



1975
The Golden Blade

The Golden Blade

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BOOK REVIEWS

Europe: a Cosmic Picture—New Life on the Land—Spirit of the
Circling Stars—Science and Morality—Eurythmy and the Impulse
of Dance—Shorter Notices

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Edited by Charles Davy and Adam Bittleston

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Anthroposophy springs from the work and teaching of Rudolf Steiner (1861-1925). He spoke of it as "a path of knowledge, to guide the spiritual in the human being to the spiritual in the universe".

The aim of this Annual is to bring the outlook of Anthroposophy to bear on questions and activities which have relevance to the present time.

The title derives from a reference by Rudolf Steiner to an old Persian legend. "Djemjdid was a king who led his people from the north towards Iran, and who received from the God, whom he called Ahura Mazdao, a golden dagger, by means of which he was to fulfil his mission on earth . . . It represents a force given to man whereby he can act upon and transform external nature".

EDITORIAL NOTES

ALEXANDER Solzhenitsyn's *Letter to Soviet Leaders* should not be forgotten. Not only does it pose—whether it is heeded at all or not—a great, reasoned question to the rulers of Russia; but at moments it looks, with a detachment we should value, at the situation in the West:

The catastrophic weakening of the western world and the whole of western civilisation is by no means due solely to the success of an irresistible, persistent Soviet foreign policy. It is, rather, the result of an historical, psychological and moral crisis affecting the entire culture and world outlook which were conceived at the time of the Renaissance and attained the acme of their expression with the eighteenth-century Enlightenment.

And Solzhenitsyn adds: "An analysis of that crisis is beyond the scope of this letter." Later, nevertheless, he ventures on something like a prophecy. He has been saying that mankind will have to give up the ideal of economic growth and adapt itself to the technology of a stable economy within the next twenty or thirty years, or the biosphere will become unfit for life. And we must begin this transformation at once. But he goes on:

Actually, though, it is more than likely that western civilisation will not perish. It is so dynamic and so inventive that it will ride out even this impending crisis, will break up all its age-old assumptions and in a few years set about the necessary reconstruction.

We are still very far from understanding this deeply enough. Man is a complicated being; it is difficult for him to observe the changes in himself while they are going on, or afterwards: there is loss and gain, and the gain may hide the loss.

What was lost in the fifteenth and sixteenth centuries was the living, spiritual picture of man which the soul needs. "Humanism" arose as the search for this lost picture, or for one that could replace it. "One does not aspire to humanism because one has man, but because one has lost him." (Rudolf Steiner, *The Michael Mystery*, 30 November, 1924). The search led back to the Greeks, and later on, in the nineteenth century, to the wisdom of the East; but pictures brought from the past did not fill the need. Many people believed that the great new ideas about the universe and the history of the

earth would provide an idea of man as well. And twentieth-century man has still not understood why this does not happen.

Rightly, we seek objectivity. But we make a great mistake about this: we identify objectivity with a *limited* use of the senses and of thinking. The great, new, enormously successful ideas about the material world are indeed achieved with the help of this limitation; but man himself cannot be understood in this way. "It is not enough to be able to *think* this distinction; we need to admit it deeply into our hearts. In ordinary life, after all, we can notice at every step our failure to understand one another; quite practically, we fail to use all our senses well enough, and fail to develop our thinking to grasp what we observe. But again, it is not enough to accept this in a general way; we need to look quite specifically at the senses we have, and at those beyond them which can be developed.

Perhaps even those long concerned with the work of Rudolf Steiner have done this too little. We have not realised enough that what he says about the twelve senses of man is not just an interesting study, but has far-reaching social and moral consequences; in particular his description of those senses which are little understood—the speech-sense, the thought-sense, and the sense of another person's 'I.' Thus in printing in this issue two lectures by Rudolf Steiner and an article by John Davy, all concerned with the senses and life-processes in man, the editors of the *Golden Blade* are not offering a holiday from social and economic problems—but a way of approaching them which can be much more effective, in the long run, than outer calculations can be. For in the whole ring of the senses, and in the life-processes as conceived here, the human soul can understand itself as living.

In social life everything depends on our understanding of one another, as individuals and as groups. And we cannot understand one another without warm and colourful ideas about man in general. But these ideas need not be arbitrary constructions. The fear of arbitrary subjectivity is a trap in which man has caught himself for centuries; it has driven him into purely quantitative ways of thinking from which all subjectivity seems to be excluded. But this preference for the quantitative is itself a subjective bias. We all know that in encounters among people it is possible to achieve balanced judgments of a qualitative kind. Few have attempted this

on a great scale in the study of nature; Goethe's work on light and colour—described here by Michael Wilson—is a rare success.

There are two sorts of objectivity we can recognise: a one-sided sort, which in the end proves misleading, and one that is achieved much more slowly but is much more complete. The first brings the human spirit into subjection beneath the being called, in anthroposophical cosmology, Ahriman—though man remains unconscious of this subjection. The second leads to a conscious understanding of the Christ. For thoughts which take full account of the reality and freedom of the human soul are thoughts in which man meets with Christ.

In *every* field of human knowledge and activity we need such thoughts. Dr. Georg Unger shows here how thoroughly modern cosmology is permeated by Ahriman—and by really powerful "Luciferic" elements. A thorough-going restoration of health in cosmology can be achieved only when a conception of space is worked out in accord with the life of the soul. Ahriman teaches *his* concept of space—an emptiness which he nevertheless presents as the abiding reality. For the Christian mind, space is something extended by the World-soul like a tent into which human souls can come, from which they can go. And its directions differ in quality, as up and down, and forward and backward, do for the human body.

Rudolf Steiner looked forward to the time when all sorts of relationships between astronomy and embryology would be established. Some of his followers, notably Dr. Karl König and Mr. George Adams—have made significant contributions to this, in different ways; we need many workers in this field. Such work could in the end prove to be both practical in its effects, and able to inspire new reverence for the path of the soul into incarnation.

Dr. Kirchner-Bockholt's short article again suggests a starting-point for such research. She links a general description by Rudolf Steiner of what can be seen by initiate vision as an Imagination, when he looks back at the body from outside in sleep, with specific physiological processes. To-day medicine is able to influence human behaviour and emotional states by surgery and drugs in ways undreamt-of when she wrote. But a real understanding of

what interventions are permissible or impermissible can be won only on the path she attempts.

Before the age of the loss of the idea of man, and still during the beginning of this age, this path was described in beautiful pictures, by men of great seriousness, as the quest for the Grail. What can hinder man in the development of selfless understanding, heart-filled objectivity, was called the wound of Amfortas. Not to flee from the presence of this wound into the barren fields of calculation, but to bring into the act of knowing the influence of compassion, wonder, and the power of true conscience, is the way of Parsifal, on which the stars come nearer again to man, and the three sisters who were estranged meet and help each other once more.

A.B.

THE TWELVE SENSES AND THE SEVEN LIFE-PROCESSES IN MAN

RUDOLF STEINER

*A lecture given at Dornach, 12 August, 1916**

WHEN we speak, as Goethe, for example, speaks in *Faust* of the great world and the small world, of macrocosm and microcosm, we mean the whole Universe as macrocosm and man as microcosm. And we know well that the connections between the cosmos and the human being are manifold and very complicated. To-day I want to remind you of something that has been spoken of during recent years; I would like now to connect it with a study of man's relation to the Universe.

You will remember what has been said of the Senses: that they were laid down in germ and received the first impulse for their existence during the Old Saturn period of evolution. Naturally, it must not be imagined that in their germinal form on old Saturn the Senses were similar to those of to-day. That would be nonsense. It is extraordinarily difficult to picture the form in which the senses were present during the Old Saturn time. It is difficult to picture them even as they were on the Old Moon, for then, too, they were altogether different from what they are to-day. In this lecture I want to throw some light on the senses as they were during the Old Moon period of evolution; that is, during their third stage of development, after the Old Saturn and Old Sun periods.

At that time the senses were far more living organs than they are to-day, but they could not meet the needs of fully conscious human life. They were suited only to the dreamlike clairvoyance possessed by the Moon-man, who was incapable of freedom in his actions and desires. Freedom could not develop as an impulse in human beings until the Earth period of evolution. In other words, the senses were not yet foundations for a consciousness such as ours, but only for a vaguer, more imaginative form of consciousness, similar to that of our dream-life to-day.

* From shorthand notes unrevised by the lecturer. Published by kind permission of the Rudolf Steiner Nachlassverwaltung, Dornach, Switzerland, and in agreement with the Rudolf Steiner Press.

As he now is, man recognises the existence of five senses. We know, however, that this is not correct, for in reality there are twelve different senses. The seven senses that are over and above the familiar five have just as much reality in our earthly existence as the five others. These five are, as you know: the sense of sight, the sense of hearing, the sense of taste, the sense of smell, and the sense of touch. The sense of touch is often not distinguished from the sense of warmth, although in some quarters the distinction is now coming to be recognised. In earlier times the sense of touch and the sense of warmth were regarded as indistinguishable. Of course, these two senses are in fact quite unlike each other. The sense of touch tells us whether an object is hard or soft. The sense of warmth is something altogether different. If we really understand the relation of man to the rest of the Universe, we shall distinguish twelve senses, and to-day we will enumerate them once more.

The sense of Touch is the sense through which man relates himself in the most material way to the external world. He presses against it, so to speak. Nevertheless, the process involved in the act of touching takes place *inside* the skin. A person presses against an object with his skin, but the process which makes him aware of the object he is touching goes on inside the skin, within the body.

Still further within the organism is what we may call the sense of Life. This is a sense which receives almost no attention to-day, for it works dimly within the organism. When anything in the organism is upset, the disturbance will be felt. But in the ordinary way no heed is paid to the harmonious interaction between all the organs which expresses itself in the everyday feeling of life, a feeling present throughout waking consciousness. No heed is paid to it because normally a man takes it for granted as a natural right. It consists in a general feeling of well-being. When this feeling diminishes, people try to refresh it by resting a little. We are aware to some extent of this diminishing and freshening of the feeling of life, but generally we are too accustomed to it to be aware of it. Nevertheless this sense of life is a distinct sense, through which we feel life within us, just as with our eyes we see things around us. We should be unaware of the flow of our life if we did not have this sense of life within us.

More inward still, in the bodily sense, is what we will call the sense of Movement. Through the sense of life we become aware of the condition of our organism as a whole: we have a feeling of well-being or of discomfort. Through the sense of Movement we can perceive the movements of our limbs relative to each other.

I am not speaking of movements by the body as a whole: that is something different. I mean that when you bend an arm or a leg, or when you speak (for then there is movement in the larynx), you perceive the inner movements, the inner changes of position of the different limbs, and you perceive them with the sense of Movement.

And now think of what we call our Equilibrium. As a rule we give no thought to this. But if we get dizzy and fall down, or if we faint, the working of the sense of equilibrium is interrupted, just as the working of the sense of sight is interrupted when we close our eyes. Just as we perceive inner changes of bodily posture, so do we perceive our balance, our equilibrium, when we bring ourselves into relation with above and below, left and right, and so feel ourselves standing upright in the world. We become aware of this feeling of balance through the sense of equilibrium. This, too, is an actual sense.

Now the processes connected with these senses remain entirely within the organism. True, in acts of touching you press against an object, but you do not get inside it. If you come up against a needle, you say it is sharp, but in the mere act of touching you do not enter into the point of the needle, or you would prick yourself, and that is no longer an act of touch. All the working of these senses lies inside the organism. You press against an object, but what you experience as touch lies inside the boundary of your skin.

Inward, too, is what you experience through your sense of Life, and so it is also with the sense of Movement. I do not mean a movement which consists in walking to and fro, but the inner movements that take place when I move my limbs or when I speak. It is these inner movements that are perceived through the sense of Movement. When I move myself outwardly, as in walking, I also move my own being inwardly. So you must make a distinction between the actual movement of walking and the inner movements made by the limbs. The sense of Life, the

sense of Movement and the sense of Equilibrium all give rise to inward perceptions. With these senses you do not perceive anything external.

Now with the sense of Smell you begin to pass outside yourself: it brings you into relation with the external world. But you will feel that in smelling you go only a very little way outwards; you experience only a little of the outside world. Moreover, a human being—unlike the dog—has no wish to know what a subtler sense of smell could tell him about the world outside. He allows himself merely to *perceive* through his sense of smell. His contact with the outer world remains slight, and he is not inclined to deepen it by this means.

Through the sense of Taste we enter more deeply into the outer world than we do in the case of smell. We have a very inward experience of the nature of sugar or of salt when we taste them. The outer becomes very inward in the sense of taste, more so than in the case of smell, and so it brings about a stronger relationship between the outer and inner worlds.

Still more is this so with the sense of Sight. With the sense of sight you take in far more of the qualities of things in the outer world than with the sense of taste. And far more still with the sense of Warmth. What you perceive through the sense of sight remains more remote from you than what you perceive through the sense of warmth. Through the sense of warmth you enter into a very intimate relationship with the outside world. When we feel an object to be warm or cold, we experience this strongly as a quality of the object itself. We cannot say this about the sweetness of sugar, for example. The point here is more what sugar becomes through the act of tasting; the experience has less to do with sugar as it exists in the outside world. For the sense of warmth no such distinction can be made, for here you have a direct experience of the inner character of whatever you are perceiving.

Through the sense of Hearing we enter more intimately still into a relationship with the inwardness of the outer world. Sound and tone reveal a very great deal about the inner texture of external things, more than warmth does and very much more than sight can do. The sense of sight gives us only pictures of surfaces. When a metal begins to sound, it manifests its inner nature to the sense of hearing. The sense of warmth, too, penetrates inwards, for

when we take hold of a piece of iron, let us say, we feel strongly that not only the surface is cold but that the iron is cold through and through. When we look at some object, we see only the colour of the surface, but if we make a metal give forth sound, we become intimately aware of its inner nature.

The perception is still more intimate when meaning enters into the sound. Here we go beyond the sense of hearing: the sense of Speech, or the sense of the Word, are now the terms we need. It is sheer nonsense to imagine that the perception of words is the same as the hearing of sound. They are just as different as are taste and sight. It is quite true that through the tone we become aware to some extent of the inner nature of the outside world. But this becomes a still more intimate experience when the tone or sound is imbued with meaning, as in words; when, that is, we do not merely become aware of sound through our sense of hearing but perceive the meaning of the sounds through our sense of speech. But even then, by experiencing the actual words, we are not penetrating the outer world so intimately as when, through words, we experience the thought behind them. Most people make no distinction here. Yet there is a difference between experiencing the words—the sound imbued with meaning—and perceiving directly the thought behind the words. After all, words can be perceived even when they are released altogether from the thinker and transmitted through a gramophone. They are accessible even in writing. But to enter into living connection with the person who shapes the word, to pass by means of the word into a direct relationship with him as a thinking being—this requires a sense still deeper than the ordinary sense of speech. It requires what I will call the sense of Thought.

An even more intimate relationship with the outer world is made possible by the sense that allows us to feel so much at one with another person that it is as though he were our very self. This is the sense that enables us, through the thinking that comes to meet us from the other person, to gain a perception of his Ego. I will therefore call this sense the Ego-sense.

Now we must make a clear distinction between this Ego-sense which perceives the Ego of another person, and the perception of one's own Ego. The difference is not that at one moment we become aware of our own Ego and next moment of the Ego of another.

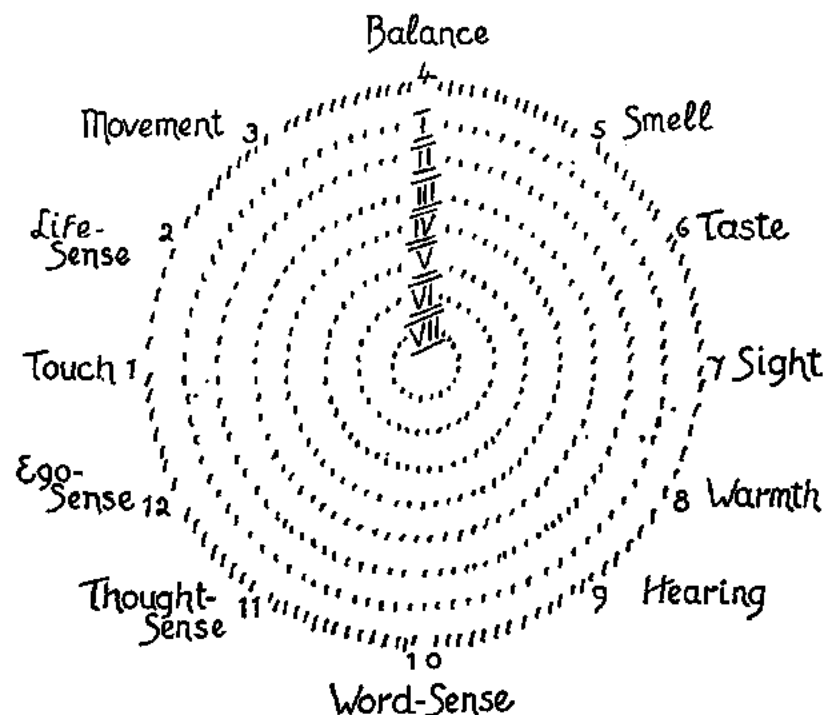
There is a difference in actual origin. The germ of the faculty for knowing the Ego of another was laid down in our being on Old Saturn, together with the germs of the other senses. Our own Ego was not acquired until the period of Earth evolution. The Ego which ensouls our inner being is not the same as the Ego-sense of which I am speaking here. When we speak of the Ego-sense we are speaking of the faculty for becoming aware of another Ego.

You know that I have never failed to acknowledge the truth and grandeur of materialistic science. Here in Dornach I have given lectures paying tribute to its achievements. But we must learn to love this materialistic science so deeply that we can handle even its shadow-side with affection. Its way of thinking about the senses is only now beginning to take some kind of shape. Physiologists to-day are coming to distinguish at least the senses of life, movement and equilibrium, and to separate the sense of warmth from the sense of touch. But materialistic science does not recognise the other senses of which I have just been speaking.

Now with regard to the perceiving of another Ego—and I say this out of deep love for materialistic science because this very love enables one really to understand it—materialistic science is burdened with stupidity. It becomes nonsensical when it speaks of the functioning of the Ego-sense in human beings. For it says that when one man confronts another, he unconsciously infers the Ego from the gestures, facial expression and the like, of the other man. In other words, he infers the existence of the Ego quite unconsciously. This is sheer nonsense! We perceive the Ego of another human being just as directly as we perceive a colour. To imagine that we infer the Ego merely from perceptions of bodily features is idiotic, for it ignores the existence in man of a deep-lying sense whereby he apprehends the Ego of another. Just as light, darkness and colours are perceived through the eye, so is the Ego of another human being perceived through this Ego-sense. It is a sensory relationship to the other Ego. Just as colours work upon us through the eye, so does the Ego of another human being work upon us through the Ego-sense. When the time is ripe, we will speak of the organ of the Ego-sense, just as we speak of the sense-organs of sight and hearing. Only it is easier to indicate the material manifestations of these senses than

it is to speak of the organ for the Ego-sense. Nonetheless the organ is there.

Now if you think about the senses you will say to yourselves: The organism specialises or differentiates itself in these senses. It does indeed differentiate itself, for seeing is not the same thing as perceiving tones; perceiving the nature of words is not the same thing as hearing; hearing is not the same thing as perceiving the thought; and perceiving the thought is not the same thing as touching. These are all separate domains of the being of man. So we have twelve senses, each with its distinct domain. I would ask you particularly to bear this fact in mind. Each sense is a domain in itself; we can therefore inscribe all twelve in a circle, distinguishing twelve separate domains in the circle.



It is different when we come to speak of forces which lie more deeply within the being of man than do the forces connected with the senses. The sense of sight is associated with the eye and constitutes a definite domain in the organism. The sense of hearing

is bound up with the ears—or at least mainly so. In fact we hear with a domain far wider than that connected with the ears themselves. The ear is simply the most normal field of action for the sense of hearing.

All these sense-domains are equally permeated with *life*, with the element of life. The eyes live, the ear lives, everything that underlies the senses lives. Life indwells every one of the senses, flows through all their domains of activity.

If we study this element of life more deeply, we shall find that it, too, is differentiated. There is not only one single life-force. You will realise, of course, that the sense of life, the sense by means of which we become aware of life, is not the same as the element of life itself—the life that permeates our being.

We must think of the twelve domains of the senses as being to a certain extent stable within the organism. But life is pulsing through the whole organism, and life, too, is differentiated. First we have a process that must be present wherever there is life—namely Breathing. The relationship to the outside world that comes through breathing must be there in everything that has life. I cannot now go into the way in which this process differs in animal, plant and human being, but some form of breathing takes place in every living creature. The breath-process in man is ever and again renewed by something he receives into his being from the outside world. Every sense-domain benefits from this. The senses of smell, sight, hearing—none of the senses, indeed, could function if they did not benefit by what the element of life receives from the breathing process. Therefore we must connect breathing with every one of the senses.

As a second life-process we have what I will call Warming. Warmth enters into us together with breathing, but it is different from breathing. Inner warming is a second means of support for life, and a third is Nutrition, nourishment.

Thus we have Breathing, Warming, Nutrition—three forms in which life from outside comes to meet the life-process within. The outer world contributes to all of them. Breathing presupposes the existence of a substance—the air in the case of human beings and animals. Warming requires a definite degree of warmth in the environment. Just think how impossible it would be for you to live with the proper inner warmth if the temperature around

you were much higher or much lower! If it were 100 degrees lower, your own warming process would cease altogether. If it were 100 degrees higher—well, you would not merely perspire! Nutrition is equally necessary insofar as we are concerned with the life-process in earthly existence.

Now our study of the several life-processes will lead us more deeply into the inner being of man. The next life-process consists in the re-casting, the “making-inward”, the transformation of what is taken in from the outside. I will give to this process of transformation the name we used for it once before. Science has as yet no exact expression for it, because in this field the necessary distinctions are not yet made. The re-casting and transformation of what is taken into the organism from outside are subject to processes that are entirely inward and can be pictured in various forms. The first process that occurs after the taking-in of nourishment is inner Secretion. Secretion is already taking place when foodstuff is transmitted to the body and becomes part of the organism. Not only is there excretion, but also a transmission to the inner being of what has been received in the foodstuffs. Secretion consists partly in excretion, but also in assimilation. This latter is a secretion brought about by the organs which serve the process of nutrition: secretion into the organism itself. Now what is thus secreted into the organism must be sustained, and Sustenance is a life-process in itself. In order however that life may exist, it must not only sustain what it receives but must enhance it. Everything that lives is subject to an inner process of increase, of augmentation; that is, to a Growth process in the widest sense. The growth-process belongs to and is part of life. Reproduction, too, is part of life here on earth. The growth-process is responsible only for causing one member of the organism to grow out of another. Reproduction is a higher process than growth, for it engenders an individual, an entity of like species.

Apart from these seven, there is no further life-process in the inner being. Life is divided into seven processes; but we cannot here speak of domains, for these seven processes permeate with life every one of the twelve domains of the senses. We have, then:

- | | | |
|--------------|---------------|-----------------|
| 1. Breathing | 4. Secretion | |
| 2. Warming | 5. Sustenance | 7. Reproduction |
| 3. Nutrition | 6. Growth | |

Hence we must think of the living human being as having twelve distinct senses, with their domains of activity, and pulsing through these twelve domains a seven-fold life—an inwardly moving, seven-fold life. Add to the twelve domains the corresponding signs of the Zodiac, and you have the macrocosm—and the macrocosm becomes the microcosm in the twelve senses of the human being. Add to the seven life-processes the signs of the planets and you have the macrocosm. Give the seven processes the names we have ascribed to them here, and you have the microcosm. And just as in the macrocosm the planets move through the Zodiacal constellations, so does the sevenfold life-process flow continually through the stable domains of the senses. In many other respects, too, man is a microcosm.

Now anyone with a thorough knowledge of modern physiology, and of experimental psychology, as it is called nowadays, might say: "This is nothing but a neat trick. One can find such connections between anything. If you choose to assume the existence of twelve senses, you can easily say that they correspond to the twelve signs of the Zodiac. And if you choose to divide the life-process into seven parts, you can connect them with the seven planets." In other words, the whole can be regarded as some kind of fantasy. I can assure you that it is not, most truly not.

The being of man has developed very gradually and by slow degrees: on the Old Moon, as I said just now, his senses were much more living; they were the foundation of a dream-like, clairvoyant consciousness. The senses to-day are much deader than they were on the Old Moon and much more separated from the sevenfold and yet unitary life-processes. During the Old Moon period of evolution the senses were themselves more of the nature of life-processes. Seeing and hearing to-day are already rather dead processes, connected more with the periphery of our being. Perception on the Old Moon was a much more living process.

We will take one of the senses as an example—the sense of taste. You are all familiar with the sense of taste as it is now on Earth. During the Old Moon period, however, tasting was a process in which the being of man was not as separated from the outer world as it is now, when sugar is there as a substance and we have first to touch it with the tongue before an inner process begins to function. In acts of tasting there is a clear distinction between subject and

object. It was not like that during the Moon period of evolution. The process of tasting was then still much more of a life-process, rather resembling the breathing-process. When we breathe, something real is happening within us. When we in-breathe the air, something happens in our whole blood-forming process. This belongs to the breathing inasmuch as breathing is one of the seven life-processes. Outer and inner come together here. Air without, air within, and a real process is in operation while we breathe. It is a much more real process than when we are tasting anything. Tasting, it is true, provides a foundation for our consciousness to-day, but on the Old Moon tasting was more of a dream-process, just as our breathing is to-day. Nowadays we are not as conscious in the breathing process as we are in the process of tasting. On the Old Moon, man got no more from tasting than we do from breathing, nor had he any desire to do so. He had not yet become an epicure and could not be one, for he could activate his tasting only insofar as it contributed to his sustenance as a living being.

It was the same with the process of seeing during the Old Moon period. A man did not then look at objects and perceive the colours on their surfaces. The eye lived *in* the colours, and life was sustained by the colours which flowed through the eye. The eye was a kind of colour-breathing organ. The life-system of the human organism was connected with the relation to the outer world that came about through the process of visual perception. On the Old Moon, man's being widened out, expanded, in the colour blue; drew together, contracted, when he ventured into the red: expansion—contraction, expansion—contraction. This was connected with the perception of colours. And so all the senses were still related in a living way to the outer world and the inner world, just as the life-processes are to-day.

Now take the Ego-sense. The Ego first entered into human beings during our Earth period; on the Old Moon, therefore, there could be no Ego-sense. Thinking, too, as we know it, is connected with our earthly consciousness. The sense of thought as it is to-day was not in existence on the Old Moon, nor were there any speaking human beings. The Word lived as the Logos, sounding through the whole universe and passing through the being of man. It signified something to him, but he did not perceive it in the form of words coming from another being. The sense

of hearing was already in existence, but in a much more living form than we have it on Earth, where it has come to a kind of standstill. As a rule, when we are listening, we keep quiet. Unless the eardrum is cracked by some noise, nothing is substantially changed in our organism by hearing. We remain at rest within our organism and merely perceive the sound. It was not like that on the Old Moon. The sound approached and was heard, but every act of hearing was combined with an inner quivering and throbbing, with an inner vibrating experience of the tone itself. Man's whole being was permeated with what we call the Cosmic Word, but the Word was not consciously perceived. Hence we cannot properly speak of a sense of hearing on the Old Moon. The Moon-man thrilled in response to this sounding that underlies the sense of hearing to-day. If what we hear as music had sounded on the Moon, it would have given rise to an inner dance, for the inner organs, with few exceptions, would have moved inwardly, just as my larynx responds with inner movement when I send sounds through it. Man's whole being throbbed inwardly, either in harmony or in disharmony, and he was aware of this throbbing. It was an actual process in which he participated—a life-process.

The sense of warmth, too, was a life-process on the Old Moon. To-day we are more or less passive in face of our environment. It feels warm or cold, and we participate slightly in its condition. But on the Old Moon a man's whole life-system changed as the warmth increased or decreased. It was a much more intense participation. Just as man throbbed together with sounds, so did he experience an inner warming and cooling and was well aware of it.

Now the sense of sight. I have already told you what it was like on the Old Moon. Man lived in and with the colours. Certain colours caused his form to expand; others caused it to contract. To-day we can feel this only symbolically, for we do not literally shrink together in the face of red, or expand in the face of blue, as we did on the Old Moon.

I have already spoken of the sense of taste. The sense of smell on the Old Moon was intimately associated with the life-process. The sense of equilibrium existed there, and was needed. The sense of movement was much more living than it is to-day, when we simply move our limbs. There is little inner vibration. But just

think what the sense of movement was obliged to perceive at a time when all these movements were like the inner throbbing that arose from the hearing of sounds. This inner vibration was perceived by the sense of movement when it was set going by man himself, as he imitated what the sense of hearing awakened within him.

We now come to the sense of life. From what I have said you will realise that the sense of life, as it is on Earth, cannot have existed in the same form on the Old Moon, where man lived and shared in a much more universal life. The inner life was not as shut off by the skin as it is to-day. Man swam in the universal ocean of life. And because all the sense organs were at that time life-organs, no specific sense of life was necessary. All the organs were life-organs and in a certain way aware of themselves.

And now think of the sense of touch. It arose for the first time with the coming into existence of the mineral kingdom, and the mineral kingdom is a product of the Earth-evolution. On the Old Moon there was no sense of touch in the form developed on Earth through the existence of the mineral kingdom. There was no more a sense of touch than there was a specific sense of life.

If we count how many senses functioned as life organs on the Old Moon, we have seven. Life is always sevenfold. The five senses—those of speech, thought, ego, touch and life—which have been added on the Earth, making twelve in all, do not come into the picture on the Old Moon. On the Old Moon there were seven senses, but they were all living senses, not connected with the fixed domains of the twelve Zodiacal constellations.

This is only a small, elementary part of what could be said in order to show that we are not speaking out of arbitrary speculation but from living observation of the world of supersensible facts, which is at first not perceived by the human senses during Earth evolution. The more deeply we enter into the study of world-mysteries, the more do we realise that this relationship of 12 to 7 is not a trifling fantasy. We come to see that it runs through the whole of existence. The fact that this relationship is expressed out there in the cosmos in the relationship of the resting constellations to the moving planets is one fragment of the great mystery of Number in cosmic existence. The relation of 12 to 7 is the expression of a deep mystery of existence; how man as a being of Sense

is related to himself as a being of Life. The number 12 embraces the mystery of our having been able to receive an Ego. Inasmuch as our senses have become 12, spreading over 12 stable domains, they are the foundation of Ego-consciousness on Earth. The seven organs of sense that were still organs of life on the Old Moon were the foundation of the astral body. And, so the number 7 underlies the astral body as mysteriously as the number 12 underlies the Ego-nature, the Ego of man.

EDITORIAL NOTE

BETWEEN the two lectures printed here, Rudolf Steiner gave a lecture (13 August, 1916), which was only in part concerned directly with the twelve senses and the seven life-processes. It describes how mobile our conceptions need to be if we are to grasp what is revealed as spiritual existence to a higher consciousness.

On earth, Dr. Steiner went on to say, the life of the twelve senses is relatively static. After death, their significance changes. The higher senses are no longer needed, in the forms they have on earth. We do not require the Ego-sense, the Thought-sense, or the Speech-sense in these forms. But we need a transformed, spiritualised Hearing, through which we enter into the music of the spheres. We hear it all without the help of physical air, and with its sequence reversed.

After death we have a Warmth-sense, very much altered. Even more altered is the sense of Sight, and still more so are Smell and Taste, which over there have great significance. Though we regard these senses here as lower, after death they are of great importance, though very much spiritualised.

The senses of Equilibrium and of Movement are significant in the spiritual world; much less so the Life-sense, and the sense of Touch not at all. The sense of Equilibrium is not then concerned simply with the position of our own organism, as on earth, but is as it were externalised; by its means we recognise how we stand among spiritual Beings. We find a balance among the Spirits of the Hierarchies. And in these worlds we are in continual movement.

The life-processes, too, have their significance after death. Something great and exalted in the spiritual world is reflected on

earth in the four life-processes of secretion, sustenance, growth and reproduction. Into this world we are received after death, to live and weave there in the spiritual preparation for the organism of our next incarnation. This has to be perceived in Imaginations, as if there were something beyond the Zodiac of which the Sun, Venus, Mercury and Moon were reflections.

There is a further realm, to be perceived only through Inspiration, which is reflected on earth in breathing, warming and nutrition. It is as though Saturn, Jupiter and Mars were the reflections of spiritual realities beyond the Zodiac.

In present-day life on earth our ego is particularly connected with the twelve senses, and our astral body in a more unconscious way with the life-processes. The realm that lies beyond the Threshold can break into our ordinary consciousness in pathological conditions. This hidden realm of consciousness can be approached in a right and healthy way through all that is described in *Knowledge of the Higher Worlds: How is it Achieved?* A.B.

ALIEN

The calm and terrible sea
deceives only the gentle simple
and the yet undrowned.

