NOON

All how silent and how still,
Nothing heard but yonder mill;
While the dazzled eye surveys
All around a liquid blaze;
And amid the scorching gleams,
If we earnest look, it seems
As if crooked bits of glass
Seem'd repeatedly to pass.
Oh, for a puffing breeze to blow!
But breezes are all strangers now;
Not a twig is seen to shake
Nor the smallest bent to quake;
From the river's muddy side
Not a curve is seen to glide;
And no longer on the stream
Watching lies the silver bream,
Forcing, from repeated springs,
' Verges in successive rings.'
Bees are faint, and cease to hum;
Birds are overpower'd and dumb.
Rural voices all are mute,
Tuneless lie the pipe and flute;
Shepherds, with their panting
sheep,
In the swaliest corner creep;
And from the tormenting heat
All are wishing to retreat.
Huddled up in grass and flowers,
Mowers wait for cooler hours;
And the cow-boy seeks the sedge,
Ramping in the woodland hedge,
While his cattle o'er the vales
Scamper, with uplifted tails;
Others not so wild and mad,
That can better bear the gad,
Underneath the hedgerow lunge,
Or, if nigh, in waters plunge.
Oh! to see how flowers are took,
How it grieves me when I look:
Ragged-robins, once so pink,
Now are turn'd as black as ink,
And the leaves, being scorch'd so
much,
Even crumble at the touch;
Drowking lies the meadow-sweet,
Flopping down beneath one's feet;
While to all the flowers that blow,
If in open air they grow,
Th'injurious deed alike is done
By the hot relentless sun.
E'en the dew is parched up
From the teasel's jointed cup:
O poor birds! where must ye fly,
Now your water-pots are dry?
If ye stay upon the heath,
Ye'll be chok'd and clamm'd to
death:
Therefore leave the shadeless goss,
Seek the spring-head lin'd with
moss;
There your little feet may stand,
Safely printing on the sand;
While, in full possession, where
Purling eddies ripple clear,
You with ease and plenty blest,
Sip the coolest and the best.
Then away! and wet your throats;
Cheer me with your warbling
notes;
'Twill hot noon the more revive;
While I wander to contrive
For myself a place as good,
In the middle of a wood:
There aside some mossy bank,
Where the grass in bunches rank
Lifts its down on spindles high,
Shall be where I'll choose to lie;
Fearless of the things that creep,
There I'll think, and there I'll
sleep,
Caring not to stir at all,
Till the dew begins to fall.

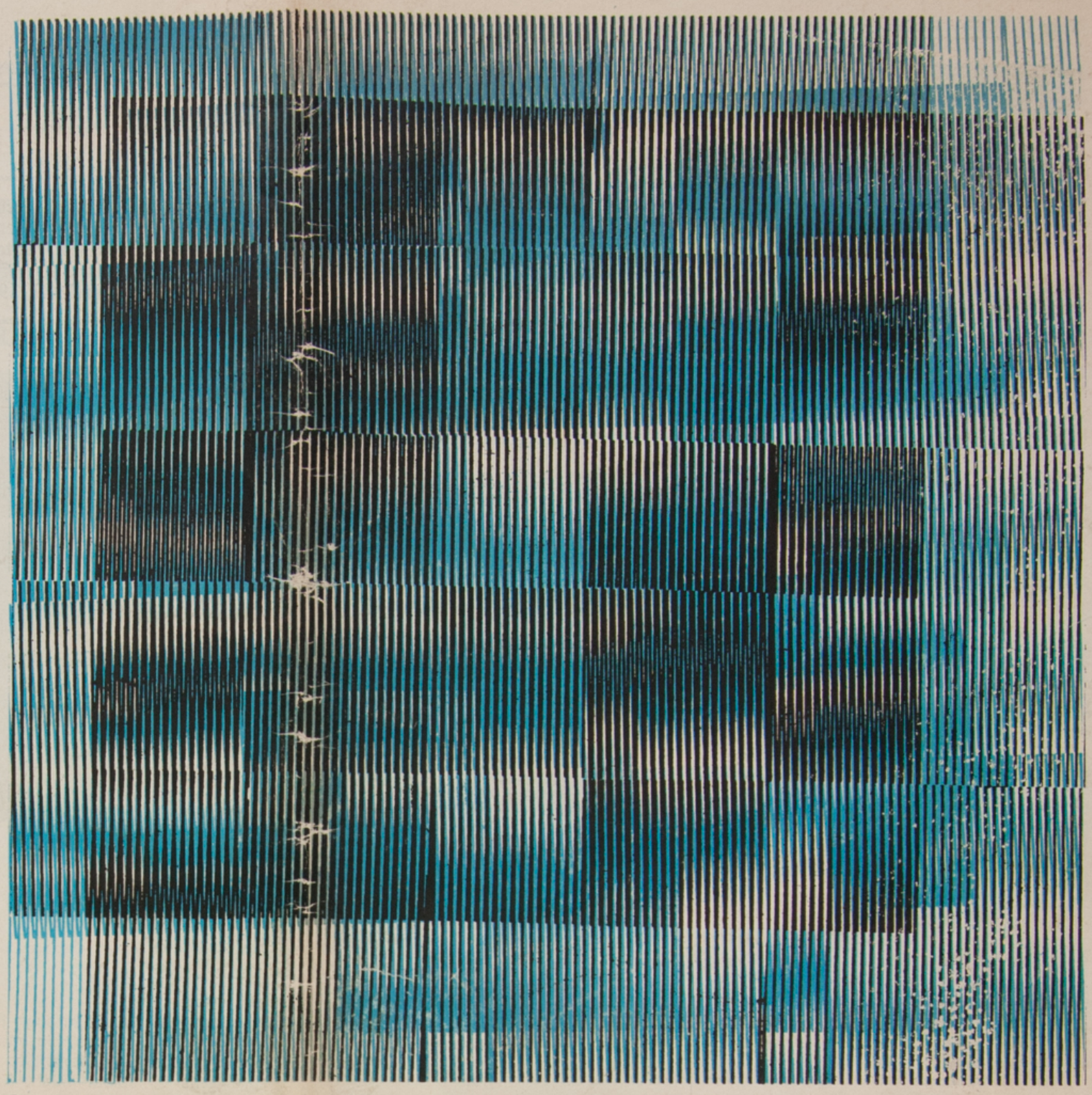
1809

John Clare

(English poet, 1793-1864)

Glossary of Dialect Words used in the poem above

swaliest: shadiest.
ramping: growing luxuriantly.
drowking: drooping.
clamm'd: parched.
goss: gorse.
spindles: shoots and stems of plants.



Carlos Cruz-Diez: Study of Interferences 1965

A Decade of Physichromies by Carlos Cruz-Diez at SIGNALS LONDON, 39 Wigmore St W1, Telephone: Welbeck 8044, from September 23 to October 23, 1965

SIGNALS

director : paul keeler
editor : david medalla

vol one number nine
aug - sep - oct 1965

four shillings

American painter Barnett Newman

Statement by Barnett Newman

'First we feel, then we fall.'
James Joyce, *Finnegan's Wake.*

'The freedom of space, the emotion of human scale, the sanctity of place, are what is moving — not size (I wish to overcome size), not colours (I wish to create colour), not area (I wish to declare space), not absolutes (I wish to feel and to know at all risks).

The fetish and the ornament, blind and mute, impress only those who cannot look at the terror of Self. The self, terrible and constant, is for me the subject matter of painting and sculpture.

The play of formal devices, their manipulation, the framing of space, the association — free or not — of areas, colours, lines, for whatever their sake, abstract or otherwise, must lead to the denial of self through fetishes with — threats of fire and brimstone and through ornaments with — voodoo ecstasies. Instead of the falling in love, what comes through is the falling in love with oneself, the self-love of the sha-man. Like the man-made image of an artist instead of the artist as a man, inspired and inspiring, the fetish and the ornament demand only one emotion — the worship of the artist himself by himself and by those whom he can intimidate. Instead of an eloquence that means what it says, that gives life to mud, one is left, no matter what the magic and the techniques, with so much mud.

Life, as is a true work of art, is, after all, always positive.

Statement printed in the catalogue of the American representation at the Eight Biennial of Sao Paulo, 1965

Navrongo housewife (Gold Coast, Africa)

The first Festival of Negro Arts will be held next spring 1966 in the Republic of Senegal. We hope to publish details of this exciting festival in a future issue of SIGNALS. Meanwhile in Great Britain the first Commonwealth Arts Festival is enjoying a commendable success.

SIGNALS IX

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Director : **Paul Keeler**
Editor : **David Medalla**

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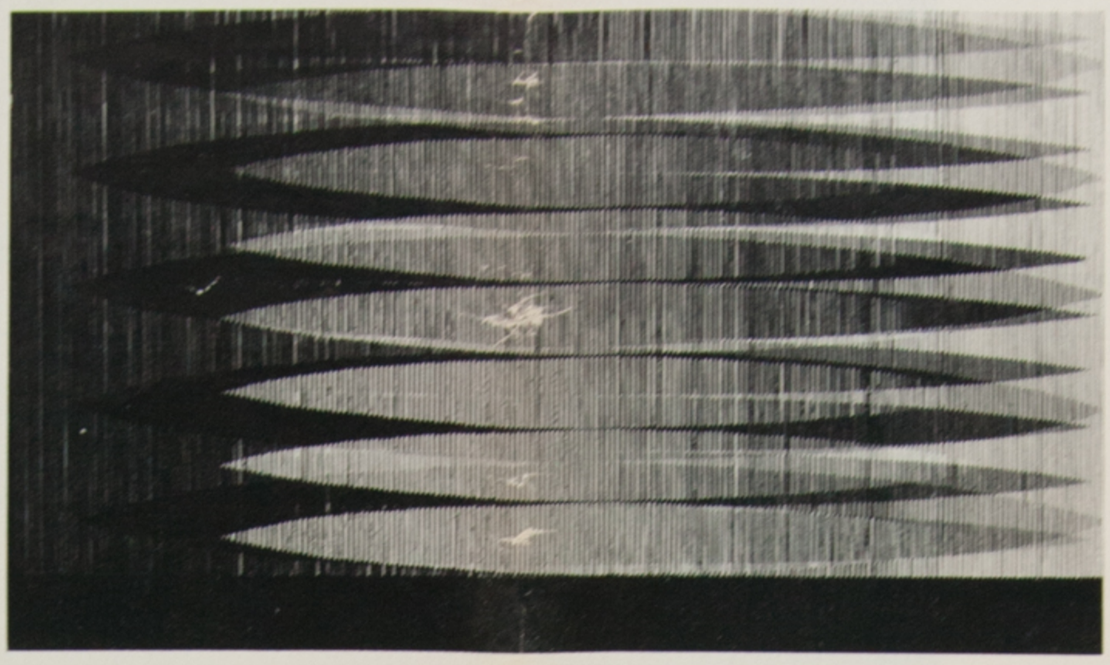
The Cruz-Diez exhibition is the first of three major retrospectives by three leading artists of Venezuela. The other two retrospectives will be devoted to 'The Achievements of Jésus-Rafael Soto' (October 28 to December 24, 1965) and to 'A Quarter of a Century of the Beautiful Art of Alejandro Otero' (January 20 to March 19, 1966).



Carlos Cruz-Diez : Physichromie no 152, Paris 1965

CARLOS CRUZ-DIEZ

by Manuel Quintana Castillo

from the catalogue of the Second Biennale Armando Reveron, Caracas, Venezuela, 1963

We all remember something of the painting of CRUZ-DIEZ and of the different stages that have marked its evolution. The inquisitive spirit of research and the desire to accumulate experiences that have always inspired him — are evident throughout his artistic work. CRUZ-DIEZ seems to have been eagerly seeking — with a really admirable boldness, perseverance and firmness — that which in his innermost artistic self he foresees and demands with a definite and personal means of expression. At first there was his stage of figurative painting by means of which the artist sought to realize a more or less faithful image of the world, or, better said, of his immediate world. At that time he represented, with the patience and 'finesse' of a miniature-painter, all the aspects of Venezuelan life with which he has proved himself to be profoundly acquainted. There we see the slums of Caracas: the man of the hills who from the height of his poverty watches city life roll by. The customs, the colour and gaiety of our most beautiful folklore traditions. All those things: the landscape, the flora, the fauna, the brilliant chromatism of our light, the multishaped richness of our vegetation, as well as the barren lands of erosion, the forests full of shadows and of birds, the tumultuous rivers and the sea, the ever-green and ever-changing sea, have all passed through the painting of CRUZ-DIEZ. But it isn't only that, or the diversity of his aptitudes, which have enabled him to undertake very many different specialties ranging from newspaper illustration to photography and neatly accomplished publicity design, that determines his creative capacity. CRUZ-DIEZ is deeply aware of the most significant movements that affect and modify the plastic arts of our time. He welcomes all new experiences and opens wide his eyes and his sensibility to every new discovery that might mean one more possibility for painting. Abstract art finds in him one of its most enthusiastic followers. It would seem as if abstraction furnished him with the most efficient means of expression that his temperament required. Colour, freed from the task of representing something other than itself, is inscribed within absolutely plane geometrical forms. This is the time when CRUZ-DIEZ besides searching for a new vision of colour also seeks a solution to the problem of space. But, in my opinion, the purpose or the intuitions of CRUZ-DIEZ lead him to face the problem in a different way to that in which others have faced it. He does not formulate the problem of the solution of plastic space through form, or vice-versa, as the fundamental proposition; but the perception of space through the sensation of colour. At times his enthusiasm on finding solutions different to the physical problems of colour might have led him to excesses or to apparently decorative effects. Colour is reduced to plane hues, to pure shades at their maximum saturation, which, distributed in configurations and groups of varying formal character throughout the length and breadth of the support, produce — more than anything else — a sensation of gaiety and optimism. But CRUZ-DIEZ does not stop at this point as at a definite solution. He insists on carrying his experiences further in the field of chromatic possibilities to the point of avoiding its representation by means of the usual procedure of placing the pigments directly on a surface. He finds the means of producing chromatic sensations through refraction of opposite shades, which effect is achieved by the action or the motions of the spectator in front of the visual groups that he calls **Physichromies.** But the fact that he obtains harmonious results through the superimposition of opposite hues and shades, together with his attitude of considering colour as a sensation and not as material substance, does not necessarily mean that CRUZ-DIEZ has set for himself as an ultimate goal the obtainment of decided chromatic appearances or luminous effects through the simultaneous presence in the same plastic locality of the colours, values and shades which the **Physichromies** might produce. There is more to it than this. These recent works of CRUZ-DIEZ have, on the one hand, the intrinsic value of being plastic objects in themselves, intellectual and sensitive constructions made up with sobriety and in a spirit of balance and serenity; on the other hand, they have the importance of containing a result whose intention is that of opening up new perspectives in the visual arts. In the art of CRUZ-DIEZ we do not find the aggressive turbulence of material substance, or the violent exaltations of expressionist colour, or the passionate complexity of surprising forms; there is in it, however, the instinct of an ideal balance and the need to convey a spiritual state full of serenity and deep thought, expressed by means of a synthesis of formal means whose most significant keynote is their character of order and sobriety, qualities which, because they are peculiar to him, are therefore equally authentic. The **Physichromies** of **CRUZ-DIEZ** demand the extension of the architectural wall to be fully developed. Before a widespread surface and space, as the spectator moves along he will be able to perceive all the variety of subtle luminous and chromatic changes that result from these visual groups.

