three for other members of the sixth form. Mathematics and possibly English might be given special status so that they would be continued at least until the penultimate year.

* * *

The Goethean approach to science

Coping with change

MICHAEL WILSON

IT has always been far easier for artists and poets to feel sympathetic towards Goethe's scientific ideas than it has for scientists. Today it is still difficult for someone with a strict scientific training, particularly in the field of physics, to take Goethe seriously as a scientist. The conventional physicist will only accept causes which can be measured, formulated and depended upon to produce the corresponding effects exactly, whenever they are allowed to operate under the appropriate conditions.

For Goethe this limitation of allowable causes was much too narrow. He was a person for whom the laws of nature were still connected with the divine forces that had created nature in the first place, and for him the idea that these universal laws should be no more than expressions of the functions of matter was quite unacceptable. I believe that had he had a little more understanding for the methods of the physicist he could have found a physical basis for his theory of colours which would have earned the respect, instead of the scorn, of contemporary scientists.

It has to be admitted that there are many assertions in his theory of colours which, if taken as statements of physical fact, simply do not make sense. On the other hand there are grandiose and sweeping pronouncements—such as “colours are the deeds and the sufferings of the light” and his characterization of the formation of green and magenta in the spectrum as “the earthly and the heavenly offspring of the Elohim”—which in their nature seem far removed from scientific statements, and yet when seen in the perspective of his whole attitude to nature are found to be fully supported by modern technical knowledge.

I stress these points because for a long time Goethe's ideas about colour have been set up in *opposition* to the generally accepted line of scientific thinking as represented by Isaac Newton, and this has been made into a controversial issue that has consumed much time and energy without making the situation any clearer. No one has in fact been able to show that Newton's experimental work was other than scrupulously correct although the interpretation put upon some of it, partly by Newton himself and partly by others, is very much open to argument.

Here we should remember Goethe's own words: “The senses do not deceive; it is our judgment that deceives . . . It will therefore be best if in our observing we are as conscious as possible of the objects, and in our thinking about them as conscious as possible of ourselves.”

Like all great pioneers of human thought Goethe had the kind of insight into the relation of man to the world which was in the first place a direct perception into the depths of existence rather than a synthesis of laboriously collected facts. If we do not understand this, then we cannot understand his science at all. For him it was a matter of actual perception that the separate existence of single objects at any one moment was only part of the truth. The “process of becoming” was part and parcel of the things themselves.

He saw that just as in the human sphere all intelligent action proceeds from an underlying idea in the mind of man, so in nature all the wonders of creation proceed from a higher kind of intelligence which he calls *idea* and which does not proceed from the mind of man, although man can find access to it.

In the study of living organisms this is not too hard to understand. The plant, for instance, cannot be completely defined at any one given moment. Its life cycle is part of its whole being. It lives in time as well as space. Goethe said that he could even “see” the idea of the archetypal plant at work in every single example of plant growth.

* * *

It is in the inorganic realm that we face the greatest difficulties, for here the living process of “becoming” is at an end. The *idea* now takes the form of what we call natural law, and stands in the background. Our conquest of nature consists of making these inorganic laws obey our own will, and very often the process can be made to work equally well in either direction (such as changing the white light into colours or the colours into white light), so that at this level it is impossible to say which is the original cause and which the original effect. Nevertheless Goethe saw these phenomena always in relation to the world processes through which they have become what they are. How are we to picture these?

Here we come to the point where Goethe's own approach is unable to answer the kind of questions which arise from our present state of knowledge. Rudolf Steiner made it clear that his own work was a continuation of what Goethe had begun. Only in the light of Steiner's own work shall we be able to find a “Goethean approach to science” which makes sense in the light of modern technical knowledge. During the last six months of his life, when his final illness had brought his lecturing activity to an end, Steiner

wrote a new chapter of anthroposophy in the form of *Letters to the Members*. In the course of these (October 1924) he summarized the evolutionary process and showed that the Gods have come to the end of their work of creating the world of outer nature and have retired, leaving the whole machine of natural processes to run by itself.

When we look at this world of outer nature we can and must continue to see it as divine handiwork, but we must have no illusion that the Gods themselves are still in control of the machine. The place where they are now to be found at work is not outer nature, but the region of the human soul, and it is in *this* region that the future of our life on earth will be determined.

Again and again Steiner impresses upon us, in this final message, the need to discriminate between the working of the existing world of nature, the "world of finished work", on the one hand and, on the other, the workings of our own soul life, our life of inner activity which for better or worse will determine the kind of life that can be lived on earth in the future. With Steiner's own description of world evolution in mind let us look once more at nature and man in the "process of becoming" and see where Goethe's *idea* leads us.

* * *

The mineral world, the world of inorganic processes, has the longest history, the oldest memory, and embodies the divine will and wisdom at the deepest level. It has undergone the greatest number of transformations, and now runs by itself. For us its laws are given, immutable. But man is free to manipulate them as he will.

The plant world can also run by itself. Its wisdom, too, is very old, and is a constant source of inspiration for man. He can manipulate it to nourish and to surround himself with greater beauty. Only to a small extent can he use his own growth powers to influence the growth of the plants.

The animals are closer to man and their history is shorter. In them, man finds memories of part of himself. He can make some of them serve him, can breed them and change some of their habits. He can find his own moods and feelings reflected in them.