The bright and deadly sun
blinds the unsmiling eye,
isolates white bone.

The dread wrecker wind
roars unwarned from the north,
death branding its ice breath.

The kind killing earth
bears our foot, frames our flesh,
receives the substance of form final.

For all that, we are none of these.
Sired of spirit, seed of soul, we take on sea
sun wind all elements,
but hold at arm's length strangers
alien till redeemed.

Charles Austin

THE SENSE-ORGANS AND AESTHETIC EXPERIENCE

RUDOLF STEINER

*A lecture given at Dornach, 15 August, 1916 **

WE have been concerned with getting to know the human being as he is related to the world through the realm of his senses and the organs of his life-processes, and we have attempted to consider some of the consequences of the fact which underlies such knowledge. Above all, we have cured ourselves of the trivial attitude which is taken by many people who like to regard themselves as spiritually minded, when they think they should despise everything that is called material or sense-perceptible. For we have seen that here in the physical world man has been given in his lower organs and his lower activities a reflection of higher activities and higher connections. The sense of touch and the Life-sense, as they are now, we have had to regard as very much tied to the physical, earthly world. The same applies to the Ego-sense, the Thought-sense and the Speech-sense.

It is different with the senses which serve the bodily organism only in an internal way; the sense of Movement, the sense of Balance, the sense of Smell, the sense of Taste, to a certain extent even the sense of Sight. We have had to accustom ourselves to regard these senses as a shadowy reflection of something which becomes great and significant in the spiritual world, when we have gone through death.

We have emphasised that through the sense of Movement we move in the spiritual world among the beings of the several Hierarchies, according to the attraction or repulsion they exercise upon us, expressed in the form of the spiritual sympathies and antipathies we experience after death. The sense of Balance does not only keep us in physical balance, as it does with the physical body here, but in a moral balance towards the beings and influences found in the spiritual world. It is similar with the other senses;

the senses of Taste, Smell and Sight. And just where the hidden spiritual plays into the physical world, we cannot look to the higher senses for explanations, but have to turn to those realms of the senses which are regarded as lower. At the present day it is impossible to speak about many significant things of this kind, because to-day prejudices are so great. Many things that are in a higher spiritual sense interesting and important have only to be said, and at once they are misunderstood and in all sorts of ways attacked. For the time being I have therefore to abstain from pointing out many interesting processes in the realms of the senses which are responsible for important facts of life.

In this respect the situation in ancient times was more favourable, though knowledge could not be disseminated as it can be to-day. Aristotle could speak much more freely about certain truths than is now possible, for such truths are at once taken in too personal a way and awaken personal likes and dislikes. You will find in the works of Aristotle, for example, truths which concern the human being very deeply but could not be outlined to-day before a considerable gathering of people. They are truths of the kind indicated recently when I said: the Greeks knew more about the connection between the soul and spirit on the one hand and the physical bodily nature on the other, without becoming materialistic. In the writings of Aristotle you can find, for example, very beautiful descriptions of the outer forms of courageous men, of cowards, of hot-tempered people, of sleepyheads. In a way that has a certain justification he describes what sort of hair, what sort of complexion, what kind of wrinkles brave or cowardly men have, what sort of bodily proportions the sleepyheads have, and so on. Even these things would cause some difficulties if they were set forth to-day, and other things even more. Nowadays, when human beings have become so personal and really want to let personal feelings cloud their perception of the truth, one has to speak more in generalities if one has, under some circumstances, to describe the truth.

From a certain point of view, every human quality and activity can be comprehended, if we ask the right questions about what has been recently described here. For instance, we have said: the realms of the senses, as they exist in the human being to-day, are in a way separate and stationary regions, as the constellations of the Zodiac are stationary regions out in cosmic space as compared

* From shorthand notes unrevised by the lecturer. Published by kind permission of the Rudolf Steiner Nachlassverwaltung, Dornach, Switzerland.

with the orbiting planets, which make their journeys and alter their positions relatively quickly. In the same way, the regions of the senses have definite boundaries, while the life-processes work through the whole organism, circling through the regions of the senses and permeating them with the effects of their work.

Now we have also said that during the Old Moon period our present sense-organs were still organs of life, still worked as life-organs, and that our present life-organs were then more in the realm of the soul. Think of what has often been emphasised: that there is an atavism in human life, a kind of return to the habits and peculiarities of what was once natural; a falling back, in this case into the Old Moon period. In other words, there can be an atavistic return to the dream-like, imaginative way of looking at things that was characteristic of Old Moon. Such an atavistic falling back into Moon-visions must to-day be regarded as pathological.

Please take this accurately: it is not the visions themselves which are pathological, for if this were so, and if all that man experienced during the Old Moon-time, when he lived only in such visions, had to be regarded as pathological—then one would have to say that humanity was ill during the Old Moon period; that during the Old Moon period man was in fact out of his mind. That, of course, would be complete nonsense. What is pathological is not the visions themselves, but that they occur in the present earthly organisation of the human being in such a way that they cannot be endured; that they are used by this earthly organisation in a way that is inappropriate for them as Moon visions. For if someone has a Moon vision, this is suited only to lead to a feeling, an activity, a deed which would have been appropriate on the Old Moon. But if someone has a Moon vision here during the Earth period and does things as they are done with an earthly organism, that is pathological. A man acts in that way only because his earthly organism cannot cope with the vision, is in a sense impregnated by it.

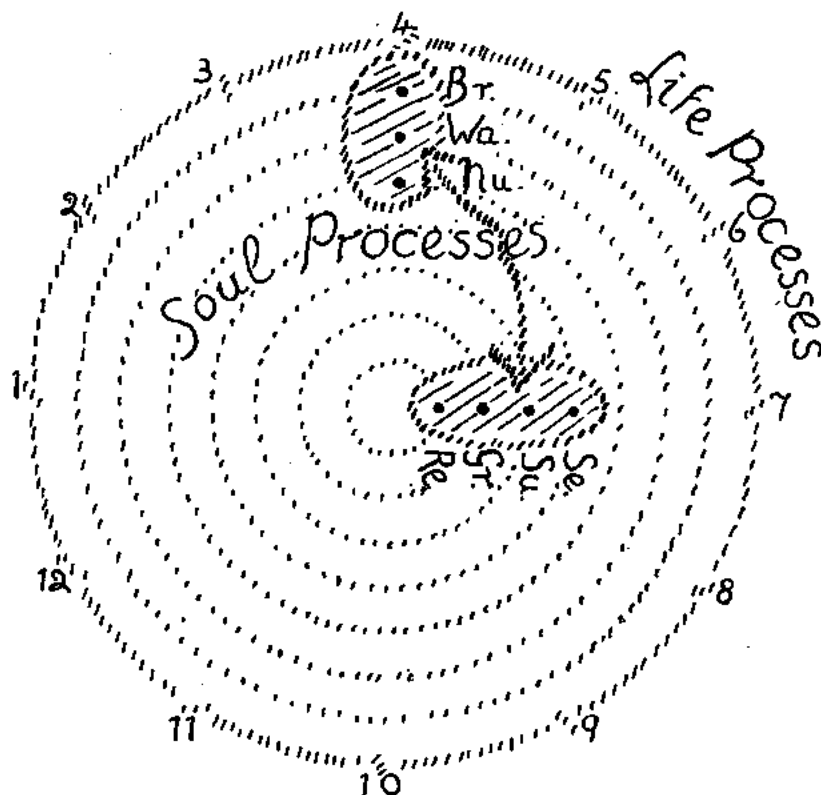
Take the crudest example: someone is led to have a vision. Instead of remaining calm before it, and contemplating it inwardly, he applies it in some way to the physical world—although it should be applied only to the spiritual world—and acts accordingly with his body. He begins to act wildly, because the vision penetrates

and stirs his body in a way it should not do. There you have the crudest example. The vision should remain within the region to which it naturally belongs. It does not do so if to-day, as an atavistic vision, it is not tolerated by the physical body. If the physical body is too weak to prevail against the vision, a state of helplessness sets in. If the physical body is strong enough to prevail, it weakens the vision. Then it no longer has the character of pretending to be the same as a thing or process in the sense-world; that is the illusion imposed by a vision on someone made ill by it. If the physical organism is so strong that it can fight the tendency of an atavistic vision to lie about itself, then the person concerned will be strong enough to relate himself to the world in the same way as during the Old Moon period, and yet to adapt this behaviour to his present organism.

What does this mean? It means that the person will to some extent inwardly alter his Zodiac, with its twelve sense-regions. He will alter it in such a way that in his Zodiac, with its twelve sense-regions, more life-processes than sense-processes will occur. Or, to put it better, the effect is to transform the sense-process in the sense-region into a life-process and so to raise it out of its present lifeless condition into life. Thus a man sees, but at the same time something is living in his seeing; he hears and at the same time something is living inwardly in his hearing; instead of living only in the stomach or on the tongue, it lives now in the eye and in the ear. The sense-processes are brought into movement. Their life is stimulated. This is quite acceptable. Then something is incorporated in these sense-organs which to-day is possessed only to this degree by the life-organs. The life-organs are imbued with a strong activity of sympathy and antipathy. Think how much the whole of life depends upon sympathy and antipathy! One thing is taken, another rejected. These powers of sympathy and antipathy, normally developed by the life-organs, are now poured into the sense-organs. The eye not only sees the colour red; it feels sympathy or antipathy for the colour. Permeation by life streams back into the sense organs, so we can say that the sense-organs become in a certain way life-regions once more.

The life-processes, too, then have to be altered. They acquire more activity of soul than they normally possess for life on earth. It happens in this way: three life-processes, breathing, warming and

nutrition, are brought together and imbued with heightened activity of soul. In ordinary breathing we breathe crude material air; with the ordinary development of warmth it is just warmth, and so on. Now a kind of symbiosis occurs; when these life-processes form a unity, when they are imbued with activity of soul, they form a unity. They are not separate as in the present organism, but set up a kind of association. An inward community is formed by the processes of breathing, warming and nutrition; not coarse nutrition, but a process of nutrition which takes place without it being necessary to eat, and it does not occur alone, as eating does, but in conjunction with the other processes.



Similarly, the other four life-processes are united. Secretion, sustenance, growth and reproduction are united and also form a process embracing activity of soul. Then the two parties can themselves unite: not that all the life-processes then work together, but

that, having entered into separate unities of three and four processes, they work together in that form.

This leads to the emergence of soul-powers which have the character of thinking, feeling and willing; again three. But they are different; not thinking, feeling and willing as they normally are on earth, but somewhat different. They are nearer to life-processes, but not as separate as life-processes are on earth. A very intimate and delicate process occurs in a man when he is able to endure something like a thinking back into the Old Moon, not to the extent of having visions, and yet a form of comprehension arises which has a certain similarity to them. The sense-regions become life-regions; the life-processes become soul-processes. A man cannot stay always in that condition, or he would be unfitted for the earth. He is fitted for the earth through his senses and his life-organs being normally such as we have described. But in some cases a man can shape himself in this other way, and then, if his development tends more towards the will, it leads to aesthetic creativity; or, if it tends more towards comprehension, towards perception, it leads to aesthetic experience. *Real aesthetic life in human beings consists in this, that the sense-organs are brought to life, and the life-processes filled with soul.*

This is a very important truth about human beings, for it enables us to understand many things. The stronger life of the sense-organs and the different life of the sense-realms must be sought in art and the experience of art. And it is the same with the processes of life; they are permeated with more activity of soul in the experience of art than in ordinary life. Because these things are not considered in their reality in our materialistic time, the significance of the alteration which goes on in a human being within the realm of art cannot be properly understood. Nowadays man is regarded more or less as a definite, finished being; but within certain limits he is variable. This is shown by a capacity for change such as the one we have now considered.

What we have gone into here embraces far-reaching truths. Take one example: it is those senses best fitted for the physical plane which have to be transformed most if they are to be led back half-way to the Old Moon condition. The Ego-sense, the Thought-sense, the immediate sense of Touch, because they are directly fitted for the earthly physical world, have to be completely

transformed if they are to serve the human condition which results from this going back half-way to the Old Moon period.

For example, you cannot use in art the encounters we have in life with an Ego, or with the world of thought. At the most, in some arts which are not quite arts the same relationship to the Ego and to thought can be present as in ordinary earthly life. To paint the portrait of a man as an Ego, just as he stands there in immediate reality, is not a work of art. The artist has to do something with the Ego, go through a process with it, through which he raises this Ego out of the specialisation in which it lives to-day, at the present stage in the development of the earth; he has to give it a wide general significance, something typical. The artist does that as a matter of course.

In the same way the artist cannot express the world of thought, as it finds expression in the ordinary earthly world, in an artistic way immediately; for he would then produce not a poem or any work of art, but something of a didactic, instructive kind, which could never really be a work of art. The alterations made by the artist in what is actually present form a way back towards that reanimation of the senses I have described.

There is something else we must consider when we contemplate this transformation of the senses. The life-processes, I said, interpenetrate. Just as the planets cover one another, and have a significance in their mutual relationships, while the constellations remain stationary, so is it with the regions of the senses if they pass over into a planetary condition in human life, becoming mobile and living; then they achieve relationships to one another. Thus artistic perception is never so confined to the realm of a particular sense as ordinary earthly perception is. Particular senses enter into relationships with one another. Let us take the example of painting.

If we start from real Spiritual Science, the following result is reached. For ordinary observation through the senses, the senses of sight, warmth, taste and smell are separate senses. In painting, a remarkable symbiosis, a remarkable association of these senses comes about, not in the external sense-organs themselves, but in what lies behind them, as I have indicated.

A painter, or someone who appreciates a painting, does not merely look at its colours, the red or blue or violet; he really tastes the colours, not of course with the physical sense-organ—then he

would have to lick it with his tongue. But in everything connected with the sphere of the tongue a process goes on which has a delicate similarity to the process of tasting. If you simply look at a green parrot in the way we grasp things through the senses, it is your eyes that see the green colour. But if you appreciate a painting, a delicate imaginative process comes about in the region behind your tongue which still belongs to the sense of taste, and this accompanies the process of seeing. Not what happens upon the tongue, but what follows, more delicate physiological processes—they accompany the process of seeing, so that the painter really tastes the colour in a deeper sense in his soul. And the shades of colour are smelt by him, not with the nose, but with all that goes on deeper in the organism, more in the soul, with every activity of smelling. These conjoined sense-activities occur when the realms of the senses pass over more into processes of life.

If we read a description which is intended to inform us about the appearance of something, or what is done with something, we let our speech-sense work, the word-sense through which we learn about this or that. If we listen to a poem, and listen in the same way as to something intended to convey information, we do not understand the poem. The poem is expressed in such a way that we perceive it through the speech-sense, but with the speech-sense alone we do not understand it. We have also to direct towards the poem the ensouled sense of balance and the ensouled sense of movement; but they must be truly ensouled. Here again united activities of the sense-organs arise, and the whole realm of the senses passes over into the realm of life. All this must be accompanied by life-processes which are ensouled, transformed in such a way that they participate in the life of the soul, and are not working only as ordinary life-processes belonging to the physical world.

If the listener to a piece of music develops the fourth life-process, secretion, so far that he begins to sweat, this goes too far; it does not belong to the aesthetic realm when secretion leads to physical excretion. It should be a process in the soul, not going as far as physical excretion; but it should be the same process that underlies physical excretion. Moreover, secretion should not appear alone. All four life-processes—secretion, sustenance, growth and reproduction—should work together, but all in the realm of soul. So do the life-processes become soul-processes.

On the one hand, Spiritual Science will have to lead earth-evolution towards the spiritual world; otherwise, as we have often seen, the downfall of mankind will come about in the future. On the other hand, Spiritual Science must renew the capacity to take hold of and comprehend the physical by means of the spirit. Materialism has brought not only an inability to find the spiritual, but also an inability to understand the physical. For the spirit lives in all physical things, and if one knows nothing of the spirit, one cannot understand the physical. Think of those who know nothing of the spirit; what do they know of this, that all the realms of the senses can be transformed in such a way that they become realms of life, and that the life-processes can be transformed in such a way that they appear as processes of the soul? What do present-day physiologists know about these delicate changes in the human being? Materialism has led gradually to the abandonment of everything concrete in favour of abstractions, and gradually these abstractions are abandoned, too. At the beginning of the nineteenth century people still spoke of vital forces. Naturally, nothing can be done with such an abstraction, for one understands something only by going into concrete detail. If one grasps the seven life-processes fully, one has the reality; and this is what matters—to get hold of the reality again. The only effect of renewing such abstractions as *élan vital* and other frightful abstractions, which have no meaning but are only admissions of ignorance, will be to lead mankind—although the opposite may be intended—into the crudest materialism, because it will be a mystical materialism. The need for the immediate future of mankind is for real knowledge, knowledge of the facts which can be drawn only from the spiritual world. We must make a real advance in the spiritual comprehension of the world.

Once more we have to think back to the good Aristotle, who was nearer to the old vision than modern man. I will remind you of only one thing about old Aristotle, a peculiar fact. A whole library has been written about catharsis, by which he wished to describe the underlying purpose of tragedy. Aristotle says: Tragedy is a connected account of occurrences in human life by which feelings of fear and compassion are aroused; but through the arousing of these feelings, and the course they take, the soul is led to purification, to catharsis. Much has been written about this in the age of

materialism, because the organ for understanding Aristotle was lacking. The phrase has been understood only by those who saw that Aristotle in his own way (not, of course, the way of a modern materialist) means by catharsis a medical or half-medical term. Because the life-processes become soul-processes, the aesthetic experience of a tragedy carries right into the bodily organism those life-processes which normally accompany fear and compassion. Through tragedy these processes are purified and at the same time ensouled. In Aristotle's definition of catharsis the entire ensouling of the life-processes is embraced. If you read more of his *Poetics* you will feel in it something like a breath of this deeper understanding of the aesthetic activity of man, gained not through a modern way of knowledge, but from the old traditions of the Mysteries. In reading Aristotle's *Poetics* one is seized by immediate life much more than one can be in reading anything by present day writers on aesthetics, who only sniff round things and encompass them with dialectics, but never reach the things themselves.

Later on a significant high-point in comprehending aesthetic activity of man was reached in Schiller's *Letters on the Aesthetic Education of Man* (1795). It was a time given more to abstractions. To-day we have to add the spiritual to a thinking that remains in the realm of idealism. But if we look at this more abstract character of the time of Goethe and Schiller, we can see that the abstractions in Schiller's *Aesthetic Letters* embrace something of what has been said here. With Schiller it seems that the process has been carried down more into the material, but only because this material existence requires to be penetrated more deeply by the power of the spiritual, taken hold of intensively. What does Schiller say? He says: Man as he lives here on earth has two fundamental impulses, the impulse of reason and the impulse that comes from nature. Through a natural necessity the impulse of reason works logically. One is compelled to think in a particular way; there is no freedom in thinking. What is the use of speaking of freedom where this necessity of reason prevails? One is compelled to think that three times three is not ten, but nine. Logic signifies the absolute necessity of reason. So, says Schiller, when man accepts the pure necessity of reason, he submits to spiritual compulsion.

Schiller contrasts the necessity of reason with the needs of the

senses, which live in everything present in instinct, in emotion. Here, too, man is not free, but follows natural necessity. Now Schiller looks for the condition midway between rational necessity and natural necessity. This middle condition, he finds, emerges when rational necessity bows before the feelings that lead us to love or not to love something; so that we no longer follow a rigid logical necessity when we think but allow our inner impulses to work in shaping our mental images, as in aesthetic creation. And then natural necessity, on its side, is transcended. Then it is no longer the needs of the senses which bring compulsion, for they are ensouled and spiritualised. A man no longer desires simply what his body desires, for sensuous enjoyment is spiritualised. Thus rational necessity and natural necessity come nearer to one another.

You should, of course, read this in Schiller's *Aesthetic Letters* themselves; they are among the most important philosophical works in the evolution of the world. In Schiller's exposition there lives what we have just heard here, though with him it takes the form of metaphysical abstraction. What Schiller calls the liberation of rational necessity from its rigidity, this is what happens when the senses are reanimated, when they are led back once more to the process of life. What Schiller calls the spiritualisation of natural need—he should really have called it “ensouling”—this happens where the life-processes work like soul-processes. Life-processes become more ensouled; sense-processes become more alive. That is the real procedure, though given a more abstract conceptual form, that can be traced in Schiller's *Aesthetic Letters*. Only thus could he express it at that time, when there was not yet enough spiritual strength in human thoughts to reach down into that realm where spirit lives in the way known to the seer. Here spirit and matter need not be contrasted, for it can be seen how spirit penetrates all matter everywhere, so that nowhere can one come upon matter without spirit. Thinking remains mere thinking because man is not able to make his thoughts strong enough, spiritual enough, to master matter, to penetrate into matter as it really is.

Schiller was not able to recognise that life-processes can work as soul-processes. He could not go so far as to see that the activity which finds material expression in nutrition, in the development of warmth and in breathing, can live enhanced in the soul, so that

it ceases to be material. The material particles vanish away under the power of the concepts with which the material processes are comprehended. Nor was Schiller able to get beyond regarding logic as simply a dialectic of ideas; he could not reach the higher stage of development, attainable through initiation, where the spiritual is experienced as a process in its own right, so that it enters as a living force into what otherwise is merely cognition. Schiller in his *Aesthetic Letters* could not quite trust himself to reach the concrete facts. But through them pulses an adumbration of something that can be exactly grasped if one tries to lay hold of the living through the spiritual and the material through the living.

So we see in every field how evolution as a whole is pressing on towards knowledge of the spirit. When, at the turn of the 18th and 19th centuries, a philosophy was developed more or less out of concepts, longings were alive in it for a greater concreteness, though this could not yet be achieved. Because the power to achieve it was inadequate, the endeavour and the longing for greater concreteness fell into the crude materialism that has continued from the middle of the nineteenth century up to the present day. But it must be realised that spiritual understanding cannot reside only in a turning towards the spiritual, but must and can overcome the material and recognise the spirit in matter. As you will see, this has further consequences. You will see that man as an aesthetic being is raised above earthly evolution into another world. And this is important. Through his aesthetic attitude of mind or aesthetic creativity a man no longer acts in a way that is entirely appropriate for the earth, but raises the sphere of his being above the sphere of the earth. In this way through our study of aesthetics we approach some deep mysteries of existence.

In saying such things, one may touch the highest truths, and yet sound as if one were crazy. But life cannot be understood if one retreats faint heartedly before the real truths. Take a work of art, the Sistine Madonna, the Venus of Milo—if it is really a work of art, it does not entirely belong to the earth. It is raised above the events of earth; that is quite obvious. What sort of power, then, lives in it—in a Sistine Madonna, in a Venus of Milo? A power, which is also in man, but which is not entirely fitted for the earth. If everything in man were fitted only for the earth, he would

be unable to live on any other level of existence as well. He would never go on to the Jupiter evolution. Not everything is fitted for the earth; and for occult vision not everything in man is in accord with his condition as a being of the earth. There are hidden forces which will one day give man the impetus to develop beyond earth-existence. But art itself can be understood only if we realise that its task is to point the way beyond the purely earthly, beyond adaptation to earthly conditions, to where the reality in the Venus of Milo can be found.

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We can never acquire a true comprehension of the world unless we first recognise something which there will be increasing need to recognise as we go forward to meet the future and its demands.

It is often thought to-day that when anyone makes a logical statement that can be logically proved, the statement must be applicable to life. Logic alone, however, is not enough. People are always pleased when they can prove something logically; and we have seen arise in our midst, as you know, all kinds of world outlooks and philosophical systems, and no-one familiar with logic will doubt they can all be logically proved. But nothing is achieved for life by these logical proofs. The point is that our thinking must be brought into line with reality, not merely with logic. What is merely logical is not valid—only what is in keeping with reality.

Let me make this clear by an example. Imagine a tree-trunk lying there before you, and you set out to describe it. You can describe it quite correctly, and you can prove, beyond a doubt, that something real is lying there because you have described it in exact accordance with external reality. But in fact you have described an untruth; what you have described has no real existence. It is a tree-trunk from which the roots have been cut away, and the boughs and branches lopped off. But it could have come into existence only along with boughs and blossoms and roots, and it is nonsense to think of the mere trunk as a reality. By itself it is no reality; it must be taken together with its forces of growth, with all the inner forces which enabled it to come into being. We need to see with certainty that the tree-trunk as it rests there is a

lie; we have a reality before us only when we look at a tree. Logically it is not necessary to regard a tree-trunk as a lie, but a sense for reality demands that only the whole tree be regarded as truth. A crystal is a truth, for it can exist independently—independently in a certain sense, for of course everything is relative. A rosebud is not a truth. A crystal is; but a rosebud is a lie if regarded only as a rosebud.

A lack of this sense for reality is responsible for many phenomena in the life of to-day. Crystallography and, at a stretch, mineralogy are still real sciences; not so geology. What geology describes is as much an abstraction as the tree-trunk. The so-called "earth's crust" includes everything that grows up out of it, and without that it is unthinkable. We must have philosophers who allow themselves to think abstractly only in so far as they know what they are doing. To think in accordance with reality, and not merely in accordance with logic—that is what we shall have to learn to do, more and more. It will change for us the whole aspect of evolution and history. Seen from the standpoint of reality, what is the Venus of Milo, for instance, or the Sistine Madonna? From the point of view of the earth such works of art are lies; they are no reality. Take them just as they are and you will never come to the truth of them. You have to be carried away from the earth if you are to see any fine work of art in its reality. You have to stand before it with a soul attuned quite differently from your state of mind when you are concerned with earthly things. The work of art that has here no reality will then transport you into the realm where it has reality—the elemental world. We can stand before the Venus of Milo in a way that accords with reality only if we have the power to wrest ourselves free from mere sense-perception.

I have no wish to pursue teleology in a futile sense. We will therefore not speak of the purpose of Art; that would be pedantic, philistine. But what comes out of Art, how it arises in life—these are questions that can be asked and answered. There is no time to-day for a complete answer, only for a brief indication. It will be helpful if we consider first the opposite question: What would happen if there were no Art in the world? All the forces which flow into Art, and the enjoyment of Art, would then be diverted into living out of harmony with reality. Eliminate Art from human

evolution and you would have in its place as much untruth as previously there had been Art.

It is just here, in connection with Art, that we encounter a dangerous situation which is always present at the Threshold of the spiritual world. Listen to what comes from beyond the Threshold and you will hear that everything has two sides! If a man has a sense of reality, he will come through aesthetic comprehension to a higher truth; but if he lacks this sense of reality he can be led precisely by aesthetic comprehension of the world into untruth. There is always this forking of the road, and to grasp this is very important: it applies not only to occultism but to Art. To comprehend the world in accordance with reality will be an accompaniment of the spiritual life that Spiritual Science has to bring about. Materialism has brought about the exact opposite—a thinking that is not in accord with reality.

Contradictory as this may sound, it is so only for those who judge the world according to their own picture of it, and not in accordance with reality. We are living at a stage of evolution when the faculty for grasping even ordinary facts of the physical world is steadily diminishing, and this is a direct result of materialism. In this connection some interesting experiments have been made. They proceed from materialistic thinking; but, as in many other cases, the outcome of materialistic thinking can work to the benefit of the human faculties that are needed for developing a spiritual outlook. The following is one of the many experiments that have been made.

A complete scene was thought out in advance and agreed upon. Someone was to give a lecture, and during it he was to say something that would be felt as a direct insult by a certain man in the audience. This man was to spring from his seat, and a scuffle was to ensue. During the scuffle the insulted man was to thrust his hand into his pocket and draw out a revolver—and the scene was to go on developing from there.

Picture it for yourselves—a whole pre-arranged programme carried out in every detail! Thirty persons were invited to be the audience. They were no ordinary people: they were law students well advanced in their studies, or lawyers who had already graduated. These thirty witnessed the whole affair and were afterwards asked to describe what had occurred. Those who were in the

secret had drawn up a protocol which showed that everything had taken place exactly as planned.

The thirty were no fools, but well-educated people whose task later on would be to go out into the world and investigate how scuffles and scimmages and many other things come about. Of the thirty, twenty-six gave a completely false account of what they had seen, and only four were even approximately correct . . . only four!

For years experiments like this have been made for the purpose of demonstrating how little weight can be attached to depositions given before a court of justice. The twenty-six were all present; they could all say: "I saw it with my own eyes." People do not in the least realise how much is required in order to set forth correctly a series of events that has taken place before their very eyes.

The art of forming a true picture of something that takes place in our presence needs to be cultivated. If there is no feeling of responsibility towards a sense-perceptible fact, the moral responsibility which is necessary for grasping spiritual facts can never be attained. In our present world, with its stamp of materialism, what feeling is there for the seriousness of the fact that among thirty descriptions by eye-witnesses of an event, twenty-six were completely false, and four only could be rated as barely correct? If you pause to consider such a thing, you will see how tremendously important for ordinary life the fruits of a spiritual outlook can become.

Perhaps you will ask: Were things different in earlier times? Yes, in those times men had not developed the kind of thinking we have to-day. The Greeks were not possessed of the purely abstract thinking we have, and need to have, in order that we may find our place in the world in the right way for our time. But here we are concerned not with ways of thinking, but with truth.

Aristotle tried, in his own way, to express an aesthetic understanding of life in much more concrete concepts. And in the earliest Greek times it was expressed, still more concretely, in Imaginations that came from the Mysteries. Instead of concepts, the men of those ancient times had pictures. They would say: Once upon a time lived Uranus. And in Uranus they saw all that man takes in through his head, through the forces which now work out through

the senses into the external world. Uranus—all twelve senses—was wounded; drops of blood fell into Maya, into the ocean, and foam spurted up. Here we must think of the senses, when they were more living, sending down into the ocean of life something which rises up like foam from the pulsing of the blood through life-processes which have now become processes in the soul.

All this may be compared with the Greek Imagination of Aphrodite, Aphrogenea, the goddess of beauty rising from the foam that sprang from the blood-drops of the wounded Uranus. In the older form of the myth, where Aphrodite is a daughter of Uranus and the ocean, born from the foam that rises from the blood-drops of Uranus, we have an imaginative rendering of the aesthetic situation of mankind, and indeed a thought of great significance for human evolution at large.

We need to connect a further idea with this older form of the myth, where Aphrodite is the child not of Zeus and Dione, but of Uranus and the ocean. We need to add to it another Imagination which enters still more deeply into reality, reaching not merely into the elemental world but right down into physical reality. Beside the myth of Aphrodite, the myth of the origin of beauty among mankind, we must set the great truth of the entry into humanity of primal goodness, the Spirit showering down into Maya-Maria, even as the blood-drops of Uranus ran down into the ocean, which also is Maya. Then will appear in its beauty the dawn of the unending reign of the good and of knowledge of the good; the truly good, the spiritual. This is what Schiller had in mind when he wrote, referring especially to moral knowledge:

Nur durch das Morgentor des Schönen

*Dringst du in der Erkenntnis Land.**

You see how many tasks for Spiritual Science are mounting up. And they are not merely theoretical tasks; they are tasks of life.

* Only through the dawn of beauty canst thou penetrate into the land of knowledge.

ON COMING TO OUR SENSES

JOHN DAVY

EVERY morning, I wake up. This simple phrase describes a mysterious—and in my case rather gradual—process. I wake up first to sounds—birdsong, the newspaper being shoved through the letterbox, a small boy playing trains in the next room. Next comes awareness of warmth (or cold if the blankets have fallen off), and of position and weight; cramp if I have been lying awkwardly, the pleasures of moving and stretching. Sometimes smells come next—especially if bacon is being fried downstairs—and perhaps a dawning awareness of hunger. Only then may I open my eyes, a bit dazzled at first, gradually beginning to 'see'. Getting out of bed, washing, shaving, dressing, breakfast, and the first conversations of the day continue the process.

On some mornings, I may feel 'all there' within a few minutes of waking; on other, more reluctant days, it may be well after breakfast before I feel fully able to cope with the world. But however this extraordinary metamorphosis of consciousness occurs, as it has done regularly and without fail since the day I was born, it marks a daily gateway to life on the earth, to all conscious relations with nature and with other people.

Waking up is deeply involved with a sphere of human nature which is easily taken for granted—the senses, and the perceptions they offer. If we want to wake someone up, we switch on a light, call out, touch him, shake him by the shoulder, or as a last resort dribble cold water onto his face from a sponge. In other words, we stimulate his senses of sight, hearing, touch and movement, warmth and cold. We bring him—sometimes a bit roughly—to 'his senses'. Wherever we may be during sleep, the senses bring us down to earth, to an awareness of ourselves, inhabiting bodies and surveying a surrounding world.

Once awake, and if we begin to attend more carefully to the role of the senses in everyday life, we find that they are essential to thought, feeling and action. Most of our thoughts have a content derived from past sense-experiences—memories and the like. Our desires demand satisfaction through the senses (normal people are

not content to imagine a steak or a symphony; they insist on tasting the one and hearing the other, in reality). Our actions and physical skills depend on healthy senses of balance, movement and touch (as the drunk whose senses are disordered by alcohol may discover rather painfully). A damaged or destroyed sense can be far more crippling than loss of a limb.