Translated from the Spanish by
Ana Teresa Serna

PATMOS *by Dan Georgakas*

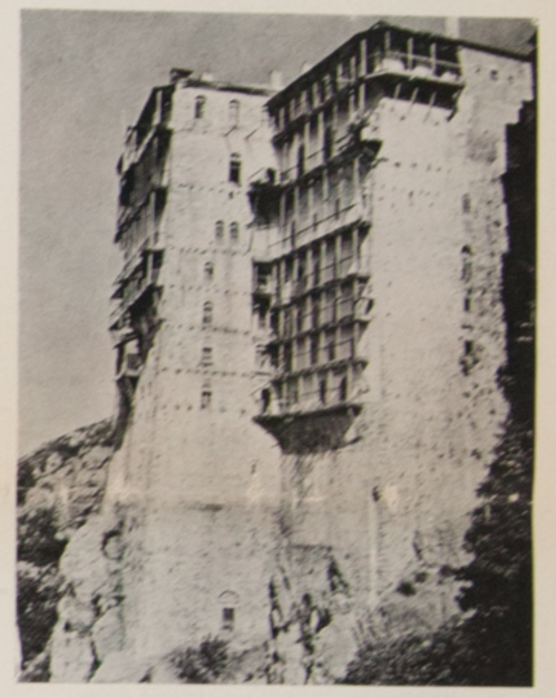
The Byzantine church dark and chill. Faded frescoes just uncovered by the tremoring of the earth. Large-eyed faces peeping through gray time as from behind a veil of fog. Silver and gold suspended from the ceiling because desperate men caught in wicked seas had promised. In this place where St John the Divine once wrote.

The Greek moves from the interior of the church to the patio. Somewhere in the mountain is the grotto of the Apocalypse. His eyes smart under the brightness of Aegean light. The cloudless blue extends indefinitely before him. The blue shattered from behind by a sun too powerful to be looked upon directly. Even through the darkest of glasses. The crisp air smoulders.

A small village of houses stretches along the slope. Whitewashed so thick the walls curve at their bases. Melt into the street to meet the drift from the wall across the way. Form a corridor of white. Becoming a stairway in time. With the sun washing white. Crackling the air with the heat of vision.

The Greek forces his eyes away. Searches for the grotto. Passes a clump of trees. Slides along the hump of hot rocks. Attracted by dark boat forms. Captured by another nest of white. Jagged rock beaches and great stone slabs. So many times quay for mariners. For Greek and Venetian. For Mede and Turk and Syrian. For every race to cross the Bosphorus. The brown. The rocks. In some places assembled into walls to pen sheep and goat. The solid brown spotted with green. Licked by Aegean blue. The water blue of cleanness. The clear of darkest blue. By brightest white. The nest of white brighter than even the square white of the mountainside. White bleaching white into a searing purity. Moulded by the island. Cradled in the blue.

The church tower comes to life as monks are called to assembly. Their black robes whisk out of dark cubicles. Women in black dresses are suddenly scrubbing in the street. A startled gull flings himself from the tower. Fans his body high into



Simon Petra monastery, Mount Athos, Greece

the blue. Soars sunward. Then glides with wings taut. A silent gliding grace. Banking. Descending like a lead dart into the patch of quay white.

The Greek lulled into a peace beyond the cessation of hostility. A dream cracking like a cocoon. The old vision of triumphant flight. The screaming challenge to the sun. The proud defiant unfettered delirium of freedom. Inadequate. Noble and necessary and joyous but only in the banking and the earthward swoop the gathering of riches. The intoxication of white and blue. The impelling to sources. The surrender of disembodied chance. The swooping to soil however brown and rocky. The bathing in water. The entrance into streets. The touch of other living things.

A hard stiff oblong clutched tightly by five gripping bands only the sickening of the self. The paranoid's inability to untense. A bruising inversion. The mad staring at themselves until blinded. When with a soft sigh the gull banks free to breathe again. Drifts back along the gallery of sifting sails and tritons. Presses beads and rich cloth. Tastes red Patmos wine and the resin which flavors it. Honors the brown and blue of its growing. Gives a final paeon to the sun. In that instant between the sounding of bells.

All his life possessed with rage. Raging against those fates which dehydrate the spirit. Enraged by the slightest dimming or shading of lights. Enraged by the smashing of people against one another. By the more common attrition which ladles out misery in digestible portions. The rage flaming to a new fury. Flaming yet controlled. By the knowledge that it must always be so. Leading to that ultimate acceptance which is not condoning. Which is not resignation.

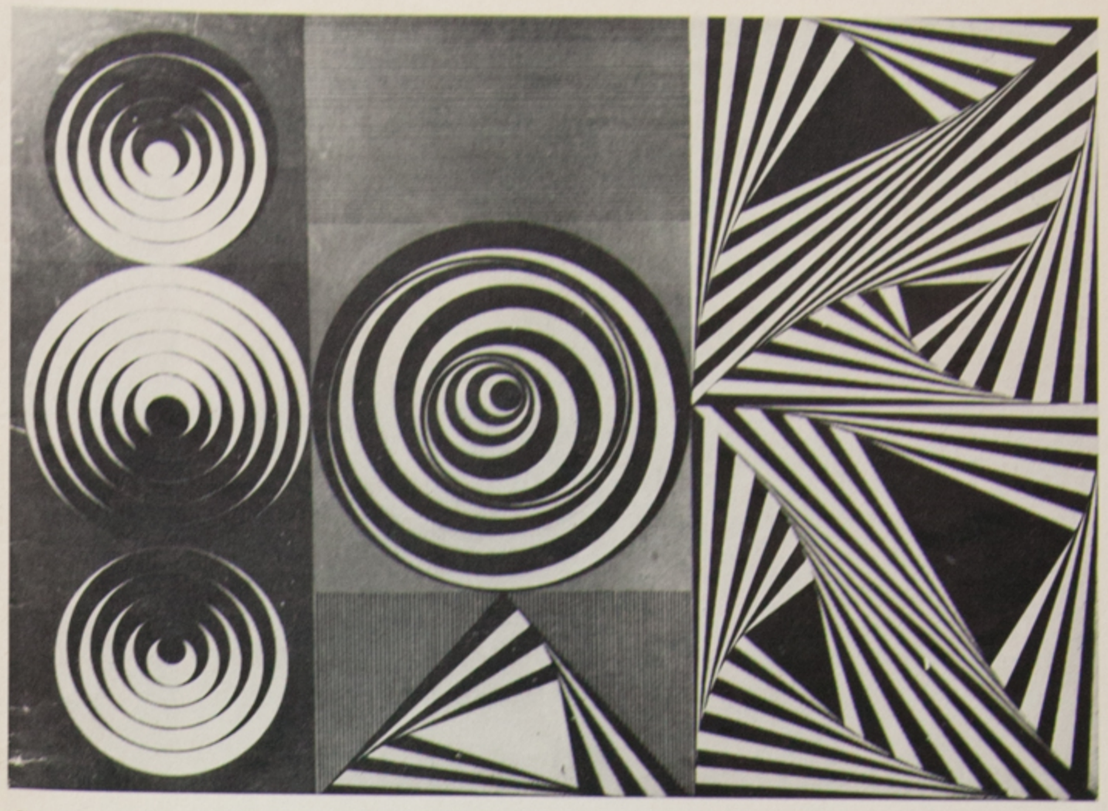
The sound of marketplace glamor and luxury no longer a temptation. No longer a possibility. When the island has no price. Mouths that propound schemes. Hands that sell fingers. Brains that think coins. Simply poison the very needs they hope to satisfy through cheating. Making mash of the will. To choke ultimately on their own phlegm.

St John the Divine, the I John saw these things, artist John creating his most imaginative ecstasies. In a grotto. In the dark. Spewing up monsters and revenge. Cloaking spleen with justice.

The Greek smiling. The gods still dwell on the top of the mountain and not in its entrails. The old gods of the white voices. Confirming their truth in the sun. Amid hot rocks. During the interval of bells. In shattering blue and white. On Patmos. Island of Hellas.

The Role of Modern Physics in the Present Development of Human Thinking

by Professor Werner Heisenberg
Director, Max Planck Institute of Physics and Astrophysics



Carlos Cruz-Diez : Torsion by displacement of circles and triangles, Caracas, 1959

Editor's Note : *The following article is the concluding chapter of* Physics and Philosophy: The Revolution in Modern Science *by Professor Werner Heisenberg. The papers that made up this book were originally delivered as the Gifford Lectures at the University of St. Andrews, Scotland, during the winter term of* 1955-1956. *They were first published in Great Britain under the present collective title by George Allen & Unwin Ltd., publishers, in* 1959, *as part of the World Perspectives Series edited by Ruth Nada Anshen. A second impression of this book appeared in* 1963, *and the chapter that follows is from the second edition. Professor Heisenberg worked with the Danish physicist Niels Bohr in formulating the principles of the quantum theory in physics, and his 'matrix mechanics'* (1925), *together with Schrödinger's discovery of wave mechanics* (1926), *were instrumental in bringing forward De Broglie's hypothesis of matter waves to replace Newtonian mechanics in the description of the lightest particles. Heisenberg's celebrated and much misunderstood* principle of indeterminacy *advanced the revolutionary proposal that it is fundamentally impossible to give an accurate description of the position and velocity of a particle. This principle ended the determinism of classical physics and has had a profound impact on twentieth century philosophy. In the paper that follows, Werner Heisenberg maintains that, contrary to the erroneous belief of the* 19th *century, the idealised but 'limited' language of physics, which stems from experimental analyses of certain phenomena, is not in direct opposition to, or even at variance with, the vaguely defined but more 'expansive' concepts of natural language. He thus seeks to outline a much needed balance between the concepts of modern physics and the concepts of natural language, which could probably form one of several bases from which a future cultural unification can proceed. This worldwide cultural unification is one which ideally should accommodate older cultural traditions within the wider, 'open' sphere of modern scientific thought. It is therefore different from old-fashioned totalitarian and supra-nationalistic goals. Nor is it merely syncretic as most utopian schemes are ; it is not merely based on the fulfilment of limited, materialistic aims as was the case with most schools of* 19th *century political ideas. The unification process envisaged by Heisenberg is a truly dynamic evolution on a world-communal scale, corollary to the biological process, wherein the imaginative needs of man — his intrinsic desire for poetry and music and the arts — will play a major, complementary part to man's utilitarian needs. Needless to say, such a process will provoke multiple tensions which can easily break into worldscale violence ; indeed some of these tensions are now breaking into localised conflicts. It is a credit to Heisenberg's prescience that, as early as* 1955, *when these lectures were first delivered, he saw and analysed some of the great dangers which the process of cultural unification will provoke. The greatest of these dangers is the use of nuclear weapons, the effective control of which has not yet been thought out by the powers who possess these monstrous weapons.* (Cf., Josué de Castro's article on page 6 of **SIGNALS Newsbulletin,** volume one, number seven). *Heisenberg does not give easy answers to these problems, but he does offer several intelligent suggestions as to how these problems, which cannot be avoided, can be tackled by governments (and the people who make governments) without resorting to mass-scale violence and self-annihilative force. We would like to thank Professor Heisenberg's English publishers for permission to reprint the following article.*

•

THE PHILOSOPHICAL IMPLICATIONS OF MODERN PHYSICS have been discussed in the foregoing chapters in order to show that this most modern part of science touches very old trends of thought at many points, that it approaches some of the very old problems from a new direction. It is probably true quite generally that in the history of human thinking the most fruitful developments frequently take place at those points where two different lines of thought meet. These lines may have their roots in quite different parts of human culture, in different times or different cultural environments or different religious traditions: hence if they actually meet, that is, if they are at least so much related to each other that a real interaction can take place, then one may hope that new and interesting developments will follow. Atomic physics as a part of modern science does actually penetrate in our time into very different cultural traditions. It is not only taught in Europe and the Western countries, where it belongs to the traditional activity in the natural sciences, but it is also studied in the Far East, in countries like Japan and China and India, with their quite different cultural backgrounds, and in Russia, where a new way of thinking has been established in our time ; a new way related both to specific scientific developments of the Europe of the nineteenth century and to other entirely different traditions from Russia itself. It can certainly not be the purpose of the following discussion to make predictions about the probable result of the encounter between the ideas of modern physics and the older traditions. But it may be possible to define the points from which the interaction between the different ideas may begin.

In considering this process of expansion of modern physics it would certainly not be possible to separate it from the general expansion of natural science, of industry and engineering, of medicine, etc., that is, quite generally of modern civilization in all parts of the world. Modern physics is just one link in a long chain of events that started from the work of Bacon, Galileo and Kepler and from the practical application of natural science in the seventeenth and eighteenth centuries. The connection between natural science and technical science has from the beginning been that of mutual assistance: The progress in technical science, the improvement of the tools, the invention of new technical devices have provided the basis for more, and more accurate, empirical knowledge of nature ; and the progress and understanding of nature and finally the mathematical formulation of natural laws have opened the way to new applications of this knowledge in technical science. For instance, the invention of the telescope enabled astronomers to measure the motion of the stars more accurately than before ; thereby a considerable progress in astronomy and in mechanics was made possible. On the other hand, precise knowledge of the mechanical laws was of the greatest value for the improvement of mechanical tools, for the construction of engines, etc. The great expansion of this combination of natural and technical science started when one had succeeded in putting some of the forces of nature at the disposal of man. The energy stored up in coal, for instance, could then perform some of the work which formerly had to be done by man himself. The industries growing out of these new possibilities could first be considered as a natural continuation and expension of the older trades ; at many points the work of the machines still resembled the old handicraft and the work of the chemical factories could be considered as a continuation of the work in the dyehouses and the pharmacies of older times. But later, entirely new branches of industry developed which had no counterpart in the older trades ; for instance, electrical engineering. The penetration of science into the more remote parts of nature enabled the engineers to use forces of nature which in former periods had scarcely been known ; and the accurate knowledge of these forces in terms of a mathematical formulation of the laws governing them formed a solid basis for the construction of all kinds of machinery.

The enormous success of this combination of natural and technical science led to a strong preponderance of those nations or states or communities in which this kind of human activity flourished, and as a natural consequence this activity had to be taken up even by those nations which by tradition would not have been inclined toward natural and technical sciences. The modern means of communication and of traffic finally completed this process of expansion of technical civilization. Undoubtedly the process has fundamentally changed the conditions of life on our earth ; and whether one approves of it or not, whether one calls it progress or danger, one must realize that it has gone far beyond any control through human forces. One may rather consider it as a biological process on the largest scale whereby the structures active in the human organism encroach on larger parts of matter and transform it into a state suited for the increasing human population.