Individual man is the youngest member of creation. He has a memory that is short compared to world memory, but has a freedom to penetrate the world with his thinking, a freedom that exists nowhere else. His ideas are still at the visible level and he can always change them. His habits and instincts take longer to change, and his body is such that he cannot add one cubit to his stature. But he stands at a turning point in time, where the Gods have retired from the outer scene, leaving the future in his hands.

The Goetheanist will recognize all the facts and processes of the

finished world of creation whether they be comfortable or not. He will revere them as divine handiwork at their different levels and will be grateful that they are put into his hands to control and to use for his own needs. He will still see them against the background of their own cosmic memory but will not try to populate them with a spirituality which has long since retired. On the contrary he will study *how* the Gods did their work in the past, and from this he will learn *how* they are ready to do their work in his own soul life, once he has made the necessary decisions. Here he meets darkness and light in their full reality.

In observing nature he will not try to make the facts fit any theory, but with patience and humility will array all the aspects before his mind's eye, training his outer and his inner senses and awaiting the moment when the unifying *idea* behind the phenomena will speak to him. When this happens, then every scientific fact falls into its place in perspective and the experience of beauty is such that any deliberate adornment is mere insult. He will never fear the evidence of his senses, remembering with Goethe that it is not our senses, it is our judgment, that deceives.

On the other side of the picture he will ask himself: "What ideas am I putting into the world when I bend the laws of nature to my own purposes? What sort of a world am I helping to create with my new-found freedom? How can I become a channel through which the Gods can bring new life into a dying universe?"

Rudolf Steiner summed up Goethe's whole approach in a single sentence: "In our knowledge, the *idea*; in our action, *love*. This must be our guiding star".

* * *

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Colour in art and science

Interplay of darkness and light

ROLAND EVERETT

TALKING about his forthcoming summer holidays, a builder, working in the house, remarked: "I like to take the kids for a walk. If you take the wife, it's nice all right. But if you take the children, you see so much more. They are always finding things—waterfalls behind some rocks, crystals, or a hawk's nest. Then I have to climb up the tree and see if there are any eggs in it. With them it gets real' exciting".

This love of adventure, of seeing things for the first time can be even more uplifting for adults than the healing atmosphere of nature itself. Yet how easily can such an attitude of wonder and enthusiasm in the young deteriorate into apathy and boredom in the classroom. Time and again the teacher must ask himself: "What must I do, how must I present my subjects, to keep alive this precious source of inspiration?"

At this point, another danger looms ahead, namely, that of falling into the opposite error of making lessons too exciting and sensational, thus depriving pupils of finding the necessary solid ground into which to strike roots. How can the teacher be both "child and father" in the sense of Wordsworth's well-known lines? Let me endeavour to give a few hints from the practice of a Steiner school.

Three stages of development

All healthy children feel a natural connexion with the world of colour. They all love to draw and paint pictures—the adult can learn to read them like signatures of their different stages of development. If one tries to combine the child's inherent feeling for colour with the understanding of a grownup, one can recognize that despite its infinite variety, colour undergoes three main stages of development: (1) colour as pure manifestation of light and darkness; (2) colour as intrinsic feature of natural objects; (3) colour "trapped" into matter as a colouring agent.

Examples of the first stage would be the changing colours during sunsets or the varying intensity of blue in distant mountains or hills. Here one can experience colour-in-the-making rather than finished coloured objects, so that it becomes possible to speak of "blueness" as a quality of its own and not merely as an attribute of mountains, seas or skies. This kind of evanescent, yet very real quality of

colour reaches a climax in the rainbow which shines in the distance, however near to the beholder its portal may appear.

In the second stage, colour has become far more part of the earth but nevertheless it has retained something of matter's nascent state which can reveal inner qualities of substances. This fact is used in chemical analysis where coloured flames indicate the presence of certain chemical elements (e.g. green flame, copper; deep blue flame, sulphur; yellow flames, sodium) and help to identify the "frozen flames of precious stones"*.

Compare the ethereal quality of whites, pinks and yellows prevailing in spring flowers with the saturated and earthly quality of the sunflower, or of the autumn flowers which glow not only with the sun's heat but also with the warmth radiated back to them from the sun-soaked earth. Contrast blossoming trees in spring, verdant summer trees, golden autumn trees and the stark silhouettes of the trees in winter—all provide an ever-fertile theme for painting lessons.

Who has not felt the temptation to pick a bright red berry? An inner glow at the sight of a red rose after a storm? In this and many kindred ways does colour in the second stage speak to us in its own inimitable language.

In the third stage, colour appears torn from its natural surroundings, to be at the beck and call of man, for better or worse, in the form of pigments, paints and dyes. This final stage in colour's descent into matter is both an end and a beginning, for man can now make use of it in creating works of art or in expressing himself in his surroundings, but he is equally free to exploit its possibilities for more egotistic purposes, such as for advertising or for colouring food.

Colour in art

When observing growing children one can experience how they, too, undergo a gradual descent into the earthly realm from the stage of the baby in the cradle to the fully "arrived" young person who is ready to take on responsibilities within his community. It therefore behoves the teacher to use colour in lessons in accordance with his pupils' different stages of development.