If we reflect on these experiences, leaving aside all theories about sense-organs and sense-perception that we may have learnt, we can become aware that throughout our waking hours the senses are providing a kind of *nourishment*—a content for our thoughts, sensations for our feelings, an essential support for our actions. The most physically massive kind of nourishment that we need to live properly in our bodies and on earth is the food we supply to our stomachs and digestive system. A second, and finer kind of nourishment is the air we breathe into our lungs, so that the blood is supplied with oxygen. Without adequate supplies of either of these, we grow faint and may die. But through our senses, which are linked through the central nervous system to our brain, we are nourished in a still finer way. We are supplied, so to speak, with 'light'—the light of day. Without this nourishment we cannot wake up properly.

In preparation for manned space flights, experiments were made in the United States with volunteers who underwent almost complete 'sensory deprivation'. They floated in water at blood heat, immobile, surrounded by silence, wearing goggles which admitted only a dim diffuse light or no light at all, and soft gloves to damp out touch. Most volunteers quickly fell asleep at first. But later they would wake up, and in some cases be gradually overcome by uncontrolled fantasies, hallucinations, or disordered perceptions of their own bodies (feeling, for example, that a foot or a leg had grown to an enormous size and was floating away from the rest of the body). These experiments showed vividly how essential a free flow of normal sense-experience is for a healthy day-time consciousness.

Further exploration of our own sense-experience shows that this 'nourishment' reaches us as a variety of distinct sensations, which before we begin to weave thoughts around them, have the nature of pure 'activities': warmth, colour, sound, movement, etc. Each of these qualities of activity is differentiated within itself (we experi-

ence a whole range of colours, of tones, etc.), but offers a distinct realm or mode of experience (defined physiologically, of course, by the functioning of a particular sense-organ or set of organs). If we contemplate the senses in this way, we may begin to understand what Rudolf Steiner meant when he once described the senses as 'well-springs'.* These wells are filled with what I have called the 'light of day' from sources lying outside our direct daytime experience.† The human being, Steiner remarks, dips into these springs to meet the needs of his soul, his inner life.

Steiner goes on, both here and in other books and lectures (two of which are printed in this issue of the *Golden Blade*) to describe how there are really twelve of these 'well-springs' flowing into our waking lives, twelve distinct modes of sense-experience, or, more simply, that we have twelve senses. Of some of these, such as sound, sight, warmth, etc., we are vividly aware. Of others we are barely aware unless they go wrong, notably balance and movement (which textbooks usually call the proprioceptive and kinaesthetic senses). A few are not at present clearly recognised at all.

The twelve are: touch, life, movement, balance, smell, taste, sight, warmth, hearing, thought, word and 'I'. Of these, eight are clearly recognised in modern textbooks. A ninth, the sense of 'life', is less clearly defined, but in Steiner's terms is responsible for our sensations of general bodily 'well-being' (or ill-being), as well as the physical component of the sense of pain.‡ The final three: 'word', 'thought' and 'I' (by which Steiner means the direct perception of the 'I' of another human being), are not to be found in any textbooks. I shall have more to say about them below.

So far, I have described these twelve well-springs as bringers of a kind of nourishment for our healthy day-consciousness. But now we must recognise that the senses also bring problems which have had profound effects on human life throughout history. These

*In *Anthroposophie: ein Fragment* (Rudolf Steiner Nachlassverwaltung, 1970). Not yet translated.

† We may object that we hear birdsong 'coming from a bird'. But that is an interpretation, added by thinking, to the sensation itself. The actual percept is simply 'given', as are all sense-perceptions, simply by waking up and becoming open to sense-experience. For a fuller discussion of this crucial point, see Rudolf Steiner's *Philosophy of Freedom*. (Rudolf Steiner Press, 1964).

‡ It is extremely difficult, and a subject of much current scientific debate, to disentangle the physiological and the psychological components of pain experience.

problems are of two main kinds: problems of morality and problems of knowledge.

In the East, and in the past, men were much concerned with the role of the senses in moral behaviour. They can tempt to indulgence, egotism, excessive 'attachment' to the pleasures of this world. Again and again, ascetic and puritan teachings have arisen, urging men to 'purify' or even as far as possible to deny their senses—or rather, to deny satisfaction to those desires which can only be stilled temporarily with the help of the senses. The pleasures of this world, men have repeatedly been told, are vain, illusory, and divert the soul from its true path, which should be to seek a Divine and unfallen world by withdrawing from our daytime world.

Nowadays, there are only faint echoes of such moral debates in scientific cultures, although many people probably feel vaguely guilty after excessive bouts of indulgence in food, drink, sex or generally luxurious living. But the issue is still with us, in a new, unexpected and still barely recognised guise. It lives, in fact, in the problem of economic growth, and the struggle for 'higher standards of living'.

Of course there are millions of people struggling for a higher standard for simple reasons of health, strength and minimum human dignity. But in the 'advanced' countries, vast numbers of people consume quantities of food, goods and services far greater than they need for sufficiency. The essential product offered by many consumer industries consists of sense-experiences; and the true consumers are the insatiable human appetites attached to them—magnified by advertising and elaborate forms of stimulation. When salesmen are taught 'don't sell the steak, sell the sizzle', they are acknowledging that their real customers are our senses of hearing (plus sight, taste and smell), and not our stomachs (where we are more or less unconscious, except when we have indigestion).

What an Eastern teacher in the past might have called excessive attachment to self and to earthly illusion, we might call addiction: enslavement to appetites and sensations which have got out of hand, so that we are no longer nourished and supported, but made dependent and ill. The very phrase 'a slave to such and such' expresses our direct experience that our true selves are not identical with these sensations and desires, but subject to and entangled in

them. Monsters can lurk in our well-springs, and drag us in to drown.

The second problem in which the senses are deeply involved is that of knowledge. I have assumed that the senses enable us to 'know the world', that they bring us the true light of day. "Seeing is believing", we say. If I am not sure whether I can 'believe my eyes', I may pinch myself to make sure that I am awake and not dreaming. If I *am* properly awake, the implication is, then I can and must believe my eyes.

Nevertheless, Eastern teachers and religions have frequently held that what the senses reveal is Maya—illusion, a veil over a different reality. In a new guise, this issue has re-emerged in modern times in science and philosophy, as we have come to believe that ultimate reality is something other than what our senses reveal to our normal consciousness. We do not see the atoms, particles, or waves of which the universe is supposed to consist. The experiences conveyed by the senses are held to be 'subjective' and therefore not to be naively trusted. In very recent times, the notion that our senses hide rather than reveal a more profound reality has also been revived in connection with drug experiences. Under the influence of mescaline, Aldous Huxley believed that 'doors of perception', which are normally closed, began to open.

At the same time there is a wider social problem, a kind of companion to the problem of growth and excessive consumption, which goes by the name of 'alienation'. This word has come to be used very broadly to describe a kind of inner loneliness and isolation, a sense of being 'out of touch' with the world, a stranger among strangers who can never really meet each other properly, and who are not perhaps to be wholly trusted. In political life, the problem of trust has loomed very large in recent years, and there is often a growing sense of a discrepancy between the public 'image' of a person and the private 'reality', hidden but perhaps fundamentally inaccessible, behind a mask.

Such problems point to a kind of illness or disorder in the sphere of sense-perception, whose true function, as we have seen, is to lead us into a healthy waking consciousness in which we 'come to our senses', and can thereby live properly in the world. 'Alienation' points to a kind of dream state persisting into waking life,

an inadequate 'coming down to earth', whereas greed and addiction point to an opposite extreme, in which we become frantic consumers of sense-experiences to feed insatiable drives and desires.

These social disorders point to the need for a kind of therapy for the senses, a therapy which will depend on a deeper understanding of the twelve realms of sense-experience that Rudolf Steiner describes. "The I", he once remarked, "moves among the circle of the twelve senses as the sun moves among the signs of the Zodiac." We have some direct awareness of this in the simple capacity to 'attend' to one mode of sense-experience or another—to be particularly awake in our hearing, for example, or in the sense of smell. When we are deeply absorbed in one mode of sense-experience, the others retire into the background. But if we attend in turn to the various senses Steiner describes, we shall discover that the circle is differentiated in many ways—it has a complex anatomy and structure.

One kind of distinction to which Rudolf Steiner drew attention* is between six more 'inward' senses—touch, life, movement, balance, taste, smell—and the remaining six which tend to take us more out of ourselves, so to speak—sight, warmth, hearing, word, thought, 'I'. In the first four of the first set, we are clearly concerned in perceptions of our own bodies. *Touch* defines for us the bodily boundary of the skin; *life* the harmony or disharmony of our body's contents; *movement* allows us to be aware of the motions of muscles and joints; *balance* allows us to perceive how our weight is disposed in space. When we attend to the sensations conveyed by these senses, we are turned inwards to our own bodies. Here we are seldom troubled by distrust of our perceptions. We use touch as a kind of ultimate test of reality; one does not argue about a sense of bodily discomfort—if we don't feel well, there is no room for doubt. Nor do we ever question the trustworthiness of our senses of movement and balance. Here, quite particularly, we find a sureness and security in our relation to our own bodies.

Taste and smell begin to relate us to aspects of nature outside our own organism. Nevertheless, these senses function only when

* *Man as a Being of Sense and Perception*, three lectures, Dornach, July 1921. (Rudolf Steiner Press; out of print).

we draw fine vapours deep into our nose, or dissolve something on the tongue. We also react in a particularly personal way to tastes and smells, the latter conjuring up personal memories and associations, the former often being involved with strong personal preferences. A person's 'taste' in food, drink, clothes, literature, etc., is a very individual matter.

Through these six senses we are strongly attached to our own bodies, and in taste and smell are 'consumers' of products of nature. It is through these senses, more particularly, that we are prone to indulgence in 'sensuality' and greed. On the other hand, the healthy function of these senses is the basis of a secure, 'down-to-earth' waking consciousness, and it is through these senses that we know most directly and intimately, through knowing them in our own body, the 'primary qualities' of the earth—weight, movement, solidity, and so on. In early childhood, as we learn to manage our bodies and move around in the physical world, it is these senses in particular which serve us as we learn to become earth citizens.

Our whole orientation begins to change with the senses of sight (which in this context should be understood more specifically as the sense of colour), and warmth. Here we experience a kind of 'breathing' with the surrounding world, and the certainties of the more body-oriented senses begin to dissolve. Colour and warmth are most often quoted in popular text books as proof that all sense-perception is 'subjective'. If we emerge into a mild day from a cold room or from a hot room, the same outside air feels warm or cool. So we cannot trust our senses, we are told. This is revealed as complete nonsense as soon as we realise that these senses show us *relationships*—and show them with great precision. Our sense of warmth in effect tells us whether we are losing or gaining warmth from our surroundings, or from an object we are touching. Colour perception also brings us an experience of colour as a relationship between the hue of an object and the ambient illumination (this is why, when we buy clothes, we try to inspect them both by daylight and by artificial light).

These two senses are a kind of bridge to a world other than ourselves (in so far as we identify our 'self' with percepts of our own organism). With hearing, as Rudolf Steiner often described, we begin to enter into a kind of 'inwardness' of what is around us.

No
Described
here!

You see a vase in a room. It may not be clear to the eye whether it is made of metal, clay or stone—but tap it with a finger and you will know at once. The sound allows you to hear right into the matter of which it is made (this fact is widely exploited in engineering, where ultrasonic vibrations are used to detect flaws in metal structures, on the same principle as a crack in a bell is instantly audible as a flawed tone). The eye shows us a bird or a cow from outside; but the sounds uttered by these animals convey something of their inner joys and sufferings. Most far-reaching of all, of course, is the entry into the 'inwardness' of another human being which begins when he opens his mouth and speaks.

Hearing, as Steiner describes it, is the first of four senses which play the most crucial role in human relationships. The others are the senses of word, thought and 'I'. Steiner sometimes described these four senses as a kind of turning inside out of the four 'body' senses of balance, movement, life and touch. This is a theme on which much research will be needed in the future, and all I can do here is to point to a few phenomena which seem to me suggestive for further study.

The sense of hearing, as we all know, is anatomically closely associated with the sense of balance in the ear. But I am here concerned not so much with the anatomy and physiology of these senses as with exploring and comparing the sense-experiences themselves. Here it is worth noting that the sense of balance leads us into security of stance in physical space, while hearing leads us most strongly 'out of ourselves' into a totally different kind of 'space' which is essentially 'weightless': we can observe this most strongly when listening to music. If we could trust our senses, we would realise that a symphony is not *in* the air waves of the concert hall, but that we perceive the music *through* these waves, and with the help of our ears can reach directly into a reality of which the air waves are merely a bearer, not the cause.

The sense of word—or more precisely the sense of speech-sounds—reveals to us the 'sculpture', the gestures, made by a speaker's larynx, tongue and lips, which shape a stream of sound into the forms of vowels and consonants. These forms are composed by the speaker into a kind of 'dance'—something between gesture

and music—a sequence of sounds which is characteristic of the particular language he is using. In perceiving this aspect of language, with the sense of speech sounds, we are concerned with feeling rather than thought, and indeed we can enjoy the speech sounds of languages of which we don't understand a word. Into the speech sounds there also flow the individual's own intonation and feelings, which 'move' us in various ways. With the help of our sense of speech sounds, we dance a little inwardly with the words we hear, using a metamorphosed sense of movement turned away from our own movements to apprehend the movement, as also the colour, mood and 'emotion', in the speech of another.

It is important to realise that the sense of speech sounds is not particularly concerned with the conceptual meaning these sounds may bear (except in so far as some words bear something of their meanings within the sounds themselves—'thud', 'snake', 'rush', 'sting', etc). To discern the thoughts borne by the words we need the sense of thought. How can we try to understand this sense as a kind of turning inside out of the sense of life? The latter is concerned with perception of the harmony or disharmony of our organic processes. These processes are essentially organised rhythms. With our sense of life we perceive how the stream of rhythmic time-processes is well-organised or ill-organised.

The physical medium by which thoughts are borne to us is also a pattern of organised movement. This may be the pattern or organisation—the *sequence* of movement—in a stream of speech sounds. Or it may be the sequence of gesture-movements made by a skilled mime (who may be able to convey remarkably complex thoughts in this way). Here, again, it is important to recognise that the *sense* of thought does not give us the thought *content*, but only the physical vehicle, the stream of organised living movement in speech or gesture, into which a content can flow. We ourselves search inwardly for the content—for the concepts which belong to the perceived speech sounds and organised pattern of speech flow. (This distinction applies to all the senses; they give us percepts which are themselves without 'meaning' until we find the corresponding concepts.)

Thus we may begin to understand the sense of thought as a perception of the 'life form' of the thoughts themselves which someone is trying to convey to us, apprehended by a sense of life turned

outward from immersion in the organised flow of our bodily life processes, in order to apprehend the 'thought life' of another.

Finally, and perhaps most difficult of all, is the search for a clear awareness of the sense of the 'I' of another person. When we use the word 'tact', we indicate that in the meeting of two people there is a kind of delicate, non-physical touching. But it is not easy to become more aware of what the perception actually is. It can be helpful to recollect, soon afterwards, a first meeting with someone. There will be memories of what was said, of a physical appearance, emotional reactions, etc. But if all these are put aside, and one asks what is left, there may remain an impression which is best described as a kind of 'force-form', as though one had 'touched', very dimly, the essential *will* of the person one has met.

It is particularly with these three senses that the problems of truth and illusion become most acute (the more so because their very existence is not generally recognised). They already arise clearly with sight and hearing: we never normally say "I could not believe my balance"; but we often say that we could not believe our eyes or ears.

Much more serious, though, is the 'alienation' which leads to doubt and distrust in every human encounter. Many people will remember vividly sudden moments of such doubt, probably in their ninth year, when children begin for the first time to feel separate, alone and perhaps surrounded by strangers. Such moments pass, but often return strongly with adolescence. The healthy side of this is an acute sense for the integrity or otherwise of those around, and a sharp nose for what is 'phoney' (except that it is not the nose, but the senses of 'I', thought and word which are particularly involved). But if this awakening to separateness becomes extreme, it may bring cynicism, chronic distrust and an inability as an adult to 'make contact' with other human beings—a contact which depends on a proper functioning of the senses of word, thought and 'I'.

It is probable that some elements of indulgence or illusion can touch every one of the twelve senses. Nevertheless, it seems clear that the problematic aspect of the senses which most concerned the

East—attachment and entanglement in 'self' and in earthly existence—arises mainly in connection with the six bodily or 'self-centred' senses. The problem of knowledge, on the other hand, has arisen more strongly in science in connection with the six 'world-centred' senses. In the West, we have gained great confidence in the science of bodies, in grasping mass, motion, position, etc., with mathematical certainty. It is a certainty born out of the establishment of an inner security in our own bodies, in early childhood, as we learn to stand, walk and manipulate the objects around us. (Certain lines of research in child development are beginning to reveal what Steiner pointed to over fifty years ago, namely that the apparently abstract mathematical thinking of later life is deeply at work, although unconsciously, in small children learning to know the world of bodies.) At the same time, we are deeply uncertain about any realities outside our capacity to touch, weigh, measure and manipulate—so much so, that they may be banished to an inaccessible realm of 'things in themselves' (as with Kant), or in the case of spiritual realities to a realm accessible only to faith. The division in the sphere of the twelve senses is reflected in the split between 'science and religion', and in the emergence of a kind of empirical and manipulative knowledge working with 'laws of nature', but empty of *moral* laws.

It is therefore not surprising that it is the West, particularly, which has produced a body-centred, consumer society, plundering the earth to assuage disordered appetites, while at the same time experiencing an increasing emptiness of moral life and human relationships, and a deep uncertainty about the meaning of existence.

I mentioned earlier the need for a 'therapy of the senses'. I believe that we can begin to see our way if we take a new look at the whole sphere of the senses, not dualistically, but as a threefold structure. Rudolf Steiner often classified the twelve senses in this way also, speaking of four 'will' senses (touch, life, movement, balance), four 'feeling' senses (smell, taste, sight, warmth), and four 'spiritual' senses (hearing, word, thought, 'I').

In Steiner's recommendations for three main phases of education—nursery, lower school and upper school—we can glimpse a remarkable kind of nurture of the twelve senses. He wanted the nursery and kindergarten to be full of practical activities—baking, cleaning, washing up, making things out of simple materials—but

activities filled with reverence and care for the substances and things of the surroundings. Here the qualities of the substances, materials and furniture matter greatly—perhaps more than at any other time.

Small children, Steiner sometimes said, are completely united with the whole sphere of their sense-perceptions, which is less differentiated than in adults. Because of this they are deeply imitative—everything in the surroundings makes a deep inner impression. Small children have no possibility of ‘alienating’ themselves from their surroundings (except in tragic disorders of autism and the like). Thus they ‘imitate’ the very qualities of the things around them, so it is crucial that these should be ‘honest’. An object which is a kind of a lie—which is in any way fake, or made of materials estranged from nature—brings a kind of immorality to the child through his senses. The traditions and instincts of true *craftsmanship* are needed above all in the creation of the environment to nourish the senses of young children. The children, Steiner once said, should be able to experience at this time ‘the world is *good*’. This is the source for true security and inner certainty in the world in later life, and for the birth of the real creative moral being of the individual working in the will.

In the lower school, from six to fourteen, a great demand is made on the class teacher. He or she must strive to be above all an *artist*. For the emotional life of children is awakening in a new way, with a sense for drama, the battle of good and evil, beauty and ugliness. Here all the arts are needed, and here, too, lie the strongest and most comprehensive possibilities for a nourishment and therapy of all twelve senses. The plastic arts—sculpture, modelling, woodwork, etc.—engage particularly the will senses, but relate these activities also to the life of feeling. The arts involving music and language (including drama and poetry) engage particularly the spiritual senses of hearing, word, thought and ‘I’ but again embracing them into the sphere of feeling. Quite centrally stands painting, the art which lives with colour, but into which play subtly our senses of taste, smell and warmth.

It is at this time, above all, when a kind of bridge can be created, so that the child learns to breathe freely between himself and the surrounding world. And it is in the arts that the most crucial therapy for the enlivening and healing of the senses lies. In the

middle school, Steiner said, the child must experience ‘the world is *beautiful*’.

In the upper school, the pupils are faced with a new kind of challenge. They meet teachers in a new way, as ‘knowers’, as ‘scientists’ in the true sense, specialists in different fields of knowledge. The task here is to open the world to the pupils as it lives in the experience and enthusiasm of adults. In adolescence, a more detached perception begins; the spheres of sense perception and inner life begin to be more distinguished, and among other things pupils begin to take a more objective look at their teachers and parents, and to realise that they are by no means perfect. But adolescents are always searching for true perceptions mediated by the spiritual senses of word, thought and ‘I’, for the truth in the human beings around them.

The confusion of untruthful images and violent or chaotic music with which our culture assaults adolescents at this time is a direct attack on the senses, but particularly on the spiritual senses which are most crucial for building a true understanding between man and man. Here again, we must seek for therapies in all the arts, but perhaps particularly in drama, poetry and song.

A deeper understanding of the senses will also open the way to new science, in which the senses can be trusted because they are known in their different functions and qualities. In the upper school, adolescents will be greatly helped by teachers who can show them a path of devoted and exact observation of natural phenomena. In this connection, Steiner pointed often to the path taken by Goethe, which enabled him to discover the ‘Ur-plant’, the archetypal plant present formatively in the plants around him—an Idea perceived in reality. This is the path for the healing and overcoming of alienation. In the upper school, Steiner said, the pupils should come to experience ‘the world is *true*’.

I began this essay by exploring the role of the senses in waking up, a birth out of the womb of sleep into the light of day. Growing up entails a related birth and awakening, for which home and school provide a womb. If human beings are to awaken to themselves in the world, they need the freedom of a healthy sphere of

twelve senses. To help this is one of the central tasks of the education initiated by Rudolf Steiner. But it is a task which needs to continue throughout adult life. In practical terms, it means working for an environment in which the 'goodness' of the crafts, the beauty of the arts, and the truth of the sciences interweave.

The birth of our true humanity thus depends on the right nourishment through the 'well-springs' of our senses as essentially as on air we breathe and the food we eat. But we need also to become aware of the 'monsters' which lurk in these well-springs. I have already mentioned the kind that would enslave us in greed and addiction, and fetter us permanently to the world of bodies. But there are also the monsters that would alienate us, abstract us from reality and take us wandering in worlds of private inner fantasy because we can find no secure relation to the surrounding world and other people, or do not wish to come down to earth.

In the whole spectrum of the arts, which (as we have seen) can weave through all our senses, we can begin to bring the different spheres of perception into a more living and weaving relationship, as the rainbow makes a bridge between heaven and earth. We need to bring something of the realism and certainty which is given naturally through the body-senses into the world of our spiritual senses, while these need to lend some of their essential 'selflessness' to the will-senses.

Through our four feeling-senses we are linked quite particularly with the world of nature: with colour, the warmth of the sun, the tastes and smells of the plants and animals which feed us. We have developed a civilisation which in its knowing is estranged from nature, and in its doing is destroying nature. The therapy must begin with a sense of gratitude and wonder to the nourishment that is given by nature, through our twelve senses, so that we may awaken to ourselves, and to our responsibilities on earth.

THE EVOLUTION OF LIGHT, DARKNESS AND COLOUR

MICHAEL WILSON

This article is based on lectures given by Michael Wilson in 1971 to audiences familiar with Rudolf Steiner's account of the evolutionary history of Earth and Man. For a deeper study of this we would refer readers to the following books by Rudolf Steiner: "Occult Science, an Outline"; "The Inner Realities of Evolution," "Cosmic Memory" and "Spiritual Hierarchies."

Introduction

Since Goethe gave such an important place in his Theory of Colours to the concept of *active darkness*, we have to see how this can be understood so that it still makes sense in the face of modern colour technology, where "darkness" is considered to be no more than the absence of light. Rudolf Steiner's descriptions of the evolution of our solar system make such an understanding possible, and we will therefore turn our attention to this before we come to the question of colour.

There is no doubt that Steiner was able to read the language of the "cosmic memory," and from this he was able to describe the gradual creation of our material universe out of pure spiritual energy, or "will." This took place in four vast cosmic cycles, separated by long intervals of cosmic night in which all outer manifestation withdrew into purely spiritual existence. The first of these cycles he called the "Saturn" evolution, since it contained the very beginnings of our physical universe. The second cycle he called "Sun," since it consisted of radiating heat and light and incandescent vapour. The third cycle he called "Moon," since here the sun's light came from outside rather than from within; and the fourth cycle is that of our present "Earth," whose central feature is the principle of Death and Resurrection and the attainment of individual freedom.

To the first cycle we owe the physical laws and substance of our bodies; to the second the organisation and growth of our bodies; to the third the ability to react to our surroundings by voluntary movement, and to the fourth the ability to be aware of ourselves as thinking and knowing individuals with wills of our own.

A knowledge of these four cycles of evolution is essential for a deeper understanding of the nature of Man. In this essay we can give only the briefest sketch of this from the aspect of light and darkness.

The "Saturn" Condition

The first manifestation of anything resembling physical existence was the appearance of what Rudolf Steiner calls "warmth," or heat, which existed in its own right without being merely a condition of matter. Today we can hardly conceive of "warmth" without any material to "be warm" or "be cold." When Rudolf Steiner first described the birth of matter out of pure warmth it was almost impossible for the scientific thinking of that time to conceive of this even as a possibility. But perhaps we can get nearer to what is meant when we realise that what is today known as cosmic radiation is a form of energy which can readily manifest as heat-energy but can also exist in its own right. Even more important is the known fact that the beginnings of matter are continually being born out of this radiation-energy.

The first appearance of this physical heat was the result of a sacrificial deed in which divine Beings of the First Hierarchy, known as Thrones or Spirits of Will, poured out their own inner will-substance to produce an outer manifestation. This appeared as patterns of "heat" in the cosmic void. These heat-patterns were the first beginnings of physical bodies which could serve the consciousness of a lower rank of spiritual beings (the Archai) who used them to develop the beginnings of "personality." One cannot say that these bodies were "inhabited," but they served as reflectors for the consciousness of the Archai Beings.

Since "light" did not yet exist, it is meaningless to speak of "darkness." One can only say that there was "absence of light." Indeed it is hardly possible to speak of "space" at all, since the only dimension of differentiation was the presence or absence of warmth. Only towards the end of this cycle of evolution did the patterns of physical heat begin to glow or flicker with the quality of light.

The "Sun" Condition

In the interval of cosmic night (*Pralaya*) which followed the dissolving and re-spiritualising of the Saturn evolution, the basis of

the "heat" patterns which had formed the vehicles for the consciousness of the Archai had been re-designed so that these patterns would be capable of receiving into themselves an organising principle which they had not previously possessed.

This organising principle was a development of the "light" which had begun to appear at the end of the Saturn evolution. Through the influence of the Spirits of Wisdom (Kyriotetes), the refining of the heat into light was accompanied by the "precipitation" of a gaseous substance which Steiner, following the mediaeval custom of calling the four states of matter "fire," "air," "water" and "earth," characterised as "air."

In this differentiation of the "heat" into "light" and "air" we have a duality, but not yet a polarity. Both the light and the air were part of the process of the birth of matter. Steiner describes this air as the "shadow" of the light, but these two qualities of light and shadow were not yet separated into opposites. We can picture the warmth and the light as the incandescent quality and the "air" as the more material quality. Today in an ordinary flame we still have a mixture of these qualities. Only towards the end of the Sun evolution could one say that the light and the shadow began to develop in different directions. But in the cosmic night which followed the dissolution of the Sun evolution, this tendency for the light and the shadowy material to develop in opposite directions was incorporated into the new designs.

The "Moon" Condition

The re-designed heat and air patterns now evolved once more, but this time so that they were capable of receiving into themselves a principle of movement, whereas previously they could be "moved" only from outside by those Beings who were using them as a vehicle for their consciousness.

Then a cosmic event took place which changed the character of all subsequent evolution. The Spirits of Movement (Dynamis) divided into two factions. One faction left the incandescent Moon-body and took with it a great part of the heat and light to form a separate body of light out in space—a Sun. The other faction wanted to develop an existence independently of the authority of the Sun-Beings. They remained with the Moon-Body, which gradually ceased to be incandescent and became a place of increasing shadow.

The forces of attraction and repulsion, which were a gift of the Spirits of Movement, now began to be woven into the evolving "bodies," or vehicles of consciousness, with which the Moon-body was now populated. This gave the possibility of change and movement in the developing picture-consciousness of these bodies, together with the possibility of outer movement in response to this. This is the origin of our present body-of-emotions, our "astral" body, which enables us on the one hand to move our bodies at will and on the other hand to direct our mental activity as we choose. This "inner movement" plays an essential part in our experience of colour.

A Longing for Light

When the Sun-beings had left the Moon-body, the feeling of longing for the light and warmth that had departed, together with the impossibility of regaining it, led to the attitude of "resignation" on the part of the Moon-beings, and to a further differentiation of the air principle into an organising principle of movement and change on the one hand, and to a condensation into the "liquid" or "watery" condition of matter on the other. If we use our imagination to put together these new forces of Cooling, Darkening and Condensing, we can begin to understand what is meant by "active darkness" in its wider sense.

In this shadowy condition of air and water came those beings of the rank of Archai who had failed during the Saturn evolution to develop to the stage of light, and were therefore still "warmth-beings" without light. It is of the utmost importance to realise that these warmth-beings could join only in an evolution which was a "taker" rather than a "giver" of light. They were, in fact Beings of Darkness. They brought to the shadowy life of the bereft moon an activity of warmth which could evolve in the darkness of matter. This was the beginning of an organic life relatively independent of the life of the Sun. Here for the first time one can speak of an active, formative principle of darkening and cooling as the polar opposite of the element which the Beings of Light and Warmth were developing for themselves on the independent body of the Sun.

This is the origin of the polarity of Light and Darkness. Before this second half of the Moon evolution it makes no sense to speak of light and darkness as a polarity. But from this stage onwards there

is a very real active darkness which is responsible for the further organic development. This active darkness is throughout concerned with matter, with material development. It is quite different from the mere absence of light. It is an activity which takes the light that comes from the sun outside, absorbs it, and transforms it into the organic life that now evolves in the elements of air and water. We have a memory of this in what we know as "photosynthesis."

In making mental pictures of this Moon evolution it is important to remember that there was as yet no sense-perception of external things. The senses were developed as reflectors of what was experienced inwardly, not as transmitters of what existed outside. This latter development came only with the earthly period known as Lemuria, and forms part of what we call the "Fall of Man."

What we still retain of this original polarity shows itself in our instinctive longing to bask in the warmth and light of the sun as a form of relaxation, and in our need to express information in "black on white" when we want absolute precision in our life of thought. These two levels of consciousness play an important part in the process of vision, as I shall show in the following pages.

The "Earth" Condition

Towards the end of the Moon evolution the development of inner change of consciousness and of outer movement and the intensification of the experience of all this in the astral body, together with the densification of matter from the airy to the watery condition and the beginnings of the appearance of more solid horny or woody material within the fluid mass—all this made it possible for the patterns of light and darkness which were active at the level of movement to begin to imprint their patterns on to the more permanent and solid forms which were appearing as part of the organic life of the moon.

During the cosmic night between the end of the Moon evolution and the beginning of the Earth evolution, the design of the material "bodies" had been recast, so that the future bodies would be able to have a solid component as well as watery, airy, and warmth, components; and the "movement-principle" had been redesigned so as to be able to accommodate an "ego-principle" which would be capable of giving its own instructions to the movement-body from inside rather than from outside.

The evolution of the earth went once more through the early stages when it was an incandescent vapoury form, then a fluid stage accompanied by the throwing out of the satellite body, our present moon. During the subsequent development both the radiant sun and the reflecting moon exerted their influences on the earth from outside in cosmic space.

It is important to remember that the longing for the light and warmth of the sun, an experience which had been planted so deeply into the weaving of the astral body during the Moon evolution, now appeared again as an *instinct* in the very design of the earthly bodies which were the forerunners of mankind. Up to the time of the Lemurian epoch these bodies were still little more than vehicles for elements of consciousness which had not yet separated from the all-pervading divine consciousness. This divine consciousness was directed towards the Beings of the Sunbody, the Giver of Light.

With the gradual separation of the Ego from this divine consciousness, what we now call "individuality" began to come into being. At the same time the bodily senses began to open themselves to the outside world of material existence, so that the outer physical light began to take the place of the inner spiritual light. For a long time both the inner and the outer images existed side by side and this could cause a certain amount of confusion. In post-Atlantean times the inner images had almost entirely faded away, and only a memory of them was retained.

Today we count as "real" only the images which correspond to the outer physical world. However, our eye still has the capacity to produce inner forms and colours which have no outer physical counterpart, when it is stimulated by purely mechanical means such as pressure. These inner characteristics of our process of vision can be seen as remnants or memories of the earlier faculty of inner perception.