Modern physics belongs to the most recent parts of this development, and its unfortunately most visible result, the invention of nuclear weapons, has shown the essence of this development in the sharpest possible light. On the one hand, it has demonstrated most clearly that the changes brought about by the combination of natural and technical sciences cannot be looked at only from the optimistic viewpoint ; it has at least partly justified the views of those who had always warned against the dangers of such radical transmutation of our natural conditions of life. On the other hand, it has compelled even those nations or individuals who tried to keep apart from these dangers to pay the strongest attention to the new development, since obviously political power in the sense of military power rests upon the possession of atomic weapons. It can certainly not be the task of this volume to discuss extensively the political implication of nuclear physics. But at least a few words may be said about these problems because they always come first into the minds of people when atomic physics is mentioned.

It is obvious that the invention of the new weapons, especially of the thermonuclear weapons, has fundamentally changed the political structure of the world. Not only has the concept of independent nations or states undergone a decisive change, since any nation which is not in possession of such weapon must depend in some way on those very few nations that do produce these arms in larger quantity ; but also the attempt of warfare on a large scale by means of such weapons has become practically an absurd kind of suicide. Hence one frequently hears the optimistic view that therefore war has become obsolete, that it will not happen again. This view, unfortunately, is a much too optimistic oversimplification. On the contrary, the absurdity of warfare by means of thermonuclear weapons may, in a first approximation, act as an incentive for war on a small scale. Any nation or political group which is convinced of its historical or moral right to enforce some change of the present situation will feel that the use of conventional arms for this purpose will not involve any great risks ; they will assume that the other side will certainly not have recourse to the nuclear weapons, since the other side being historically and morally wrong in this issue will not take the chance of war on a large scale. This situation would in turn induce the other nations to state that in case of small wars inflicted upon them by aggressors, they would actually have recourse to the nuclear weapons, and thus the danger obviously remains. It may quite well be that in about twenty or thirty years from now the world will have undergone so great changes that the danger of warfare on a large scale, of the application of all technical resources for the annihilation of the opponent, will have greatly diminished or disappeared. But the way to this new state will be full of the greatest dangers. We must as in all former times, realize that what looks historically or morally right to one side may look wrong to the other side. The continuation of the status quo may not always be the correct solution ; it may, on the contrary, be most important to find peaceful means of adjustments to new situations, and it may in many cases be avoided only if all the different political groups are ready to renounce some of their apparently most obvious rights — in view of the fact that the question of right or wrong may look essentially different from the other side. This is certainly not a new point of view ; it is in fact only an application of that human attitude which has been taught through many centuries by some of the great religions.

The invention of nuclear weapons has also raised entirely new problems for science and scientists. The political influence of science has become very much stronger than it was before World War II, and this fact has burdened the scientist, especially the atomic physicist, with a double responsibility. He can either take part in the administration of the country in connection with the importance of science for the community ; then he will eventually have to face the responsibility for decisions of enormous weight which go far beyond the small circle of research and university work to which he was wont. Or he may voluntarily withdraw from any participation in political decisions ; then he will still be responsible for wrong decisions which he could possibly have prevented had he not preferred the quiet life of the scientist. Obviously it is the duty of the scientists to inform their governments in detail about the unprecedented destruction that would follow from a war with thermonuclear weapons. Beyond that, scientists are frequently requested to participate in solemn resolutions in favour of world peace ; but concerning this latter demand I must confess that I have never been able to see any points in declarations of this kind. Such resolutions may seem a welcome proof of goodwill ; but anyone who speaks in favour of peace without stating precisely the conditions of this peace must at once be suspected of speaking only about that kind of peace in which he and his group thrive best — which of course would be completely worthless. Any honest declaration for peace must be an enumeration of the sacrifices one is prepared to make for its preservation. But as a rule the scientists have no authority to make statements of this kind.

At the same time the scientist can do his best to promote international co-operation in his own field. The great importance that many governments attach to research in nuclear physics nowadays and the fact that the level of scientific work is still very different in different countries favours international cooperation in this work. Young scientists of many different countries may gather in research institutions in which a strong activity in the field of modern physics is going on and the common work on difficult scientific problems will foster mutual understanding. In one case, that of the Geneva organization, it has even been possible to reach an agreement between a number of different nations for building a common laboratory and for constructing by a combined effort the expensive experimental equipment for research in nuclear physics. This kind of cooperation will certainly help to establish a common attitude toward the problems of science — common even beyond the purely scientific problems — among the younger generation of scientists. Of course one does not know beforehand what will grow out of the seeds that have been sown in this way when the scientists return to their old environments and again take part in their own cultural traditions. But one can scarcely doubt that the exchange of ideas between young scientists of different countries and between the different generations in every country will help to approach without too much tension that new state of affairs in which a balance is reached between the older traditional forces and the inevitable necessities of modern life. It is especially one feature of science which makes it more than anything else suited for establishing the first strong connection between different cultural traditions. This is the fact that the ultimate decisions about the value of a specific scientific work, about what is correct or wrong in the work, do not depend on any human authority. It may sometimes take many years before one can distinguish between truth and error ; but finally the questions will be decided, and the decisions are made not by any group of scientists but by nature itself. Therefore, scientific ideas spread among those who are interested in science in an entirely different way from the propagation of political ideas.

While political ideas may gain a convincing influence among great masses of people just because they correspond or seem to correspond to the prevailing interests of the people, scientific ideas will spread only because they are true. They are objective and final criteria assuring the correctness of a scientific statement.

All that has here been said about international cooperation and exchange of ideas would of course be equally true for any part of modern science ; it is by no means confined to atomic physics. In this respect modern physics is just one of the many branches of science, and even if its technical applications — the arms and the peaceful use of atomic energy — attach a special weight to this branch, there would be no reason for considering international cooperation in this field as far more important than in any other field. But we have now to discuss again those features of modern physics which are essentially different

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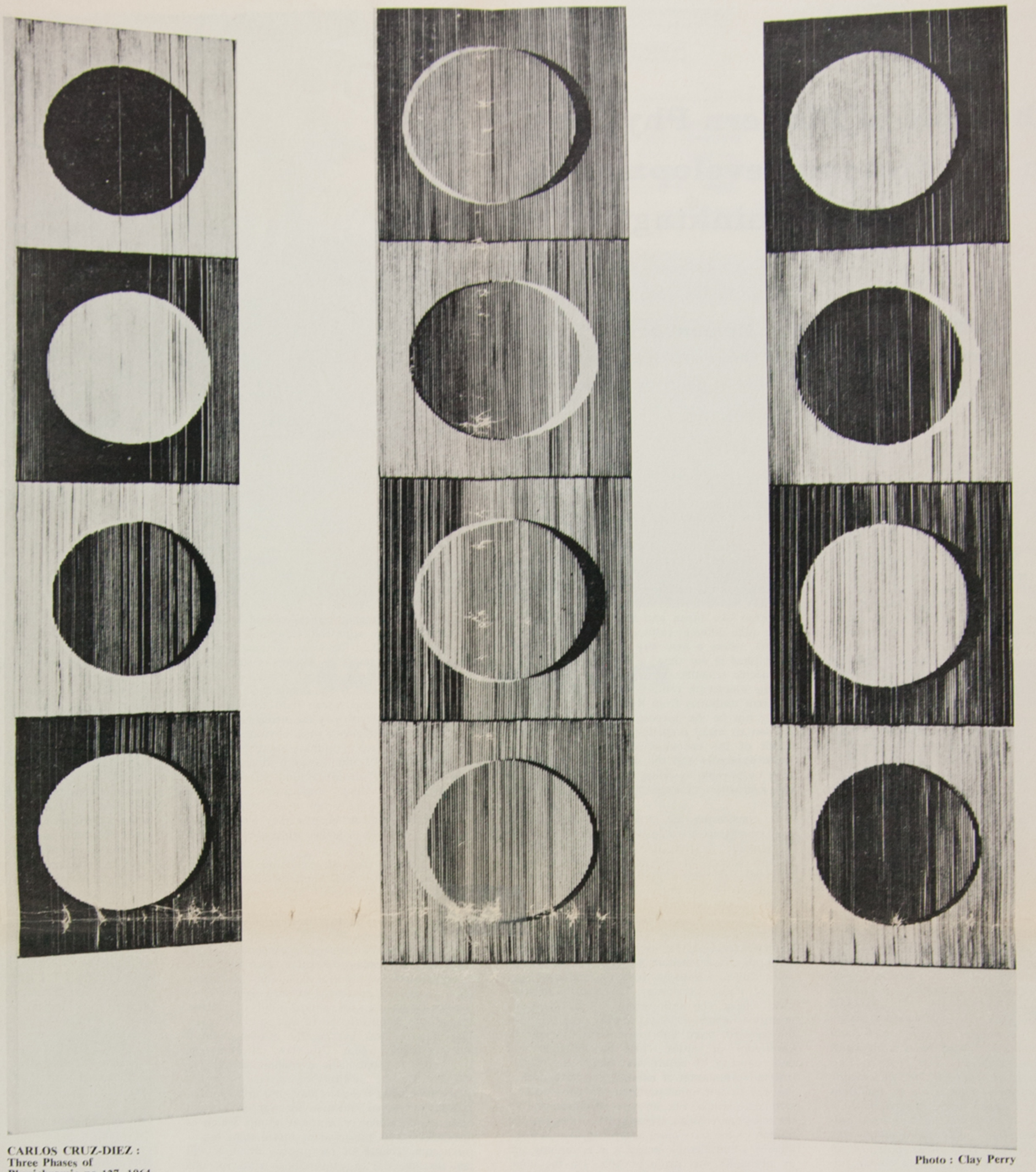


CARLOS CRUZ-DIEZ :
Three Phases of
Physichromie no 127, 1964
viewed from left to right
Collection Lord & Lady Esher, Oxford

Photo : Clay Perry

Carlos Cruz-Diez

was born in Caracas, Venezuela, on the 17th of August, 1923. From 1940 to 1945 he studied at the School of Plastic and Applied Arts of Caracas from which he received the diploma of professor of artistic education and of manual arts. From 1944 to 1955 he was designer of publications for the Creole Petroleum Corporation in Venezuela and from 1946 to 1951 he was director of art of the Venezuelan subsidiary of the McCann-Erickson Advertising Agency. In 1947 Cruz-Diez spent two months in New York, studying advanced techniques of art and publicity. From 1953 to 1955 he was illustrator for the daily 'El Nacional' of Venezuela while, at the same time, he taught the history of applied arts at the School of Arts of Caracas. From 1955 to 1956 Cruz-Diez lived in Barcelona, Spain. During this period he made two trips to Paris and he began intensive studies of the physical qualities of colour. These studies evolved, over a period of ten years, into his now celebrated **physichromies.** Upon his return to Venezuela in 1957, Cruz-Diez opened a studio of visual arts and industrial design in Caracas. At the same time he was appointed designer of publications by the Venezuelan Ministry of Education and designer of the magazine 'El Disco Anaranjado' (The Orange Disc) published by the Mene Grande Oil Company. In 1958 Cruz-Diez was appointed professor and assistant director of the School of Arts of Caracas and in 1959, professor of layout design for fourth year students at the School of Journalism of the Central University of Venezuela. Cruz-Diez held both teaching posts until 1960 when he moved with his family to Paris where he now works.

Carlos Cruz-Diez's exhibition at **SIGNALS LONDON** is his first individual show in Great Britain and the first retrospective exhibition tracing the development of his astonishing **physichromies.** 'Physichromie' is a neologism invented by Cruz-Diez from the words 'physical chromaticism' to denote his low reliefs in which colours are placed in parallel strips and at right angles to each other causing the colours to blend in the spectator's vision whenever the spectator shifts his vision. Thus, the spectator, observing these physichromies, experiences **physical sensations of chromatic changes,** changes so subtle that are not found in conventional non-kinetic abstract or figurative paintings. The colour-areas react in varying intensities to the amount of light which they absorb, refract and reflect. The colours themselves are autonomous, i.e., independent of the variable forms (usually geometric) which they define in time and space, and also independent of the spectator. The motions of the spectator modulate the actual 'reception' of the work.

David Medalla has pointed out that Cruz-Diez's 'physichromies' are a logical development of the researches into the structures of colour made by artists in the last hundred years. Medalla lists three vital contributions Cruz-Diez has made to our aesthetic knowledge of colour: the first is that colours are capable of metamorphosis and thus are not merely static elements of a picture-surface; the second is that colours of different tonal values are capable of mutation; and the third is that the dynamic inter-actions of transparent and opaque colours by means of the interference-principle can create an ambiguous space different from two-dimensional cubist space and the illusionistic space of Renaissance art. The process through which Cruz-Diez made these individual contributions has been a logical one, based on an ordered analysis of observed phenomena. It is also a process which is continuously quickened by one of the most poetic sensibilities at work in today's art.

Carlos Cruz-Diez: Awards and Distinctions

1946 **First Prize,** Alphabetisation Poster Contest, Caracas.
1950 **José Loreto Arismendi Prize,** 11th Official Exhibition of Venezuelan Art.
1950 **Emilio Boggio Prize,** Ateneo de Valencia Exhibition, Venezuela.
1951 **Honorary Mention,** National Journalism Prize, Venezuela.
1952 **Aristides Rojas Prize,** 13th Official Exhibition of Venezuelan Art.
1953 **Enrique Otero Vizcarrondo Prize,** 14th Official Exhibition of Venezuelan Art.
1956 **Third Prize, Planchart Exhibition,** Caracas.