To young children watercolours in dishes are hardly the same kind of stuff we grownups use, but some incredibly magic and mysterious source of colour. As the small child cleans his brush in the transparent water of a jam jar, he will experience the "waste" colour floating downward in the jar with the same enthusiasm with which he greets the colour flowing on the damp paper before him.

*See *Man or Matter*, by E. Lehrs.

The result of his work, the finished picture, will mean less to him than the experience of colour during the act of painting. At this early stage the teacher can approach colour directly and not in terms of an attribute. He can talk about "the cheeky little red chasing the gentle blue", or "the cheerful, spreading yellow waking up the sad blue".

At an age corresponding to the second stage of colour (from about seven to twelve years old) colour will set the mood of the picture to be painted. It will help to express the nature of plants, animals, people, scenes from stories, etc. As the child becomes more aware of the difference between his own inner life and the world surrounding him, his powers of observation will sharpen and lead him—under guidance—to colour perspective and to the subtle changes between the lit-up and shadow-darkened surfaces of objects.

At the onset of puberty, roughly corresponding to the third stage of colour mentioned above, most pupils (boys in particular) go through a critical period during which they seem to lose their innate love of and interest in pure colour. Dark, heavy and often murky colours become the signal for the teacher to introduce an entirely new medium, namely charcoal. The once gentle colours of the rainbow now withdraw into the two opposing camps of darkness and light, bringing about a dramatic tension in the no-man's-land of their polarity. This time of losing touch with colour in art lessons really represents a temporary "hard-bud" stage before a renewed but more conscious and individual opening into the world of colour can take place.

Colour in science

When caught in this apparent cul-de-sac, the adolescent pupil is introduced to colour from a completely different aspect, not in art but in his first science lessons. Whereas previously colour had been accepted unquestioned, its origin and causes now become the centre of interest. The orange-red colour of the setting sun is discovered to be the result of light penetrating and struggling through the darkening medium of a dust and moisture-laden atmosphere. The blue of the sky is recognized as appearing when we look through the light-filled atmosphere into the darkness of space.

Then comes the fascinating moment when pupils can repeat, at will and in their own classroom, the same processes taking place out there in the heavens, but on a minute scale. Simple experiments are made, such as holding jam jars filled with translucent soapy water first against the light so that red tints begin to glow and then against the blackboard whereupon the same solution appears in

shades of blue. Similar examples of colour in its nascent state are discovered in ordinary life and it is as if the young scientist were allowed a glimpse into creation's workshop, thereby learning to understand the secrets of colour in its first stage.

When contrasting the active quality of the sunset-red with the more passive mood of devotion of the sky's blue, old stories, told years ago, begin to reawaken. There was the Red Hunter, who dreamed that he was being hunted by the very animals he had killed, a story which illustrated the active and passive voice during early grammar lessons. Early mood paintings come back to mind, such as "The Wrath of Achilles" (painted in reds) and "The Sorrow of Demeter seeking her lost Daughter Persephone" (painted in different shades of blue).

During history lessons on the Renaissance pupils will meet again this contrast of struggle and surrender in the beautiful harmony of the Madonna's blue mantle enfolding the red gown. The polarity of blue and red will emerge again during physiology lessons, when man's red and blue blood will be studied and when the "muscle-man" will be contrasted with the "thinking-man". Like the story of the Red Hunter, this latter theme also has roots in the very first grammar lessons learnt some five years previously; verbs, the "doing" words were then underlined in red, while the nouns, the names one so easily forgets, were marked in blue.

The climax of his work on light is Goethe's theory that colours are the result of the interaction between light and darkness, as exemplified in the rainbow. This theory will lead to the study of the human eye which mirrors this great secret, for between the white of the eye (white is the nearest colour to light) and the black of the pupil, there spreads the coloured band of the iris. And "iris" is the Greek word for rainbow. Wordsworth's lines indeed assume a new dimension:

My heart leaps up when I behold
A rainbow in the sky . . .

* * *

Canada calling the future

ALAN HOWARD

TWO very significant publications have appeared on the Canadian educational scene this year. One is the Hall-Dennis Report, sponsored by the Government of Ontario on the aims and objects of education. The other is the publication by the Waldorf Association of Ontario, *Waldorf Education for Tomorrow*. Both make excellent reading; both are written for the general public.

But there the similarity ends, for while the one is a beautifully got-up "coffee-table" production of over 200 pages, which has been the subject of columns of comment in the daily and periodic press, the other is hardly more than a slim pamphlet, which has been circulating quietly among those who have come to hear of the Waldorf movement.

And while the one is full of what *ought* to be done about education in Ontario, the other is about what *has been done* in Waldorf schools all over the world during the last 50 years, and what is going to be done again, here in Ontario, now that the first Canadian Waldorf school, the Toronto Waldorf school, has opened its doors this fall.

There is, however, a link between these two publications, which hardly noticeable by some, might nonetheless be very significant to future historians. At the end of *Living and Learning*, as the Hall-Dennis Report is called, in the place where most authors put their bibliography, is a long list of institutions and individuals who either submitted briefs to the committee or gave evidence before it.

Among them stands the name, "Waldorf School Association of Ontario, Inc". For the association, too, not only submitted a brief, but some of its members appeared and spoke before the committee, apparently with such effect that members of the committee later visited the Rudolf Steiner school in New York in order to know more.