In ancient Persian and Egyptian times there were still initiates who had retained the power of spiritual perception and were aware that the God who had created them was to be experienced in the realm of the Sun. The light of the sun represented what was *good*, while the darkness of earth represented what was *evil*. Later it could be experienced by these initiates that the God who had previously lived in the sphere of the Sun had now left that sphere and had begun to descend to the earth itself. It was known that one day

this God would appear in the earth as the Saviour of Mankind, and so preparations were made, lasting through many generations, so that a body suitable for divine habitation could be available when the time came.

It is taking mankind a long time to realise that the Divinity who was traditionally worshipped in the light of the Sun has now been in the sphere of the earth for nearly two thousand years. This means that the true source of spiritual light is henceforth to be sought within the darkness of the earthly sphere rather than in the light of the Sun. It is here that the light will begin to redeem the darkness.

In our study of the evolution of light and darkness we have therefore to distinguish at least three stages:

1. Light evolves out of non-light as part of the creation of matter from pure-heat energy. Here darkness would be the same thing as absence of light.
2. Cooling and Darkening develop as organic activities in the shadowy life of the Ancient Moon. The light comes from the Sun outside in space. The darkness is a real formative activity and is the antithesis of the light.
3. After the middle of Earth evolution the spiritual light enters the earthly darkness. The full polarity of light and darkness belongs to pre-Christian times. The "Christian" relationship of light and darkness will be where the light begins to dissolve and redeem the darkness from inside. This will be fully understood only in the far future.

Beginning with the famous experiments of Newton, our scientists have investigated light in its relation to matter. In this field, knowledge has expanded at an almost incomprehensible speed during the 20th century. But the relationships that are being discovered and the knowledge that is being built up correspond more to the Saturn/Sun conditions than to the later stages of evolution. Goethe, on the other hand, perceived the active polarity of light and darkness in the sense of the Moon-evolution. This represents a type of thinking altogether different from that of the Newtonian school. If this difference is not appreciated, untold confusion will arise between the two schools of thought. Rudolf Steiner took his start from Goethe's point of view, and gave a number of hints as to how this should develop in the future. We are still only at the beginning of this development.

A New Dimension

So far we have considered only the relationships of light and darkness. To study colour we must go back to the conditions of the Old Moon evolution. After the separation of the Sun-body from the Moon-body, we have for the first time the condition where matter itself becomes dark and is illuminated by the light of the sun from outside. There is tremendous inner tension between the nostalgic longing for the light and warmth on one hand and the necessity for organic life in the shadowy material on the other. Light and Darkness are a real polarity in which all shades of feeling develop in the Beings who live within this polarity. These Beings belong to the Hierarchy of the Angels and serve as "messengers" between the places of light and the places of darkness. The aching "longing" which, if left to itself, would produce eternal stagnation, is brought into movement by the Spirits of Movement, and the manifold shades and nuances of feeling and desire which are thus woven are experienced in a new dimension: the element of Colour.

Colour is thus a dimension of tension and movement which is experienced between the poles of light and darkness. At this stage—the Moon stage—darkness is by no means evil. Its development holds the future. But colour is not yet a "thing." It is an experience, a movement, a formative force. If we think of colour coming into being as the "sea of astral tension" on the Old Moon, then we can speak of a "sea of astral colour-will" which works as a real formative force on the development of the human organism.

We must not think of this colour as being outwardly perceptible, for there was no outer sense perception on the Old Moon. The experience was entirely inward, but nevertheless very real in that it would tell one whether a neighbouring being was friendly or harmful. Since these forerunners of the human organism were still watery and pliable at this stage, it is easy to understand that colour itself worked as a real building and forming force. What was being formed and woven was the astral body, which on one hand is the organ of consciousness and on the other hand is the agent which engraves its experiences into the etheric body and directs its movements.

At this stage of evolution the processes of perception, imitation and reproduction are very closely connected, and they all take place in this sea of colour-will which pervades the life of the Old Moon.

Rudolf Steiner describes how the first objects to take on this new character of colour as a permanent feature were the plants, which began to retain a quality of greenness in themselves.

In Earth-evolution these stages are recapitulated, but at a more material level. The human bodies become denser and contain a solid element. During the Lemurian epoch the process of reproduction is entrusted to the newly organised stream of heredity, and at the same time human eyes are opened to external light and colour.

The sea of astral formative will becomes embodied in the bodily organs, particularly the organs of reproduction, where it is no longer perceived by the organs of sight. The vivid "colourful" sensations of our lower emotions which arise in us quite instinctively today are a memory of the conditions on the Old Moon where our body-of-emotions was woven. Thus in our study of colour we meet "memories" of earlier conditions of evolution first in the processes of vision, where the eye itself produces its own images in response to stimulation by light or by pressure or by shock, and where the process known as "adaptation" is a memory of the mobility of our colour-experience at the time when we were surrounded by a formative sea of colour; and secondly where we meet a built-in emotional response to colour, which takes us back to the time when our astral body was literally woven out of the flowing element of colour.

In the surrounding world of nature, the plants and trees have become more solid, the animals have grown bones and shells and the earth's crust has hardened into solid rocks. In all these kingdoms the quality of colour has become attached to the materials, as well as being a property of the light, so that we see every solid object as having a colour of its own, even if we only call it grey. The sun itself can appear coloured, as at sunset, and we can have light from lamps in an infinite variety of colours. Thus whereas at earlier stages of evolution colour was part of our whole being, today our consciousness is "outside" the colour, and we perceive colour either in the quality of the light, or else on the surface of objects when they are illuminated.

In our approach to the study of colour we are free to choose the level at which we study it. But it is essential to know whether we are investigating properties which originate in the Saturn evolution, or in the Sun, Moon or Earth evolutions. These properties are very different at the four different levels.

If we are looking for unvarying "mineral-like" properties of light and colour, we shall find that these were characteristic of the Saturn evolution, when light was being evolved out of pure energy on the way to becoming matter. At this level we shall not find anything that is related to our emotional experiences, to our enjoyment of colour, but we can learn a great deal about the structure of matter itself.

If we are concerned with the behaviour of coloured substances, such as paints and dyestuffs, and how they can be mixed to produce fresh colours, then we are more in the realm of chemical, or perhaps alchemical, transformation. We have to examine and measure the different ways in which the substances reflect, transmit or absorb the light; in other words, the relationship of the substances to light and shadow. This corresponds to the Sun evolution and to its recapitulation in the early stages of the Earth. But at the same time we have to make use of the methods and standards that are more "Saturnian" (spectral analysis, spectrophotometry, etc.).

If we want to find out how to use colour so as to give us aesthetic satisfaction in our surroundings, we must study how colours are related to the *light* by which we see them and to the *darkness* of the objects which carry the colours. We must also study the naturally-given polarities, contrasts and harmonies. These dynamic relationships belong to the second half of the Moon evolution. To give expression to these requirements we do of course have to make use of what we have learned in the more material realm of chemistry and physics, but it is significant that nearly all our colour technology—printing, photography, lighting, cinema and television—is based on the way that colours are oppositely related to light and to darkness, so that when a colour-picture is turned from a positive into a negative image, all the colours automatically change into their opposites. This is essentially a Moon-relationship.

How we recognise objects

At this level we have been rather misled by the way our physicists have thought. Because they could not deal with "darkness" as a form of radiant energy, they could consider it only as mere absence of light. They therefore described the process of human vision in terms of the presence of light and the absence of light. This led to the general conclusion that objects are recognised by the quantity

and the colour of the light entering the eye. But this does not at all correspond to our actual experience. We recognise objects by the way they *darken the light that illuminates them*. Our visual process has a built-in instinct which distinguishes between what belongs to the character of the illumination and what belongs to the character of the objects. If we did not do this, we would be quite unable to interpret our surroundings.

Ordinary objects are not self-luminous; they require an illumination if they are to be seen. Their shape is recognised mostly by the way they obscure the light to produce varying degrees of shadow, and their colour by the way they darken the light towards their "own" colour. Physicists call this Selective Absorption. If we cannot see that they are changing the colour of the light that falls upon them, we cannot say that the objects themselves are coloured.

For instance, if we see a red object, say a red billiard ball, in deep red light, we are aware that the total appearance is red, and we may even be aware of the source of red light, but we cannot attribute the redness to the billiard ball unless we see that it is actually darkening, changing the light to red. If we take a red and white ball and put them both into the deep red light, we find that we cannot tell which is which. They "look" identical. We have to attribute the redness to the light.

Or again, if we look at a garden full of flowers on a sunny morning, and then again later when it has clouded over, we do not say that the flowers have all changed their colours, but we say that the light has changed. If we take two colour snapshots of the same scene in these two different conditions of lighting, we shall see at once how much the colour of the light has changed. In the original scene we unconsciously "adapted" to the colour of the daylight, and "perceived" the various darkenings done by the flowers. Since this darkening is a property of the actual petals of the flowers, it does not change with the daylight. We say that the flowers have kept their colour but that the light has changed. This process is so automatic that in normal illumination we do not notice it.

Once we have accustomed ourselves to think in this way, this perception of the darkening becomes self-evident and shows itself in countless instances. It is the key to the understanding of such visual effects as the "coloured shadows" to which Goethe paid so much attention. It is a built-in feature of our perception that we

instinctively identify with the colour of the light, the illumination, and then assess the colour of the darkening in relation to this.

In the case of Goethe's experiments with the "coloured shadows," the total illumination is always a mixture of two lights, a strong one which is coloured, and a weaker one which is colourless. If the strong light is red, then the "total" surrounding light will be reddish-white. Within this reddish-white light any shadow or partial shadow *which does not change the colour of the illumination* will be seen as a "neutral" or "grey" shadow. Therefore a shadow from which the red component has been removed must appear "less red than neutral." But something that is *less red than neutral* cannot be other than green. We therefore perceive the shadow as a "green darkening seen in reddish light."

This description of the phenomenon is borne out by countless variations of the experiment and is the simplest one possible. If we remember that on the Old Moon the deep instinctive longing was for the light, whereas the *thinking consciousness* was directed towards the developing darkness, then this present-day feature of our perception becomes at once understandable.

We can also see that this feature, which has hitherto been purely instinctive, must in future be taken into full consciousness as the Ego begins to develop the qualities of Spirit-Self.

We can now distinguish between the activities of the four principles which constitute our human being:

1. Our physical body, our nervous system, responds to the stimulation by the radiation entering our eye.

2. Our etheric body enables us to experience this as the quality of light, by means of the chemical processes that take place in our retina.

3. Our astral body enables us to become *conscious* of these sensations of light, and of the darkening and differentiation of light into colours. Thus we perceive, through our astral body, the optical images of the outside world upon our retina and, in just the same way, the less fleeting impressions of light and colour upon our retina that we know as "after-images." (How we "project" these retinal images into the space outside us belongs to another chapter of study).

4. Our ego, through our "intellectual soul" calls our attention to some surprising effects such as the coloured shadows. We used

to call them "optical illusions," but they are really due to the instinctive and therefore partly unconscious reactions of our astral body within our visual process. Through our "consciousness-soul" we must learn to perceive the movements of our astral body, which have hitherto been unconscious. When we learn to do this, our Ego will be able to grasp the whole process of our relation to light and darkness.

Painting Technique

When we come to the realm of art, we are dealing with the way in which the Ego builds a bridge between the spiritual world and the physical world. We have to be able to make use of the principles we have learnt at the physical, etheric and astral levels. We have to see how the behaviour of the colours in the inner qualities of warming, cooling, lightening, darkening, hardening, softening, bringing joy or sadness, etc., represents a whole world of moral experience. We must find a way of showing in our painting how the light which was formerly outside the earth in the sun, both physically and spiritually, has now *spiritually* entered the sphere of the earth itself. We must find a way of showing how the light and darkness which were formerly opposites and in a sense antipathetic to each other, have undergone a change since the Mystery of Golgotha in that the spiritual light has now entered the darkness and is beginning to redeem it from inside. This means that in our painting technique we must be able to show not only how colour-as-light and colour-as-darkness meet *externally* as lights and surfaces, but also how darkness can be illuminated and transformed *from within*.

Here it is interesting to note how Vincent van Gogh, who was so passionately devoted to the sun, never painted the external light. When he puts the sun into a picture, it is painted like a piece of putty. I know of only one picture which contains a real shadow, and that is the distorted shadow of himself as "The Painter on his way to work." But in every object that he paints, even the old chair in his bedroom, he tries to let the light shine out from within the object, and it is this that gives such extraordinary vitality to his pictures.

To achieve this consciously in our use of colour will involve all the technical knowledge and skill that we have gained from the other three levels, which I have compared to the Saturn, Sun and Moon

stages, as well as the heightened feeling for what Goethe called the Deeds and Sufferings of the Light.

When we learn to "live ourselves into" these processes at their various levels, we shall understand what Rudolf Steiner meant when he said in one of his lectures (Dornach, 10 December, 1920): "We see today a world of light; millions of years ago it was a moral world. We bear in us a moral world, which, millions of years hence, will be a world of light." We must remember that the task of Earth Evolution is to transform our Planet of Wisdom into a Planet of Love. The conclusion of the book, "Occult Science," is: "Love is the fruit of Wisdom reborn in the Ego." In the future we must be able to say: "The Light shone in the Darkness, and the Darkness, made transparent through the warmth of Love, is able to comprehend it."

TRAIN

Two horses in a field,
green, silent.
Red velvet cows by stream,
willowed, secret.
Sheep.

Out from hell's tunnel stabbing cut air
screams the rampaging scot and
blasts its diesel thunderbolt
the flying urgent screech
of eldrich damned and
rushes gurgling down cutting
headlong lost
swallowed
black

gone

Two horses in a field,
green, silent.
Rich velvet cows by stream,
willowed, secret.
Sheep.

Charles Austin

GRADUAL

H. L. Hetherington

'Gradual' was a term applied to an anthem sung at the foot of the steps to the altar. Its alternative form is 'Grail' and both words indicate the steps which have to be taken in a spiritual process or path. The four poems which follow indicate four steps in the Incarnation and so can be thought of as a Gradual

At sunset
winter early
the camel line wound into a desert valley
the beasts tethered and the servants busy with gear and food over fires
winking in the ring of tents pegged down in the sand.

The masters of the caravan walked out on to a hillock
to watch the stars flame forth
as green died to blue—
the three of them on the skyline
silent, surprised at nothing
yet ever amazed.

Among the constellations in the crystal vault
they read again the great sign set.
This in an autumn sky had called them out.

Star men these
scanning the sky for imminent births
then acting resolutely on information gained
brooking no delay.

They came at last to the village
quite unannounced
some bustle in the street
the neighbours perplexed and curious—
the strangers did not stay long
but were said to have been generous—

the pair with the little boy were off soon afterwards
journeying south towards the sun

II

gaunt baptizer
bending to his task
legs braced against Jordan
both strong hands firmly placed upon the nape
of the next disciple kneeling in the flood—

God invoked and a harsh heave
pilgrim asprawl, ecstatic, weltering
holy Jordan roaring in his ears
homecoming penitent

but this one otherwise—
for, lifting up his eyes,
John saw the whole sky flaming,
a bird winging from a golden sea,
a trumpet call proclaiming:
'Thou art my son,
this day have I begotten thee.'

III

At time's pivot
from which all before, all after is counted
Imperial Rome sat unperturbed, at peace,
straddling the central sea.

In an eastern province
a minor disturbance
quelled by a minor appeasement
shrugged off by the washing of hands
publicly and with a governor's scorn.

A shameful death
given to bestial and violent men
unshaven brigands, assassins, furtive and loose-lipped,
baring blackened teeth:
men whom only torture deters.

Raised between two such
the Son of Man died
broken
lasting three hours only.

This was remembered
the bitter cross burgeoned in the heart
sweetening the sweaty degradation
of a felon's tree.

IV

shadow brown land
beneath the green dawn-sky

cool
quiet
dew-time still

Magdalen in the garden
face grubby with tears by the empty tomb
weeping this last betrayal of her Lord

then
as the sky grew brighter
she saw a gardener standing there
or so she thought him

but
when he spoke
she knew
the sun had risen

MODERN THEORIES OF THE COSMOS

Galaxies, Pulsars, Black Holes

GEORG UNGER*

DIRECTLY Einstein had arrived at a new concept of time and space, after pursuing certain difficulties encountered in electrodynamics, he became obsessed with the idea that the reconciliation of the principle of relativity with the fundamental equations of electrodynamics was only a special case of a more general relativity. Namely, that systems of motion which do not appear uniform to one another should all the same be regarded as equivalent.

Einstein's famous but purely fictitious thought-experiment concerning an observer enclosed in a box was designed to give plausibility to such an idea. Assume that, unknown to the observer, the box is given an acceleration from outside in a region of space free from gravitational fields. From inside the box he will then observe that "all objects fall with the same speed"—i.e. start to move with the same acceleration relative to his box. He would also note that a ray of light entering his box from outside appears bent, as if by its own nature.

This "observation" interpreted in terms proper to the observer in the box, implies that the light has acquired a mass, even if minute, and in particular that this is a gravitational mass, subject to the fictitious "gravity" experienced in the box. Though this is well known, it is mentioned here because its repercussions are an important factor in modern astrophysics, and particularly in cosmology.

We thus note that, by the above argument, light is subject to gravity, even if very weakly. We shall encounter the idea that an ultra-strong gravitational field, appearing somewhere in the universe, could give rise to a situation where light can no longer escape from it.

A further concept developed from the early theory of relativity must be mentioned. This concerns the inter-relation between matter and space. The relativistic theories of gravitation claim that gravity is nothing more than the consequence of a change in structure of

the interplay of space and time. When one speaks of the "curvature of space" in this connection, this is meant only in a metaphorical sense. But it describes a mathematically meaningful relation that had led to the idea of "curved space" long before the time of Einstein.

To give a more tangible example of what is meant by "curved space," we may compare a plane, possessing its properties of Euclidian geometry, with a sphere and its corresponding properties of spherical geometry. If one now calls the field of a two-dimensional geometry a two-dimensional "space", then the "space" corresponding to spherical geometry is "curved". In this case one can visualize the "curvature" as embedded in the three-dimensional space around it. By analogy, modern geometry has recognized, since the end of the last century, the existence of a three-dimensional geometry which compares with ordinary geometry as spherical does to plane geometry. By *analogy*, we can speak of a three-dimensional curved space, although we cannot visualize it. These scientific developments were used in the theory of relativity to bring gravity into relation with curved space.

The purely speculative origin of these considerations should be emphasised. Einstein was aware early on that a uniform distribution of matter in all space (even if it is uniformly distributed only on average) implies zero density for an infinite universe; in other words this is not possible for a finite density of matter. Einstein found further that by introducing a certain constant in his mathematical formulation, a self-consistent solution to the fundamental equations of general relativity is made possible. He had already introduced the term, "cosmological constant". Later, it may be added, this had to be abandoned. Even today, theoretical ideas on these topics are in a state of flux. Thus, quite early in the history of relativity there was a strongly speculative element. In the field of astrophysics this element has stimulated a whole new branch of speculative cosmology.

Interpreting the Red-shift

Since about 1920, astrophysicists have known that distant objects emit light with a spectroscopic property known as the red-shift—i.e., the spectral lines are shifted by a certain amount towards the red end

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of the spectrum. This indicates a steadily increasing distance between the source of light and the observer (the Doppler effect). Hubble was the first astronomer to interpret the red-shift of distant objects as evidence that they are receding from us.

In the meantime, some other exact solutions of Einstein's equations had indicated that various hypotheses concerning the recession of distant objects are possible. For example, one could conceive of a finite, closed universe with positive curvature (curved back on itself), and with a pulsating "radius", so that there would be periods of expansion, giving rise to the red-shift, alternating with periods of contraction.

Before going further with these cosmological ideas we will discuss some recently discovered phenomena which have completely changed the face of astrophysics in this century. The large reflecting telescopes revealed that the so-called spiral nebulae consist of vast numbers of individual stars and are in fact separate galaxies, similar in structure to our own galaxy. But how far off are they?

The answer came from a study of certain variable stars, the Cepheids, found both in our galaxy and in the distant ones. The brightness of a Cepheid goes through a regular cycle, known as its period, of alternating increase and decrease. In 1912 an American astronomer, Henrietta Leavitt, found that the period of a Cepheid is conveniently correlated with its degree of brightness—the longer the period, the greater the brightness. The distance of a group of Cepheids in our galaxy was calculated, and then, as their periods were known, it was possible to determine their absolute or intrinsic luminosity—i.e. how bright they really were, allowing for attenuation by distance.

The next step was to observe the periods of Cepheids in other galaxies, and so to establish their absolute luminosities. The difference between the absolute luminosity of such a Cepheid and its apparent faint luminosity, as seen for the earth, gave a measure of its distance. The results were taken to show that the other galaxies are at enormous distances, running up into many millions of light-years, from our own.

The Centre of our Galaxy

Recent research, including the results of radio-astronomy, has provided far-reaching descriptions of the centre of our galaxy. For

example, one is led to assume that the galactic centre, were it not hidden by cosmic dust clouds, would show up as a moderately bright region of the sky, some 33,000 light-years away in the constellation of Sagittarius. Immense gas clouds appear to be moving both towards and away from us. An article in the April 1974 issue of the *Scientific American* finds it necessary to speak of a ring of matter, which by computer simulation techniques is shown to be consistent with the observed distribution of material, and continues:

The mechanism of this hypothetical flow is not known. The gas may flow into the central core from the galactic plane, or it may come from outside the galaxy. One provocative suggestion is that mass may spontaneously appear in the nuclei of all galaxies through some process that lies outside our present understanding of physics. One does not, however, tamper highly with the known laws of physics. This alternative should be considered only if further theoretical and observational investigations reveal no other reasonable explanation of the events that are occurring in the active centre of our galaxy.

The observation of binary stars also belongs to the development of astrophysics in the twentieth century. Among these are some which must have an extremely small invisible companion. This is deduced by applying Newton's laws of motion—i.e. the mutual attraction and consequent orbital motion round a common centre of mass. From the proximity of the companion to the main partner, and from the orientation, an unusually small radius must be inferred in certain cases; otherwise the companion would be part of an eclipsing binary.

Calculations give an unusually high density for such a companion, for example in the case of the star Sirius. Other considerations concerning the hypothetical interiors of stars had led already in the 'thirties to a "model" involving super-dense nuclei in all stars, including the sun. The models produced in the twentieth century for the nature of the atom now made it appear possible that in the presence of sufficient gravitational pressure the atoms would collapse. In a super-dense state, therefore, atomic nuclei and free electrons would have to coexist in an otherwise unknown state of very high energy (high "temperature"). *This state would not normally be described as consisting of ordinary "matter".*

Later, white dwarfs were discovered. These are stars with high surface temperatures which should not normally occur for such small objects, according to the usual rules. Again it was possible to find ways of comprehending such objects through the laws of atomic physics. For on the atomic scale there is a rule, known as the

Pauli exclusion principle, which states that for atoms, molecules, and perhaps also crystal structures, no energy state can be "occupied" twice over. Certain substances, among them gases, show deviations—"degeneracy"—from the normal laws at low temperatures. Here the Pauli exclusion principle prevents any further energy from being acquired because all energy states are already occupied. The idea that a small star, held together by an exceptionally powerful gravitational field, should have such a high surface temperature as to make it appear white could now be understood in terms of a state of degeneracy, applied to the dimensions not of molecules or even crystals but to those of a cosmic object.

Atomic Physics and the Universe

As we continue with our brief account of astrophysical and cosmological facts and theories, it becomes apparent that an increasing number of ideas in modern physics are employed to devise a theoretical framework with which astronomers try to comprehend the ever-increasing number of observations that cannot be immediately understood in material terms.

A real revolution occurred in the 'sixties of this century. For the developments mentioned above were supplemented by the challenging observation of more clearly defined radio sources, made possible by the improved resolution of radio-telescopes. Many of these point-sources were associated with diffuse gas clouds observed in the radio spectrum. These observations led to the astonishing discovery of quasars (quasi-stellar objects) in the following way.

The final proof that these radio sources were point-sources came from the lunar occultation of one radio source in the constellation of Virgo. During the transit of the moon, the radio signal was sharply interrupted. At the position calculated from the occultation, something like a faint blue star was observed—clearly the source of the signal. But it was impossible to identify the observed lines in the radio frequency spectrum. Only the bold assumption that an unusually large red shift must be present led to a provisional explanation. One had to suppose that this was not a case merely of light-waves being shifted to the red end of the spectrum, but that electromagnetic waves had been shifted all the way from the visible and even the ultra-violet parts of the spectrum, past red, into the region detected by radio aerials.

Hubble's work, already mentioned, had led to the finding that the greater the red shift, the more distant is the object. Applied to quasars, this meant that they were at enormous distances. But this created a new problem. Only gigantic and exceptionally energetic objects could produce the detected radiation from such a distance. How could gas clouds of such dimensions radiate coherently and thus produce the radio emissions? All explanations broke down.

Presently certain empirical rules became apparent. Quasars are associated with a special type of irregular, "exploding" galaxies, known as Seyfert galaxies, after Carl Seyfert.

Large cosmic explosions had already been speculated about for a long time, but we will not here pursue the theory that our whole universe owes its existence to a primeval "big bang". Recently, more refined observations have shown luminous filaments connecting galaxies; they point to an immense flow of matter on a cosmic scale. If a gaseous filament connecting a quasar with a galaxy is observed, it will be necessary to give up interpreting the observed red-shifts in accordance simply with Hubble's findings. Indeed, a more thorough scrutiny of observations has already raised an increasing number of objections to the universal validity of "Hubble's law."

Pulsars and Black Holes

We must briefly mention a further category of very recent observations in the field of astrophysics. These concern the pulsars and X-ray sources. Cosmic objects have been discovered which show intensity fluctuations in visible light, in the radio spectrum and also in X-radiation. The most remarkable features of these fluctuations are their particularly short time-scale, as compared with the variable stars, and the extraordinary regularity of their periods. Again models could be constructed, using ideas from physics and nuclear physics, to explain the origin of these radiations. The period of the pulsar in the Crab nebula increases at the rate of 15 microseconds a year. Neutron stars are envisaged which rotate about an axis; the Crab nebula pulsar, for example, has a rotation rate of 30 times a second.

The idea of a neutron star is not, of course, based directly on observations. It is entirely the result of a theoretical formulation.

The assumption is that a neutron star can be created in the explosion of a supernova, like the one observed in the constellation of Taurus by Chinese astronomers in 1054.

It is characteristic that the idea of a neutron star was developed some decades before the observations which it was then used to interpret. The relevant work appeared in 1938 and 1939. For a long time astronomers doubted the possible existence of neutron stars, but in 1967 the first pulsars were observed. Today it is widely believed that pulsars are small enough to be able to rotate so rapidly that, as Roger Penrose says in an article on black holes in the *Scientific American*, "The radio and optical pulses emitted by pulsars owe their energy and extraordinary regularity to the presence of a rotating neutron star." The first pulsars were discovered by radio telescopes, and in 1969 the first optical pulsars were detected by Cocke *et al.* It had previously not been noticed that a star which was itself well known turns on and off 30 times a second.

This is not the place to discuss the considerations which are thought to determine the normal cycle of evolution of stars with different masses. A star the size of the sun is said to evolve into a white dwarf. A star twice the size of the sun, when it has burnt up most of its original hydrogen fuel by fusion, will first of all expand to large proportions and then start to contract again. It has no stable equilibrium state that would enable it to settle down as a white dwarf. Therefore the star, or a substantial part of it, will continue to collapse under its own gravity. The resulting high density will cause new reactions and a supernova explosion will result. Finally, a collapsed core, too small for a white dwarf, will form the neutron star. Its rotating magnetic field is thought to be the origin of the observed radiation.

We now come to the strange objects which recently made headlines because it was believed that they had been confirmed by observation. These are the so-called black holes.

In the early days of the theory of relativity it was postulated that an excessively large mass could become separated from our space-time continuum, purely by analogy with the singularities on a geometric plane. Now, from the exact solutions to certain of Einstein's equations, a black hole is described as a kind of maelstrom of cosmic dimensions. Stars and galaxies can vanish into this

enormous funnel, which has a boundary beyond which light is so strongly subject to gravitational force that no light or other signals can escape to the outside world.

In this situation, gravity must dominate over all other forces. No stable states of matter which could withstand the gravity can exist. The original object, the excessive mass of which was the starting-point for the forming of the black hole, would lose all physical identity. The enormous spatial gradients of the gravitational field would destroy not only rigid bodies, but also molecules, atoms, and even fundamental particles.

I will not continue to pursue the various processes that could occur in the vicinity of a black hole. Some of these are reminiscent of science fiction. I will only mention in passing that minute black holes of unknown origin are now being postulated. Thus, according to recent reports in the press, it has been suggested that the devastation of a large remote area of Siberia, apparently by a meteorite, on 30 June, 1908, may in fact have been caused by the penetration through the earth of a very small black hole.

A remark concerning singularities may be added here. Penrose says correctly:

Physicists are unhappy with a theory that predicts the evolution of a truly singular physical state for matter. In the past, whenever a singularity was encountered in a theory, it was generally a warning that the theory in its present form was breaking down and that new theoretical tools were needed. In the case of black holes we are again being presented with a situation of this kind, but one more serious than before. Here the singularity refers to the very structure of space and time.

Again we are given a view that illustrates how theoretical ideas are connected with the new phenomena.

A Brief Recapitulation

Whereas the end of the first quarter of this century was characterized by the new theoretical developments in quantum physics, the ideas of astronomy remained comparatively conservative. Physicists were forced by various phenomena to revise the simple concepts of force and matter, and were led to use mathematical methods that defy pictorial understanding. Since then, many phenomena have been discovered only because they were first *predicted* by theoretical considerations. I quote the positron and the anti-proton as examples.

The neutron, on the other hand, was discovered in the first place, while many other physical phenomena were first devised and then discovered, often after a lapse of many years. Thus Pauli had predicted the neutrino in order to reconcile the laws of conservation of energy and momentum with certain apparent anomalies that occurred in collision processes. He did so by postulating the escape of neutral particles of zero mass which are fundamentally unobservable. Moreover, the equivalence of mass and energy, predicted theoretically by Einstein in 1905, was confirmed some 33 years later by the splitting of the uranium atom. Half a century after Einstein had produced his formula, the immense energy of the hydrogen bomb gave further spectacular evidence for it. In the middle of the 'fifties the existence of the neutrino in the vicinity of nuclear reactors was finally established, at great expense. After this, at a celebration in Zurich to mark the event, I heard Pauli remark with a smile: "But we had endowed the neutrino with such properties that proof of its existence should never have been possible."

If in this connection a quotation from Friedrich Dürrenmatt, author of the play, "The Physicists," takes on a strange and macabre significance, then the same quotation must today be considered in the new context of astrophysics, now that 33 years have again elapsed since the decision was taken to harness atomic energy. Dürrenmatt said: "Thinking has become dangerous; as dangerous as smoking in a gunpowder factory."

The picture of the universe beyond the solar system is characterised by the peculiar idea that because of the enormous distances and the finite velocity of light, occurrences are never seen as they happen, but as they were in a more or less distant past. It is characterised also by a multitude of new phenomena which year after year, one might say, include the same mixture of invented and subsequently discovered facts.

"Invented facts!" That is an absurd expression, but I must confess that when I stated in a lecture some twenty years ago that "the thoughts of today become the realities of tomorrow," and that "false thoughts lead to false realities," I was well aware of the boldness of this remark. I was all the more surprised when, after the lecture, a member of the audience pointed out a passage from a lecture by Rudolf Steiner, given in the 'twenties on the subject of social phenomena, where he had already made the second statement.

We must ask ourselves: Does it make sense also in astrophysics to fear that false thoughts can lead to false realities?

Spiritual Aspects of Pseudo-material Pictures

Rudolf Steiner said much that could supplement astronomical research. Most of his statements concern our solar system and the Zodiac, with only occasional references to the stars beyond. In my opinion it is still too early to attempt a conclusive interpretation of the present quasi-material image of the universe. But let us once more remember that all the laws of classical and quantum physics are called on to provide explanations for new observations, and that the consequences of these laws have led to anticipations of later observations. Also, the present scientific interpretation of the universe is highly speculative.

Let us proceed with the idea that at the present stage of the earth's incarnation all that we perceive in the form of earthly phenomena is intended to have meaning for us. Only with great technical support are we able to penetrate beyond the stars to the world of countless galaxies, to the flashing pulsars, the radio sources and the objects such as black holes which are 99 per cent theoretical, yet they are set before us on the same footing as the objects we directly perceive.

According to Spiritual Science, there are other worlds besides the earth-evolution which takes its course within the solar system and the Zodiac. But they do not send any strong physical impulses to us on our physical earth. They send only weak signals, one might say. These signals are at present interpreted in material terms. Hence they lead to the picture of a gigantic universe penetrated by immense processes of creation and annihilation which cannot be understood in terms of the present laws of physics. To do justice to these manifestations in a spiritual sense, we will try to apply the methods of understanding taught by Anthroposophy.

We note that supersensible facts manifest themselves in the form of "Imaginations." These are, in the first place, images, the reality of which can be established only by the higher stages of understanding, through Inspiration and Intuition.