CARLOS CRUZ-DIEZ INDIVIDUAL EXHIBITIONS

1947 **Caracas,** Instituto Venezolano Americano.
1955 **Caracas,** Museum of Fine Arts of Caracas.
1956 **Madrid,** Spain, Bucholz Gallery.
1960 **Caracas,** Museum of Fine Arts of Caracas.
Central University of Venezuela, Faculty of Architecture.
1965 **Genoa,** Italy: Galleria La Polena.
Turin, Italy: Galleria Il Punto.
London: SIGNALS LONDON: first London exhibition: A Decade of Physichromies by **Carlos Cruz-Diez** organised by **Paul Keeler.**

International Collective Exhibitions in which Cruz-Diez participated

1953 **Biennale de Sao Paulo,** Brazil.
1957 **Biennale de Sao Paulo,** Brazil.
1958 **International Fair of Brussels,** Belgium: Venezuelan Pavillion.
12 Venezuelan Painters: Museum of Modern Art of Mexico.
1961 **Movement Exhibition:** Stedelijk Museum, Amsterdam, Holland.
Movement Exhibition: Moderna Museet, Stockholm, Sweden.
Movement Exhibition: Louisiana Museum, Copenhagen, Denmark.
Carnegie International Exhibition: Pittsburgh, Pennsylvania, USA.
Galerie Iris Clert: Paris.
Galerie Denise René: Paris.
1962 **Galerie Marcel Dupuis:** Paris.
Anti-Peinture: Hessenhuis, Anvers, Belgium.
17 Venezuelan Painters: New York.
17 Venezuelan Painters: Haifa and Tel-Aviv, Israel.
XXXI Biennale of Venice, Italy: Venezuelan Pavillion.
Krit-Punto 2: Palacio de la Virreina, Barcelona, Spain.
Anno 62: Rotterdam, Holland.
Latin American Artists in Paris: Musée d'Art Moderne, Paris.
1963 **Biennale de Sao Paulo,** Brazil.
Nouvelle Tendance: Recherches Continuelles: Galeria Cadario, Milan, Italy.
L'Oeil de Boeuf: Galerie 7, Paris.
Venezuela: from landscape to plastic expression, a travelling exhibition sponsored by the Fina Gomez Foundation: Le Havre, Geneva, Madrid and Barcelona.
Nove Tendencije 2: Zagreb, Yugoslavia.
Esquisse d'un Salon: Galerie Denise René, Paris.
Transition: Galerie Ravenstein, Brussels.
L'aujourd'hui de demain: Palais Saint Vasst, Arras, France.
1964 **First Pilot Show of Kinetic Art: SIGNALS LONDON.**
Nouvelle Tendance: Leverkusen and Dusseldorf, Germany.
Nouvelle Tendance: Musée des Arts Decoratifs, Paris.
Festival dei due mondi: Spoleto, Italy.
Second Pilot Show of Kinetic Art: SIGNALS LONDON.
II Biennale of American Art: Cordoba, Argentina.
20 South American Artists: a travelling exhibition sponsored by the Kaiser Foundation: Mexico City; Oakland, California; and New York.
Cruz-Diez, Soto, Bury and Kramer: Galerie Kerchache, Paris.
First Festival of Modern Art from Latin America: SIGNALS LONDON.
Venezuelan Art Today, an exhibition sponsored by the Neumann Foundation: Bielefeld, Germany.
Mouvement 2: Galerie Denise René, Paris.
1965 **Anthology of Kinetic Sculpture and Perceptual Art: SIGNALS LONDON.**
Art and Movement, an international exhibition sponsored by the Scottish Committee of the British Arts Council: **Royal Scottish Academy,** Edinburgh, and **Kelvingrove Art Museum,** Glasgow.
The Responsive Eye: The Museum of Modern Art, New York.
Aktuell 65: Bern, Switzerland.
Kinetic Art, Spatial Art, Spatial Exploration Machines: Midland Group of Artists, Nottingham.
De Nieuwe Stijl: Galerij de Bezige Bij, Amsterdam.
Light and Movement: Kunsthalle of Berne, Switzerland.
ArtScience: Link Week Exhibition 1965: University of Liverpool Students Union, Liverpool.
Sonomontage: Hampstead Festival of Arts: London.
Salon de Mai: Paris.
Art and Movement: Museum of Tel-Aviv, Israel.
Perpetual Motion: Galeria del Obelisco, Rome.
Latin-American Artists in Paris: Musée d'Art Moderne, Paris.
De l'art construit au mouvement: Galerie Denise René, Paris.
Group Exhibition: Galerie Kerchache, Paris.
Movement: a touring exhibition: Galerie Bleu, Stockholm; Museum of Gavlo; and Museum of Norrkoping, Sweden.
Soundings Two: an international exhibition of modern art from the pioneers of abstraction to today's most significant exponents of kinetic, optical and elemental art: **SIGNALS LONDON.**
Selections from Soundings Two: Eton College, Windsor.

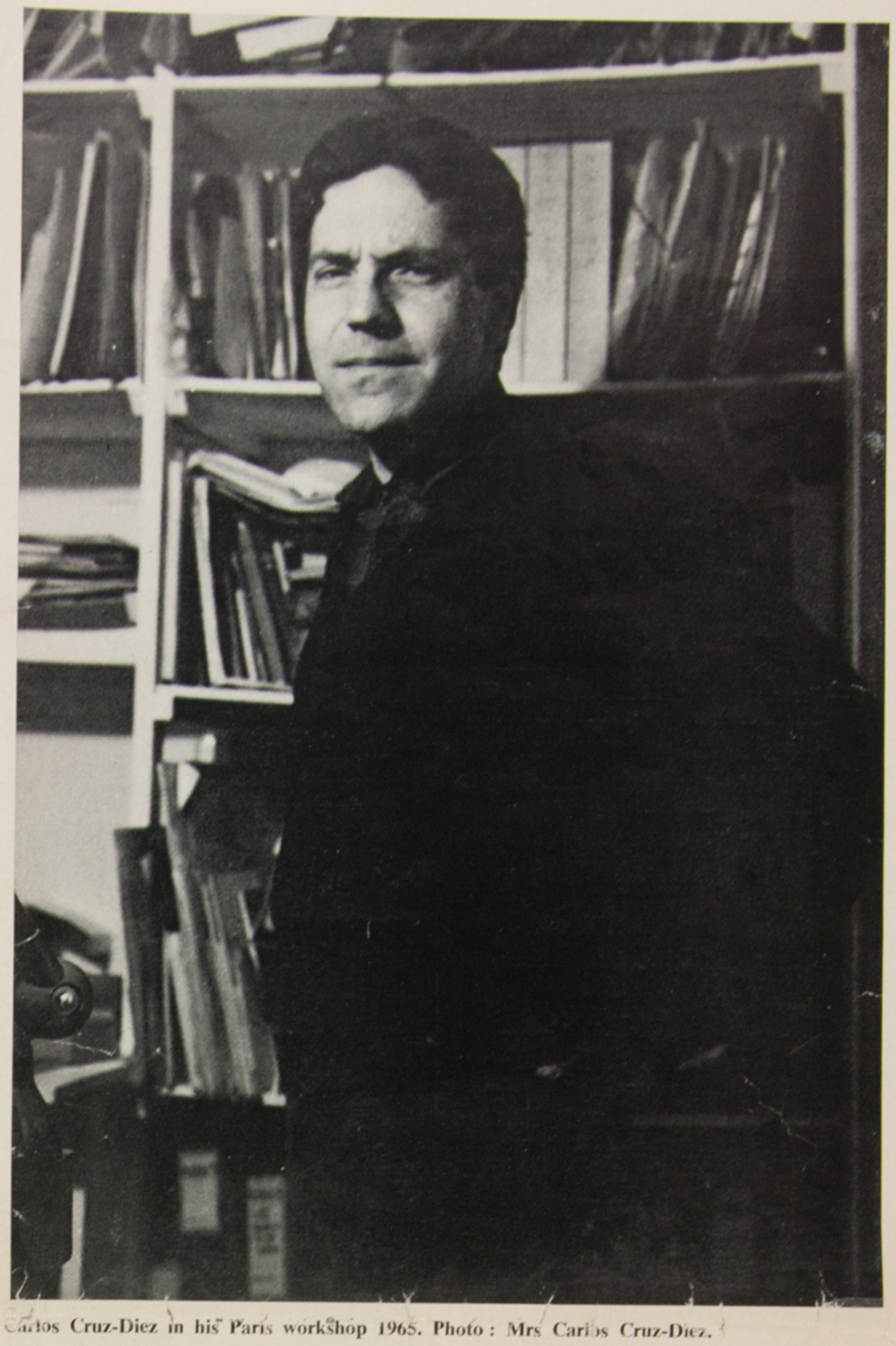
Collective Exhibitions in Venezuela in which Cruz-Diez participated

1946 **Annual Salon of the Ateneo de Valencia.**
1947 **National Salon of Venezuelan Art.**
Inaugural Exhibition of the Taller Libre de Arte, Caracas.
1948 **Collective Exhibition of the Taller Libre de Arte,** Caracas.
1950 **Annual Salon of the Ateneo de Valencia.**
1951 **Salon Planchart,** Caracas.
Annual Salon of the Ateneo de Valencia.
1954 **Salon Planchart,** Caracas.
1956 **Salon Planchart,** Caracas.
1958 **First Salon of Abstract Art,** Galeria Don Hatch, Caracas.
1959 **Salon Cristobal Mendoza,** Valera.
Retrospective Exhibition of National Prize-Winners in Art, Caracas.
1960 **Subasta Exhibition,** Sala Mendoza, Caracas.
1961 **Venezuelan Painting from 1661 to 1961,** Caracas.
1963 **Second Biennale 'Armando Reveron',** Caracas.

The following films have been made on the art of CRUZ-DIEZ :
La Pintura en Venezuela. Ministry of Education, Caracas. Eastman-colour. 16 mm. Caracas, 1958.
Fisicromias de Carlos Cruz-Diez por Angel Hurtado (director). Eastman-colour. 16 mm. Caracas, 1960.
Latin American Art Today. A film made by the Central Office of Information, London, with the cooperation of **SIGNALS LONDON.** Black & White. 16 mm & 35 mm. London, 1964.
Angel Hurtado's film on Cruz-Diez and another film on J. R. Soto's 'Vibrations' were shown at the Institute of Contemporary Arts in a lecture on kinetic art given there by Frank Popper early this year. The Cruz-Diez film will again be shown in September at the showrooms of **SIGNALS LONDON;** in October at the Penwith Society of Arts, St. Ives, Cornwall; and at Eton College, Windsor, during the exhibition **Selections from Soundings Two,** also in October. The film on Latin American Art Today made by the Central Office of Information is currently being shown on various television programmes and by mobile film units all over the world.

Works by Carlos Cruz-Diez are in the permanent collections of the Victoria and Albert Museum, London; the Casa de la Cultura of Havana, Cuba; the Stadtisches Museum of Leverkusen, Germany; the Museum of Fine Arts of Caracas, Venezuela; the Fundacion Fina Gomez, Paris; and the Neumann Foundation of Venezuela.

The following persons also own works by Carlos Cruz-Diez :
Mr and Mrs Carlo Belloli, Milan; Mr Jorge Bezara, Caracas; Mr Jean Clay, Paris; Dr V. Cotlenko, Paris; Mrs Lucia Delgado, Paris; Mr & Mrs Paul Elek, London; Lord & Lady Esher, Oxford; Mr Lira Espejo, Caracas; Mrs Mariela de Figueredo, Paris; Dr & Mrs Owen Franklin, London; Mr John Fraser, Somerset; Mrs Fina Gomez, Paris; Mr Konrad Gromholt, Oslo; Mr & Mrs Rafael Angel Insausti, Paris; Mr & Mrs Jose Jimenez, Caracas; Mr Alberto Junyent, Paris; Mr Paul Keeler, Windsor; Dr & Mrs Luis Kremp, Paris; Mr & Mrs McLachlan, Hongkong; Mr Henrique Machado, Caracas; Mr Géronimo Marcano, Caracas; Mr Robert Mayer, Boston; Mr Rodolfo Moleiro, Caracas; Mr Hans Neumann, Caracas; Mr Lotar Neumann, Caracas; Mr Jean Noel, Caracas; Mr Nordstrom, Malmo; Sweden; Mrs Irma Orellana, Caracas; Mr Miguel Otero Silva, Caracas; Mr Armando Perez, Valencia, Venezuela; Mr Leonce Petitot, Arras, France; Mr & Mrs Hector Poleo, Paris; Mr Frank Popper, Paris; Mr Karl K. Ringstrom, Oslo; Dr Maria Rivas, Caracas; Dr René Rojas L., Caracas; Mrs Aline Saarinen, New York; Mr & Mrs Jésus-Rafael Soto, Paris; Mr & Mrs Aby Sujo, Caracas; Mr David Talbot-Rice, London; Dr A. Tomatis, Paris; Mr Gonzalo Ulivi, Caracas; Mr Silvio Ulivi, Caracas; Mr Robert Urbye, Oslo; Dr E. Vivas, Caracas; Mr Wasserman, Boston; and others.



Carlos Cruz-Diez in his Paris workshop 1965. Photo : Mrs Carlos Cruz-Diez.

PHOTO-STRIP CRUZ-DIEZ

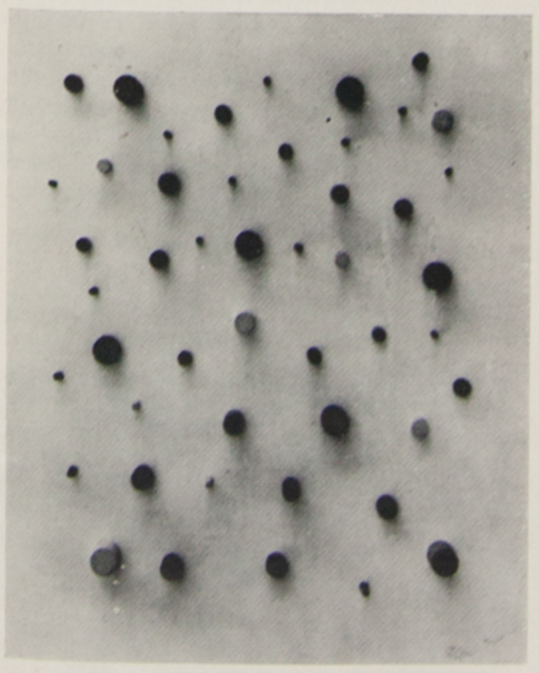
1954-1965

It is ridiculous to have to explain our own work. People should accept it or reject it, but they should at least make an effort to discover it. I don't know whether a painter's work needs an explanation because people suffer collectively from a mental fatigue caused by the tremendous number of different messages thrown at them each day.

Maybe it is because of this fatigue that nowadays everyone tries to explain or justify things that simply cannot be explained or justified. The plastic arts are inexplicable. They exist in time and in space. This I believe.

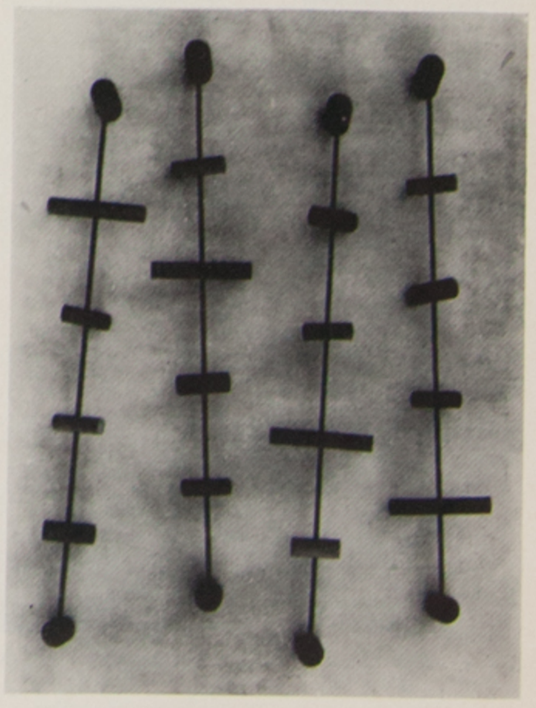
The principle of experimentation has always guided my work. All my works are based on experiments in Physics but these experiments are valuable to me only in so far as they help to create a plastic object, a visual event. I have deliberately not referred to 'expression', because I think that no one is interested in my expression but only in the plastic object that I may be able to create.

Here I will try to tell you about my work in the last ten years, how it was done, the materials I used and what were my objectives.



1 — *Project for an outside mural.* Caracas, 1954
Coloured cylinders, of different heights and diameters, pasted on a white background. Colouration of the background by means of colour reflection. Projection of shadows.