While no other reference to the association's methods is made, there is indication enough that some of the educational ideas Waldorf teachers have been practising and expounding for years are at last getting through, probably by some process of ideological osmosis.

Take, for instance, the Waldorf view of the first two decades of human life as something conforming to a definite growth pattern, which education, if it is to be effective, should follow. The Hall-Dennis committee also sees the development of the child as

proceeding in "growth-stages", and education as something that should be adapted to it, particularly after kindergarten.

Education, according to the report, should be a straightforward "twelve-grade continuum", not something parcelled out among different kinds of schools such as elementary, secondary and high. It should be a whole, accommodated to the growth of the child, not an arbitrary organisation of schools into which the child is drafted.

This means that the curriculum should unfold in line with this pattern, too; and here the Hall-Dennis findings come very near what Waldorf teachers follow. In the first two or three grades they recommend that the motif should be "communications", and the material comprise reading, writing, speaking and listening.

In the next stage, corresponding to grades 4, 5 and perhaps 6, this work should broaden out into what are called "environmental studies", where the child should begin to come in touch with what is happening around him in Nature and the world of man, and to realise his relation to his habitat, and how it all came to be.

From about grade 6 onwards the development of science and mathematics as specific subject-disciplines would come more to the fore, together with a deepening of what has been done earlier; and from the age of 15 onwards the student should take a more individual part "according to his interest and ability" in his further studies.

This approximates very closely to what we already do. In the first three years our work centres around writing, reading, storytelling, speech and arithmetic. From grade 3 onwards we begin to draw the child's attention to what is going on in the world around him: the work men do, animal and plant life, and the beginnings of geography and history.

In grade 6 we begin to introduce the sciences, and the higher stages of mathematics, and although we do not offer a wide choice of individual subjects in the high school, we present as wide a curriculum as possible, consistent with exploring it to the depth that that age demands. This, if anything, is certainly a "continuum", adapted to the child's growth, and carried out in the environment of one school establishment.

The report also advocates the abolition of all "crude" rewards and punishments, including not only the really crude ones of physical violence and over-praising of natural brilliance, but all discrimination based on tests and examinations. The child should be involved in an experience of adventure and discovery in learning, which should be sufficient in and for itself.

At the end of the school year a report should be given, concentrating on a description of the child as a human being, rather than

something merely indicating what marks were obtained in what subjects. Not only would we wholeheartedly endorse this, but at the risk of preening ourselves on the fact that we've been doing just that for years, it is nonetheless the simple fact that we have.

Languages, the report continues, should be taught from grade 1, and the emphasis in teaching the first two or three grades should be entirely on conversation. This has been our practice, too, to which we add, as was no doubt envisaged by the committee, all kinds of poems, plays, games and songs in those languages. The report does not advise any formal grammatical work in the language until grade 4.

The committee would like the textbook to be no longer regarded as the pillar upon which education rests, but simply to be one of the adjuncts of the total teaching programme. In connexion with this matter of books, the committee suggests bringing the public library service under the jurisdiction of the educational authorities, and setting up a special body composed of publishers, teachers and members of the Ontario Institute of Studies in Education to advise on and supervise the preparation of books for children in schools.

The public education service in Canada probably makes an even greater use of television, films and visual aids than is the case in England (after all, is not Toronto the home of "The Medium is the Message"?). We in the Waldorf schools have fought this creeping paralysis of the imagination with Old Testament fervour, if not always with New Testament charity, and as far as the elementary school years are concerned we are not only probably right, but more people might agree with us now than would have done ten years ago.

But Rudolf Steiner, from whom we take most of our ammunition, was also strongly against anything in education which might separate the children from the real world in which they live. How far can we go? For there is no doubt about it, visual communications have come to stay, they will increase in the future, and they are already part of the child's world.

The Hall-Dennis committee did not shut their eyes to this problem. Their solution gives teachers an excellent opportunity. The report suggests that these things should be brought more under the control of the teachers with teachers vetting and supervising the programmes and, where possible, with teachers creating the actual programmes themselves.

The curriculum should be stated in broad outline, and not worked out in detail except by the faculty of teachers in and out of the individual schools—a practice which has also long been followed in Waldorf schools.

Indeed, it is one of our boasts that while you would find children

in every Waldorf school occupied in a given year with the same basic themes (because part of Steiner's work was to show how closely the theme is related to growth), the way the teachers would be presenting them would vary in every case according to teacher, district and children.

The report tends very much toward bringing the practising teacher more into the whole direction of the work, and to one who has had experience in public education, and has later experienced the greater freedom and reliance on individual responsibility of a Waldorf school, this is a very encouraging sign. After all, education is the teacher's business. They are the "front line", and anything that involves them more in the whole campaign is to be welcomed.

Granted, the report also makes higher demands on the individual teacher in that it expects them all to have obtained, or be in the process of obtaining, a university degree by 1972, and suggests that inefficient teachers should gradually be "weeded out" (a point, by the way, that Rudolf Steiner also delicately hinted at, only he suggested that the teachers do it themselves). Nonetheless the rank and file teacher is to take much more part in what is going on.

Parents and public are not forgotten. They are to be "educated", too, but into the meaning and significance of education itself in the public life of the community. District and school committees, on which parents would serve, should be set up, so that they could interpret the school to the environment and the environment to the school. Though one wonders whether this was not put in with an eye to recent student disturbances, it is even suggested that an ombudsman should be appointed to protect the rights and investigate the grievances of individual students.