We have seen that the development of physics has already taken a similar turn, but at a lower level, as it were. For in order to

overcome the difficulties posed to a material way of thinking by the discoveries at the turn of the century, Niels Bohr had to create a new free combination of pictorial elements in his model of the atom. One could describe this as a kind of "physical imagination." Bohr's pupil and friend, Werner Heisenberg, was able to develop an essentially mathematical formulation, *not* based on images that could be visualised, which accounted for the observations and therefore now allowed Bohr's model to be "understood." From this arose for present-day physicists a reality that can no longer be termed "material" in the ordinary sense—and certainly it derides itself if it claims to interpret in material terms the universe that comes before us as appearance.

From this point of view we will now examine some of the appearances obtained through the large modern instruments, as well as the conceptual ideas, "inventions," and the imageless scientific formulas (such as those of the theory of relativity) with which the appearances are inseparably bound up.

Crossing the Threshold

If we wish to continue with this comparison, we must remember a spiritual truth concerned with the threshold of the spiritual world. For in modern physics we have already quite obviously crossed a threshold from a material environment to a—let us say—sub-sensible environment. In the same way, through the ideas of modern astrophysics, we are about to encounter extra-physical worlds through imaginations and inspirations.

Now the crossing of the threshold leads man to the sphere of spiritual beings. Present-day research workers are quite unaware of this. But ignorance does not protect them from dangers or influences.

The pupil of spirit-knowledge who follows an ordered path to the threshold is aware that he will encounter powers of temptation—Lucifer and Ahriman. In the second lecture of the course, "The Karma of Materialism" (Berlin, 1917), Rudolf Steiner showed the polarity of the atomistic and the continuous in the light of this encounter. As an ordering principle in the world of thoughts, which are indeed themselves beings, we can take this polarity of the continuous and the atomistic as a guide. Thus the concept of fields

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belongs to the continuous, while particles are atomistic. The ideas in Einstein's general theory of relativity are continuous. The elementary particles, and other empirically and theoretically based ideas that now play into astrophysics, are by nature atomistic. This applies, for example, to the "explanations" of the various stable configurations for stars such as white dwarfs and neutron stars.

Let us allow some images to act upon us without regard to their standing in present-day cosmological theories, and let us try to be aware of their ethical consequences in the sense of Goethe.

In contrast to the distant galaxies, we may regard the explosions which are theoretically postulated at the centre of our galaxy as a turbulent mixture of processes involving both fields and particles. *These are, however, relevant to our own world-system and its development.* The astrophysical image can be interpreted as follows: The creative Beings who were once at work have withdrawn. The dark dust-clouds which are apparently seen in front of this centre hide from our view, as it were, the waste products of their past activity.

We must regard the white dwarf star as an extreme case of atomistic formation, because the complete stand-still of all processes brought about by the Pauli exclusion principle leads to the imagination of total rigidity.

On the other hand, we can see in the extended gas clouds, where electrons are supposed to move as they do in a synchrotron accelerator, a cosmic location for predominantly continuous processes.

Spiritual Science leads us to regard the great polarity of Lucifer and Ahriman in such a way that it appears to man as a constant battle between them and between their respective servants; but in a wider perspective we must also see them working in close and constant collaboration, as in their negative influences on human beings they play into each other's hands.

Ahrimanic dream

As an application of this thought, the black hole is a particularly horrifying imagination. It is attributed to J. Robert Oppenheimer, as is the concept of the neutron star. In so far as the black hole can

be predicted by the theory of relativity and regarded as an area where all material identity vanishes, this thought-form belongs to the realm of Lucifer. In so far as the image of the eternal void, into which all existence vanishes, is contemplated, this thought certainly belongs to the realm of Ahriman.

Perhaps a personal reminiscence may be added here. In the early thirties I was present, as a voluntary stage-hand, at a rehearsal of Goethe's "Faust" when Marie Steiner dedicated a whole afternoon to a single passage, even a single word, that she wanted spoken in a special way. This was the passage: "da liebt' ich mir das Ewig-Leere" ("then I'd prefer the *eternal void*"). The actor was to put the full force of the Ahrimanic aspect of Mephistopheles into the word *Leere*, so that it ought to make the audience shudder. So one can take the black holes as a prophetic Ahrimanic dream, given artistic expression by Goethe.

The aphoristic remarks with which we have tried to find ways of seeing the spiritual aspect of modern thoughts and facts do not pretend to give an "explanation" in terms of Spiritual Science of the conditions described above. The late George Adams worked out ideas about negative space which he consciously brought into context with certain statements by Rudolf Steiner, who indicated that one should regard the interior of stars as a negative, "in-sucking" space. Such ideas are raised to a new actuality by the current development of astrophysics, and should be taken by all interested persons as a field for further independent work.

It may be remarked that in my view, as a student of Steiner, one should not try to build up a complete world-picture from the indications he gave for the science of *his* time. One can, however, experience with surprise how remarkably relevant to modern research many of his insights were. Thus he describes "negative space," which actually begins at the sun's corona, in vividly expressive words: "If you were to pass through the sun's corona, you would experience the void you were entering as unpleasant in the highest degree, for it *tears you apart.*"

It is just this image of tearing apart that is used by research workers when they want to illustrate the conditions that would be encountered on approaching a black hole. Also, in another connection we can find a deeper significance, without falsely claiming a "prediction" by Steiner, when with reference to the nebula in Orion he said that

the occult symbol ∞ refers to an old world ending and the beginning of a new world. Science recognises regions of creation and annihilation on a cosmic scale in the spiral nebulae, and here one can regard the mathematical models of the type described above as cosmic dreams, for they have only a very, very tenuous basis in astronomical observations.

I will end with a quotation from a lecture by Rudolf Steiner (Stuttgart, 14 September 1923), plainly confirmed by the turning upside down of natural laws in the latest astrophysics:

"What is true with reference to laws of nature on earth is no longer true out there in the cosmos. It is true only up to a certain distance. Beyond that, the prevailing conformity to law is of the kind we encounter in dreams. Hence people should be clear that when they look at the Orion nebula and want to understand it, they must not think in terms of experimental physics. They must begin to dream, for the Orion nebula shows its conformity with dreams. When people think about the Orion nebula not as is done in observatories and astronomical departments, but by dreaming, they will get to know more about it."

NICHOLAS ROERICH

Citizen of the World

JOHN FLETCHER

IN 1974 the world celebrated the centenary of the birth of Nikolai Konstantinovitch Roerich (Nicholas son of Constantine Roerich). In the Arctic regions there is a mountain called Mount Roerich. When the Russian explorer, Sedov, who gave it this name, climbed to the top and stood on the roof of the world, he must have felt, "Here below me, to the West, the South and the East, lies the Realm of Roerich."

What is this Realm of Roerich? When we contemplate his paintings or read his books, he opens a door and leads us gently into another world, a world behind the purely physical. He does not avoid the outer world, but he looks at it with the eyes of a seer.

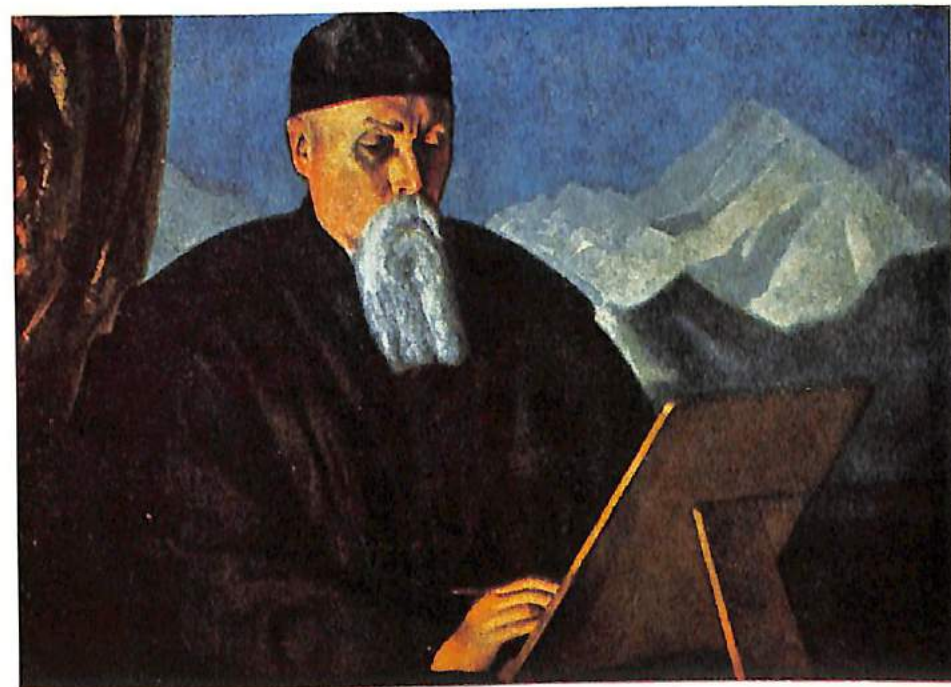
One often hears enthusiastic expressions such as Roerich's mountains, Roerich's skies, Roerich's clouds, Roerich's earth, Roerich's colours. One writer, Leonid Andreyev, has said: "The only grass that can be as green as Roerich's grass is the grass that knows the advent of winter and death after the brief summer" (the Russian summer).

The late Eleanor Merry, in an article on Roerich*, wrote:

Let us approach the ideal of Goethe, who said: 'In that man is placed upon Nature's pinnacle, he regards himself as another whole Nature, whose task it is to bring forth inwardly yet another pinnacle.' From this new and higher pinnacle man can look even beyond the world of the elements, and see in them the imprint of Divinity, endlessly creating. In Roerich's book, *Himalayas, Abode of Light*, we read: 'The teaching of Kalachakra . . . the teaching of Fire . . . ancient teaching though it be, shall be the new teaching for the new era . . . What is revealed in Kalachakra? . . . It is revealed most scientifically how the natural forces of the elements can be used by humanity.'

If we wish to attain to the expression of elemental harmony and power in painting, we must also learn to find the primal qualities—the right tones, combinations of the colours; and these will then have a healing effect on those who look at the pictures . . . The world of the Elements certainly sounds forth from many of the works of Nicholas

* Included in Eleanor Merry's book, *Art: its Occult Basis and Healing Value* (New Knowledge Books, 1961).



Nicholas Roerich in his last years
Portrait by Svetoslav Roerich

By courtesy of Svetoslav Roerich and the Roerich Museum, New York

Roerich. He had given birth, in himself, to a new pinnacle of human nature—an image of those mighty snow-clad summits that no merely earthly powers can ever hope to conquer; and so the great Elements themselves were ready to come to his aid.

Here, again, is the Realm of Roerich.

Apart from his paintings and writings, the story of his life is full of significance, and even more revealing is the tremendous impact he had on innumerable people whom he met and who have recorded their impressions. These are people who have stood in front of his paintings, or who have passed through the 'door' when they have read one of his books.

People in Britain know little concerning Roerich, if indeed they have ever heard of him. Only three of his paintings are in public galleries here—two in the Victoria and Albert Museum and one in the Worthing Art Gallery. New York has the Roerich Museum, with hundreds of his paintings, and others are on view elsewhere in the United States. In Russia he is represented in all the major galleries; in India there is a Roerich Museum in the Himalayas, where he died, and in various Indian cities his works can be seen. Others are to be found in most countries in Europe, and even in Japan. It is estimated that 6,000 of his pictures are scattered through public and private collections all over the world. He wrote twenty-seven books, besides a great number of essays, articles and poems. The climax of his writing came in his book, *Himalayas, Abode of Light**, published a few months before his death in 1947.

One of his greatest contributions to a better understanding among nations was the Roerich Pact for the International Protection of Cultural Treasures in time of war and civil commotions, which was accepted by thirty-six nations.

Early years in Russia

Roerich was born in St. Petersburg in September, 1874. His father was a barrister. From the age of sixteen he became interested in painting, through his interest in nature during holidays spent near one of Russia's great forests. At the age of nineteen he was faced with a dilemma. He wanted to enter the Academy of Fine Arts, but his father wanted him to study law. He solved the problem in a manner that was to characterise him all through his life, when

* David Marlow Ltd., London.

meeting conflicting demands. He enrolled both in the University to study law and in the Academy to study art. His final thesis at the University, "The Painters of Old Russia," combined a juridicial-social theme with the historical-artistic one.

During his years at the Academy he had already painted a number of pictures, including two murals. In 1897, aged 23, he left the Academy and in the same year began to exhibit pictures. A brilliant career lay ahead, but not without many difficulties. His painting style was so original that it was regarded, in one critic's phrase, as "uncomprehended novelty." He had considerable family difficulties, too.

At this early period Roerich was already painting without models or sketches. His creative talent was helped by a vivid imagination. In a painting called *The Terrible Castle* he imagined himself a gnome to get behind nature's forms; during these early years his themes were mainly historical. By 1900 he had developed new imaginative themes; he changed from a narrow nationalism to wide-ranging mystical subjects. By 1902 the Tsar and Alexandra Museum, St. Petersburg, and the Tretyakov Gallery, Moscow, had bought some of his paintings.

In 1903 he began exhibiting abroad, in Prague, Vienna, Munich, Berlin, Paris. Strangely enough, Roerich never appeared at these exhibitions, disliking the commercial side.

In 1904 and 1905 he created many religious paintings which are quite distinct from his other paintings—*The Miraculous Christ*, *The Fiery Furnace*, *Treasures of the Angels*, *The Archangel Michael*, and sketches for Church wall-paintings. He said: "Even the blindest, even the dullest of people will soon understand the tremendous significance of our primitives, the significance of Russian icon paintings." Roerich's own religious paintings show his powerful imagination, especially *The Treasures of the Angels*—a dark landscape with Heaven in the background, surrounded by fairy-like trees in which are barn owls; white-clad angels with blue wings, row after row of whom guard a mysterious treasure connected with the future destinies of the world. It is a strange stone, blue-black in colouring, with the Crucifixion carved on it, and it gives out an emerald glow. It is guarded by two angels with spears.

This was probably the same stone that he was to write about in his old age, in his *Himalayas, Abode of Light*. In the chapter

"The Sacred Land," he speaks of "... the miraculous stone coming from a far star, which is appearing in different places before great events. . . . The stone is usually brought by quite unexpected, unknown people. In the same way in due time it disappears, to be again manifested some time after in quite another country . . ."

These sagas remind us of the *Lapis Exilis*, sung by the famous Meistersinger Wolfram von Eschenbach, who closed his song with the line, 'And this stone is called the Grail.' What a world of experience lies between the painting of this picture in Roerich's youth and the writing of this great mystical book in his old age!

We must pass on. It is so tempting to linger when writing about any period of Roerich's life. Condensing and leaving out will be a continual sacrifice as we pass quickly onward.

In 1912 and 1913 Roerich tried out new colour-effects by taking two or three colours and contrasting them very boldly. In *Sword of Courage* he painted a huge mountain, dark-blue and green, and a castle, contrasted with an Archangel holding a sword, clad in flaming red. Another picture, *The Battle of Kerjhenetz*, has a ruby-coloured sky and emerald green hills, and in the middle a lake which reflects the sky.

During this period his painting began to show an increasingly cosmic quality, through his special way of combining colours. Museums in Russia as well as those abroad had become interested in buying his pictures and he was on his way to becoming internationally famous.

Designing for the Stage

Roerich entered a new element around 1912-1913 when he painted stage scenery for the great Russian operas, *Prince Igor*, *Sadko*, and *The Snow Maiden*, and for Stravinsky's new ballet the *Rite of Spring*. He experienced music through the orchestra, the voices, the dancers in the same way as he did through the colours and movements of his paintings as he composed them. Concerning his work for the theatre he said: "I compose a symphony, with the music choosing a *leitmotiv* of colour which corresponds with the tonality of the piece." Sensitive music-lovers can experience musical themes when looking at some of his paintings. Many people consider that his stage-painted scenery for opera, the drama and ballet are the

most interesting of all his creations. It has even been said, after the *Rite of Spring* had been staged in Paris in 1913, that in the future it might be considered the most important artistic event of the 20th century. It was the combined inspiration of four men, Stravinsky, Roerich, Nijinsky and Diaghilev. Roerich wrote the libretto, conceived the ritual, and painted the scenery. Stravinsky recognised his genius by dedicating the work to him.

The music, the ritual, the dancing, the scenery were so powerful and elemental, and so far in advance of their time, that the public of 1913 could not take them in, and a riot ensued.

In a diary during his travels in Mongolia, many years later, Roerich wrote: "When a Mongol refused to repeat his beautiful song to us because he sang only for the great desert (Gobi), we remembered Stravinsky and how he embodied in the music for the *Rite of Spring* the eternal rhythm of human striving and the victory of the spirit."

By 1917 his formative years in Russia were coming to an end. An exhibition of forty of his paintings was opened in Petrograd and continued under gun-fire and all the upheavals when the February Revolution broke out and the Tsar was overthrown. In spite of this the exhibition was a huge success, most of the paintings being sold.

Roerich had foreseen the terrors of the Revolution in two articles written in 1916, "Dreams" and "Fears and Horrors," which were later connected with a series of prophetic paintings he had completed in 1914. In spite of his popularity with the new revolutionary regime—he remained in high favour even with the Bolsheviks of the October revolution of 1917—he decided to move to Finland. By November 1918 he felt his work in the North was completed.*

I can perhaps best sum up his Russian period as expressed by E. Gollerbach in an article on Roerich: "He is a Russian of the Russians, and even more Russian than the Russians themselves. His is an enormous world-feeling . . . the all-embracing Russian heart drawn to the world."

* For the information regarding Roerich's Russian period I am indebted to Nina Selivanova's book, *The World of Roerich* (Corona Mundi, International Art Centre, New York, 1922).

A visit to London

An interlude followed, as though to enable him to meet the challenge of the extreme West. After a period in Sweden and Norway he came to England, and in May 1920 an exhibition of his paintings, called "The Spells of Russia," was held in London, and aroused considerable interest. Articles appeared in the press; the Victoria and Albert Museum bought two paintings, "Polovetsky Star" and "Northern Landscape," and many paintings were bought by private collectors. A doctor who had seen the paintings told Roerich he thought they had an element of healing through their colours and he hoped to buy some for his hospital. The exhibition visited many British cities. The Worthing Art Gallery now has one picture, "Northern Sunset."

Now destiny took a hand. Roerich and his wife had planned to go direct to India from England, but in the short time of one week all plans collapsed, as loss of money through faulty investments and many other difficulties arose. At the same time the possibility of a visit to America took shape; tickets for India were exchanged for tickets to New York, and in September 1920 Roerich and his family set sail for New York. There seemed to be some uncertainty whether he was destined to reach America; through an accident he was nearly killed on the voyage and the ship was caught in a cyclone, but in October, 1920, the family eventually arrived in New York.

The American years

Barnett Conlan, in his inspiring book, *Nicholas Roerich: A Master of the Mountains*,* says: "If Pheidias was the creator of divine form, and Giotto the painter of the soul, then Roerich may be said to reveal the spirit of the Cosmos," and he goes on to speak of the importance of Roerich's three life-periods and their connections—the early Russian phase; the final Asiatic (India) phase; and, in the middle, the theatre phase (which had started in Russia and was concluded in America). He considers that Roerich's early Russian period was a preparation for his main work in the theatre, his stage designs for drama, opera and ballet, bringing together in a wonderful synthesis the four arts of music, painting, the dance, and speech.

* Flamma, Liberty, Indiana, U.S.A.

Soon after Roerich's arrival in America an exhibition of his paintings in New York drew huge crowds. Between January 1921 and April 1923 the exhibition visited twenty-one cities; many pictures were sold to public galleries and to private owners all over America.

One of the results of the New York exhibition was a commission for Roerich to paint the stage scenery and design the costumes for Rimsky-Korsakov's opera, "The Snow Maiden," in Chicago. In connection with these designs he gave a lecture called "Spiritual Garment," where he spoke of the connection of the colour of human clothing with the human aura, which can create powerful effects. He gave many lectures on art in other cities. He spent the summer of 1921 painting in New Mexico, the Grand Canyon, and Arizona.

During these years in America seeds were planted full of promise for the future. By the time Roerich set sail for India he had created stage scenery for many famous operas, not only Russian, as well as for dramas by Maeterlinck and for ballets. One of the great seeds he left behind ripened in 1929 in the form of the Roerich Museum in New York. This was perhaps the first time in history that a whole building had been dedicated to an artist while he was still alive. By 1931 over 600 of his paintings hung there, more than 80 of them dedicated to India; messengers from East to West. During his years in the United States Roerich had come so close to the American way of life, that Americans felt him to be one of themselves.

In an essay, "The Eternal Garment," Roerich wrote: "Here in America you do not need to be negative. So many beautiful things are possible if we can keep our positivity and open-mindedness. We can feel how the primal energy is electrified in this country: and through this energy in the easiest way you can reach the inner constructive feeling of the nation." As one American writer put it: "Roerich's influence seems to have touched latent relationships between this country and himself."

Dudley Watson, at that time a member of the Chicago Art Institute, wrote to Roerich: "Your exhibition is open and is more beautiful than I had ever hoped. Your painting needs no explanation, but if I can open the eyes of some of the people to its potent message of beauty and quality, the inner struggle of the spirit, the

supreme calm of the soul, I shall feel that my effort is well repaid."

Babette Deutsch, the American poet, wrote: "This realm of Roerich extends even to those hidden regions of the spirit which few care to find and fewer to penetrate."

Roerich's paintings, as distinct from his theatre work, stand apart from the main trends of twentieth century art. That is perhaps one chief reason why his work is not more widely known. It expresses a personal vision in a style which to most modern art critics is likely to seem strange and not very congenial. A further reason may be that Roerich's paintings very often do not reveal their secrets at a first viewing. The magic comes through quiet contemplation and returning another day.

During this middle period of his life, in Europe and America, Roerich spoke of his admiration for the new Russia he had left, "flowing in thunderous tide." He felt the powerful elemental forces surging through the Russian Revolution. One wonders how he would have felt after reading such a book as *The Gulag Archipelago*,* by Alexander Solzhenitsyn, who sums up his account of the Soviet penal labour camps with the words: "How mediaeval, how primitive! The only thing new about it was that it was applied in a socialist society!"

Towards the end of Roerich's stay in America his colours began to change. He used his colour combinations in a softer way; the tempestuous skies he had loved became transparent and clear. As one writer, Michael Babenstchikov, expressed it: "His colours began to smoulder like coals, with all the shadings of violet-blue, pale-yellow and orange-rose. Alarm and menace in his soul were replaced by peace and benevolence."† He even changed his medium, becoming more interested in pastel and tempera and less so in oils and water-colours.

We now pass with Roerich to India, where with his wife and two sons, he arrived in 1923.

Home in the Himalayas

Whatever the outward events were that led Roerich to India, more important still were his inward urgings. As early as 1905, when he was 31 and still in Russia, he had painted a number of

* Collins/Harvill/Fontana.

† Roerich: *Fragments* (New World Library, New Delhi).

pictures devoted to an India he had never seen physically. As a boy he had revered an old painting of India's Holy Mountain, Kinchinjunga in the Himalayas, which he was to paint and write about during the last period of his life. The titles of two paintings of 1905-1906 were significant—"The Way to India" and "Sons of India." He also wrote essays on India during this period. But it was a different Roerich who arrived in India 17 years later. Aged 51, mature and full of experience, he brought gifts from the West to the East. They were like unopened buds that burst into blossom in the spiritual atmosphere of Asia and were to be reflected in a magnificent series of paintings, called "Banners of the East," which found their way back to the West, into the Roerich Museum, New York.

The Roerich family made their new home in the beautiful Kulu valley at Naggar in the Himalayas. In his own words he says why he chose this spot:

It would be rather feeble to compare the Himalayas with any other mountain range—the Andes, the Caucasus or the Alps, all these will appear to be but single peaks when compared with the supreme mountain range of the Himalayas . . . In the Himalayas was crystallized the great Vedanta. In the Himalayas Buddha became exalted in soul. The very air of the Himalayas is penetrated with spiritual tension.

During these years in India, Roerich made extensive journeys through Tibet and Mongolia. His experiences and his conversations with Tibetan lamas are described in his last book, *Himalayas, Abode of Light*. Here the reader finds the word Shambhala constantly recurring. Roerich says: "If I shall tell you the most sacred word of Asia—Shambhala—you will be silent. If I shall tell the same name in Sanscrit—Kalapa—you will be silent. If I shall tell you the name of the mighty Ruler of Shambhala—Rigden Jyepo—even this thundering name of Asia will not move you"—so little is known in the West concerning Shambhala.

There is a heavenly Shambhala and an earthly Shambhala. Roerich's great painting, "The Commands of Rigden Jyepo," reproduced here, will help us. Founded upon the Tibetan legend of Shambhala, it shows the royal Lama, Rigden Jyepo, King of Shambhala, giving his messengers their instructions. In the heart of a mountain the huge figure of the King is seated. Around him



The Commands of Rigden Jyepo
By courtesy of the Roerich Museum, New York

rays of light shine on the messengers. The figure is the supreme Bodhisattva, or Siva himself. He imparts light and energy to the messengers.

In Roerich's book, a Lama says to him: "You come from the West, yet you are bringing news of Shambhala. Probably the ray from Rigden Jyepo has reached all countries; he is ever vigilant in the cause of mankind."

In another chapter Roerich says of the holy mountain, Kinchinjunga: "From all parts people come to pay homage to treasures of Kinchinjunga, which points the way to Shambhala." He mentions also the black aconite that grows on the road to Kinchinjunga: "The natives gather it by night, when it glows and can thus be distinguished from other species of aconite. Verily, the Fire-blossom grows in the Himalayas."

He describes the magnificent roseate fires that appear long before dawn over the mountains; they are in constant movement "gathering into garlands, breaking into fragments: they flash out and disappear." Then they reappear, gathering into one powerful flame. "Who has kindled these pillars of light? . . . Aurora Borealis cannot glimmer in the Himalayas . . . they come from Shambhala."

Maria Schindler, in the chapter on Russia in her book, *Europe: A Cosmic Picture*,* says of St. Sergius: "In the Asian East, the spirituality of St. Sergius is known. The Russian painter Nicholas Roerich tells how the Indian seeks to honour St. Sergius as a Bodhisattva: as one of those who beheld the features of Christ . . . The Russian soul has the mission to realize the experience of the Holy Grail as the message of an all-embracing universal Church of the future."

Nicholas Roerich died amidst the snowy peaks of his beloved Himalayas on 13 December, 1947, aged 73.

* Reviewed by Robert Powell in this issue, prior to publication by New Knowledge Books in January 1975.

FIVE POEMS

Peter Gruffydd

SUMMER'S CHILD

One day, a truant from school,
Out along roads where white
Grass faltered in summer heat,
I saw murmuring fields of wheat
As grails of great light
That floated above the soil.

Beside their full croceous,
Rippling I leant tiredly,
Remembering gown and word,
The wielded stones and chains
That smash out the brains
Of shambling generations.

The mountains of Eryri propped
Summer curves of cloud to the sky.
There from tilted stones I learnt
More of life's real making.
Then one huge shade approached,
Loomed, grew luminous, drenched
Drying soil with ripe wheatdust:
A vast discus, just beyond
The creaking doors of senses,
That passed from me, vanished,
Its supernal stride's great glory gone,
Myself alone by some fields of wheat.

Nothing then I understood
Not much more now
But still remember the holy shade
That broke lightly from the land,
Its form the bread I eat,
The stuff I drink, the loving flesh
That I now tread underfoot.
For then I slept and now I sleep,
In a dream, dream of a dream,
Turn like a sleeper to the vision
Which stilled with fire that summer's child.

SICK FOX

Others have marked its poise,
The coat's glowing rank, eyes
Hot quartz in a wedge head.
Once I saw one fleet as flowing
Rust flit a hill's gorsed flank,
Metamorphose into landscape:
Skill men dream of yet destroy.

To-day, in our footpath's gloom,
Sudden this sticklegged thing,
Burnished brush a mangy stump,
Did drag itself away to creep
Down into long grass and wait
Until my pausing tread came near,
Force itching flesh through the fence
To slump again in roadside nettles.

That's all: yet I cannot sift
Its misery from my blood, fear
That sickening visit as portent
Of our poisonous way with the world.

WIND AND RAIN

Rain pocks the windows
With clear, slight beads
Wind raises wet heads
Of grasses, spraying drops
Along damp concrete paths.

There is unease in me
For my friends who are not
With me, unravelling
Coloured threads of lives
Alone in wind and in rain.

But that is also close
To self-pity, the closed
Circles of my eyes
Seeing only my own mess
Of knots, my evasions.

I wish them, one whose smile
 And spirit always quelled
 A cold winter day, foretaste
 Of something more lasting
 Than the turn of seasons,
 One whose puzzled questioning
 Then reflected my helpless
 Answers, my own silences,
 Others from whom I learned much,
 I wish them well, that they live
 To make sense or symphony
 From the pitching warp and weave
 Of days, out of wind and rain.

BIRD AND BLOCK

Swifts carve up
 Grey faces
 Of an opposite block,
 Their shadows zoom
 Trip over sills,
 Balconies, vanish
 In the invading blue.

From this distance
 Which is the bird,
 Which the shadow?
 Which the form of flying
 Air-filled bone
 And feathers,
 Which the trailing
 Shade, bumping
 Over the lumpy masonry below?

OLD HARRY

One morning as dew hung threaded
 On tall grass waiting in ditches,
 In a dipping lane where small oak, alder
 Met overhead, almost fully down,
 I saw him, up to his chest in docks
 And lush nettles, snaking briars,
 And the dark, night-loving grasses.
 His sickle swung slowly, surely
 Into the thick rustle of sapped green.

He was bowed, short, broad braces
 Strapped across a bulged back,
 His khaki trousers bristled with seed.
 But most of all I noticed his hands,
 Clenched roots of brown skin that gripped
 The old, handled tools with peace.
 "Morning," I said; he nodded, glanced,
 Shifted a dulled burnt briar over his gums.
 I could smell the strong twist all the way
 To the fields where baskets waited whitely
 In the draining shadows of fruit and leaves.

In the twilight, walking up to the village,
 The twitten then an arch of trimmed branches,
 Chopped stumps level and white at the top,
 Grasses and docks laid aside in fat rolls,
 I asked a friend, "Who did this—cut here?"
 "Ah, old Harry did; he's a queer 'un.
 Half-crackers they say, talks to himself,
 Sings at night, lives in an old 'ut there
 Up the middle o' 'Owarth's fields yonder."

Cracked, I thought, the man who wrought
 Here to let cooling sunlight enter
 In with the lapping dusk of evening.
 If madness lies so, I thought then and now,
 Let me live alone and make paths for others,
 That they may trudge home not seeing
 But sensing the careful labour that worked
 A way for them through clutching lanes.

THE HEARTH

WHEN Caedmon saw the harp being passed round the fire,
each in turn to sing (and he couldn't sing), he slipped
away, into a barn,

and there, cast down in sleep, an angel spoke to him
and when he awoke he wrote down what he remembered.

This was the beginning of English poetry.

When Caedmon slipped away from that fire he withdrew
from the old lore. Into a loneliness.

Those fireside stories were a working always within
the tribal lore drawn from the hearth that each heart
focussed on, recognizing itself.

Caedmon had to leave the fireside to receive the new—
a Christian poetry, free from magic and the tribe.

But his poems disappoint us—myth dies into allegory
and moralizing. The vision is no longer trusted.

So there is a sadness here. And it continues. Through
centuries. Till we long for that hearth men gathered
round—not just for its warmth, but because fire is
the source of stories.

It seems to us now that Caedmon withdrew from hearth
and heart into a dark study where the things we love
live only by reason of what they stand for. Or as
commodities.

I cannot deny an angel guided him (it was our destiny
to forget the stories for a time),

but I in my own study here am in despair of it and
lonely locked in my English head.

*but my daughter
(who is four years old) knows
all the stories.*

*She told us to-night
about a horse of silver leaves
who shook*

*his riders off and eating snow
inside the forest
he could not die.*

*And though her heart
(which is mine) rambles
from truth*

*to nothingness
it is a hearth for us.*

Paul Matthews

THREE ESTRANGED SISTERS: RELIGION, SCIENCE AND THE ARTS*

CHARLES DAVY

ON various occasions Rudolf Steiner spoke of religion, art and science, how they sprang from a common source, how they have diverged into separate activities, and how they should come together again in this Michael age. For example, in the four lectures on the Cycle of the Year and its festival seasons (Dornach, 1923), he spoke of how a renewal of the Michaelmas festival could work as an inspiration for our whole spiritual and cultural and social life. For then, he said, "there will be established in our life not the abstract Spirit on the one hand and spirit-void Nature on the other, but what we really need—Nature permeated through and through by Spirit, Spirit creative in the sphere of Nature. For these are one, and they will weave into living unity once more, religion, art and science."