CRUZ-DIEZ



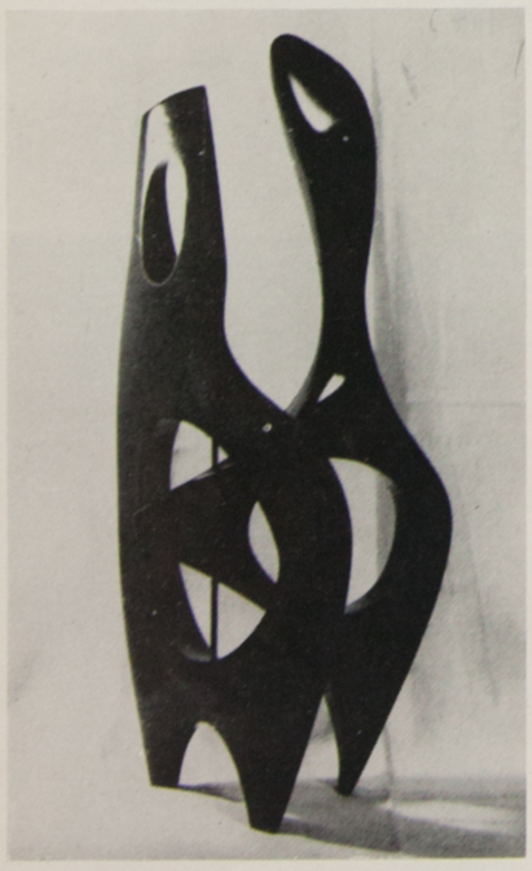
2 — *Project for a movable outside mural.* Caracas, 1954
Several cylinders of different sizes, coloured and pierced by copper axes which the viewer can manipulate and thus modify the rhythm of the structure.

please continue next page

PHOTO-STRIP CRUZ-DIEZ *cont'd from p5*

3 — *For a yellow wall.* Masnou, Spain, 1955
Oil on canvas. Background painted with a roller so as to preserve a fresh, clean colour. Superimposition of screens of forestal signs of sufficient contrast to give a multi-plane effect.
From October 1955 up to July 1956 I lived in a small coastal village, twelve kilometres north of Barcelona, Spain. There I tried a stylization of the patterns made by the branches of trees.

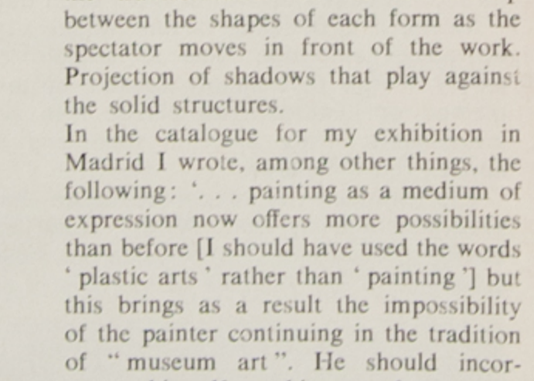
4 — *Signs written on blue.* Masnou, Spain, 1956
I completed a series of thirty-five works, twenty of which were shown at an exhibition in the Buchholz Gallery, Madrid, in May 1956. In some of these I tackled the problem of colour vibration.



5 — *Mobile rhythmic object.* Masnou, Spain, 1956
Wooden objects lacquered in black, supported on a revolving stand. The internal forms are also made of wood and also revolve, but one is covered with aluminium and the other one with copper.
I made several works with motion as my objective and also the active participation of the spectator.

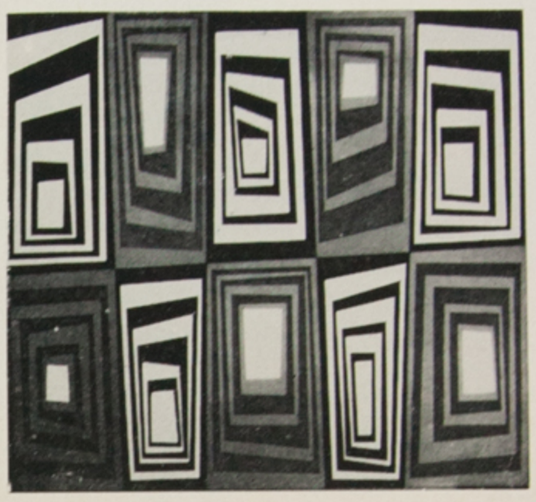
6 — *Mobile rhythmic object.* Masnou, Spain, 1956
Forms in wood: one red and the other black; one revolving on a copper axis fixed to the other one. A three-dimensional representation of the shapes previously used on canvas.

7 — *Signs in relief for a mural.* Masnou, Spain, 1956
Two forms in metal: one yellow and the other one blue, set against a white background. The intention of this work is the transformation of the relationship between the shapes of each form as the spectator moves in front of the work. Projection of shadows that play against the solid structures.
In the catalogue for my exhibition in Madrid I wrote, among other things, the following: '. . . painting as a medium of expression now offers more possibilities than before [I should have used the words 'plastic arts' rather than 'painting'] but this brings as a result the impossibility of the painter continuing in the tradition of "museum art". He should incorporate himself to this era of great discoveries in which we live; the age of the machine and of standardization, which has brought with it new materials which permit many more forms of expression.'

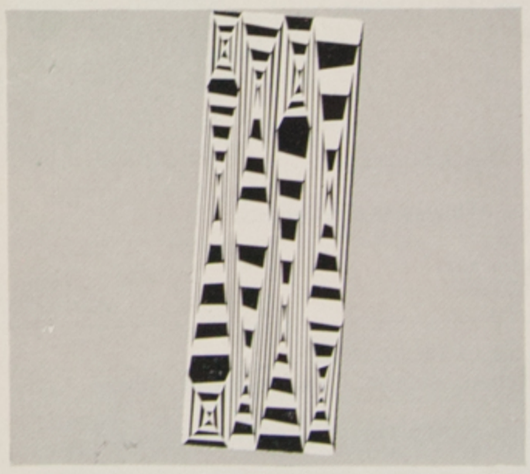


8 — *Signs and rhythms.* Caracas, 1957
Tempera on canvas. Shapes of violent colour with superimposed lineal structures that give the optical effect of relief.

9 — *Surface in motion.* Caracas, 1957
A multiple structure of trapeziums in black lines. The rhomboidal forms are produced by the diagonals of the trapeziums; colour is placed to emphasize these forms. Effect of a changing image: the fatigue of the eye causes one shape to eliminate the others.
On my return to Caracas I continued the investigation of the kinetic problem and of colour through the study of colour reproduction in photography and the graphic arts.



10 — *Space in motion.* Caracas, 1958
Unstable surface produced by the vibration, between red and green and the irregularity of the design.

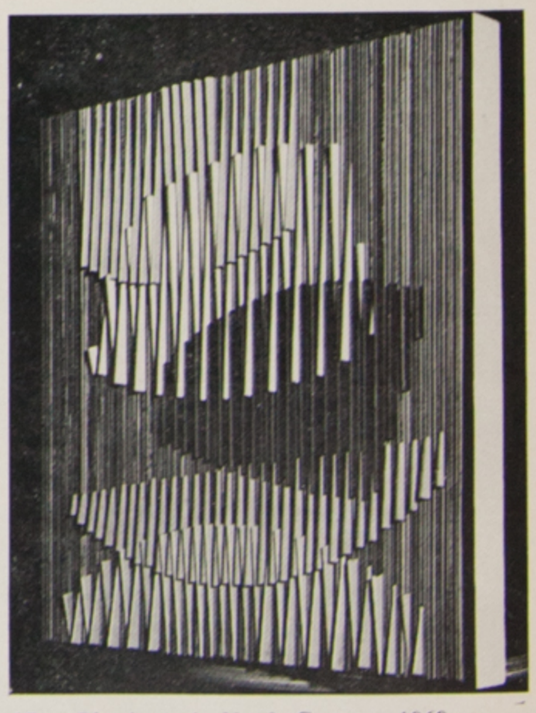


11 — *Vibration in space.* Caracas, 1958
Persistence of the image in the retina. On the dark background the central image is repeated as if by a series of flash-backs.

12 — *Chain construction.* Caracas, 1958
Variation on the same proposition as No 10.

13 — *Colour radiation.* Caracas, 1959
Deformity produced by the eye's perception of acute and right angles. Also, the influence of colour lines on a given surface. This work led me to experiment with colour radiation and reflected colour and also to investigate the phenomena of interference and 'moiré' produced by frames.

14 — *Physicromie No 1 (physical colour).* Caracas, 1959
Surface of additional colour. I used red and green as the only primary colours and white and black as light-modulators.



15 — *Physicromie No 3.* Caracas, 1960
The solution I found with more plastic possibilities for taking the most advantage of colour reflection, was that of constructing a surface made of parallel blades, spaced regularly. The slant of these blades controls the admission of light. The result thus obtained is that of a changing chromatic atmosphere and not that of plain colour simply painted on with a brush.

please turn to page 9

from **Le Dauphine Liberé,**
Grenoble, 16.IX.1963

Carlos CRUZ-DIEZ's field of attack is the world of optical illusion, but like Ganzo in his poems, the painter of Caracas rediscovers in his compositions the embracing mystery of his country.

His works reveal themselves in scent, like the flowers in a peacock's tail, like the corolla of a plant which opens only for those who can pierce its mystery.

Here the light is enclosed within the painting, created by a network of parallel wooden strips all separated by a space in which geometrical figures or voluntary simplified figures are inscribed.

Seen from in front, the strips in relief, between which the motif is hidden, are all the same colour as the background. The painting looks like an inert surface. But as soon as one moves in front of it, the colours build up, sing, and fade away. Like a rare species, Cruz-Diez's work opens and closes, lives and palpitates like a mysterious flower.

The world of the tropical rain-forest suddenly emerges and one thinks of these unknown landscapes where the poet guides us, and where Cruz-Diez's vision is focused.

René Deroudille

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from **Le Peuple,**
Brussels, 7.I.1964

CRUZ-DIEZ. This Venezuelan artist matches, by the general composition of his works, the very strict discipline of geometrical abstracts. What is more, the motive lines of his work are generally horizontal and vertical; but that is in fact only paving the way for a more astonishing result. By means of wooden strips strictly perpendicular to the canvas and painted up to critically calculated lines, the work changes colour and even form according to the angle of vision. These chromatic changes which amplify the structure are fascinating because of the limitless variety of nuances. The expression of this carefully ordered whole becomes lyrical for the hollow areas between the coloured rods vibrate through the conflicts and mixtures of colours which the eye can no longer detect.

André Lemoine

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from **El Universal,**
Caracas, 14.VII.1964

Cruz-Diez, Colorista

por Alberto Junyent

. . . **Cruz-Diez** — que es un excelente diagramador de artes gráficas — pondera también con un tino muy feliz el proporcionamiento compositivo de las formas, pero les sobrepone la magia romántica o dionisíaca de un delicioso colorismo.

Muy pocos artistas han meditado y analizado tan a fondo como él los problemas de la cromática. Y las **fisicromías** nos brindan sus hallazgos colorísticos mediante la yuxtaposición de una infinidad de laminillas coloreadas que, sobre el sustentaculo de un plano rígido, él acomoda de canto en verticales estrías paralelas, con una paciencia benedictina y una pulcritud chinesca.

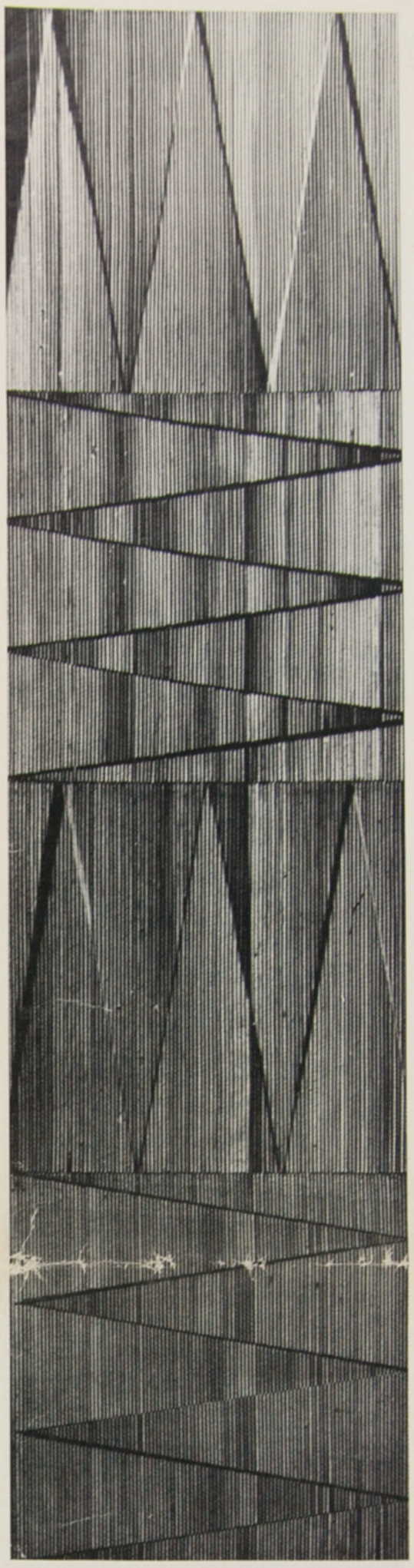
Movido por el típico rigorismo de los neófitos, en un comienzo quiso operar únicamente con un color primario, el rojo, y un color binario, el verde. Entre los mimos se intercalaban algunas laminillas blancas (sintesis de todas las coloraciones) y negras (carencia de color) a fin de intensificar los reflejos con las primeras o bien absorberlos con las segundas. Pronto, empero, esa austera metodología se le reveló excesivamente restringida en sus posibilidades, por cuanto el color, en estética, tiene alcances y exigencias distintos a los que interesan en el laboratorio de fisica y en la pantalla del espectro solar. Aleccionado por esta experiencia, el indagador ha ido enriqueciendo poco a poco aquellas gamas simplistas con múltiples tonos quebrados que él estudia, dosifica, interpone e integra con una sensibilidad y una sapiencias sobresalientes. Color proteico, maleable, fugaz, obtenido con inteferencias de reflejos tan bien ordenados, tan armoniosos, que sobrepasan en amplitud y finura las irisaciones de los nácares más bellos. . . .

Paris, 7.VII.1965
from **Carrefour,**

The centre of attraction is the 'visual art' group. Here the Latin-Americans appear as pioneers rather than as followers. Through artists like CRUZ-DIEZ, Martha Boto, Garcia-Rossi, Contreras, Soto, Vardanega, Le Parc, Sobrino, Demarco, the transposition of the pictorial or sculptural language into the realm of space-time, of light, movement, and sound as well has gained an absolute and convincing authenticity. Exactitude within the imagination, discipline in freedom, the most ingenious technique linked with boldness of conception, here we have a new art, autonomous art — an art in itself, which already has its own vocabulary, syntax, style.

If Latin-America has taken much from Europe, she has contributed in her turn a means of expression whose infinite possibilities are only becoming apparent.

Frank Elgar



Carlos Cruz-Diez : Physichromie no 126, 1964

Christiaan Huygens
On the Motion of Light

from *The Treatise on Light* by Christiaan Huygens, written in France in A.D. 1678, and communicated to the Netherlands Royal Academy of Science in the same year by its author. Translated from the Latin by Silvanus P. Thompson, 1912.