Altogether it is a vast and sweeping report covering all aspects of education and child welfare. It is put together in a 12" x 10" book of over 200 pages with 258 separate recommendations, and has already become something of a best seller. It is "designed to be read, not shelved", as a member of the committee remarked when someone complained that it was too big to go comfortably on his shelves.

Although full implementation of the Hall-Dennis report may have to endure some "shelving", it should be read, for it is doubtful if a more far-seeing statement on the aims and objects of public education has ever been made. This fact alone, that it is being widely read, and will be read again, is a happy augury for the future generally, and an encouraging indication of the educational climate of this province in which the world's latest Waldorf school has so recently come into existence.

The Psychedelic Revolution

Safety valve of a desperate generation

FREDERICK HIEBEL

IN August, 1960, Timothy Leary, at that time 39 years old and assistant professor of psychology at Harvard, spent his vacation in Mexico, where he made experiments with certain mushrooms which produced, when consumed, changes in consciousness. First of all, he took hold of psilocybin, and then hit upon lysergic acid with diethylamid—LSD—the drug discovered unintentionally, as if by chance (how frequently the destiny of inventions takes on this mask), 13 years ago in the Sandoz chemical laboratories.

Leary, by birth a Roman Catholic, and then converted to Hinduism, and his younger colleague Alpert began to experiment on themselves, and then on students of the university, with the result that the two were dismissed. Leary, until then an unknown university lecturer, grew famous. LSD became the most discussed drug in the world. To Leary it offered the means of spreading a new message of salvation. He began to speak of his inner experiences through LSD as zealot of a new religion:

He realized that he had died, that he, Timothy Leary, the naive and gay Timothy Leary, was dead. He turned round and saw his body lying on the bed. Life fled from him. Once more he lived through many events he had forgotten long ago*.

Even more was disclosed to him after this panoramic retrospect on life, namely:

He experienced the past from a historical-evolutionary aspect. It was his own evolution, and finally he recognized himself again as a unicellular organism. The boundaries of his understanding were broken down . . . The discovery that the human brain had unlimited possibilities and that hitherto unknown conceptions of space and time were at its disposal, filled him with gladness and devotion. He felt sure that he had woken up from a long ontological sleep, and that a powerful transcendental experience would decisively influence everybody, transforming human life from the very bottom.

With lightning speed, and in a way which has no precedents in history, the LSD movement took hold of modern youth.

God is not dead. He is not even concealed. He is within us, in the deepest region of our spirit-soul, where He has always been. LSD is the strongest of all sacraments . . . it is the truth, the path, and the godhead.*

The younger people are suffering from a physical, religious, and even metaphysical hunger, which traditional religions are simply incapable of stilling. The traditional, standard religions have all been afflicted for

centuries with a cardinal error—they preach. To be sure, they tell us what we should do, but they are not sources of strength.*

The book *Utopiates*, which Leary brought out together with Alpert and Metzner, states concerning the ecstasy produced by hallucinogenes:

Many names were given to this soul-condition: Sambadi, Numina, Nirvana, mystical or visionary state, transcendence. For centuries men knew that ecstatic conditions can be produced by methods which transform the body's chemical processes, such as fasting, contemplative concentration, Yoga exercises, and certain foodstuffs and drugs. The new name given to the ecstasy produced by drugs is "psychedelic experience".**

Leary wrote in a newly founded periodical called *Psychedelic Review*:

A guiding line was needed for our meetings, so that the persons undergoing tests might be led through the transcendental experiences with a minimum of fear and confusion. We did not wish to start *de novo*, nor stake our understanding and limited experience for the planned trip. Instead, we sought help from the only available sources dealing with consciousness and its changing conditions: from the ancient wisdom of the east. The Tibetan *Book of the Dead* is a psychedelic textbook, with incredibly exact descriptions of the sequence and uniqueness in an ecstatic condition.**

The ancient wisdom of the East is stated to be "the only available source dealing with consciousness and its changing conditions". No sources are deemed to be "available" in the stream of the Christian spiritual development in the West. Nor in the spirituality of Central Europe, from Master Eckhardt's mysticism to Steiner's anthroposophy, with only one exception (again dealing exclusively with Indian wisdom), Hermann Hesse's Buddha-book *Siddhartha*.

The LSD movement, which thus began through a lecturer at one of the strongholds of western intellectualism as a revolt against the routine of science, rapidly spread from university students and pupils of the higher grades to juveniles belonging to every social class, from the United States to Canada, from there to England, Scandinavia and Holland, and to Central Europe. Everywhere it is ascertained that in spite of police prohibition, LSD is being taken more and more frequently and irresponsibly.

The LSD wave mainly affects the generation born after the atomic bomb episode, and coming of age at the time of the Vietnam war. Brought up in a civilization full of bathrooms, many of these young people do not wash themselves. In a world of capitalistic security based on bank accounts, they voluntarily turn towards insecurity. Adverse to intellectual drill and learning, expelled from educational institutions, avoiding examinations, running away from their square, bourgeois parents, they gather in woods and meadows, in public parks, in the suburbs of a metropolis, in dark cellar-rooms.