Now in speaking of this living unity, Dr. Steiner certainly did not mean a blending of religion, art and science into a vague mishmash. He often emphasised the importance of distinguishing clearly between separate things and not saying they are all one because they have some aspects in common. In this same lecture he went on to say: "The anthroposophical impulse would consist in this: to feel at Easter-time the unity of religion, art and science, and at Michaelmas to feel how the three, having one mother, become three sisters, standing side by side, completing one another."

Evidently, this is not happening to-day. The three sisters have gone their separate ways, and each sister is apt to be rather suspicious of what the others are up to.

Soon we will try to get a clearer idea of what the three sisters think and feel about one another at the present time, but first we had better ask—what were the sisters like as children, when did they first become estranged? This backward glance can be brief: it will be more interesting to see what is happening to-day and what

may happen in the future. But we need a little historical background.

In most early societies we find the arts closely associated with religion, and so too were the beginnings of science: astronomy and astrology, for example, and some forms of measurement and calculation. All this is well known. If we ask—when did the first signs of divergence appear?—we must look to ancient Greece during its golden age, those wonderful hundred years running roughly from Pericles to Aristotle. In the arts we find sculpture no longer confined mainly to gods and mythical heroes and semi-divine rulers; we find it turning to glorify the human form. We find drama moving away from its ritual origin in the Mysteries and widening its range of secular subjects. In Greek philosophy, which embraced mathematics and scientific speculation, we find the human mind exercising itself in a new mode of free, rational inquiry, not restricted by religious doctrines. We feel this particularly in Socrates, the Socrates depicted in the Platonic dialogues, of whom Rudolf Steiner said that his task was to bring a sort of foretaste of the Consciousness Soul epoch into his own epoch, the epoch of the Intellectual or Mind Soul.

However, these divergent trends in ancient Greece were not destined to endure. For the coming of Christianity, in the middle of the Graeco-Roman epoch, changed the course of history, both profoundly and in external ways.

If now we pass on to the Middle Ages in Europe, we meet a quite different situation. Religion and the arts are no longer drawing apart. The arts were then sustained partly by the patronage of Princes, but they were very largely engaged in the service of the Christian Church. As for the third sister, science, during this period in Europe she was suffering from malnutrition and had no strength or wish to strike out a path of her own. However, her time was coming, and it was not far off. With Copernicus, Kepler, Galileo, Bacon and Newton, we enter the avenue that leads on to the modern scientific world.

No need to review here the well-known work of these pioneers. I want to mention only the change from the mediaeval world-picture to the world-picture that came in after the onset of the Consciousness Soul epoch during the 15th century, for I think this change did a lot to set religion and science on divergent courses.

* Adapted from a lecture given at Michael Hall, Forest Row, in December, 1973.

Most people nowadays have learnt to think of the mediaeval world-picture with a sort of pitying condescension. How ignorant it was, how parochial, to think of our little Earth as the centre of the universe! Well, from a modern point of view the mediaeval world-picture was ignorant and it was parochial, but it had a quality that our world-picture lacks. It had another dimension, so to speak, a dimension of spiritual depth and light. This is well brought out in a book by C. S. Lewis, *The Discarded Image*.^{*} I will quote a few lines from it. You must suppose that you are standing on earth, at night, and looking up from outside at this great transparent sphere of the fixed stars, and in imagination looking through it at the heavenly city beyond:

Whatever else a modern feels when he looks at the night sky, he certainly feels that he is looking *out*—like one looking out from the saloon entrance on to the dark Atlantic or from the lighted porch upon dark and lonely moors. But if you accepted the Mediaeval Model you would feel like one looking *in*. The Earth is 'outside the city wall'. When the sun is up, he dazzles us and we cannot see inside. Darkness, our own darkness, draws back the veil and we catch a glimpse of the high pomps within; the vast, lighted concavity filled with music and life. And, looking in, we do not see, like Meredith's Lucifer, 'the army of unalterable law, but rather the revelry of insatiable love. . . . Then, laying aside whatever Theology you held before, run your mind up heaven by heaven to Him who is really the centre, but to your sense the circumference, of all; the candle to whom all these moths move yet are not burned. The picture is nothing if not religious.

"The human mind," Lewis adds, "has seldom had before it an object so sublimely ordered as the mediaeval cosmos." But time moved on, and when the influence of the new epoch, the Consciousness Soul epoch, began to take hold, it became much harder to accept the mediaeval model, harder to imagine the spiritual heavens lying beyond the visible scene. The mediaeval model began to seem like a fairy-tale. The visible scene itself, the night sky and the stars, could still be admired as a spectacle, but it had lost meaning. And the Ptolemaic model of the solar system, with its epicycles, wheels within wheels, was complicated and confusing, almost impossible to picture.

Then came Copernicus and Kepler, and a far simpler model of the planets and the earth all revolving round the sun; and Galileo, with his telescope, began a process of observation which was to give a quite new impression of the scale of the universe,

^{*} Cambridge University Press, 1964; paperback, 1971.

in terms of space and time. The mediaeval model, having lost its spiritual content, was bound to be superseded; but the change opened a path towards the modern conception of a godless universe.

However, in spite of the conflict over Galileo,^{*} the coming divergence between science and religion was not immediately apparent. Isaac Newton was a Deist, and his statement of the laws governing planetary motions was at first widely greeted as a reinforcement of religion. In 1709 the preparation of a revised second edition of Newton's great work, the *Principia Mathematica*, was undertaken, with Newton's approval, by Roger Cotes, a brilliant young mathematician who at the age of 25 had been elected Plumian Professor of Astronomy at Cambridge. Ten years later, when Cotes had died at the age of 34, Newton said of him: "If Mr. Cotes had lived, we might have known something." For this second edition of the *Principia* Cotes wrote an eloquent Preface; here is part of it:

The gates are now set open, and by the passage Newton has revealed we may freely enter into the knowledge of the hidden secrets and wonders of natural things. . . . Therefore, we may now more nearly behold the beauties of nature and entertain ourselves with the delightful contemplation; and, which is the best and most valuable fruit of philosophy, be thence incited the more profoundly to reverence and adore the great Maker and Lord of all. He must be blind who from the most wise and excellent contrivances of things cannot see the infinite Wisdom and Goodness of their Almighty Creator, and he must be mad and senseless who refuses to acknowledge them.

Newton was probably in accord, more or less, with these sentiments, but Cotes's words could give a misleading impression of Newton's peculiar attitude to his own work. So could Wordsworth's well-known lines, inscribed on Newton's statue in Trinity College, Cambridge:

Newton, with his prism and silent face,
The marble index of a mind forever
Voyaging through strange seas of thought alone.

They are good lines, but if the voyaging refers to Newton's scientific explorations, as it surely must, 'forever' is not true. Newton did almost no serious scientific work after the age of 43, although he lived to be 85. In the course of his life he gave far more time to theology and alchemical chemistry than to science, and he wrote

^{*} For a short clear account of the real issue in this conflict, see *Space and Spirit*, by Edmund Whittaker, F.R.S. (Nelson, 1946).

voluminously on religious topics. In old age he burnt many of his papers, but his extant theological manuscripts, mostly unpublished, run to well over one million words, together with hundreds of pages of extracts copied from contemporary works in this field. He accepted Bishop Usher's date of 4,004 B.C. for the creation of the world and spent much labour on trying to harmonise the chronology of the Old Testament with the records of history. On rare occasions in later life, when mathematical problems were sent to him as a challenge, he showed that his genius was unimpaired, but he regarded all such work as relatively unimportant. For him, the essential thing was to learn as much as one could about the purposes of God and the destiny of mankind, and this was to be had from a diligent study of the Bible, specially the Old Testament prophetic books, with some aid from a few mystical writings, chiefly those of Jacob Boehme.

However, it would be wrong to suppose that Newton thought of his scientific work as quite unrelated to religion. His work had strengthened his belief in an all-powerful Deity who had created the universe and endowed it with the majestically simple laws that governed the movements of the heavenly bodies. When Leibnitz complained that atheistical doctrines were implicit in the *Principia*, Newton reacted strongly. He engaged a noted theologian, Dr. Samuel Clarke, to reply at length to Leibnitz, and the controversy continued until Leibnitz died, eleven years before Newton's death in 1727.

Quite soon, however, the course of events showed that Leibnitz had been prophetically right. Science found it easy to dispense with Newton's remote cosmic Deity; the operations of the universe gave no sign of his presence and went on just as well without him. But although a chilly wind was blowing from the Newtonian system towards religion, there was nothing in his system to disprove the accepted doctrines of Christianity or the accuracy of the Bible. Hence there was still no obvious conflict between science and religion; these two sisters could still live side by side—rather distantly but without actual quarrels.

The real conflict arose in the 19th century, when the geologists were ranged against the chronology of the Bible and Darwin against the special creation of man. Then, a little later, Marx came, and Freud; for different reasons they declared that religion was a

fantasy, a wish-fulfilment. The two sisters were now compelled to part company, not without some acrimonious words, and they are still estranged to-day.

But we are going too fast. Before coming on to the relations between the three sisters at the present time, we must ask how the third sister, art, became estranged from the other two. Her first estrangement was not from religion but from science, and even this was slow to come about.

When science in Europe began to revive during the Renaissance, there was at first a close partnership between science and at least some of the arts. I need only mention Leonardo, in whom artist and scientist were one. But although Leonardo was unique in genius, he was not alone in versatility. For example, his younger contemporary, Leoni Alberti, a Venetian, was renowned as painter, poet, philosopher, musician and architect. It is typical of that period in Renaissance Italy that painters, architects and mathematicians found it normal to collaborate in the development of perspective and the study of architectural proportions. But painting and architecture involve manual skill and techniques of handling materials; they are natural collaborators with science. For a divergence between science and the arts we must look rather to poetry, and further ahead in time, to the Romantic revival towards the end of the 18th century.

By this time the implications of the Newtonian system, and of the new scientific outlook it represented, were becoming clear. This way of thinking about the world came to be called the analytical philosophy. Its essential feature was that the thinker stood apart from the world and looked on it as something to analyse, to dissect into its components. This was held to be the only reliable way of acquiring objective knowledge about the external world and so of gaining power over it. We can say that the Consciousness Soul epoch was giving rise to its characteristic mode of consciousness, now often called the onlooker consciousness: I believe it was Dr. Lehrs who first coined this phrase.

The onlooker consciousness is a necessary stage in human evolution: necessary not only for the emergence of modern science but also as a culminating stage in the gradual fall of man; his falling away from his pre-earthly home in spiritual worlds and his gradual and painful growing up towards responsible freedom on

earth. Where the onlooker consciousness goes wrong is when it not only fails to recognise its limitations but actually builds a world-picture, a *Weltanschauung*, upon them, as modern science has been inclined to do ever since Newton's time.

An early outcome of this tendency was the view, first stated explicitly by John Locke, that our direct experience of nature through our senses is subjective, not part of the real world. The real world, from this point of view, is the world 'out there'; its constituents are solidity and shape, for these primary qualities can be measured and analysed and—unlike colours and sounds and scents—they *seem* to exist independently of our sense-perceptions. This view can easily be assailed—as it was by Bishop Berkeley and by later philosophers—but in a vague general way it has continued to have great influence. It has led to a widespread belief that the old sacramental view of nature, as in some way an expression of spiritual powers, has been shown to be an outdated superstition.

If a person comes under the influence of this supposedly scientific outlook—and countless people have been and still are influenced by it in some degree—what will it mean for him? He will still experience nature through his sense-perceptions just as before, but he may be impelled to regard his experience as somehow deceptive, projected on to an outer world—"heartless, witless nature"—which in itself has no meaning, no comfort, for man. Hence it is not surprising that poets came to regard this new scientific philosophy as a hostile, destructive influence; it seemed to imply that the beauties of nature were an illusion and that poetry had nothing to do with reality.

However, it took a little time for this attitude to emerge. Poetry lived quite happily alongside Newtonian science until about the middle of the 18th century. Then came the first great counterblast. In 1757 William Blake was born. Blake has been very widely written about and quoted from in recent years; his saying—

May God us keep
From single vision and Newton's sleep

has become almost hackneyed by reiteration. I need not quote further from him here; and I must leave aside Goethe's well-known attack on Newton's theory of colours. I must pass on to the English poets of the Romantic revival. They were not, I believe,

influenced by Blake, whose genius was then known to only a small circle of admirers, but they too (excluding Shelley) had come to regard Newtonian science as an enemy, breathing out a cold air in which poetry could not live. This feeling comes out in the familiar lines by Keats, where by 'philosophy' he means what we should call natural science:

Do not all charms fly
At the mere touch of cold philosophy?
There was an awful rainbow once in heaven:
We know her woof, her texture; she is given
In the dull catalogue of common things.
Philosophy will clip an Angel's wings,
Conquer all mysteries by rule and line,
Empty the haunted air and gnomed mine. . . .

Wordsworth, too, could write of the philosopher—again meaning a natural scientist—as

a fingering slave,
One that would peep and botanise
Upon his mother's grave.

All this is familiar ground. No need for me to discuss how far the Romantic protest was justified, how far not; you will find it all in Owen Barfield's 'Romanticism Comes of Age' and in his later book, 'Saving the Appearances.' I am concerned only to indicate one reason why poetry became estranged from science during the 19th century.

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So much for the moment about the arts and science. Now we must ask: How have the arts been related to religion since our modern epoch began?

First and most obviously, they broke away from their close connection with religion during the Middle Ages and became increasingly secularised. Of course, religious art, or art dealing with religious subjects in any medium, went on, but as only one strand in the spreading out of the arts into all sorts of fields. For a long time the attitude of the arts towards religion remained amicable and generally respectful—with some exceptions, as when Shelley defiantly declared himself an atheist—until well into the 19th century.

Then we find, at first among writers in France and later in this country, a movement which turned against the values of prosperous bourgeois society and its conventional religion. Art—it was said—has its own values, its own autonomous standards; artists should live by these standards; they owe no obedience to any rules imposed by society or by religion. A similar trend over here led on in the nineties to aestheticism, the cult of art for art's sake, associated with Walter Pater, Oscar Wilde and the *Yellow Book* magazine.

I think the artist should be—as he very often is—a non-conformist, for artistic work does have standards and values more exacting than the compromises which are bound to prevail in politics and social affairs. The only society that might measure up to these standards would have to be itself a work of art—and it is hard to imagine such a society existing on our human earth. But the cult of art for art's sake, with its coterie atmosphere and its tendency to despise ordinary society, was short-lived, and now the trend is towards the opposite extreme. The artist is often told that he should be “committed”—actively engaged in working for some party or group or cause; and to judge a work of art on purely aesthetic grounds is regarded as a frivolous evasion of social realities.

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These brief historical glimpses have brought us into the twentieth century. How does it stand with the three sisters to-day? Let us look first at the uneasy relations between science and the arts, passing on to the arts and religion, and finally to religion and science.

The artistic approach to the world must and should be different always from the scientific approach, but not so radically divergent that neither can make any sense of the other. To-day the situation between them is confused. On the one hand there is a group of artists, the abstract painters, who—as Professor Waddington, himself a scientist, has shown—can see various affinities between their search for ways of rendering the structures and patterns they discern in the outer world and the scientific study of structures and patterns in the underlying molecular and sub-atomic realms. Then there are modern musicians, not only in the pop field, who make extensive use of scientific aids, electronic modulators and the like.* But

* See Joscelyn Godwin's article, *Where is Music Going?* in this issue.

also, in contrast to these signs of rapprochement, we find among writers—and among young people who are not writers—something like that hostility towards science that we noted in the poets of the Romantic movement. They have a forcible spokesman in a young American, Theodore Roszak, whose recent book, *Where the Wasteland Ends*, was reviewed in the last issue of the *Golden Blade*. He argues that the modern scientific outlook, stemming from the onlooker consciousness, has desecralised the world; has banned as superstition the aura of the sacred, the numinous, from the world, and the dimension of transcendence from human life. I think he fails to do justice to modern science as a great and necessary adventure of the human mind, but much of what he says about the impoverishing influence of the scientific world-picture is justified.

How does this affect the relation of modern science to the arts? Many scientists are strongly drawn to one or other art, especially music. But in the context of the scientific world-picture it is not easy for them to go along with the view of the arts that has been held by most artists. Certainly, they can recognise that a work of art does more than give pleasure; they can regard it as a means of communicating states of feeling—not necessarily the personal feelings of the artist when he was producing the work, but states of feeling that he imagines or is possessed by, and is then able somehow to symbolise in patterns of imagery—musical, pictorial, verbal. But many artists—and many people who respond to art without producing any—have felt that a work of art can do more: it can elicit an experience which seems to be saying that the world has a meaning and purpose which are in some way relevant to human aspirations. Works of art do not speak only of beauty and serenity in the world, or there would be no tragic art, but they seem to tell us that tragedy is not blind waste. And this experience is difficult to reconcile with the scientific picture of a fundamentally material universe, mindless and indifferent to man.

However, the view of the arts that I have attributed to most artists would be repudiated by many artists to-day. In most fields of art there is a trend away from anything solemn or portentous; away from the very idea of great works of art; a kind of anti-art movement which prefers the casual spontaneity of unrehearsed happenings, freedom to improvise, and so on. This will not make it any easier for scientists to appreciate the arts in what I would call their

true worth; while science, as long as it clings to its current world-picture, will seem uncongenial to many artists, some of whom will even see it as an enemy.

In the fairly near future, however, this situation could change. Science may move away from some of the assumptions implicit in its world-picture, and it might be drawn by its own researches to become more artistic—as Goethean science already is. Goethe's theory of colour often appeals to artists but seldom to scientists, for it is qualitative, not quantitative, and does not lead immediately to a wide range of practical applications, as Newton's theory—more a theory of wave-lengths than of colours—did. Similarly, projective geometry is more artistic than analytical geometry, but less useful at present to scientists, for it involves no measurable quantities or numerical calculations.

It might seem that Goethean science and ordinary science are on parallel tracks, never likely to meet short of infinity, but I am not sure. Certain branches of modern science could develop on lines which would bring them into a fruitful relationship with Goethean science; this could come about through a deeper understanding of number.

Numbers, as used by ordinary science, are abstract counters, but they are not human inventions. Somewhat as figures can be used to represent musical harmonies—the figured bass used in older music—so do numbers point back to underlying relationships in the higher worlds. Rudolf Steiner spoke of chemical affinities reflecting the music of the spheres. Could something similar be said of the interactions between the particles, or wave-fields, that are studied by nuclear physics? They may reflect a kind of intellectual music which plays formatively into the sub-atomic realm from higher levels.

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Now a few words on the present and future relations between the arts and religion. The days are long past when sternly religious men, in some places at certain times—Puritan England, for example, and Calvin's Geneva—frowned on the arts as frivolous distractions from the serious duties of life. Organised Christianity to-day is very welcoming and indeed permissive towards the arts, wishing to

draw most forms of art into the orbit of religious activities. Pop music is heard in churches, and so on. But if we ask how religion and the arts are to collaborate in terms of deeper understanding, this is more difficult, and not only because of the chaotic situation in the arts to-day.

The arts have served religion in many ways, through architecture, music, painting and so on, and this they can continue to do, though probably with diminishing scope in a world where the externals of organised religion are widely in decline. But religion *can* be practised without them, and similarly many good works of art in all mediums have no obvious relevance to religion. Can we nevertheless discern any ways in which the arts could contribute something of distinctive value to religious experience, not only to religious observance?

It would be easy, but misleading, to say that the religious function of the arts is to express and convey spiritual truths. There is a place for didactic or allegorical art, but the action of what I would call a true work of art is different. What it says, the experience it conveys, cannot be extracted from it and paraphrased. From a poem, for example, one can extract a surface meaning; one can say roughly what it is about—though with some contemporary poetry this is far from easy—but a good poem will always transcend its prose meaning and cannot be paraphrased without loss of its poetry.

In an early lecture by Rudolf Steiner, given to the Goethe Society in Vienna during the 1890s and reprinted with his approval in 1919, he referred to Hegel's remark that "the beautiful is the sensuous appearance of the idea", and he went on: "This amounts to an admission that, for Hegel, the essential in art was the idea. . . . This is surely a clear statement that the goal of art is the same as the goal of science, namely, to penetrate to the Idea. . . . But then it is not clear what independent mission art is to have by the side of science. . . . If this standpoint in aesthetics is adopted, there is no escape from the compromising conclusion that allegory in the plastic arts, and didactic poetry in the poetic art, are the highest artistic forms. The independent significance of art cannot be grasped." What then, Dr. Steiner proceeds to ask, is the independent significance of art—what does art stand for—and he answers:

"Not for the embodiment of the supersensible, but for the transformation of the physical and the actual."

Can we gain from these words some indication of what the arts can contribute to religious experience? Obviously, religious experience takes many forms, but most usually it is inward experience, in which the soul seeks for communion with spiritual powers. It can also be an experience of the outer world transformed, as though irradiated by the divine, but this is a grace which comes seldom and to few. One might say that the arts in their various forms, can bring something like this experience of the outer world, or of some part of it, to many persons who might never get there by themselves. Walter de la Mare spoke of this with regard to music in a well-known short poem: not one of his very best, but it brings out what I mean. Here is the first stanza:

When music sounds, gone is the earth I know,
And all her lovely things even lovelier grow;
Her flowers in vision flame, her forest trees
Lift burdened branches, stilled with ecstasies.

Here is suggested, I think, one service of the arts to religion: they can make directly evident that dimension of transcendence which the scientific outlook tends to dismiss. It will always be possible for a sceptical scientist to regard the kind of experience described by de la Mare as a subjective illusion, but he will not convince any one who has responded to what the arts can do.

However, as long as the current scientific world-picture continues to imprison so many minds, any fruitful coming together of the arts and religion will be greatly handicapped. And I will not try to forecast how at some future time this coming together might occur. Any endeavour to direct the arts towards a defined goal—as when they are enlisted as propaganda agents for the State—has a crippling influence on them, and I think this would apply equally to any consciously conceived plan for bringing the arts into closer union with religion. In this realm the wind bloweth where it listeth.

But there is one field where a conscious use of the arts for a definite purpose is proving fruitful: the field of therapy. All good art, even tragic art, can have a harmonising, healing influence; there are also forms of art, not uncommon to-day, which can have a disintegrating effect. The therapeutic use of art, however, comes

not so much through experiencing the arts—though this can be helpful, especially with music—as through endeavours to practise them, at first on a quite elementary level, under skilled and sympathetic guidance. Particularly valuable are painting, generally in water-colour, and modelling. The virtue of these exercises does not depend on the artistic merit of the results. By entering into the realms of colour and form, however ineptly at first, and by educating the hand in the control of brush or clay, a person can relieve tensions in himself and may learn something about their origin in his emotional life.

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Finally, we come to a central question—the present relations between religion and science. Nowadays we often hear that the old conflicts between them are out of date. Each has its own sphere, its own approach to truth—why should they quarrel?

One can readily feel in sympathy with the wish of many Churchmen to come to terms with modern science, at a time when organised Christianity has to defend itself against many hostile tendencies, but I think they often go about it in the wrong way. Rudolf Bultmann, for example, pioneer of the demythologising school of theology, argues—to put it briefly and rather crudely—that in order to make the Gospels acceptable and intelligible to modern people, we must remove from them everything that cannot be expounded in scientifically valid language. This radical programme is supported by quite a few modernist theologians, but surely they are forgetting an essential fact: that religious truths can often be given expression only in symbolic language, the language of poetry. As Wittgenstein observed, they cannot be said; they can only be shown.

Or take the well-known and much more widely influential line pursued by Dr. John Robinson, the former Bishop of Woolwich, in his best-selling book, *Honest to God*, and in his subsequent writings. He is trying to produce a sort of basic Christianity—basic in the sense of Basic English, as it used to be called—keeping only as much of it as the limited onlooker consciousness can make sense of. Even further along the modernist path are the so-called Christian atheists, who agree with Nietzsche that God is dead and that we can get along better without him.

I know that these brief references to Bultmann and Dr. Robinson are not quite fair. They are trying honestly to do what they regard as right and necessary for making Christianity viable in a scientific age. They are under the spell of the current scientific world-picture and assume that in broad outline it must be correct. Hence they see no future for Christianity unless it can be reduced to a scientifically acceptable form. But modern science is still very young—hardly more than 300 years old—and has grown up under the spell of “single vision and Newton’s sleep.” One day it will wake up, and be transformed.

In the meantime there is one form of religion which stands apart from science and cannot be emasculated by modernist criticism. I mean, personal inward mysticism. Hence it is not surprising that there should now be a strong movement, especially among young people, towards various forms of mysticism, often, though not always, of an Eastern type. But this movement, though it may be helpful and valuable for individuals, cannot lead to a genuine reconciliation between religion and science, for mysticism as such is not concerned with science. An individual can be both a scientist and a mystic and can go far along both roads, but for him they will generally be distinct. Again, he may not accept the current scientific world-picture or the usual scientific account of the evolution and nature of man, but he will probably have no definite alternatives to offer and will be inclined to regard anything that takes its course in time, on the unreal level of temporal events, as unimportant compared with the inner development of the soul. The mystical path can be followed more or less regardless of anything that goes on, or has gone on, in the external world.

Rudolf Steiner often emphasised that Christianity is not only a religion of inward experience, though of course it should be that also. It is bound up with the evolution of man and the earth, with the Mystery of Golgotha as an objective event, a turning-point in earth history. Obviously, this world-picture—and indeed any religious world-picture—is utterly at variance with the current scientific world-picture of an aimless, godless universe, in which life and mind have evolved more or less by chance from lifeless matter and will survive only while material conditions favour them. It is here above all that the conflict between science and religion persists, and has probably not yet reached its climax.

Now in conclusion we will cast a look into the future. Can we imagine how one day a harmony between religion and science might come about?

The need is for a science which would be itself religious in spirit, and for a religion which would have some of the characteristics, the clear thinking and the reliance on direct experience rather than on authoritarian dogma, that are the enduring virtues of science. This is not so hard to imagine, for we already have an example, a model, of it in Rudolf Steiner’s Spiritual Science. But many changes in the world will have to come about before religion and science can be widely united on the lines of this example.

Many changes certainly will come during the rest of this century—there is no lack of prophecies—and to the Anthroposophical Movement they will come as an exacting challenge. We have been warned to expect various crises—an energy crisis, already apparent; a population crisis, a pollution crisis. These various forecasts may or may not be exactly fulfilled, but it seems fairly certain that the close of the century will be a time of troubles and conflicts.

A warning of this was given by Rudolf Steiner almost fifty years ago, during his lectures in 1924 on karmic relationships. Thus in a lecture at Arnhem on July 19 of that year he said: “In the course of the twentieth century, when the first century after the end of Kaliyuga has elapsed, humanity will stand either at the grave of all civilisation—or at the beginning of that age when in the souls of men who in their hearts ally intelligence with spirituality, Michael’s battle will be fought out to victory.” He is also reported to have said to Albert Steffen that the end of the century would see the beginning of a crisis which would determine the fate not only of humanity but of the Earth itself.

It may seem that our movement cannot do much to influence the course of world events, but we can take encouragement from the widely growing opposition to the Ahrimanic forces now at work in the world—at work not only through science and technology but in all dehumanising tendencies, and wherever money dominates human affairs. This opposition, manifest in the conservation societies, in radical youth groups and in very many individuals, may not succeed in averting the crises and conflicts that are looming up on the horizon. But it will be preparing, laying a sort of scattered groundwork, for whatever new forms of civilisation may emerge from the conflicts.

And this preparation is something that our movement can do and is doing, through its various practical activities, as they are called; through study groups and publications, and through the Christian Community. We can try also to show by example how religion, science and the arts can come into closer harmony. We are still only feeling our way towards this harmony, but it is something we can hold on to and try to cultivate during the years ahead, while the arts are going through an experimental period; while Luciferic forces are trying to lead religion towards other-worldly forms of mysticism and Ahrimanic forces are trying to keep science and religion divorced.

When we think of this coming period, we can remember that we shall have with us not only other movements with some similar aims, but the friends who have gone through death, some of whom—Rudolf Steiner said—may return to earth life towards the end of this century. By then, too, we are told, some of the great Masters of the School of Chartres will be working on earth again; some of them may now be among us as children or infants. And we shall have with us the ruling Archangel of this age, whose battle with the dragon may be approaching a climax. I will conclude with a few more words from all that Rudolf Steiner said on this theme.

"The whole Michael tradition," he said, "must be renewed. Michael with his feet upon the dragon—it is right to contemplate this picture of Michael the warrior, defending the Cosmic Spirit against the Ahrimanic Powers under his feet." And on another occasion: "Michael is a Spirit filled with strength, and he can make use only of thoroughly brave men, men full of inner courage."

A GRAIL CASTLE IN THE BRAIN *

MARGARETHE KIRCHNER-BOCKHOLT

IN the lectures given by Rudolf Steiner at The Hague in March, 1913, he has much to say about the significance of foods and their influence on the human body. We learn many wonderful things about the different ways in which animal, vegetable and mineral foods behave in our organism. We learn also that in the brain there is a small, noble part which is protected from all the animal and even vegetable nutriment that is carried up into the brain, for it can be nourished only by the finest products of the mineral realm. It is a place where this delicate mineral extract merges with the noblest of radiations that come in through the sense organs.

From the study of physiology we are accustomed to think that we live on what we absorb as nourishment through our alimentary tract. Spiritual Science, however, shows that we do not build up our body, especially in the metabolic and limb system, from the foods we absorb, but that these act only as stimulants; in reality we absorb the materials for building up our body directly out of the cosmos through the sense organs. On the other hand, we certainly need earthly materials for our system of nerves and senses, and these we take out of the food we consume. So it is only for the brain and nervous system that the food we consume really comes into question as far as substance is concerned. And even there differences arise, for all parts of the brain are not nourished in the same way. Some parts take up animal substance; other parts are nourished only by vegetable substance; and a small part can receive nourishment only from the mineral realm. Where in the brain can we find this small part?

If we look at the brain, there can hardly be any doubt. In the middle of the brain there is a small part which has a quite special place; its central position cannot fail to be recognised. It is the part of the brain and indeed of the brain-stem which is known to be there,

* From *Natura*, September, 1926, by permission of Herr Kirchner-Bockholt. Dr. Kirchner-Bockholt (who died in 1973) was the author of an article on Curative Eurythmy in the last *Golden Blade*, where some account of her life and work will be found.

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fully developed, at birth, and which does not grow much more, as do most other parts of the brain. It is the part known as the "four hills" (*corpora quadrigemina*), together with the epiphysis or pineal gland. This part, lying low down in the brain, is almost completely free and yet has connections on all sides, and we can follow the course to it of almost every sensory nerve.

The optic nerve leads there. Its path, strong and majestic, goes through the whole brain from the front backwards. The gesture of crossing over is strong and becomes the optic chiasma: here the nerves from the two eyes cross, the nerve from the right eye going to the left side of the brain and vice versa. From this point the way goes upwards in a bold swing to the "four hills", where one may well assume an important stopping-place, because from there the paths go back and forth to the brain centre for the act of seeing, right at the back pole of the cerebrum.

The auditory nerve also strives towards the "four hills" from both sides. It finds its way with difficulty through the endless abundance of fibres in the bridge and then gathers its strength for an ascending loop to the "four hills", in order to go from there by a direct path to its final goal, the centre for hearing in the temporal lobes of the cerebrum. It takes its course across the brain from left to right and from right to left.

The olfactory nerve goes up from below in a curve over the beam (*corpus callosum*) of the brain, and one may well assume that its fibres also reach the pineal gland, although this cannot yet be completely proved physically.

In this way we can follow the paths on which sense-impressions reach this part of the brain from outside. If now we look into the inner part of man, we see how the blood flows up to the brain through great vessels, how it then surges round the parts of the brain already described into the cavities of the four cerebral ventricles and from there closely encompasses the "four hills" and the pineal gland. But there it does not move through wide, firmly defined vessels, for a network of capillary branchings and ramifications and interweaving arises, and this readily gives the impression of a fine sieve through which nothing ignoble can pass. Everything that may not approach this protected part of the brain is thus kept away. In this part of the brain, and nowhere else in the whole cerebrum, we encounter mineral substances, calcium and magnesium

salts, which are known to be present in the epiphysis in fine quantities as so-called cerebral sand. So here in the epiphysis we have to look for the place where only the noblest mineral nourishment can coalesce with the noblest of the sense-impressions.

If now we picture this part of the brain quite vividly and graphically, it reveals an especially wonderful structure. Almost at the central point of the brain, on the surface and yet in the depths, wholly concealed and yet accessible, surrounded by the water of the four cerebral cavities, the "four hills" emerge, and above them stands strongly and powerfully the organ we seek, the epiphysis. This part of the brain can appear to us truly as a strong fortress, surrounded by dykes and ditches, standing in connection with the external world in every direction and at the same time with the interior of man. For below the "four hills", on the ground of the fourth cerebral ventricle, we find, closely compressed, almost all the kernels of the twelve cerebral nerves, which merge here from out of the whole organism and crowd together round this point.

We are reminded through this picture of the path described by Chrétien de Troyes in his story of the Grail, where we hear how Parsifal has to follow this path in order to find his way to the castle of the Holy Grail:

He rides to the summit of the mountain, and when he has reached the summit he looks round about him for a long time and sees nothing but heaven and earth.