It is inconceivable to doubt that light consists in the motion of some sort of matter. For whether one considers its production, one sees that here upon the Earth it is chiefly engendered by fire and flame which contain without doubt bodies that are in rapid motion, since they dissolve and melt many other bodies, even the most solid; or whether one considers its effects, one sees that when light is collected, as by concave mirrors, it has the property of burning as a fire does, that is to say it disunites the particles of bodies. This is assuredly the mark of motion, at least in the true Philosophy, in which one conceives the causes of all natural effects in terms of mechanical motions. This, in my opinion, we must necessarily do, or else renounce all hopes of ever comprehending anything in Physics.

And as, according to this Philosophy, one holds as certain that the sensation of sight is excited only by the impression of some movement of a kind of matter which acts on the nerves at the back of our eyes, there is here yet one reason more for believing that light consists in a movement of the matter which exists between us and the luminous body.

Further, when one considers the extreme speed with which light spreads on every side, and how, when it comes from different regions, even from those directly opposite, the rays traverse one another without hindrance, one may well understand that when we see a luminous object, it cannot be by any transport of matter coming to us from this object, in the way in which a shot or an arrow traverses the air; for assuredly that would too greatly impugn these two properties of light, especially the second of them. It is then in some other way that light spreads; and that which can lead us to comprehend it is the knowledge which we have of the spreading of Sound in the air.

We know that by means of the air, which is an invisible and impalpable body, Sound spreads around the spot where it has been produced, by a movement which is passed on successively from one part of the air to another; and that the spreading of this movement, taking place equally rapidly on all sides, ought to form spherical surfaces ever enlarging and which strike our ears. Now there is no doubt that light also comes from the luminous body to our eyes by some movement impressed on the matter which is between the two; since, as we have already seen, it cannot be by the transport of a body which passes from one to the other. If, in addition, light takes time for its passage — it will follow that this movement, impressed on the intervening matter, is successive; and consequently it spreads, as Sound does, by spherical surfaces and waves; for I call them waves from their resemblance to those which are seen to be formed in water when a stone is thrown into it, and which present a successive spreading as circles, though these arise from another cause, and are only on a flat surface.

JOHN NEWELL ON SCIENCE, 7

Blue Galaxies

American astronomers, at Mount Wilson and Palomar observatories, have announced that they have discovered a new kind of galaxy in the universe. The new discovery suggests that the whole universe may be alternately expanding and contracting, in other words pulsating.

The new galaxies are not actually newly discovered. They have been visible to powerful telescopes for many years — at least some of them have. But until now they have been thought of as being not galaxies, each of hundreds of millions of stars, but *single* stars, much closer to us than the galaxies actually are. In fact, these blue galaxies (from the colour of their light) or quasi-stellar galaxies (because they were mistaken for single stars) were previously thought to be stars actually within our own galaxy, the Milky Way, and thus relatively speaking neighbours in space since there are thousands of millions of galaxies like our own in the universe. Now some of the blue galaxies are believed to be near to the frontier of the observable universe. In order to be so clearly visible at such a distance, the galaxies must be giving out light energy at up to a hundred times the rate of an ordinary galaxy; their brilliance indeed is why it was thought for so long that they must be very close.

In the tremendous power of their radiation, the blue galaxies resemble the recently discovered quasi-stars, although, unlike the quasi-stars, they do not appear to be powerful radio sources.

The really important thing about the blue galaxies is that, because they are so brilliant, they can be seen at very great distances. Dr Allan Sandage, the American astronomer who reported the discovery, said that one blue galaxy already observed was only slightly less than half-way from our own galaxy to the boundary of the observable universe. He believes that others will be visible as far away as nine-tenths of the distance to that boundary.

The boundary of the universe is a phrase which needs explaining. At present every galaxy in the universe is moving away from every other galaxy as though they were all spots on the surface of a balloon which was being blown up. The more distant a galaxy is from our own, the faster it and our own galaxy are moving apart. At a sufficiently great distance the two will be moving apart at the speed of light, and thus become no longer able to see each other, or to pick up any form of radiation from each other, since nothing can travel faster than light. This distance out from our own galaxy, in every direction, is the boundary of universe observable to us. As the universe expands, more and more galaxies are rushing headlong over that border, lost for ever to human observers, or any other observers in our galaxy, no matter how advanced their telescopes may be.

But, says Dr Sandage, they may *not* be lost for ever. One day — actually in twenty-nine thousand million years' time — the expanding universe will stop expanding and will start to contract. It will rush in on itself for the next forty-one thousand million years, until the pressure of the contracted universe provokes a cosmic catastrophe, a sort of super-super-nova explosion, and the universe explodes and starts to expand again. And so on *ad infinitum*. This is the theory of the pulsating universe.

The only way in which such deductions about the nature of the universe can be made is by finding out what has happened to the universe in the past. The distant galaxies give us a convenient way of doing this. They are so far away that the light or radio waves from them take thousands of millions of years to reach us. Thus we see them, not as they *are* but as they *were*, and the farther away they are the older is the sample of the universe we are looking at.

This is the real value of the blue galaxies. They are so bright that they can be seen at very great distances and so, by using them, astronomers can look very far back into time, further than either optical or radio telescopes have been able to look so far. The farther away we are able to look, the larger is the sample of the universe we are examining, because we are, so to speak, examining the successive rings of an onion out from the centre, each one larger than the last. Thus, although this discovery is relatively new, the astronomers have already made some deductions from it. They have concluded that, at the time when the distant blue galaxies gave off the light we are seeing now, the universe was not the same as it is now. Specifically, it was expanding faster at that time. This observation supports the idea of a pulsating universe, with the momentum of the original explosion being used up until eventually the galaxies will stand still, and then begin to fall towards each other again.

Some other astronomers believe that Sandage has been over-hasty in making this deduction from the relatively few blue galaxies which he has catalogued so far. But whether or not the astronomers have already proved that the universe is changing with time, everyone agrees that they will soon have the opportunity of doing so. It seems likely that there are as many as one hundred thousand distant blue galaxies within the range of the largest telescopes. If the distance of each of these is measured, and the rate at which they were moving apart from each other when their light left them is also measured, it should soon be possible to calculate fairly simply whether the expansion of the universe has always gone on at the same rate or whether it is slowing down.

It should also be possible to calculate from the blue galaxies whether the galaxies were closer together thousands of millions of years ago, or whether their spacing has always remained constant. This is important, because one theory of the universe, the so-called steady state theory, says that the density of the galaxies has always been the same in spite of the expansion of the universe, because new matter has been created to fill in the gaps between the galaxies as they fly apart. On this theory the rate of expansion should be constant. So Dr Sandage's declaration that it is not constant may be what Professor Martin Ryle called it, 'Another nail in the coffin of the Steady State Theory'.

Pero no más allá

por *José Angel Valente*

Pero no más allá, no debo herirte,
no debo herirte más cuando me acerco
con palabras de amor hasta los bordes.

Pero no debo herirte. . . .
A veces cuando
me acerco a ti con tanto amor escondo
en lo profundo un áspid, un veneno,
un agudo cuchillo que ignoraba
y que hiere al amor donde más duele.

A veces pongo esta palabra: pan,
sobre la mesa y suena a muerte, pongo
la palabra amistad y alguien levanta
el brazo armado para defenderse.

Pienso en amor y algo tus labios hiere,
pronuncio luz y lejos gime el día:
algo que mata el corazón oculta,
algo que entre el amor yace y de pronto
puede matar, herir cuando no quiero.

Cuántas veces he dicho vida y cuántas
tal vez muerte escondía sin saberlo,
cuántas habré cegado la esperanza,
cuántas, creyendo luz, habré arrojado
palabras, piedras, sombras, noche y noche
hacia el sol que amo tanto.

Heisenberg on Physics & Philosophy continued from page 3

from the previous development of natural science, and we have for this purpose once more to go back to the European history of this development that was brought about by the combination of natural and technical sciences.

It has been frequently discussed among the historian whether the rise of natural science after the sixteenth century was in any way a natural consequence of earlier trends in human thinking. It may be argued that certain trends in Christian philosophy led to a very abstract concept of God, that they put God so far above the world that one began to consider the world without at the same time also seeing God in the world. The Cartesian partition may be called a final step in this development. Or one may point out that all the theological controversies of the sixteenth century produced a general discontent about problems that could not really be settled by reason and were exposed to the political struggles of the time; that this discontent favoured interest in problems which were entirely separated from theological disputes. Or one may simply refer to the enormous activity, the new spirit that had come into the European societies through the Renaissance. In any case during this period a new authority appeared which was completely independent of Christian religion or philosophy or of the Church, the authority of experience, of the empirical fact. One may trace this authority back into old philosophical trends, for instance, into the philosophy of Occam and Duns Scotus, but it became a vital force of human activity only from the sixteenth century onward. Galileo did not only *think* about the mechanical motions, the pendulum and the falling stone; he tried out by experiments, quantitatively, how these motions took place. This new activity was in its beginning certainly not meant as a deviation from the traditional Christian religion. On the contrary, one spoke of two kinds of revelation of God. The one was written in the Bible and the other was to be found in the book of nature. The Holy Scripture had been written by man and was therefore subject to error, while nature was the immediate expression of God's intentions.

However, the emphasis on experience was connected with a slow and gradual change in the aspect of reality. While in the Middle Ages what we nowadays call the symbolic meaning of a thing was in some way its primary reality, the aspect of reality changed toward what we can perceive with our senses. What we can see and touch became primarily real. And this new concept of reality could be connected with a new activity: we can experiment and see how things really are. It was easily seen that this new attitude meant the departure of the human mind into an immense field of new possibilities, and it can well be understood that the Church saw in the new movement the dangers rather than the hopes. The famous trial of Galileo in connection with his views on the Copernican system marked the beginning of a struggle that went on for more than a century. In this controversy the representatives of natural science could argue that experience offers an undisputable truth, that it cannot be left to any human authority to decide about what really happens in nature, and that this decision is made by nature or in this sense by God. The representatives of the traditional religion, on the other hand, could argue that by paying too much attention to the material world, to what we perceive with our senses, we lose the connection with the essential values of human life, with just that part of reality which is beyond the material world. These two arguments do not meet, and therefore the problem could not be settled by any kind of agreement or decision.

In the meantime natural science proceeded to get a clearer and wider picture of the material world. In physics this picture was to be described by means of those concepts which we nowadays call the concepts of classical physics. The world consisted of things in space and time, the things consist of matter, and matter can produce and can be acted upon by forces. The events follow from the interplay between matter and forces; every event is the result and the cause of other events. At the same time the human attitude toward nature changed from a contemplative one to a pragmatic one. One was not so much interested in nature as it is; one rather asked what one could do with it. Therefore, natural science turned into technical science; every advancement of knowledge was connected with the question as to what practical use could be derived from it. This was true not only in physics; in chemistry and biology the attitude was essentially the same, and the success of the new methods in medicine or in agriculture contributed essentially to the propagation of the new tendencies.

In this way, finally, the nineteenth century developed an extremely rigid frame for natural science which formed not only science but also the general outlook of great masses of people. This frame was supported by the fundamental concepts of classical physics, space, time, matter and causality; the concept of reality applied to the things or events that we could perceive by our senses or that could be observed by means of the refined tools that technical science had provided. Matter was the primary reality. The progress of science was pictured as a crusade of conquest into the material world. Utility was the watchword of the time.

On the other hand, this frame was so narrow and rigid that it was difficult to find a place in it for many concepts of our language that had always belonged to its very substance, for instance the concepts of mind, of the human soul or of life. Mind could be introduced to the general picture only as a kind of mirror of the material world; and when one studied the properties of this mirror in the science of psychology, the scientists were always tempted — if I may carry the comparison further — to pay more attention to its mechanical than to its optical properties. Even there one tried to apply the concepts of classical physics, primarily that of causality. In the same way life was to be explained as a physical and chemical process, governed by natural laws, completely determined by causality. Darwin's concept of evolution provided ample evidence for this interpretation. It was specially difficult to find in this framework room for those parts of reality that had been the object of the traditional religion and seemed now more or less only imaginary. Therefore, in those European countries in which one was wont to follow the ideas up to their extreme consequences, an open hostility of science toward religion developed, and even in the other countries there was an increasing tendency towards indifference toward such questions; only the ethical values of the Christian religion were excepted from this trend, at least for the time being. Confidence in the scientific method and in rational thinking replaced all other safeguards of the human mind.

Coming back now to the contributions of modern physics, one may say that the most important change brought about by its results consists in the dissolution of this rigid frame of concepts of the nineteenth century. Of course many attempts had been made before to get away from this rigid frame which seemed obviously too narrow for an understanding of the essential parts of reality. But it had not been possible to see what could be wrong with the fundamental concepts like matter, space, time and causality that had been so extremely successful in the history of science. Only experimental research itself, carried out with all the refined equipment that technical science could offer, and its mathematical interpretation, provided the basis for a critical analysis — or, one may say, enforced the critical analysis — of these concepts, and finally resulted in the dissolution of the rigid frame.

This dissolution took place in two distinct stages. The first was the discovery, through the theory of relativity, that even such fundamental concepts as space and time could be changed and in fact must be changed on account of new experience. This change did not concern the somewhat vague concepts of space and time in natural language; but it did concern their precise formulation in the scientific language of Newtonian mechanics, which had erroneously been accepted as final. The second stage was the discussion of the concept of matter enforced by the experimental results concerning the atomic structure. The idea of the reality of matter had probably been the strongest part in that rigid frame of concepts of the nineteenth century, and this idea had at least to be modified in connection with the new experience. Again the concepts so far as they belonged to the natural language remained untouched. There was no difficulty in speaking about matter or about facts or about reality when one had to describe the atomic experiments and their results. But the scientific extrapolation of these concepts into the smallest parts of matter could not be done in the simple way suggested by classical physics, though it had erroneously determined the general outlook on the problem of matter.

These new results had first of all to be considered as a serious warning against the somewhat forced application of scientific concepts in domains where they did not belong. The application of the concepts of classical physics, e.g., in chemistry, had been a mistake. Therefore, one will nowadays be less inclined to assume that the concepts of physics, even those of quantum theory, can certainly be applied everywhere in biology or other sciences. We will, on the contrary, try to keep the doors open for the entrance of new concepts even in those parts of science where the older concepts have been very useful for the understanding of the phenomena. Especially at those points where the application of the older concepts seems somewhat forced or appears not quite adequate to the problem we will try to avoid any rash conclusions.

Furthermore, one of the most important features of the development and the analysis of modern physics is the experience that the concepts of natural language, vaguely defined as they are, seem to be more stable in the expansion of knowledge than the precise terms of scientific language, derived as an idealization from only limited groups of phenomena. This is in fact not surprising since the concepts of natural language are formed by the immediate connection with reality; they represent reality. It is true that they are not very well defined and may therefore also undergo changes in the course of the centuries, just as reality itself did, but they never lose the immediate connection with reality. On the other hand, the scientific concepts are idealizations; they are derived from experience obtained by refined experimental tools, and are precisely defined through axioms and definitions. Only through these precise definitions is it possible to connect the concepts with a mathematical scheme and to derive mathematically the infinite variety of possible phenomena in this field. But through this process of realisation and precise definition the immediate connection with reality is lost. The concepts still correspond very closely to reality in that part of nature which had been the object of the research. But the correspondence may be lost in other parts containing other groups of phenomena.