They are against the conventional habits of family life, they flee

the routine of a professional training, and abhor all political phrases. The hippies revolt against automation of any kind, against coercion in thinking and a uniform levelling, against militarism and trade unions, against fascism and communism, against everything threatening to "lower the individuality". They seek to discover themselves in their own ego.

What a tragedy if their only slogan were that LSD is the path enabling them to find themselves! For what are the consequences of finding themselves in LSD, with the help of the Tibetan Book of the Dead, the Tao-tse-king, Hesse's *Siddhartha*, and the chaotic attempts with Zen and Yoga? LSD produces psychoses, nervous breakdowns, insanity, suicide epidemics, panic conditions of fear, and the birth of crippled infants.

Any youth movement, said Rudolf Steiner in a lecture course***, which seeks to be anything more than an empty phrase, longs for the vitalization of human speech through the spirit rising out of the human individuality. Individual moral intuitions must first be drawn out of the human individuality.

Steiner indicated two of the most important moral impulses: the impulse of ethical love, going towards man's inner being and, from the outer aspect, the impulse of confidence and trust from man to man.

When the thresholds of consciousness are crossed without such moral purification, the result is crime and disease, insanity and suicide. With these words we are not ridiculing the LSD clamour of modern youth. It must be taken very seriously as the safety valve of a desperate generation seeking self-expression. The hippies, with their "love-ins" and their *Peace for Vietnam* buttons, merely express in a primitive and perverted way what Steiner claimed from young people: the moral impulses of pure love and true confidence from man to man.

*See *The LSD Story* by John Cashman (quotations are from the German translation by Bodo Baumann).

**Quotations are from the German translation.

****The Younger Generation*. Anthroposophic Press, New York, 1968.

(Adapted by Frank Newell and reproduced by kind permission of the author from the *Anthroposophic News Sheet*).

Toronto school opens

ALAN HOWARD

ON a Tuesday morning, September 3, 1968, a group of children gathered round their teachers for the opening ceremony of the school year, common to all Waldorf schools. But this was not just another school year. This was the first year, of the first Waldorf school in Canada, Toronto Waldorf School.

No one took part in this except the teachers and children, the more public ceremony of speeches and congratulations being reserved for the following Saturday. The ceremony on the Tuesday was something intimate and special to those most intimately connected with it, the teachers and children. But many more were "taking part" in thought in what was happening in that school building on Lillian Street, in Metropolitan Toronto.

For many years, first as an idea in the mind of one man, then as the dream of a few who gathered together to study Steiner's work on education, and finally as the strong-willed determination of a legally incorporated body—the Waldorf School Association of Ontario, Inc.—this school had been longed for and worked for; and in that intangible way in which human beings can be together, they were all there, too, on that Tuesday.

If it is true, however, that every child is a "hostage to fortune", even more so is it true that a Waldorf School is a hostage to the human spirit. Only to the degree that the human spirit in our age is alive to the kind of education Waldorf stands for will these schools make their way in the world. Only in so far as there are people who are sensitive to the real needs of the time, can such schools be founded with confidence in their future.

The past 50 years of Waldorf education, with its 76 schools in various parts of the world are a sure sign that that spirit is not lacking; and there are many signs here in Canada that confirm it.

Many people have called at the Waldorf Information Centre, situated in a busy shopping plaza, which was open daily for months before the school itself opened. They called to inquire about enrolment, to learn about Waldorf education, to discuss their own educational problems and ideas, and in most cases to leave their names as willing to know more and to co-operate in what was being started.

The Canadian Broadcasting Corporation gave programme space for an interview on what Waldorf means, and called forth the spontaneous enthusiasm of the interviewer to the extent that he

invited further interviews in the future. A columnist of one of Toronto's leading dailies, *The Star*, devoted her space one morning to the visit she had made to the information centre. Altogether the news that Waldorf education means something different is really getting around.

What is most significant is the growing feeling of the need to foster in education the dignity and independence of the free human spirit in the world. This is the bedrock of all Steiner's teaching on man, on which Waldorf education is founded. And this alone will ensure the future of Waldorf ideas both here in Toronto and elsewhere. Out of this the Toronto Waldorf School was born, and in the confidence of this it will continue into the future.

Steiner pupils excel in creativity tests

FRANK NEWELL

DURING his year of study at Emerson College, Mr. (now Dr.) Earl Ogletree, assisted by his wife Gerda, administered creativity tests to grades three, four, five and six of three Steiner schools in England (Elmfield, Michael House, Wynstones), one Steiner school in Scotland (Edinburgh) and two Steiner schools in West Germany (Munich and Stuttgart), and to the same grades of the corresponding state school in each of the six localities.

A total of 1,165 children (499 Steiner school children and 666 state school children) were thus tested. All were given oral, verbal and figural Torrance Tests of Creative Thinking. These tests are designed to measure the children's ideational fluency, flexibility, originality and elaboration.

An interim report on the findings of a fascinating and valuable piece of research shows that the Steiner school pupils on average obtained significantly higher scores than the state school pupils. Girls excelled boys on both verbal and figural tests, in both state and Steiner schools; this result Dr. Ogletree ungallantly ascribes, not to sex, but to a girl's greater maturity than a boy of her own age.