"If I have come up here to seek cunning and betrayal, may God give bad life to him who sent me up here, for he sent me by telling to me I would find a house when I reached here. Fisherman, you who said it to me, you have done great dishonesty, if you said it to me in wrongfulness."

Then he saw the top of a tower emerge beside him in a valley; as far as Beirut none so beautiful and stately was to be seen; it was square, of grey stone, and it had two turrets besides; the hall was in front of the tower and the porticos in front of the hall. The young nobleman went down that side of the mountain and said that he who had sent him there had directed him correctly; and he praised the fisherman; he no longer called him deceiver and dishonest, nor a liar, as he had now found shelter.

So he rode up to the gateway, and before the gateway he found a bridge that was lowered; he rode in over the bridge and four pages came to meet him. Two of them took his armour off him; the third

led his horse away and gave it fodder and oats; the fourth draped a clean new cloak of scarlet red colour about him. Then they led him up to the porticos; and be assured that as far as Limoges none more beautiful could be found.

We can find this description again in the anatomical details of the brain on the way to the "four hills". We need only see how, in order to reach it, we have to ascend to the top of the cerebellum, and above is the whole vault of the cerebrum. We have to look carefully until in the valley we can see the epiphysis, protruding like a square tower from the depths. Its colour, too, is grey and it can also be reached only by the lowered bridge, the small lingula, that leads across from the cerebellum to the portico of the "four hills".

Hence we need not be amazed when Rudolf Steiner says that "the Grail is always hovering in the brain: that is, the vessel bearing the purest food for the human hero, who lies in the castle of the brain and is killed by everything else".

The Grail has always had great significance in world history. From there man received the most precious nourishment; from there came the impulses that summoned the noblest part of him to collaborate in the shaping of worlds. And the legend of the Grail is the story that brings before our souls an important point in world development.

We know much about this turning-point from the great lectures given by Rudolf Steiner, especially during the last year of his work on the physical plane. We know through him that the wisdom ruling in the world—a wisdom proper to the Sun-sphere—was experienced by man up to the Mystery of Golgotha as not belonging to him personally, but as cosmic intelligence, governed by Michael. Then the solar spirit of Christ descended, and with it, gradually, during the following centuries, the solar intelligence, which thus came into the human realm and has to be absorbed by man. That is the turning-point, where heavenly wisdom changes into earthly stupidity, dimness, as is described in the Grail legend.

Then follows a time when mankind lives cut off from the heavenly light and has to transform in his own thinking, in earthly darkness, this wisdom that has flowed down. But now we stand once more in a Michaelic age, which demands that the solar intelligence we have made into our own thinking shall be placed again by man

himself under the governance of Michael. Thereby the possibility of grasping world-thoughts with human thinking can be brought about. This is the Michaelic thinking that has to be won.

It can be won by raising our thinking out of the passivity in which it normally takes its course, when it is only a succession of concepts stimulated by external perceptions. What has to arise is a thinking that grasps thoughts from within outwards, from the "I" of man. And for this purpose the epiphysis is of quite special importance. Rudolf Steiner also indicated this in the lectures mentioned above:

Only the noblest part of the brain must be nourished by the most beautiful confluence of sense-impressions with the noblest part of the purified mineral extract. There we learn to recognise a wonderful cosmic connection of man with all the rest of the cosmos. There we catch a glimpse, so to speak, of a place in man where we can discern how human thinking prepares, through the instrument of the nervous system which serves the astral body, the sword for human strength on earth. There we make acquaintance with all that is mingled with the blood and to a certain extent contributes to the killing of the noblest element in the brain.

So from there this thinking must work, and the sword of thinking, the Michaelic sword, must be forged.

To occupy oneself with the legend of the Grail is indicated by Rudolf Steiner as a path that can help us to penetrate into the inwardness of the astral body; and it has been shown how this can lead fruitfully even into the anatomy and physiology of the brain and nervous system, the bearer of the astral body.

Translated by Nancy Hummel.

WHERE IS MUSIC GOING?

JOSCELYN GODWIN*

WHENEVER one attempts to write about the future, unless one is truly gifted with prophetic vision, one usually ends up writing about the hopes and fears of the present. This article, then, is really about the music of to-day, considered in its forward-looking aspect. That this is only a small corner of the world of music is clear from the fact that most production and consumption is still of music of the historical past. The recording and broadcasting industries, the sheet music and instrument producers, the concert and opera performers all depend for their livelihood on music written before, say, Ravel, and on pop music. Contemporary composers in Britain are supported by the surplus of this industry, by grants from the Government and from foundations, and by universities.

But in this corner of the art there is no style, no mannerism sane or insane, that does not have its protagonists. Provincial organists still compose and publish anthems in the style of Vaughan Williams. Many students emulate the music of Paul Hindemith (1895-1963) and Béla Bartók (1881-1945)—established composers with easily parodied mannerisms, who eschewed the excesses of emotion found in the late Romantic composers (Strauss, Mahler, Delius) in favour of a less self-indulgent, more sinewy music. They brought back intellectual content through a renewed draught of inspiration at the fountains of Bach (for polyphony) and Beethoven (for form) and yet did not cut loose from the expectations of intelligent listeners, or from the physical and psychological bases of music. One can mention in the same breath Prokofieff and Shostakovich, Britten and Tippett, Copland and the earlier Henze. But music is not "going" anywhere with these composers: it is virtually standing still. Its progress, for better or worse, lies in other hands.

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Schoenberg and his school

During the nineteenth century, composers had explored above all the possibilities of harmony. The trinity of melody, rhythm and harmony is equated in anthroposophical thought to that of the human faculties of thinking, willing and feeling, respectively. In a work such as Wagner's *Tristan und Isolde* (1865), a landmark in the history of harmony, scarcely anything is left but feeling, of an intensity unprecedented in music. For the composers who followed, *Tristan* was a problem: how could one go further in lushness, richness and sensuality? The feeling-content of the harmony threatened to burst its seams, precipitating it into meaninglessness. And this is precisely what happened in the early years of our century. Composers such as Scriabin, Richard Strauss and Arnold Schoenberg (1874-1951), strained the bounds of tonality to the utmost, using a preponderance of dissonant, complex and ambiguous chords, and studiously avoiding the common chord progressions which had been developed over the centuries as the universally understood meaning-content of harmony.

By 1910, Schoenberg's music, at least, had become atonal, i.e. without reference to a key (tonality) and without the traditional hierarchy between consonant and dissonant sounds. For a long and difficult period Schoenberg was unable to find a satisfactory substitute for the tonal system as a formative power. He wrote some remarkable freely atonal works, including *Pierrot Lunaire* (a cycle of twenty-one brief songs) and the powerful *Five Orchestral Pieces* (both 1912) before lapsing into a long silence. When he emerged in 1923, it was with an answer to his dilemma: the "Twelve Tone System", which enabled him to build a piece entirely on a specially selected ordering of the twelve different chromatic notes, thus providing a unifying force that could permeate a work down to the last detail.

Schoenberg's importance lies in his Promethean act of rejecting tonality and erecting in its place a substitute of his own, devised in what one may call a "quantitative" way, with no respect for the qualitative differences in the degrees of the scale. This was no simple revolution within the musical mainstream, such as Monteverdi, Beethoven and a few others had wrought before him. It was, consciously or otherwise, a defiance of Nature and an assertion of Man's mind—and in particular of the individual's

mind—against her. The tonal system, with its balance of concord and discord, is derived directly from the cosmic phenomena of vibration and number. Its symbolism, of course, reaches still further, and to write music, as Schoenberg did, that virtually avoids consonance in favour of dissonance, seems to betray an unbalanced view.

One can compare Schoenberg in many ways to his contemporary, Sigmund Freud. Schoenberg opened the Pandora's Box of Music, just as Freud opened that of sexuality. In doing so, both men thought they had found the solution to the predicament of Western man and his art since the Renaissance: for Schoenberg the Twelve Tone System was a new dispensation, the Gospel of the new age, superseding the bondage of tonality. Freud thought he had found an explanation of human nature that superseded the "primitive" theological and occult world-views. These two Viennese Jews succeeded in overturning their respective worlds of psychology and music, and one does not need to love their work in order to respect it. And just as Freud was perhaps necessary in order that C. G. Jung might deepen and redeem his work, so Schoenberg's actions were also justified to an extent by his successors.

Schoenberg's foremost students and closest friends were Alban Berg (1885-1935) and Anton Webern (1883-1945). All three men were noble characters, and their mutual friendship and loyalty is beautiful as it shines through their letters. Both pupils shared, to some degree, their teacher's dilemma, and composed little during his fallow period (which, in any case, enclosed the First World War). Both adopted the Twelve Tone System, and their collective work is ample proof that the system need not fetter invention nor crush individuality. But it seems to me that each worked in his own way for the redemption of atonality. In Berg's music, tonality is never far away: with incredible ingenuity he obtained consonant and tonal effects within, or despite, the system, so that he could quote from Wagner in his *Lyrical Suite* for string quartet, and include the chorale "Es ist genug" in Bach's own harmonization in his *Violin Concerto* without violating the unity of his style.

Webern, on the other hand, avoided consonance rigorously, used the Twelve Tone System with the utmost strictness, and imposed other quasi-mathematical patterns on his music. His pieces are very short and often very quiet. By using almost exclusively the

most dissonant intervals (major 7ths, minor 9ths, tritones) he seems to redeem dissonance by making it sound "normal", hence almost consonant, and binds it in structures of crystalline logic and clarity. He would have agreed with Schoenberg's view of the system as a gift of Grace: it was for Webern a contribution to the orderliness and beauty of the world of Nature, which he loved dearly. His music was completely unsuccessful during his lifetime, partly because he was always more willing to help the cause of his mentor than that of his own works. A pious Catholic with a mystical bent, he inspires love even in those who have no taste for his music.

After 1945 music slowly began to revive after the setback of the war, and it was above all to Webern's works that young composers turned for inspiration. The purity and rigour of his music must have seemed a safe counter to the chaos which the world had just survived. Ideas of order were dominant, to the extent that the Twelve Tone System was extended to embrace not only pitch but also the other things which comprise music: duration, intensity and tone-quality. Composers such as the young Pierre Boulez (b. 1925), Karlheinz Stockhausen (b. 1928) and Luciano Berio (b. 1925) and Milton Babbitt (b. 1916) in the United States, sought to bring every feature of a composition under a single guiding structure—largely inaudible, but perhaps having an unconsciously unifying effect on the listener. Even now, twenty-five years later, a prominent school of composers on the American East Coast, led by Babbitt, still espouses methods of this kind, believing music to be primarily a vehicle for cerebration. So the adventure begun with such passionate intensity by Schoenberg has come to one logical conclusion in the "total serialism" of a group of American university composers.

Stravinsky, Varese and Cage

One could say much about Igor Stravinsky, the chameleon of modern music, but here it is important only to trace a certain stream of development which follows from his (and Bartók's) early works, notably from *The Rite of Spring* (1913). This ballet was an extraordinary eruption from the collective unconscious: the embodiment in sound of ideas and visions that had never before broken the surface. Stravinsky himself said of it, "I heard and wrote what I heard. I am the vessel through which *The Rite*

passed."¹ Sixty years later, it retains its freshness and wild beauty. Although its violence may tempt us to make connections with the events of the years that followed, we may do better not to anthropomorphize it, but to regard it as a picture of the amoral forces of Nature—violent sometimes, it is true, yet conforming always to the greater Will of Heaven.

In musical terms, this violence opens the door not merely to dissonance *per se* (as did Schoenberg), but to noise. Noise, definable as irregular vibrations of indefinite pitch, has always been an important part of music; witness the percussion instruments of all ages and places. There is nothing immoral about noise, or even about loud noise. Nature is full of noises, from birdsong to thunder, and that should be good enough for us! But this is another Pandora's Box; a temptation to the unthinking and a danger to the unwary.

The first important composer to work extensively with noise was probably Edgar Varèse (1885-1965). In his music there is scarcely any melody, no consonance, little regular rhythm. Sounds are piled into crags and descend in cataracts, through which one occasionally hears a quasi-human voice. It is always wailing (Varèse liked to use sirens). His music dwells on the desolate, the lonely, the uneasy. He called one of his major works *Déserts*, referring to: "all physical deserts (of sand, sea, snow, of outer space, of empty city streets) but also the deserts of the mind of man . . . that remote inner space no telescope can reach, where man is alone, a world of mystery and essential loneliness."²

Varèse and many others seem to have felt a need to express what one can only call ugliness. In the past, artists occasionally made use of the ugly and the grotesque for picturesque and humorous purposes, or else in depictions of Hell. But now these baser products of the human psyche are taken with long-faced seriousness: an inevitable result of our individualistic view of art, according to which anyone is welcome to "express himself," i.e., to express his unconscious impulses and his surface personality, irrespective of whether these are worth expressing. Thus both artists and audiences are often deceived into believing that they are creating and absorbing "art", while they are in fact becoming the victims of malevolent forces.

On the other hand, some would have us believe that ugliness does not exist. The American composer John Cage (b. 1912) welcomes anything and everything into his artistic milieu and goes to a lot of trouble to avoid aesthetic judgements and personal preferences. In some works of the 1950s and 60s, he assembled musical sounds and noises into compositions by random methods, determining their nature and occurrence by throwing the Chinese *I Ching*, or by observing the imperfections in a sheet of music paper and letting these determine the notes. In these and other ways, the sounds were allowed the "freedom to be themselves", independently of human choice and interference. Here are some dicta from Cage's writings:

Why is [it] so necessary that sounds should be just sounds? There are many ways of saying why. One is this: In order that each sound may become the Buddha. If that is too Oriental an expression, take the Christian Gnostic statement: "Split the stick and there is Jesus."³

The purpose of music

Music is edifying, for from time to time it sets the soul in operation. The soul is the gatherer-together of the disparate elements (Meister Eckhart), and its work fills one with peace and love.⁴

The Indians long ago knew that Music was going on permanently and that hearing it was like looking out of a window at a landscape which didn't stop when one turned away.⁵

In his writings on music, Cage speaks from a standpoint beyond good and evil, and cites many anecdotes from the Zen Buddhist tradition to support his aesthetic of acceptance. I suppose he is the most influential figure in any of the arts to have come into prominence since 1950. Many things can be attributed, if not directly to him, at least to a partial adoption of the philosophy which he expounds: "action painters", "pop art", "happenings", "found objects" as art (though here one must not forget the school of Dada, which in many ways anticipated Cage), "minimal art" (e.g. all-white or all-black canvases), "conceptual art", "concrete poetry", "aleatoric music", and the "theatre of the absurd". A partial adoption, I said, because not many of the exponents of these fads have either the intellect or the sincerity of John Cage. To the superficial mind, he appears to give licence to pass anything off as art. What could be more welcome to the untalented artist or the half-baked musician? The results are all around us: they begin to take on the dimensions of a conspiracy of ugliness and triviality, forced on the public in the name of a higher aesthetic.

Cage's followers forget that an important prerequisite of the enlightened state is the abnegation of the personal ego. They are attempting to live with a mountain-top philosophy while still grovelling among the foothills, where it is a short step from universal acceptance to universal apathy.

Many musicians and critics regard Cage's achievement as a bad joke perpetrated against "Art". But this is to ignore the very serious philosophical and aesthetic questions he raises. It is clear, in any case, that he himself is not a charlatan. No one could have kept up his kind of attitude for so long, and against so much mistrust and hatred, if his only object had been to shock or to attain notoriety (both of which he has amply achieved). He never answers insult with polemic, and he has never been afraid to talk about Beauty. He simply sees this quality in more situations than most of us do.

Theologian and Mystic: Messiaen and Stockhausen

Two other composers of religious inclinations but "advanced" styles, Olivier Messiaen (b. 1908), and Karlheinz Stockhausen (b. 1928), have not had Cage's overwhelming effect on all the arts, but both have made their mark on the postwar history of music. Messiaen has drawn his primary inspiration, even his earliest years as a composer, from the doctrines of the Roman Catholic Church. As organist of the Trinity Church in Paris, he wrote much organ music on Christian subjects, such as *The Celestial Banquet*, *The Ascension*, *The Nativity of the Lord* and *The Glorious Body*. The titles of some of his other works reveal the same preoccupations, but also bear witness to his other interests: *Quartet for the End of Time*, *Twenty Views of the Infant Jesus* for piano, *Turangalila Symphony*, *Three Talas*, *The Blackbird* for flute and piano, *Exotic Birds* for orchestra, *Catalogue of Birds* for piano, and *Colours of the Celestial City* for orchestra. To read simply his titles is like reading a poem—and the more so when one reads his sub-titles and the explanations that accompany many of his scores. These works, though in a modernistic style, do not have the unrelenting dissonance of Schoenberg: they have a scintillating quality, rich and vibrant and full of colour.

Messiaen himself is gifted with synaesthesia, experiencing musical sounds as an inner panorama of colours: hence some of his works

bear visual indications, noting the colours and forms which he associates with the tones. Other wellsprings from which he draws are Hinduism and the songs of birds. From India come the ideas that inform his *Turangalila Symphony*, a massive work in ten movements on the subject of *Lila*, the Divine Play, and Love. Most of his recent works are filled to overflowing with idealised bird calls, mingled with musical landscapes and theology. No-one who is not entirely hardened to such things can fail to be uplifted by the very knowledge that there is a composer among us whose inner life is so elevated, yet so transparent. Even those who cannot come to terms with his musical style must respect him as an incorruptible moral force behind avant-garde music.

Messiaen grew, from the beginning, in the security of the Church's doctrine. Stockhausen also began as a Catholic, but felt the need for a wider path that accorded with his own experience of the Spirit. By his thirtieth year, he was acknowledged as a leader of the post-Webernian avant-garde, and every new piece was a landmark, eagerly received and widely imitated. Here are some ideas of his which have become part of the *lingua franca* of young composers: *Electronic Study I* (1953), the first piece composed with sine waves; *Der Gesang der Jünglinge* (1955-56), the first to use "quintaphonic" sounds; *Piano Piece XI* (1956) consists of eighteen fragments which can be played in any order—the first free form composition; *Gruppen* (1958) and *Carré* (1959-60) place the audience in the middle of the three and four orchestral groups, creating a novel concert situation; in *Mixtur* (1964) the sound of an orchestra is modified and altered by electronic means, and the result mixed with the live sounds.

As time went on, Stockhausen's works moved further in the direction of freedom, improvisation, spontaneity and unpredictability. Some of them were simply receptacles for the talents of performers: *Plus-Minus* (1963) is a collection of disconnected notes and symbols which have to be assembled into a piece (of any duration, for any performers)—a kind of "do-it-yourself" kit for creating a piece of music. Gradually, one could see the influence of Cage upon him becoming stronger, that of Webern weaker.

A religious orientation had always shown itself in his music. At the end of *Gruppen* he wrote "Deo gratias", and for *Carré* he wrote in a programme note that "I wish from my heart that

this music could give a little inner stillness, breadth and concentration; a consciousness that we have plenty of time if we want to take it—that it is better to go into oneself than to get beside oneself. . . .”⁶ But these were, on the whole, isolated cases of what was to be his main concern ten years later. In May, 1968, he betook himself to a cabin in the woods where he spent seven days without food or sleep. He emerged with *From the Seven Days*, a book of instructions for musicians, containing no actual notation. These instructions are poetic in form:

SET SAIL FOR THE SUN (for ensemble)

play a tone for so long
until you hear its individual vibrations
hold the tone
and listen to the tones of the others
—to all of them together, not to individual ones—
and slowly move your tone
until you arrive at complete harmony
and the whole sound turns to gold
to pure, gently shimmering fire.⁷

It is clear from this and other pieces in the collection that Stockhausen intends us to use music as a form of meditation. He enjoins us elsewhere in the same work to “think NOTHING/wait until it is absolutely still within you/when you have attained this/begin to play”.⁸ Hard advice, indeed: some of us have spent years trying to stop thinking! But there is a genuineness, almost a naivety, about these pieces which convinces one that the composer has been through the experiences he enjoins upon us.

Stockhausen was to find a spiritual haven in the teachings of Sri Aurobindo, the Sage of Pondicherry. In a letter to a fellow composer, Henri Pousseur, he explains: “I went first through transforming experiences and adventures. Then, through a wonderful chance, I discovered Aurobindo like a spiritual brother, and after that Satprem’s book about him, and his own writings. I was completely ripe to discover and understand him. Aurobindo had certain experiences which surpassed my own, at least as far as lasting illumination was concerned.”⁹ These recent developments may seem to indicate a Luciferic influence. But, as one might expect from the foremost pioneer of electronic music, it still takes a lot to get Stockhausen away from his machines. Nevertheless, he is the first important avant-garde figure, after Cage, to make a

whole-hearted and intelligent commitment to the spiritual purpose of art.

Electronic music

The adaptation of electronic technology to musical purposes in this century is as inevitable as were the mechanical improvements to woodwind and brass instruments that grew out of the metal-working technology of the Industrial Revolution. Some anthroposophical writers have regarded this as the final nadir of music, but without due respect for natural historical change. Rudolf Steiner disposed almost impatiently of the objection to machines raised by a questioner at his agricultural lectures (*Agriculture*, p. 82). They are here, apparently to stay for the foreseeable future, and it is our duty to use them wisely. I therefore see nothing inherently immoral in the idea of electronic music, even if it sometimes does away with the presence of a human performer. On the other hand, as Steiner went on to say, “you need not just be crazy on machines”. Unfortunately, this is all too often the case with electronic composers: the fascination of the medium drains them of their feeling for the human side of music, and they become ensnared in technique.

Electronic music is already a wide field, comprising:

1. Sounds produced electronically and recorded on tape (e.g. Stockhausen, *Electronic Studies I and II*).
2. Electronic manipulation of “live” sounds, musical and otherwise, through speed alteration, modulation, filtering, mixing, etc.; sometimes called “Musique concrète” (e.g. Varèse, *Déserts* and *Poème électronique*).
3. Combination of 1 and 2 (e.g. Stockhausen, *Gesang der Jünglinge*).
4. Combination of 1 and/or 2 with live performance (e.g. Stockhausen, *Kontakte*, version for tape with piano and percussion).
5. Modification of live sounds during performance through electronic means (e.g. Stockhausen, *Mixtur* and many later works).
6. Live performance on electronic equipment and instruments (e.g. Theremin, Electronium, Moog synthesizer).

Of all these, species 1 is the most popular. Electronic sound synthesizers are now so generally available that, in the United States at least, we have students and pop musicians who can compose in this medium, yet cannot read traditional musical notation. One may well ask what the use of all this machinery is. Presumably its purpose is to produce sounds that cannot be made on conventional instruments. This includes especially the invention of novel tone-

colours, and the use of rhythms and passages too fast or too complicated for human execution. Then there is the possibility of working not with tones but with noises. In a way, the electronic composer works on a sonic *tabula rasa*, being limited only by his own imagination and studio technique.

I shall never forget a concert of music by the American Morton Subotnick, whose recordings of specially commissioned electronic music (Species 1) have had considerable success.¹⁰ At this concert the auditorium was darkened and the music came from large loudspeakers in the four corners of the house. One was at first intrigued, then swept up by sounds that echoed, jumped and spun around one's head—or inside it. There were more noises than musical notes: knives, swathes and blocks of sound interweaving and colliding without damage, as if they passed through one another. There was nothing of personality in this music, no historical allusion, no recognizable form: just process, as if incorporeal beings were dancing in free space.

Quite suddenly, it stopped, and during the rather banal movement that followed I found myself thinking: if only what I had just heard had been *tonal*—now that might really have been the Music of Devachan! The electronic medium had enabled Subotnick to transcend, a little way, the limitations of human performers and of the present-day musical system. What was lacking was the meaning of a commonly shared language: each separate sound could have been altered, mixed up, or even omitted without making any differences to the “story”. Now if these wonderful sounds had had the coherence of a Mozart symphony, if every one of them meant something on its own and with its fellows . . . it was this I longed for. As it was, the effect was perhaps as if a mediaeval man had heard a fragment of a Wagner opera: he might have been entranced by the sound, but the sense of the music would have escaped him utterly.

Playing with sound in this way, exciting as it is, is somewhat incomplete. It is one thing to take Cage's attitude and accept any and every sound as a Divine manifestation. It is another thing to do as Stockhausen does and use music to still the mind and induce a meditative state. But when music is offered simply as music, as a composer's communication of his own aural “vision” to his listeners, then there should be the possibility of clearer

comprehension. One has the right to ask, if one cannot intuitively understand, “Why did you put this note here?” and to expect a coherent and satisfying reason. (The Twelve-Tone System is an attempt to provide such a reason, but it satisfies only the head, not the heart). Rudolf Steiner said that music reveals the laws of the Ego—but the laws, be it noted, and not chaos which is so commonly offered us. He also seems to have indicated that the use of electricity opens the door to a strong Ahrimanic influence: and certainly the fascination with machines, with little or no concern for whether the results are beautiful or meaningful, is an Ahrimanic phenomenon. It is significant that the best-selling of all electronic music recordings was Walter Carlos' *Switched-on Bach*, in which the excitement of new sounds was coupled with the sense of “lawful” ideas.

It is time now to return to our title. The answer depends to a large extent on the way the world goes for the rest of the century. Should there be a collapse of Western civilization, for whatever reason, followed by a return to a non-technological mode of life, then the music of the people would survive, and that would mean popular and folk music. As I indicated in my last article, that need not be such a bad thing. Modern serious music has become so far removed from the aspirations of the ordinary man that it no longer serves one of the primary purposes of music, that of acting as a bond between people. The Beatles have done more to bring people together in shared happiness and consensus of mind than any “serious” contemporary composer.

Assuming, however, that nothing apocalyptic occurs, it is obvious that changes are in the air. Led by the United States, which has shown the world how one can lose face, clean house, and carry on without a revolution, the rest of Europe, at least, will now follow suit and provide a breeding ground for a new step forward in consciousness. I like to think that, as a result, people will stop fooling themselves and each other into thinking that black is white, or that mediocre art is good art. This is a relatively minor problem in music, but in the visual arts, where there is big money to be made, a wily dealer or a show at the Tate is worth a thousand talents. Many people are so unsure of their taste and its social implications that they will let themselves be led by the nose! But

this concerns only a small sector of society: the proverbial man on the Clapham Omnibus does not give a fig for Varèse or Rauschenberg, and he never will. My next hope is that something will happen to bring him into the picture: that serious music will become in some sense more popular. At present it tends to lack the things which seem indispensable to most people's musical enjoyment: a recognizable melody to articulate the composer's message, a regular beat to bring this message in harmony with the rhythms of the individual, and meaningful (*ergo* tonal) harmony to provide a sympathetic feeling-content. Neither Webern's notes nor Cage's noises supply these fundamental needs, yet I cannot believe that the majority of mankind will outgrow them in a hurry. I am therefore most encouraged when I find modern composers returning to them. In "Some Optimistic Predictions About the Future of Music" (1970), Steve Reich wrote that "The pulse and the concept of fundamental tone will re-emerge as basic sources of new music".¹¹ and I think this is already happening.

I am also encouraged by a recent article of John Cage, in which he stresses the social aspect of new music:

For the most part, music that's now being made in New York, the new music, that is, is music that I for one want to hear. I notice that others feel as I do. The audiences are large, generally filling the spaces used; and I notice that more and more, as in the evenings with Philip Corner and his friends, the audiences themselves participate in the making of the music. . . . We can say that this blurring of the distinction between composer, performers and listeners is evidence of an on-going change in society, not only in the structure of society, but in the feelings that people have for one another. Fear, guilt, and greed associated with hierarchical societies are giving way to mutual confidence, a sense of common wellbeing, and a desire to share with another whatever one person happens to have or to do. However, these changed social feelings which characterize many evenings of new music do not characterize the society as a whole.¹²

When I read of these concerts, I notice that popular, serious and jazz elements are often intertwined. The distinctions no longer make sense. Pop groups often contain trained musicians and use ideas from the serious music of all times, as well as from the East. Avant-garde performing groups often look the same, dress the same, and have similarly catchy names: "Sourcream", "The Musicircus", etc. I will happily put up with a little naivety, mediocrity and vulgarity while these bridges are being built, because I am confident that they will lead to a new and more universal music.

Finally, I recall Rudolf Steiner's naming of Anton Bruckner (1824-1896) as the composer in whom the future direction of music could at that time be best discerned. Most people, unless they are among the small army of Bruckner devotees, tend to regard him solely as the composer of immensely long and repetitive symphonies. But precisely these features are becoming acceptable nowadays: there is a marked tendency towards length in compositions, and an unprecedented tolerance of slowness and uneventfulness. I think of the popularity of Indian ragas; of Morton Feldman's music, *all of which is very soft and slow*; of Stockhausen's recent hours-long or even "endless" works; of Cage's extended silences; of the stamina of audiences for new music who will listen for hours on end. Somehow they seem to have been cured of the modern diseases of haste and impatience. When I recall the performers of classical music who will omit the repeats in Mozart and Beethoven for fear of boring their audiences, I feel that the new trend is a hopeful one.

But an expanded sense of time cannot be the only thing which Bruckner heralds. John Davy, in an earlier article on the subject, sensed a more profound feature of Bruckner's work which he described thus:

One feature of his music which is often commented on is the apparent continual repetition with the smallest variations of a theme or motif throughout a whole movement, or even a whole work. . . . I suspect that Steiner pointed to him as a composer who was beginning to be able to bring into his work an element of *metamorphosis* in the Goethean sense. It is conceivable that such music, if properly understood, could not be heard without the hearer having to go through an active process of metamorphosis within himself as the music developed . . . and this would require a kind of listening very different from that to which we are accustomed at present.¹³

Metamorphosis has always been used to some degree, most obviously in the variation and fugal forms. But to let it become a governing influence of works in other forms seems to be the prerogative of the greatest composers: I think of the metamorphoses of the rhythmic motif in Beethoven's Fifth Symphony, and of the Leitmotifs in Wagner's Ring Cycle. In the twentieth century, discounting the more or less "artificial" metamorphoses of the Twelve Tone System, I find it most in the music of Béla Bartók. This composer deserves the attention of anthroposophists for his study of plant forms and his use of the Fibonacci Series, the latter

in such a skilful manner as to seem unconscious, yet far too consistently not to be deliberate, as indeed it is in the plant world. In his *Music for Strings, Percussion and Celesta*, and in the 4th, 5th and 6th String Quartets he metamorphoses tiny fragments throughout vastly different movements of the same work, in such a way as to have an overwhelming emotional effect on some sensitive listeners—which may be the “new kind of listening” of which John Davy speaks.

In contemporary music, I have come across a few pieces of what I would call metamorphosis, and although none of these appears as yet to be truly Goethean, they may presage a new direction of the kind Steiner adumbrates. These are pieces which deal with slow textural change: perhaps the first of all was Schoenberg's “Summer Morning by a Lake”, one of his *Five Orchestral Pieces*. In this piece, and in works by Riley, Glass and Reich, one does not perceive the changes as one does, say, the second subject in a classical sonata, but one will suddenly notice that the general movement is more intense, or that a different set of notes is being used, or that a modulation has taken place. The metamorphoses are almost vegetal in nature, gradual and qualitative. But it will take many experiments and a much more conscious approach before composers and listeners can create a new experience in music based upon the principle of metamorphosis. No doubt all the composers mentioned in this essay will be seen, ultimately, to have played their part in the evolution of music to its next stage.

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BOOK REVIEWS

THE SPIRITUAL MISSION OF EUROPE

Europe: a Cosmic Picture, by Maria Schindler. Edited by John Fletcher. Translated by Peter Gorge. Foreword by Gladys Mayer. (New Knowledge Books, £5.00).

THE title of this book (due for publication in January, 1975) is thoroughly appropriate. Looked at from an earthly standpoint, the countries of Europe appear to be separate, segregated; but Maria Schindler takes the cosmic perspective that Europe is a whole, a Zodiac incarnate, and that the various peoples of Europe are the bearers of the twelvefold divine creative impulses of the Zodiac.

A central European, later a refugee to England, Maria Schindler became acquainted with the peoples of Europe over an extensive period of time through travels and prolonged visits to most parts of the continent. When she settled in England she founded the New School of Painting, together with Eleanor C. Merry, and worked in close association with Dr. Eugen Kolisko, Dr. Walter Johannes Stein and Willi Sucher. Over a period of 24 years she gathered together the substance for her book, gradually unearthing the fascinating story of the founding of Europe, the mission of Europe, and the development of Europe to the present day.

It was Eugen Kolisko who first acquainted Maria Schindler with the relation of the countries of the European continent to the Zodiac. Walter Johannes Stein, from his deep historical knowledge, was able to assist her with the spiritual background to the formation of the European States; and Willi Sucher contributed to her study by indicating important star rhythms that are manifest in the evolution of Europe. Out of this background, from her fine, sensitive feeling for human nature, coupled with deep insight into the processes of spiritual evolution, Maria Schindler has bequeathed a rich, imaginative and living tableau of the continent of Europe.