Keeping in mind the intrinsic stability of the concepts of natural language in the process of scientific development, one sees that — after the experience of modern physics — our attitude toward concepts like mind or the human soul or life or God will be different from that of the nineteenth century, because these concepts belong to the natural language and have therefore immediate connection with reality. It is true that we will also realize that these concepts are not well defined in the scientific sense and that their application may lead to various contradictions, for the time being we may have to take the concepts, unanalyzed as they are; but still we know that they touch reality. It may be useful in this connection to remember that even in the most precise part of science, in mathematics, we cannot avoid using concepts that involve contradictions. For instance, it is well known that the concept of infinity leads to contradictions that have been analyzed, but it would be practically impossible to construct the main parts of mathematics without this concept.

The general trend of human thinking in the nineteenth century had been toward an increasing confidence in the scientific method and in precise rational terms, and had led to a general scepticism with regard to those concepts of natural language which do not fit into the closed frame of scientific thought — for instance, those of religion. Modern physics has in many ways increased this scepticism; but it has at the same time turned it against the overestimation of precise scientific concepts, against scepticism itself. The scepticism against precise scientific concepts does not mean that there should be a definite limitation for the application of rational thinking. On the contrary, one may say that the human ability to understand may be in a certain sense unlimited. But the existing scientific concepts cover always only a very limited part of reality, and the other part that has not yet been understood is infinite. Whenever we proceed from the known into the unknown we may hope to understand, but we may have to learn at the same time a new meaning of the word 'understanding'. We know that any understanding must be based finally upon the natural language because it is only there that we can be certain to touch reality, and hence we must be sceptical about any scepticism with regard to this natural language and its essential concepts. Therefore, we may use these concepts as they have been used at all times. In this way modern physics has perhaps opened the door to a wider outlook on the relation between the human mind and reality.

This modern science, then, penetrates in our time into other parts of the world where the cultural tradition has been entirely different from the European civilization. There the impact of this new activity in natural and technical science must make itself felt even more strongly than in Europe, since changes in the conditions of life that have taken two or three centuries in Europe will take place there within a few decades. One should expect that in many places this new activity must appear as a decline of the older culture, as a ruthless and barbarian attitude, that upsets the sensitive balance on which all human happiness rests. Such consequences cannot be avoided; they must be taken as one aspect of our time. But even there the openness of modern physics may help to some extent to reconcile the older traditions with the new trends of thought. For instance, the great scientific contribution in theoretical physics that has come from Japan since the last war may be an indication for a certain relationship between philosophical ideas in the tradition of the Far East and the philosophical substance of quantum theory. It may be easier to adapt oneself to the quantum-theoretical concept of reality when one has not gone through the naive materialistic way of thinking that still prevailed in Europe in the first decades of this century.

Of course such remarks should not be misunderstood as an underestimation of the damage that may be done or has been done to old cultural traditions by the impact of technical progress. But since this whole development has for a long time passed far beyond any control by human forces, we have to accept it as one of the most essential features of our time and must try to connect it as much as possible with the human values that have been the aim of the older cultural and religious traditions. It may be allowed at this point to quote a story from the Hasidic religion: There was an old rabbi, a priest famous for his wisdom, to whom all people came for advice. A man visited him in despair over all the changes that went on around him, deploring all the harm done by so-called technical progress. 'Isn't all this technical nuisance completely worthless,' he explained, 'if one considers the real values of life?' 'This may be so,' the rabbi replied, 'but if one has the right attitude one can learn from everything.' 'No,' the visitor rejoined, 'from such foolish things as railway or telephone or telegraph one can learn nothing whatsoever.' But the rabbi answered, 'You are wrong. From the railway you can learn that you may by being one instant late miss everything. From the telegraph you can learn that every word counts. And from the telephone you can learn that what we say here can be heard there.' The visitor understood what the rabbi meant and went away.

Finally, modern science penetrates into those large areas of our present world in which new doctrines were established only a few decades ago as foundations for new and powerful societies. There modern science is confronted both with the content of the doctrines, which go back to European philosophical ideas of the nineteenth century (Hegel and Marx), and with the phenomenon of uncompromising belief. Since modern physics must play a great role in these countries because of its practical applicability, it can scarcely be avoided that the narrowness of the doctrines is felt by those who have really understood modern physics and its philosophical meaning. Therefore, at this point an interaction between science and the general trend of thought may take place. Of course the influence of science should not be overrated; but it might be that the openness of modern science could make it easier even for larger groups of people to see that the doctrines are possibly not so important for the society as had been assumed before. In this way the influence of modern science may favour an atitude of tolerance and thereby may prove valuable.

On the other hand, the phenomenon of uncompromising belief carries much more weight than some special philosophical notions of the nineteenth century. We cannot close our eyes to the fact that the great majority of the people can scarcely have any well-founded judgment concerning the correctness of certain important general ideas or doctrines. Therefore, the word 'belief' can for this majority not mean 'perceiving the truth of something' but can only be understood as 'taking this as the basis for life'. One can easily understand that this second kind of belief is much firmer, is much more fixed than the first one, that it can persist even against immediate contradicting experience and can therefore not be shaken by added scientific knowledge. The history of the past two decades has shown by many examples that this second kind of belief can sometimes be upheld to a point where it seems completely absurd, and that it then ends only with the death of the believer. Science and history can teach us that this kind of belief may become a greater danger for those who share it. But such knowledge is of no avail, since one cannot see how it could be avoided, and therefore such belief has always belonged to the great forces in human history. From the scientific tradition of the nineteenth century one would of course be inclined to hope that all belief should be based on a rational analysis of every argument, on careful deliberation; and that this other kind of belief, in which some real or apparent truth is simply taken as the basis for life, should not exist. It is true that cautious deliberation based on purely rational arguments can save us from many errors and dangers, since it allows readjustment to new situations, and this may be a necessary condition for life. But remembering our experience in modern physics it is easy to see that there must always be a fundamental complementarity between deliberation and decision. In the practical decisions of life it will scarcely ever be possible to go through all the arguments in favour of or against one possible evidence. The decision takes place by pushing away all the arguments — both those that have been understood and others that might come up through further deliberation — and by cutting off all further pondering. Even the most important decisions in life must always contain this inevitable element of irrationality. The decision itself is necessary, since there must be something to rely upon, some principle to guide our actions. Without such a firm stand our own actions would lose all force. Therefore, it cannot be avoided that some real or apparent truth forms the basis of life; and this fact should be acknowledged with regard to those groups of people whose basis is different from our own.

Coming now to a conclusion from all that has been said about modern science, one may perhaps state that modern physics is just one, but a very characteristic, part of a general historical process that tends towards a unification and a widening of our present world. This process would in itself lead to a diminution of those cultural and political tensions that create the great danger of our time. But it is accompanied by another process which acts in the opposite direction. The fact that great masses of people become conscious of this process of unification leads to an instigation of all forces in the existing cultural communities that try to ensure for their traditional values the largest possible role in the final state of unification. Thereby the tensions increase and the two competing processes are so closely linked with each other that every intensification of the unifying process — for instance, by means of new technical progress — intensifies also the struggle for influence in the final state, and thereby adds to the instability of the transient state. Modern physics plays perhaps only a small role in this dangerous process of unification. But it helps at two very decisive points to guide the development into a calmer kind of evolution. First, it shows that the use of arms in the process would be disastrous and, second, through its openness for all kinds of concepts it raises the hope that in the final state of unification many different cultural traditions may live together and may combine different human endeavours into a new kind of balance between thought and deed, between activity and meditation.

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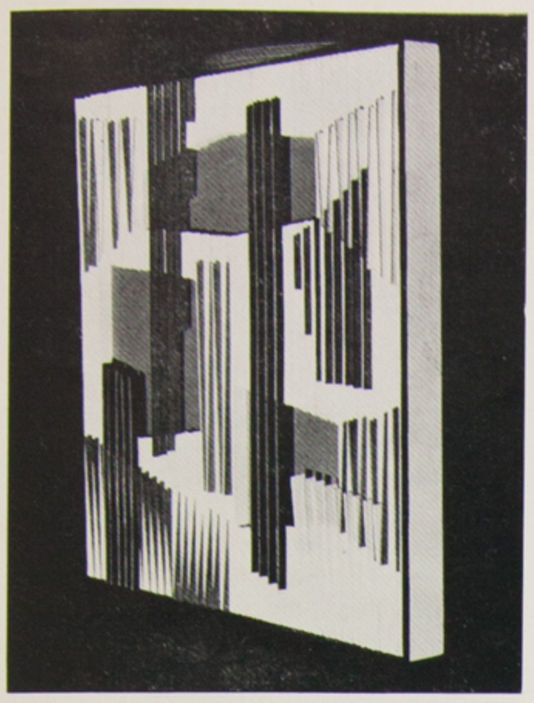
selections from soundings two
at eton college, windsor

sept 24 — oct 10, 1965

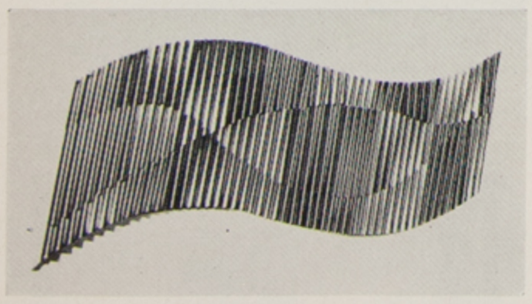
sponsored by the alexander cozzens society of eton college : organised by hardress waller : mr thomas, art master : with the full co-operation of SIGNALS LONDON

PHOTO-STRIP CRUZ-DIEZ *cont'd from p6*

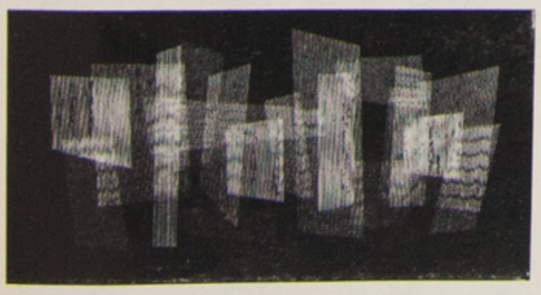


16 — *Physicromie* No 4. Caracas, 1960
In all of my further works I have used shape only in order to make more evident the principles of colour reflection, additional colour and 'vibration' as explained above.
These experiments coincided with the publication in *Newsweek* and *Fortune* of an article by Dr Land in which he explained his experiences with the projection of red and green monochromes by means of which he was able to recreate the complete colour spectrum and thus eliminate blue. Because I became interested in this principle, my first fifty Physicromies are all worked in red and green; I thought that by means of colour reflection I might be able to achieve similar plastic results.

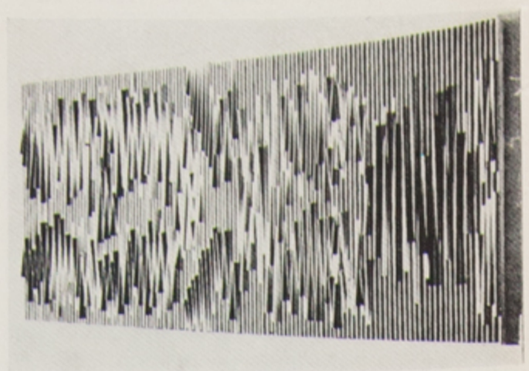
17 — *Physicromie No 6.* Caracas, 1960



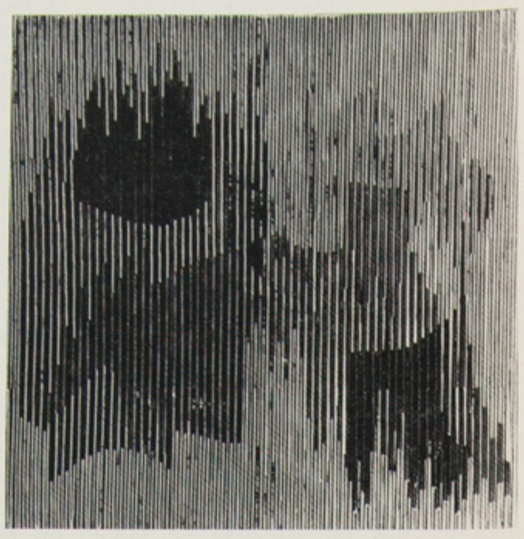
18 — *Physicromie No 10.* Caracas, 1960



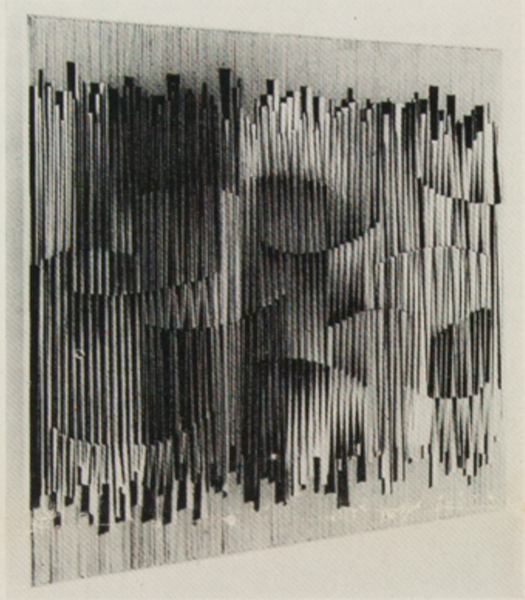
19 — *Physicromie No 11.* Caracas, 1960
(Interferences)
This work is on a flat surface and there is no colour reflection but only an additional colour produced by superimposed frames.