The teachers of the children were all asked to name which among their pupils were the creative ones. There was a positive correlation between their estimates and the findings of the tests. Teachers and tests thus seem to offer mutual support to each other—art and science, for once at least, see more or less eye to eye. One awaits Dr. Ogletree's full-scale report with both impatience and expectance.

Comment

IT is always a pleasure to quote David Holbrook, and his letter to the *Guardian* of March 13, 1968, is no exception. He had been giving a lecture to the students of Manchester College of Science and Technology in which he put forward his well known view that education is nothing if not a search for oneself, and that this can be best achieved through a sensitive preoccupation with the arts. Subsequently he wrote to the principal, Lord Bowden, to point out the sterility of the courses at the college, and suggested some changes. Lord Bowden in his reply seemed to think there was no need to raise problems of human existence in his establishment. During a time of student unrest the same Lord Bowden accused the students of "threatening the whole university system". In his letter David Holbrook says this system "has already been destroyed from within, by those who have subdued higher education to pragmatic and material ends, to the extent that the inner life of man, even where it should be most cherished, has come into contempt . . . Student demonstrations manifest an agony among the young, in protest against the dehumanization of the environment, and the terrifying lack of preoccupation with the aims and meaning of civilization among the older generation".

* * * * *

THE same problem has been discussed by W. R. Niblett, professor of Education at the University of London. In an article in the *Guardian* he pointed out the great responsibility that rests with university staff who teach an ever-increasing proportion of the nation and are more and more being used as experts by government, press and television. Are they aware of their responsibility? Have they thought out the function of a university in the life of today? Have they given sufficient thought to the social relevance or otherwise of the research which their post-graduate students are engaged in? The easiest way for a university's staff is to concentrate on research and let the students, who in any case do not like being interfered with, get on with their own preoccupations. "But is this," Niblett asks, "a good way of carrying on? Can universities deliberately choose it without qualm? If not, they should not follow it unconsciously. Here they are places for the tertiary education of so many. Here is the nation in need of experts of a thousand kinds. But its experts must also be people having identity and more than

seriatim convictions. Universities must be places where learning is disinterestedly pursued, where scholars are trained and research is done, but places, too, in which more imagination, morality and personal creativeness are set alight."

* * * * *

AN encouraging sign of the times is the Report on Education No. 48, *Educating Gifted Children*. It is based on a study by Professor Terman and a conference of inspectors and other educationalists. Gifted children, we are told, are "taller, healthier, had fewer problems which they could not meet without stress and made a positive contribution to society". They are not found in one particular section of the population only, they cannot be defined by a high I.Q., and they need neither be creative nor intellectually curious. All this is born out by experience in the classroom. What is so encouraging is that no attempt has been made at "reductionism", to connect the phenomenon to one numerically defined variable. Equally encouraging are the conclusions drawn. The report comes down in favour of non-segregation. Though some of the time a bright pupil ought to meet minds of his own calibre he "should be educated with his fellows of a wider range of ability . . . Special schools would no doubt turn them out better informed, but not well equipped for a life which would oblige them to work with all sorts and conditions of men."

* * * * *

THE speed of any change seems to be in inverse proportion to the heat and number of words engendered. So it is, for example, in the matter of comprehensive schools. Judging by the brave promises of the one side, and the outraged cries of warning of impending disaster of the other, the layman might have thought that there was a major revolution in progress. But two years ago only 10.7 per cent of English and Welsh schoolchildren were in comprehensive schools. Of the schools the National Foundation for Educational Research has found few which are truly comprehensive in social background and range of ability. The problem is difficult in any case: it involves the freedom of choice of a responsible parent and the fact that many neighbourhoods are populated by people of one social background only. What makes it almost intractable is that it has been frozen into attitudes of political prejudice.

WE are able to create prosperity, we can provide educational opportunities, but we cannot in one generation change fundamental attitudes which have arisen in the course of centuries. "Education is for the sons of gentlemen" is so deeply engrained in Englishmen that even in 1968 we are an under-educated country. The contrast with Wales, so much poorer, yet so much richer in its love of learning and culture, is striking. The percentage of children who were still at school at 17 was (in 1965-6) 17.4 in Wales, but in England and Wales together only 13.4. Again, Wales offers a considerably higher percentage of university awards for comparable age groups. And the Welsh like teaching: 5.68 per cent of Welsh schoolchildren proceeded to colleges of education. In the various regions of England the corresponding figures were between 4.47 and 2.8.

* * * * *

IN March, 1968, *The Times Educational Supplement* gave the results of an interesting survey. Some 140 Marlborough sixth-formers were asked how they had arrived at the choice of their A level subjects. The most frequent reason by far was that they had enjoyed, and had been interested in, a particular subject up to O level. The least important reason was the financial prospect of a particular career. One very interesting detail emerged. Those who had chosen English as one of their A level subjects did so mainly because they were interested in it, but for budding physicists the main reason for their choice was their career. This bears out some of the recommendations of the Dainton report: the importance of an inspired mathematics teaching early in the school, and the need to teach physics as a cultural subject in the years before specialization.