Initially, the book focuses on the spiritual mission of Europe, which, like that of ancient Israel, is connected with the evolution of Christianity. Just as the Hebrew people divided into twelve tribes, stemming from the division of a single family, in order to fulfil their task, so has Europe a spiritual task which necessitates the division into twelve countries. Maria Schindler traces the origin of the twelvefold ordering of Europe to the ninth century. The family which stood behind the arrangement into twelve European peoples was the Carolingian dynasty. And the mission of Europe is the Grail Quest. The Carolingian dynasty was intimately connected with the Grail Events of the ninth century. The theme of Europe's destiny, then, is the Quest for the Holy Grail.

The book describes how Europa, the soul of Europe, descended from spiritual heights to become fused with the Grail impulse that was active at hidden centres in ninth-century Europe. One such centre was in the region of the Teutoburg Forest, not very far from Paderborn. Maria Schindler mentions other possible centres at Monserrat in Catalonia, St. Juan de la Peña and Montserrat-de-Sos. From these various centres there flowed forth the guiding power behind the twelve groups of peoples that comprise Europe, each with a different part to play. And the qualities and characteristics of each people have developed in accordance with the founding impulse, derived from one of the twelve zodiacal constellations.

Passing from country to country, the book goes on to give a lucid, objective account of the birth of each nation and its subsequent historical development. In the description of each country and its inhabitants the author shows that she possesses a remarkable talent for immersing herself in the soul of a people. With all the lands of Europe she manages to convey the essential impulses at work and the intrinsic nature of the folk. A careful choice of 52 beautiful plates (15 in colour) enhances the author's evocative descriptions by revealing how the great art works and monuments of Europe tell the story of Europa's spiritual mission.

In these times, when there is a movement towards European unity, it is more important than ever before that the countries of Europe should understand one another and the relationships between their folks. Maria Schindler's book makes a timely appearance in English translation to contribute towards such understanding and to further the quest that lies at the heart of Europe's existence.

ROBERT POWELL.

A PIONEER OF NEW LIFE ON THE LAND

Water Springing from the Ground. An Anthology of the writings of Rolf Gardiner, edited by Andrew Best. Published by the Trustees of the Rolf Gardiner Estate. Distributed by Ravenstone Presentations Ltd., North Moreton House, Didcot, Berks. £3.75.

Rolf Gardiner was born in London in 1902. His father was an English Egyptologist, his mother was German. He died in 1971. His life was dominated by love for the earth, for music and dance, and for human community—not as separate things, but as necessary elements in the healing of our civilisation. He was an extremely capable and practical man, but his aims were so far-reaching that he had to meet countless disappointments. Yet he remained fresh, active and hopeful to his last day.

As a young man he fostered meetings of youth leaders, particularly from Northern Europe. In 1927 he acquired a farm in Dorset, and from 1933 he made Springhead, Fontmell Magna, not far from Shaftesbury, the centre for his work. He turned a derelict millhouse into a place of extraordinary beauty, and on the surrounding hills he planted some three million trees, with careful thought for their future beauty and use.

At Springhead he and his wife Marabel gathered again and again groups of people who shared their ideals—above all for the renewal of a civilisation founded on good husbandry, quickened by the arts, and inspired by a living Christianity.

How consistent he was in serving these ideals can be judged from his article in the *Golden Blade* for 1971 (the last year of his life), "Can Farming save European Civilisation?", where he wrote strongly against what he then saw as dangerous trends in the agricultural policies of the E.E.C., and from the whole of this book, in which writings, addresses and poems from many periods of his life are collected. We see him extending his interest and his influence beyond Europe, to the new African States, and to the widest problems of the world. But always he is concerned with actual human life in all its richness, not with statistics and theoretical questions.

And for him life belonged not only to the visible human beings, or even to visible Nature as a whole, but included the world of the spirit, in which move and work the dead and the unborn. This sense of unity can be felt, for example, in this poem to Marabel:

The Voice from the Millroom

Across the courtyard float the lovely sounds
Of summer singing from the Millroom wing.
There is no music from my soul rebounds
More sweetly and more poignantly. O sing,
Sing on for ever, calmly, warmly, calling
Till all your garden hearkens, all your flowers
Fill their impassive beauty with your grace.
The notes which weave into the water's falling
Pour in the silver stream's unhurried pace,
And life no longer counts in days and hours.

So I remember, summers long ago
Gilded with radiance as the sun sank low.
Did it not seem, as then your heart's bell rang,
Our unborn children answered as you sang?

A.B.

DATING NEW TESTAMENT EVENTS

A New Chronology of the Gospels, by Ormond Edwards. (Floris Books, 34 Glenilla Road, London, NW3. £1.00 post free).

ALTHOUGH immense diligence, over centuries, has been given to the study of all the evidence that has come down to us about the life of Christ, many things remain difficult; not only the interpretation of what happened, but the external facts themselves. Indeed, it has been said that we may have to deepen our understanding of an event first, and to find out what happened physically only at the end of a long spiritual path.

The chronology of the Gospels is full of problems. Reference books may give dates for the Nativity, the Baptism in Jordan, and the Passion, but in all three cases disputes and uncertainties remain. For only one of these three dates does Rudolf Steiner appear to have given a definite date, based on spiritual research: April 3, A.D. 33 as the date of the Passion. And within the period between the Baptism in Jordan and the Passion, is there anything which can be securely dated? The different Gospels often give a different sequence of events.

It may seem to be of little importance when these things happened, compared with the significance of the fact that they did happen. But the Gospels themselves, though giving so little in the way of dates, indicate that time matters; that the hour of a happening, for example, may be very significant. And Rudolf Steiner indicated how very far-reaching this significance may be.

Over many years, from many sources, Mr. Ormond Edwards has collected evidence which may help in establishing or confirming both the great dates mentioned here and those of other particular events—the imprisonment and death of John the Baptist, for example. He has brought the results of wide study into a small, concentrated book. Naturally it is not easy reading; he makes us face the difficulties with him, like a guide on a mountain climb who is not prepared to make too many concessions to weakness.

It is generally stated as an established fact that Herod the Great died in 4 B.C. Since St. Matthew's Gospel puts the birth of the child Jesus before the death of Herod, it is held that the birth must have occurred in 4 B.C. or even earlier. (The general view does not consider as relevant to this question the difference between Matthew's account of the Nativity and Luke's account). Mr. Edwards brings forward the evidence about the death of Herod, and concludes that it is far from establishing the date 4 B.C. (Perhaps many dates we meet in historical writings really have shaky foundations?) After all, A.D.1 may be the first year after the birth of Jesus.

Even among those who have given close study to Rudolf Steiner's indications, as well as to the Gospel accounts, there are different views about the year of the Baptism in Jordan. Were the "Three Years" of the Ministry more, or less, than three calendar years? Ancient writings often use numbers in a qualitative rather than a quantitative sense. How we picture the first period of Christ's work on earth depends very much on a decision about this question. What Mr. Edwards has to say on it could hardly be summarised in a few sentences.

In the dating of particular events—for example the scene in the Synagogue at Nazareth, which is seldom recognised in its full significance—Mr. Edwards is often not only comparing views held by others, but making bold and remarkable suggestions of his own. The book can be recommended to those prepared to give it careful study and patient thought.

A.B.

SCIENCE, MORALITY AND 'SUPERIOR KNOWLEDGE'

The Scientific Conscience, by Catherine Roberts. (Centaur Press, £2.50).

Dr. Roberts is a qualified scientist, trained in microbiology. Born and educated in California, she is married to an Englishman and lives in Denmark. The main theme of her book is the misuse of science in the world to-day, and this she attributes largely to a lack of moral conscience in the attitude of many scientists towards their work and aims. As she says, they are often inclined to view pre-scientific mankind as encompassed by the darkness of ignorance and the mists of superstition. For them, the possibility of gaining reliable knowledge about the world and man's place in it came only with the rise of modern science.

Dr. Roberts recognises the value of this scientific knowledge, both in meeting the innate human impulse to explore the workings of nature and in enabling man to improve the conditions of his life on earth, but she insists that it should not be allowed to overshadow what she calls, quoting Michael Polyani, 'superior knowledge'. This is the knowledge, concerned chiefly with moral and spiritual values, that has been sought by great thinkers and teachers down the ages; it has formed our Western cultural tradition and will never be out of date:

Human greatness . . . can thus be thought of as man's participation in varying degrees in truth, beauty and goodness—values which I hold to be absolute and imperishable; therefore I believe that human greatness partakes of universality and endures.

Dr. Roberts sees that something like an evolution of consciousness has occurred, but I think she does not always allow enough for its effects. The onlooker consciousness of our epoch has given rise both to modern science and to its world-picture of a soulless, meaningless universe, with man as the transient product of an evolutionary process which started from lifeless matter and has produced the human body and mind through the action of natural selection on chance mutations. The evidence for this world-picture, if one relies solely on scientific observation and extrapolation, is fairly strong; most scientists probably accept its main features as almost certainly correct. And anyone who accepts it must conclude that the superior knowledge of the past was shot through with illusion. He must say that the world is not what the great thinkers of the past imagined it to be; that man is not an immortal spirit but an intelligent animal; and that eventually, when the earth becomes uninhabitable through predictable changes in the sun, all the works of man, all his dreams and ideals, will be as though they had never been.

Hence I doubt whether many scientists will be persuaded to take their ethical standards and their picture of man from the superior knowledge of the past. If they go by the scientific world-picture, they can argue that the only rational aim is to make life on earth healthier, longer and more agreeable for mankind; and that almost any methods which promise to do this can be justified, including research into ways of improving human beings by altering their genetic make-up.

Almost, for scientists and medical researchers usually draw the line somewhere; they would not, for example, tolerate experiments on human beings without their consent. But for Dr. Roberts it is not a question of merely knowing where to stop, but of taking a quite different course towards a different goal:

The life and thoughts of a Plato, a Socrates, a Boethius, or a Plutarch are enduring because they reveal the heights which human *arete* can attain. In doing so, they constitute knowledge of how far we have come, of what it means to be a human being. . . . I suggest, therefore, that a possible remedy for the present incompatibility between scientific progress and human progress is that the scientist should recognise the evolutionary significance of his only standard of humanness and act accordingly. This would mean an awareness, awakened by love, of human *arete* as the most precious knowledge, and the concomitant desire to participate in it.

This participation would compel scientists to 'centre their attention upon the qualitative expansion of knowledge', with the result that 'the precipitate advance of science would be retarded, restricted and redirected—for the benefit of all concerned'. And Dr. Roberts hopes it would also 'arrest the dehumanising trends that now prevail in nearly all fields of science,' especially in the biological sciences:

The modern biologist, basing his wisdom on the last four hundred years—6 per cent. of man's civilised life—evaluates scientific knowledge so highly that he now wishes to hasten his evolution by utilising it in his self-transformation. If, instead, he would look farther back to those ideas of self-transformation through participation in the spiritual realm, he might choose as the key to his evolution the realised potentials of the human spirit.

Something like this far-reaching change in the ethos of science may come one day, but is not yet in sight. However, where Dr. Roberts writes about some of the dangers inherent in certain applications of science and technology, for instance in the reckless exploitation of new inventions, she will have many scientists, as well as non-scientists, on her side. Some of these sympathisers may not go all the way with her absolute condemnation of all use of animals in laboratory work, but she argues her case with forcible clarity. As an example of the dehumanised attitudes that can arise in this field she cites the lengthy American experiments in which baby Rhesus monkeys were exposed to severe deprivation (not to any physical brutality) in order to prove—that infant monkeys (and by analogy human infants) are drawn to their mothers by a need for affection and comfort, and not only by hunger!

Dr. Roberts discusses various other related topics, including Sir Charles Snow's treatment of the 'two cultures' and Aldous Huxley's views on the relation of modern science to literature and art. More could be said about the necessary role of the modern scientific outlook in the education of mankind; see, e.g., Rudolf Steiner's lecture of 13 April, 1919, 'Spiritual Emptiness and Social Life', printed in the *Golden Blade*, 1954. But Dr. Roberts' book, thoughtful and stimulating, can be recommended to anyone concerned with the influence of modern science on the world and on human minds.

CHARLES DAVY

A KEY QUESTION IN BIOLOGY

The Case of the Midwife Toad, by Arthur Koestler. (Hutchinson, £2.00).

DURING the last 25 years Mr. Koestler has repeatedly shown great skill in writing about significant themes from the history of science. He understands how to present these subjects to the general reader attractively as well as informatively, touching on the importance of the subject in its meaning for the development of consciousness.

The subject of this book (published in 1971) is Dr. Paul Kammerer, an Austrian biologist who specialised in experiments with reptiles, amphibia, and invertebrates. He was well-known in the first quarter of this century, not only in strictly scientific circles but also among naturalists interested in the philosophical implications of his results. Kammerer firmly and passionately believed in the inheritance of acquired characteristics. In plain language this means that if changes in bodily structure or habits have been acquired by a living organism—whether through the effects of the environment or through training—these acquired features can then be innate in the offspring for up to five generations, as observed in some of Kammerer's experiments. This belief is called Neo-Lamarckism, as opposed to Neo-Darwinism. Neo-Darwinism holds that whatever changes may come about in an organism during its life, they do *not* change the heritable characteristics of the species—a "sort of biological determinative Calvinism," as a lay member of an audience once remarked, when subjected to a Neo-Darwinistic lecture, and a very apt remark it was.

In the autumn of 1926 Kammerer was found dead in the mountains near Vienna, sitting up on a ledge, shot through the head, obviously by his own hand. On the previous day he had made all arrangements for his move to Moscow, where he had been offered a very attractive scientific position. The discovery of this suicide by a passing roadworker made a great stir, first in the Vienna evening papers and later in scientific journals all over the world. Kammerer had lectured widely in Europe and in the United States, and the puzzle about his untimely death—he was in his early forties—grew as time went on. As he had been accused—most likely falsely—of having faked at least one of his results in order to prove his theories and to cause a sensation in popular scientific circles, the case went far beyond ordinary gossip. Some people assumed that he had been hounded down by his enemies; others saw in the suicide, and in the explanatory letters he had written, an admission of guilt.

Arthur Koestler, after carefully studying the evidence, decided to be Kammerer's champion of honour. He began painstakingly to collect all available information about Kammerer and his work from persons who had known him or had corresponded with him. He sees the implications of how the study of living things is approached, whether in a mechanistic or in an imaginative way. In his earlier book, *Steepwalkers*, Koestler used a similar method for the appreciation of Kepler's work, as opposed to that of Copernicus. In both cases some degree of imagination in the

best sense of the word has to be applied by the biographer himself—and this makes these books so valuable.

Koestler makes much of the fact that Kammerer was a fully trained musician and composer before he turned biologist. Also, that the secret of his unmatched skill in experimenting with low vertebrates was his positive liking for them. This went so far that he named his only daughter "Lacerta"—lizard. She is still living and was one of Koestler's sources of information about her father.

It seems to me that beyond the thrill of rehabilitating an outstanding scientist, Koestler takes a deep interest in the decisive importance of a realistic evaluation of the ideas on evolution at the present time. This was a point very much in Rudolf Steiner's mind. The unending arguments between the Neo-Darwinists and the Neo-Lamarckians cannot be resolved unless you regard the development of the spirit of man as the ultimate driving force. Towards an acceptance of this idea Koestler has contributed not a little by his various studies in the history of science.

It remains to be mentioned that the present reviewer knew Kammerer as her biology teacher in secondary school days, and in looking back has to admit the great influence he had on her scientific bent and lasting interest in biology, which finally led her to Rudolf Steiner's writings on Goethe's scientific work. She also adopted Kammerer's love for lizards, newts and the like.

MARIA GLAS

TRANSVALUATION

The Actual and the Real, by Oscar Kollerstrom. Introduction by Professor John Wisdom. (Turnstone Books, £2.95).

As a young man Oscar Kollerstrom entered the priesthood of the Liberal Catholic Church; he was ordained "at a midnight Mass on Christmas Eve in the Church's beautiful centre in Holland." But he soon found himself ill-equipped to cope with the personal problems and human relationships of the people who came to him for help. He went for training in psychoanalysis to Georg Groddeck, an unorthodox Freudian and a pioneer of psychosomatic medicine. Groddeck's powerfully original character had a deep and lasting influence on Kollerstrom and on his subsequent career. Since 1930 he has practised as an independent, eclectic psychiatrist in London.

Here I must declare an interest: the author is an old friend who allowed me to read a few parts of his book in draft. Its provisional title then was *Transvaluation*, for "my aim and my method are the transvaluation of reality by the mystic's illumination." By the book's present title he means something similar, but not quite the same:

In distinguishing the world of the real from the world of the merely actual, Groddeck characterises the former as the sphere of all that really moves us, and in which we are truly ourselves; it is the site of mankind's great dreams, of symbols, and of our fantasies—all out of childhood However often

we may fall back into the world of the literal, where we again bear the guilt of our always renewed error, the memory of one instant's knowledge of the real will at last send us back to our true home.

Kollerstrom follows Groddeck, who himself consciously followed Goethe, in regarding "all things transitory" as symbols, but this does not mean that they are a veil to be discarded on the way to higher realities. The meaning of a symbol—unlike that of a sign such as a red or green traffic light—cannot be extracted from it and verbalised; it has to be experienced, and in this sense a symbol will often have several meanings. If therefore we see transitory things—the natural scene, let us say, or events in a human life—as symbolic, we do not lose sight of them; we see them transfigured, or transvalued.

Kollerstrom brings this approach into relation with many themes and subjects, most notably Christianity:

Without question mankind's greatest symbol is the Mass, for it re-enacts the Incarnation, and is therefore its symbol . . . I came to feel the entirety of my experience of the Church as itself a "re-happening" of the Incarnation, which itself is an ever-happening event—in view of what has since come to the fore and is now widely held. But, of course, the all-important site for it is the heart of man Nature mysticism is indeed the heart's realisation of its own content in responding to the cosmic Christ.

In 1942 Kollerstrom wrote a new version of the Mass; it is, he says, "based on that of the Liberal Catholic Church and preserves all the 'ancient landmarks'; the Canon, the manual acts and so on," but with emphasis on the "humanness" of Christ and "His psychological meaning for each of us." His hope was that this new version (printed at the end of the book) might lead to the provision of other new versions by contemporary poets and musicians; he mentions his disappointment when Eliot and Auden died without having taken up the idea.

In this connection Kollerstrom quotes "a remark made to one of our priests by the Rt. Rev. J. I. Wedgwood, the real founder of our Church," who spoke of his "conviction that the last quarter of this century would experience an Advent, centring on the transforming work of the Holy Eucharist."

Of Rudolf Steiner, the author says: "I am not myself a follower of Steiner, yet because of my absorption in mysticism I cannot but be interested in him as a great seer, though he has been described as an occultist rather than a mystic Steiner's special claims to interest in this book are, first, his Christianity, and, second, that, like Groddeck, he was enormously influenced by Goethe Moreover, he holds a key position in that he had an orthodox scientific training, and integrated his seership with knowledge in such wise as would seem to widen enormously the bounds of knowledge."

Kollerstrom's main reason for not going further with Steiner is indicated in an earlier remark, where he says that "throughout . . . I have kept to pure mysticism, without anything of spiritualism, or of systems of

belief based on clairvoyant revelations and investigations, although much of interest and of value may be found in these." Nevertheless, there is not very much here about mysticism in the usual sense, nor would one think of the author as primarily a mystic, again in the usual sense. A mystic tends to follow a single path, his eyes set on a single goal; Kollerstrom's actively inquiring mind has led him to explore numerous paths, while never losing his central attachment to Liberal Catholic Christianity.

The book includes an account of an extraordinary dream, lasting only a few minutes by clock time, in which Kollerstrom, then in his late twenties, first dreamed his whole life over again, backwards, followed by three different, detailed versions of his future life, year after year up to old age. The first ended with the dreamer committing a murder; the second, with his suicide; the third was happy and successful.

Since then, Kollerstrom says, "I have often found that my life seems to be made up from strands of all three of these dream lives... Everything that is spiritually my own, everything of true worth that I have found for myself, derives from that great dream. Still it enriches and instructs me; without it my life would have been a husk."

What Kollerstrom describes is bound to be his recollection of the dream, and I wonder whether this may differ somewhat from his experience of it. But this is a truly remarkable story, though I find it tantalising that we are not told exactly how the dream has had this crucial influence on the author's life, or exactly how it instructs him.

The book covers many more topics, often deep and difficult, than can be reviewed here: the experience of death, reincarnation, ways to a knowledge of God, and the meaning of a religious attitude towards the environment. Owen Barfield's "profound and original" book, *Saving the Appearances*, is mentioned and quoted from in several places.

"I have no millennial hopes for this book," Kollerstrom says, and "I have no mission to compete with any man's faith," but "I write to proclaim that, without raising a foot from the most solid earth, we may yet breathe again the spirit of eternal life." This challenging purpose shines out now and again, but tends to be overlaid by fairly intricate discussions, notable always for the author's readiness to enter sympathetically into a variety of viewpoints other than his own. Some readers who respond warmly to parts of the book may not care much for other parts, and this applies to anthroposophists; but few will fail to find stimulating thoughts and rewarding insights scattered through its wide-ranging pages.

C.D.

HOW EURYTHMY BEGAN

Eurythmy and the Impulse of Dance, by Marjorie Raffe, Cecil Harwood and Marguerite Lundgren. (Rudolf Steiner Press, paperback, 75p).

This booklet contains reproductions of the complete series of 35 drawings for Eurythmy arising from the collaboration of Rudolf Steiner and Edith Marion; 20 of them were published in the *Golden Blade*, 1973. They are here preceded, not simply by an introduction to Eurythmy, but by a

study of the search for a renewal of the arts of movement and dance, going back as far as the work of Francois Delsarte (1811-1871), and of the relationship between Eurythmy and the achievements of such pioneers as Ruth St. Denis, Isadora Duncan, Maud Allan, Mary Wigman, Martha Graham, Rudolf Laban and others.

Even in a brief account, the enormous difficulties faced by such pioneers become evident. Most of them tried to achieve a form of dancing which would be serious, religious in mood, in some way selfless—by no means just a demonstration of personal talent. Often they looked back to ancient traditions of the dance, in Greece or the Orient or other old civilisations. In these traditions deep religious earnestness could indeed be found—but how could they be renewed, within a civilisation so alien to them?

The beginnings of Eurythmy came at a time, just before the First World War, when such endeavours were at their height in Europe and America (though of course they have continued to this day). But the development of Eurythmy remained entirely separate. And perhaps it can simply be said: audiences for the Russian Ballet, or for the great individual dancers—though their performances might be new and strange—were already there; the audiences for Eurythmy were not.

For the appreciation of any art the senses have to be enlivened and ensouled, in the ways described by Rudolf Steiner in lectures printed in this *Golden Blade*. An art does not call upon only one sense—sight or hearing, for example—but always upon several. To take one of Rudolf Steiner's rather surprising examples, for response to a painting we need not only sight, but also an inward kind of tasting and smelling. We have grown accustomed to using these senses in this way, at least for certain kinds of paintings—though we are generally unaware of how we do it.

For Eurythmy, a very active involvement of seeing, hearing, the sense of movement and probably of other senses as well, is necessary. To have anthroposophical *conceptions* is by no means enough. A feeling for the presence of the ethereal body is needed; this ethereal body which is beginning to have a looser connection with the physical body than it had in the centuries immediately behind us.

And here the drawings for Eurythmy can be found of very great value. We are all at moments filled with happiness, at moments nearer despair—or perhaps (very occasionally) tempted to believe ourselves damned clever. At such moments the ethereal body assumes a particular shape and colouring in the course of its continual metamorphosis. An *indication* of the ethereal state (the word is inadequate) that truly and necessarily belongs to each mood is contained in these drawings. Self-assertion, grief, high festival, knowledge, inwardness, merriment, greed, despair, loveableness, 'damn clever', devotion, communication, question—here they all are, strange and perhaps grotesque to us at first sight, but capable of helping us towards a comprehension of the first of those invisible parts of ourselves, which should begin to come to consciousness in us.

A.B.

HUMAN PROBLEMS IN A COSMIC SETTING

The Spirit of the Circling Stars, by Adam Bittleston (Christian Community Press, £2.50).

In this book—which will be published in February 1975—Mr. Bittleston has tried, he tells us, to “see some elements of human destiny in a very wide context indeed: in relation to the great universe beyond the earth, regarded as a revelation of the spiritual world . . . Behind the changing course of the seasons of the year and the changing positions of the sun among the stars are events in the world's soul and among spiritual beings; and both sets of outer facts may be found to express some part of the hidden realities.”

His method is to go round the year, month by month. In connection with each month he speaks briefly of some aspect of the heavens, and in each chapter a particular human problem is discussed.

The problems are those that almost everyone encounters sooner or later: they include sickness and healing, marriage, the stages of life, the meaning of nationality and the use and abuse of money, and our relations with the dead. The unusual feature of Mr. Bittleston's treatment of these problems is that he relates them on the one hand to a cosmic context, and very often to examples and teachings drawn from the life of Christ on earth—where again the stellar background comes in—while at the same time the advice he offers is thoroughly practical and “down to earth”—the advice of a priest with long experience of helping people with their personal troubles and difficulties. Thus his book has both depth and breadth, the depth of spiritual insight and the breadth of warm human sympathies and patience. It can be welcomed both as offering much for meditative study and as a wise companion along the winding and often arduous paths of daily life.

M.H.

DREAM TESTS OF TELEPATHY

Dream Telepathy, by Montague Ullman, M.D., Stanley Krippner, Ph.D., and Alan Vaughan. Foreword by Gardner Murphy, Ph.D. (Turnstone Books, £2.95).

For many years a great deal of time and patience has been spent on endeavours to establish telepathy as a scientifically proven fact, usually by the well-known card-guessing method. If the subject's successful guesses are significantly above chance level, this is taken to show that telepathy has been at work. This statistical evidence has not convinced everyone, and the evidence from innumerable reported cases of telepathy in everyday life seems to me much more persuasive, but it does not lend itself to strictly scientific—i.e. quantitative—evaluation.

Now, in the book under review, we have a detailed account of a third method, developed in the Dream Laboratory of the Maimonides Medical Center, Brooklyn, New York. The experiments were designed to determine whether a person acting as agent could communicate his thoughts

about a picture, chosen as “target,” to the mind of a sleeping subject, thereby altering or influencing the subject's dreams.

This method arose from the laboratory studies of sleep that have been carried out in various countries and by now are fairly well known. It has been found that periods of rapid eye movement (REM) occur about every 90 minutes in the course of a night's sleep. During REM sleep (the eyes remain closed and the eyeball movements are detected by electrodes placed on the temples), the subject seems to emerge from deeper sleep into a condition nearer wakefulness, and if he is awakened during one of these periods he can nearly always relate an interrupted dream. Neither the cause nor the function of the eyeball movements is understood, but REM sleep provides convenient occasions for recovering dreams and, in the telepathy experiments, of checking them against the target pictures.

All the available evidence for telepathy suggests that the process of communication occurs on the unconscious level; if the message gets through to the conscious mind it will generally be in a symbolic and often incomplete or distorted form, or mixed up with irrelevant associations. Since dreams come largely from a similar unconscious level, it could be hoped that they would be open to telepathic influence, and able to report it without much interference from the conscious mind. This was the argument that prompted these experiments, and on the whole the results were good—much more satisfactory than card-guessing, for dream tests do not depend on statistics but on the coincidence of circumstantial details, often hard to explain away in terms of chance.

What has always seemed to me surprising is not that telepathy should occur, but that it does not occur more often. It may indeed occur quite often on the unconscious level, but is censored out by the conscious mind. Something like this is the view also of the authors of this book. On a concluding page they write:

Our main surmise is that the psyche of man possesses a latent ESP capacity that is most likely to be deployed during sleep, in the dreaming phase . . . We may discover ourselves to be less alienated from each other, more capable of psychic unity and more capable of closeness in ways never before suspected . . . If technology and its concomitant philosophy of mastery over nature continue to crowd out a philosophical humanism based on a congruence between man and nature, our problems will grow worse: pollution, decay, wars, alienation. If such a humanistic philosophy guides our technology, we have a chance. Man's psychic potential suggests that in the basic fabric of life everything and everyone is more closely linked than our discrete physical boundaries would seem to suggest. Perhaps all forms of life are vitally interrelated in ways we do not yet clearly understand.

This may well be true, but the authors do not consider the possibility that ESP in the forms currently studied is not a nascent faculty, but the

remnant of a faculty that was far stronger in the distant past. It is a question whether ESP in these current forms has a promising future, or whether—as Rudolf Steiner indicated—the development of new forms of higher perception, under fully conscious control, should be seen as the right aim at this stage in human evolution.

However, the book covers its chosen ground very effectively, dealing with spontaneous telepathic dreaming and precognitive dreams as well as the laboratory experiments. The detailed reports of these are unavoidably rather tedious and can be skimmed. An appendix gives the replies, often lengthy and mostly favourable, to forty letters sent out to students and critics of parapsychology, inviting their views on the experimental results. It may be that sleep research and dream research will not get much further on their present lines, for the true nature of sleep cannot be discerned by external methods of observation; but anyone interested in this specialised field of research will find the book a useful and responsible guide.

C.D.

SCHOOLS AND SOCIETY

From New School to Old Scholar, by David Stedman, with a contribution by Roy Pride. Published by the author at 63 Wiston Avenue, Worthing, Sussex. From Rudolf Steiner Bookshops or from the author, price 50p, post free.

In this booklet, produced to mark the 50th anniversary of Michael Hall, Mr. Stedman has assembled some of his personal reminiscences of Steiner schooling, together with reflections on childhood and growing up and the outlook for education in Britain to-day. The informal warmth of the writing make the booklet a welcome supplement, slight but vivid and revealing, to more elaborate treatments of the main subject.

The author, whose memories of Michael Hall go back to the wartime years at Minehead, is now Training Manager of a British Insurance group in the I.T.T. consortium. Previously he was Director of Studies at a private College of Further Education in Surrey; he has also worked for short periods at Michael Hall and at a Steiner Special Home-School. The chapters are mostly reprints of contributions to Steiner educational periodicals—e.g. *Child and Man* and the journal of the MHOSA. In a light-hearted yet deeply serious way they cover a lot of ground, touching on such apparently diverse topics as the true function of education, alienation and acceptance, a cruise on the Thames, division of labour, recollections of individual teachers and other personal snapshot-memories.

Some readers may feel that Mr. Stedman overdoes his praise of the "rock generation," now taking its place in society:

It is not merely cast in a different mould to its parents'. Each member is determined not to be cast in any mould, but to have individual aspirations, and a respect and compassion for other individuals . . . We have seen them transform "love" from something sentimental and ineffectual into practical acts of compassion for the needy. We have seen them experiment with

drugs and with oriental mysticism, in a quest for new experiences and higher knowledge (an activity which half a century ago was confined to a modish minority of intellectuals). But we have also seen violence; and this is understandable. Who can be blamed for defacing public buildings and blocks of flats, which themselves deface the towns in which so many of our young people grow up? Who can blame the inarticulate for putting the boot in, when this is one way in which they can express their contempt for a society wherein the socially powerful can afford to have their dirty work done for them with impunity? One of education's tasks is surely to give all young people a glimpse of the world as it might be.

One would not expect to find, embedded in Mr. Stedman's fresh outlook, the overdone theory that most of the shortcomings of the rising generation are attributable to its wicked predecessors. Were its elders really such a poor lot? After all it is not the "rock generation" which produced Rudolf Steiner, or the Steiner schools, or the courageous and enterprising teachers who got them going.

Mr. Stedman is highly critical of the "academic bias" in our present educational system, but he says roundly that "well-intentioned but ill-conceived plans to abolish independent schools and make comprehensive education compulsory are a nonsense . . . They are a warning signal that society must very quickly revolutionise its education, or else it will have thrust upon it a uniform system under the state, with untold hidden dangers in store under some future government."

D.E.E.

DO-IT-YOURSELF TOYS

Wooden Toys that Work, by Marion Cathcart Millett. Diagrams by Roy Mole (Mills and Boon, £2.25).

ANYONE who has crawled about on the floor with five-year-olds, rolling empty cotton-reels down pastry-board slopes through cardboard-box tunnels, knows that children like toys which can be made to *do* something. Too many toys these days are dead—often elaborate plastic reproductions of the "miracles" of technology, rarely adaptable to the varied roles they are expected to fill in the complex settings and mysterious dramas concocted by the imaginative child at play.

Marion Millett's attractive and original do-it-yourself toy-making book is designed for the individualistic amateur with no previous training in woodwork. The seven or eight-year-old could probably help with some of the processes—another factor in favour of the book. The simple equipment required is shown in clear line-drawings, as are the patterns of the toys themselves, traceable direct from the printed page. There are also some lively colour-plates of the finished products—the acrobat, the gymnast, the magic waterfall, the Ziggedy Man.

The detailed instructions for making are lucid and simple, and both child and adult, once familiar with the procedures, are likely to be tempted to further creative experiments of their own.

D.E.E.

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