* * * * *

ONE of the unsung glories of the English educational set-up is the amount of freedom it allows to a headmaster. This makes for variety and experiment and, most important, helps a school to establish a definite identity. "Within the proper democratic structure of a thousand and one checks on me, I can run my school how I like", says Mr. A. W. Rowe. He is in charge of a comprehensive school in Hull, and calls his school an "accepting" school because there is room in it for every type of child: maladjusted, university candidate or non-academic. He is concerned with the ends of education and has little or no love for educational research

which can only deal with means and make limited statements. If each child in the school feels secure, if he is given proper scope and if personal relationships are right you can demand of him more and more. In such a school there are only children, but no streams.

* * * * *

NOR are there streams at Vauxhall Manor, a South London secondary school for girls, where Miss E. M. Hoyles is headmistress. The school has an eight-form intake and a considerable amount of ingenuity is devoted to making each separate form comprehensible in ability. In an age of increasing specialization and automation it is most important to Miss Hoyles that the child learns to build successful personal relationships, is mobile enough to be trained and retrained more than once in a lifetime, and makes full use of the possibilities for living which increased leisure is bound to offer. Like Mr. Rowe, Miss Hoyles believes that every member of the community must receive a full education and a chance of developing into a whole person. Every visitor to Vauxhall Manor will surely be impressed by the way in which Miss Hoyles translates her belief into action.

* * * * *

MR. L. CHANTER is headmaster at Ninelands Lane, a mixed infant and junior school in the West Riding. His school was the subject of an article in *The Times* on May 27, 1968. Like Mr. Rowe, and like some others in the north of England, he has introduced team teaching in his school. It is doubtless still too early to judge advantages and defects of this system. In the first flush of enthusiasm practically any new method is bound to succeed, because of the commitment of the teachers involved. Whether or not a method is generally valid can only be ascertained after a certain routine has been established. But what seems certain is that—given the right teachers, a big proviso—team teaching allows for much initiative on the part of the individual teacher and the forming of good teacher/pupil relationships. Like Miss Hoyles, Mr. Chanter wants his pupils to be proud of their work without necessarily comparing it to that of others. Boredom seems to him the greatest enemy to progress. "Children should be happy, confident and absorbed, learning to make their own judgements, able to communicate and discriminate, and to express themselves not only in words, but also in clay, painting, music and movements." How schools have developed the last 20 years! How difficult it must be for the conventional parent to understand and appreciate what now goes on in them.

Book Review

NEW BACKGROUNDS: The Immigrant Child at Home and at School. Edited by Robin Oakley. Oxford University Press. 12s. 6d.

THIS booklet, published for the Institute of Race Relations, can be warmly recommended. Though specifically written as a guide for school teachers, it should be read by all who take the problems of race relationships seriously.

The subject matter is in six sections. A group of social scientists have each contributed a study on the way of life and cultural background of the four main groups of Commonwealth immigrants—West Indian, Cypriot, Indian and Pakistani—and there are two concluding essays on the psychological and educational problems involved.

The accounts of the family life and religious traditions of the different groups are given with sympathy and understanding. The reader is made aware of the grave difficulties facing the majority of immigrants who, in complete ignorance of the English language and way of life, leave a depressed agricultural area to face industrial overcrowding, where almost every custom runs counter to their own religious code.

The educational problems are clearly shown. Most immigrant parents, with a touching faith in the merits of an English education, absolutely fail to understand modern trends. Many teachers

have to deal with situations for which their training has given them no preparation.

Social scientists and educationists at least realize the need for action. The School Council has drawn up a large scale project to provide suitable material and guidance for schools all over the country, and this booklet gives wise and sympathetic advice on ways of helping children to feel accepted. It is recognized that there should be no enforced integration, for family traditions and the home background give valuable support.

The concluding note is one of appreciation for what is brought into England through such diverse racial groups. "The blending of the immigrant culture with our own," claims one of the writers, "is for the enrichment of our society." It is only to be hoped that this view will be widely enough accepted before it is too late.

E.H.

* * *

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NOTES ON OUR CONTRIBUTORS

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Roland Everett. Born in 1918 in Heidelberg, Germany. Settled in England in 1939. After the war he joined Elmfield School, Stourbridge at its re-opening in 1946, where he has been a class teacher and teacher of German and music ever since. Wife also a full-time teacher at Elmfield. Two children (daughter teaches art in London and son specializes in music at a teachers' training College in Bath).

Dr. Frederick Hiebel. Elected member of the Council of the General Anthroposophical Society, Dornach, Switzerland in 1963. Head of the Section of Belles-Lettres. Professor of German Literature in U.S.A. for many years. Author of *Gospel of Hellas* and other books. Editor of *Das Goetheanum*.

R. A. Jarman. Major scholar in mathematics at Cambridge, worked in aeroengine design at Rolls Royce. Taught for 16 years at Michael House School in Derbyshire—upper school mathematics, physics, geography and drama, also as a class teacher and gymnast. Since then for six years upper school teacher at Michael Hall in Sussex, where he is chairman of the Council of Management. He is also chairman of the Steiner Schools Fellowship, a trustee of Emerson College and a trustee of the English Section of the General Anthroposophical Society.

Michael Wilson. Born 1901. Educated Bootham School and Royal College of Music. Orchestral player (violin). Stage lighting designer. Founder-director Sunfield Children's Homes, Clent, Worcs., since 1930, and Goethean Science Foundation since 1948. Lecturer and writer on science of colour. Chairman of the Colour Group of Great Britain, 1963-65. Lives at Clent with wife and three children. Former recreations: painting, photography, mountaineering, gliding.



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