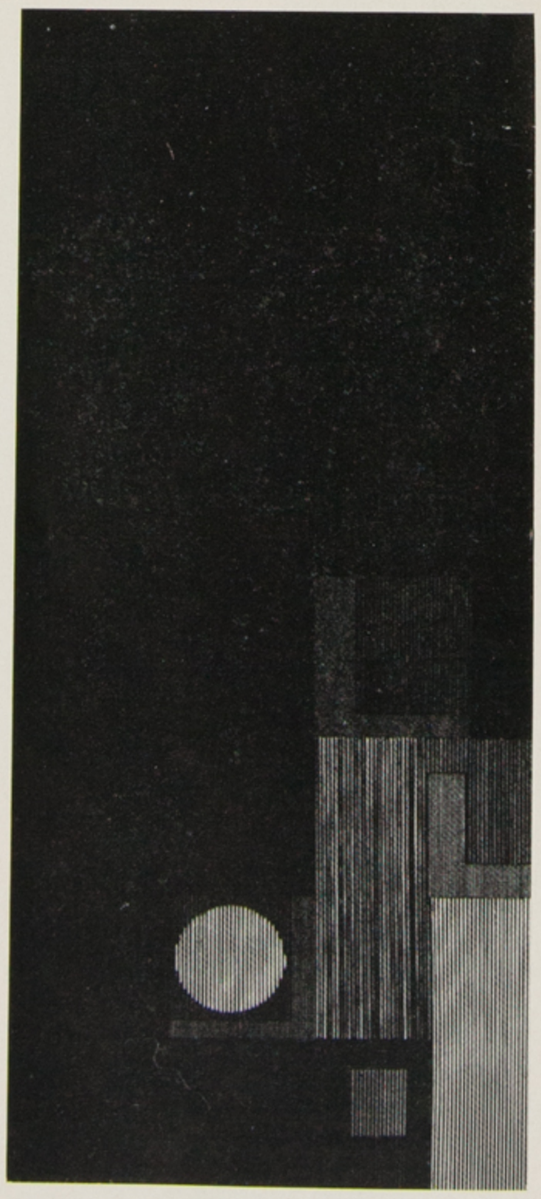
20 — *Physicromie No 15.* Paris, 1960



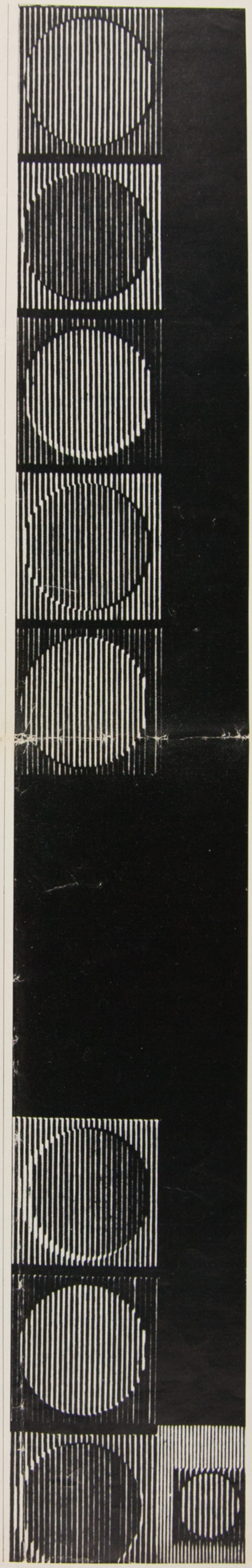
21 — *Physicromie No 25.* Paris, 1960

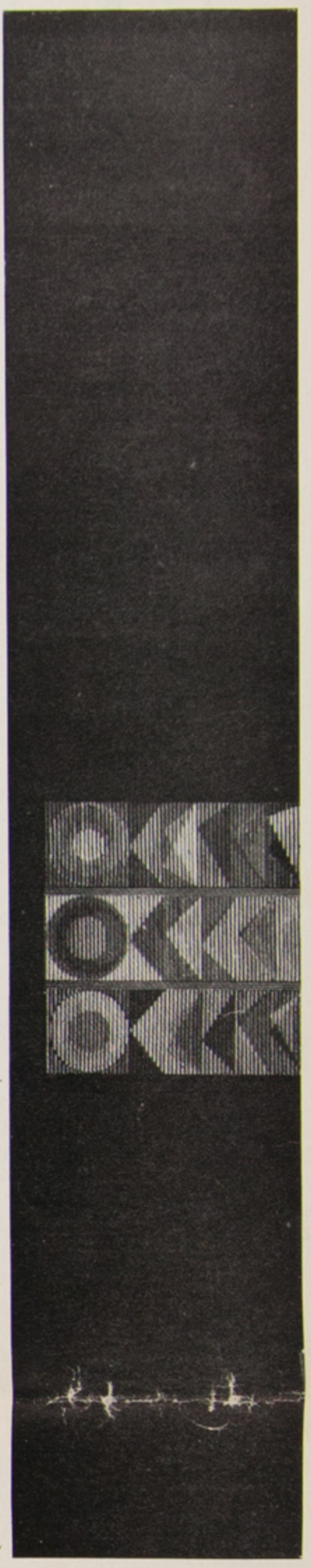


22 — *Physicromie No 35.* Paris, 1960



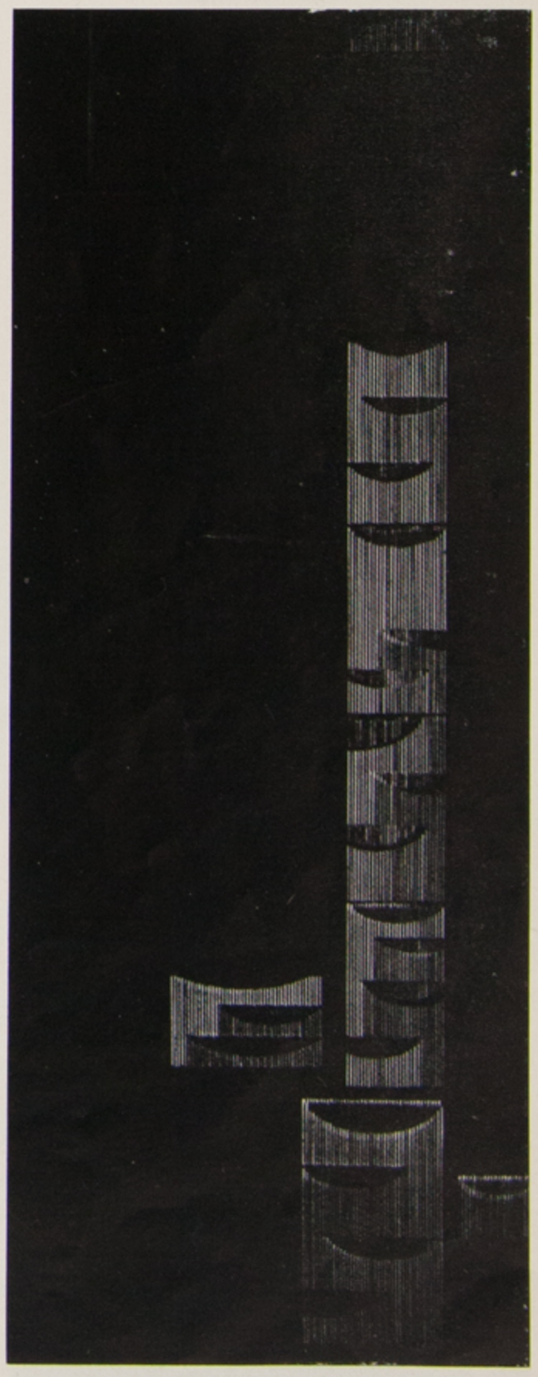
23 — *Physicromie No 55.* Paris, 1962
The structure of parallel blades permits the modification of colour by reflection. In it I eliminated red and green and used my 'open palette'. I also inscribed on the background shapes that change their colour and position in accordance with the position and distance of the spectator and also of the intensity of light received by the work itself.





24 — *Physicromie No 64.* Paris, 1962
Sequence of two inscribed shapes. A third shape is drawn on the outer edge of the blade. The empty space is meant to bring into evidence the contrast between a static and a mobile shape.

25 — *Physicromie No 83.* Paris, 1962
Displacement of coloured shapes. When the spectator changes his position in front of the work, the shapes and colours seem to move in a cinematographical way.



26 — *Physicromie No 89.* Paris, 1963

please turn to page 11

Remordimiento Erotico

por Javier Fernandez de Castro

!Ah viejo buitre! Muerto estás y que no te lloro. Pese a lo que hiciste por mi. O por Klina, que tampoco está ya. Yo inventaba historias eróticas. Para entonces ya no había días húmedos ni agua helada. Ni siquiera olor de aceite rancio metiéndose por los intersticios del cuerpo hasta borrar cualquier otro olor.

El Gran Buitre de barba hirsuta enterraba su cuerpo desnudo en la arena caliente. 'Es el maldito frio — decía — se metió en los huesos y me martiriza. Pero ya va saliendo. Lo noto en que ya no chirrian mis huesos. Sigue, sigue, con tus historias. Necesito su calor.'

Incluso a Klina la excitaban. Y vive Dios que no entendía una sola palabra. Pero mis labios le acariciaban al hablar la base de sus senos y mis palabras, gruesas y monótonas, trepaban por ellos hasta el cuello y se en rescoban en sus orejas diminutas como anillos lascivos.

Como sufrías, viejo y perverso tiburón del norte.

Me deseaba con sus ojos de mirar hielo y no eran frios. Sus miradas resbalaban como aceite por mi piel renegrida por el sol. Se enroscaban en los brazos o los muslos y me besaban el vientre. Klina recorría a continuación con sus dedos frios el camino de la mirada, para limpiar en lo posible la baba.

Cara de Ratón vino y nos echó a patadas. Nos quitó lo que no nos habíamos apropiado.

'Soy el único pariente', gritaba mostrando a todos los cuervos de la burocracia su barba hirsuta. 'Pueden mostrar esos una barba como la mia? ?Eh? ?Pueden mostrarla?'.

No entendíamos nada. Como no pudimos enseñar su barba hirsuta, los cuervos decidieron que todo le correspondía a Cara de Ratón por ser el único pariente y Cara de Ratón nos echó a patadas. Nos dejó eso si, el sol y la arena, pero ya no eran iguales.

Incluso rompió las puestas de sol.

Aquellas puestas de sol en que el rayo verde era temido y deseado. Porque significaba la sacudida cruel del escalofrio. Porque era el temor a la noche.

Porque era el frio. Las estellas gordas colgaban de un cielo que ya no quemaba. No bastaba ni un fuego ni dos. No había sol, pues se había ocultado. Era el frio, pues no había sol.

Nos abrazábamos unos a ostros y yacíamos acurrucados hasta el amanecer, en que nos dormíamos confiados porque el sol se anunciaba ya otra vez. Era un gran refugio aquel que se y nos buscó el viejo buitre.

Jamas llovió. Nunca vimos una nube que nos redimiera del escalofrio. Con la parsimonia de lo inexorable, el sol pasaba sobre nuestros cuerpos y se zambullía en el mar. El último instante, el último rayo,

era el rayo verde,

era el frio. La tierra achicharrada soltaba su calor en vaharadas que nosotros aspirábamos con ansia de alcohólicos. Las sombras ponían contornos calcinados en las arenas calcinadas. Entonces, Klina

tiritaba y lloraba. Yo encendia mi pipa y ponía las manos en cuenco para percibir su calor. Al viejo buitre la chirriaban los huesos frios y balsfemaba hasta caer agotado.

Todo había empezado en el figón de un puerto brumoso del norte brumoso. El viejo fumaba una pipa requemada y chupada. Vestía un viejo jersey de marino y unos pantalones de franela que le venian grandes. Tres dias comimos frente a frente y compartimos la botella de vino sin cambiar una sola palabra. El masticaba con su boca sin dientes el bacalao salado. Cuando terminaba, apuraba el fondo de la botella y se alejaba envuelto en humo, acompañado de un extraño rumor de huesos mal engrasados. Al cuarto dia extendió el dedo mas retorcido que he visto y apuntó al mar, por encima del mar.

— Alli no llueve — dijo por entre el bacalao.

— No, no llueve — contesté pasándole la botella.

— Ni hay nieblas . . .

— Y las mujeres tienen los pechos y las caderas redondeados . . .

— Siempre hace calor . . .

— Y las mujeres se deslizan como los delfines, en lugar de caminar . . .

— El sol quema la piel . . .

— Las mujeres gimen al ser poseidas . . .

— El sol . . .

— Los pechos . . .

Encontramos a Klina sentada en un viejo barril de pescado mirando al mar por encima del mar. En sus manos sostenía una alpargata destrozada y su pié desnudo se reflejaba en un charco gris.

El Gran Buitre y yo estábamos borrachos.

El quería abrazarme y yo queria abrazar a la muchacha de la alpargata en la mano. El viejo le contó que 'allí' no se conocía el pescado salado. Yo le conté que 'allí' las mujeres tenían los labios rojos de besar. El Gran Buitre dijo que 'allí' el sol quemaba las piedras y las manos.

Ella sonrió. Klina, la de los ojos bellos y tristes tenía una sonrisa bella y nueva porque no la había usado nunca.

Luego vendrían los dias largos y pesador como moscardones borrachos de sol y de sal. El cielo era amarillo, el mar azul y Klina maravillosa. El viejo me deseaba desde su trono de arena candente.

Klina tenía los muslos finos y mis labios resbalaban por ellos suavemente, con gemido monótono. Klina cerraba aquellos ojos suyos, tan rasgados y tan tristes, y sus labios — rojos ya de besar — se hinchaban con el sabor voluptuoso del placer. Yo hablaba sin cesar, dejando salir de mis labios palabras gruesas y sonoras que golpeaban en el cráneo semivacio ya del viejo buitre. La arena caliente resbalaba por mis costados al ritmo de los suaves puñados que Klina dejaba caer sobre mi espalda. Apoyaba la cabeza sobre su pecho y mis labios resecos buscaban el frio de la piel nórdica, una piel increiblemente suave en la cara interna de sus senos; el aire canalizado por ellos penetraba hasta mis pulmones impregnado de aquel sabor tan suyo, frio y primitivo, que incluso el sol despiadado me perdonara.

Viejo de barba hirsuta que me deseabas desde la tumba ignea de arena, con la agostada caricia de tu impotencia, maldito seas, pues nos abandonaste.

Aquellos ojos de bruma bacaladera sumergidos en el caldo espeso de las historias sobre mujeres salvajes y entregadas que, suplicaban placer. Pero Klina, sobrexcitada por la atmósfera y palpando el deseo que nos envolvía, encogía de súbito las piernas y yo me encontraba atrapado entre el sabor simétrico de sus pechos y la tentación paralela y rectilinea de sus muslos. Sus dedos largos y sus labios gruesos rebuscaban por mi cuerpo los últimos resortes de la contención. Resostes que no tardaban en saltar. En el paroxismo de la erección, proseguía vomitando frases salvajes que hablaban de posesiones salvajes y entregas sumisas. Narraba una y otra vez la historia de una mujer misteriosa, surgida de la niebla nórdica, que tenía unos ojos maravillosamente tristes y rasgados, y que era cubierta (con los labios hinchados por el placer) por un salvaje de piel morena que luchaba con ella hasta verla sumirse en el espasmo angustioso de la entrega, ante los ojos fascinados de un viejo impotente, que se enterraba en la arena hasta el cuello para sacarse el frio de los huesos.

Gran Buitre de barba hirsuta que se fué con el frio de la noche. Klina dormía en un ovillo infantil y confiado. Yo miraba pensativo el mar, sin ver el mar. Cara de Ratón proyectaba ya sobre nosotros su sombra de pescado. El humo de la pipa se enroscaba en el aire espeso de la cabaña, cuando fuera aún hacía frio.

De pronto, los huesos del viejo dejaron de rechinar y las flasfemias — que decia incluso dormido — cesaron. Le miré inquieto. Klina se despertó acuciada por algun sueño desamparado y buscó mis ojos con sus ojos vacios.

Los pescadores juraron que una ráfaga de viento helado que iba hacia el norte, apagó las mechas de su dinamita.

No tardó en llegar Cara de Ratón y presentando su barba como testamento, nos echó a patadas. Metió el cuerpo de palo del viejo en un bacaladero y se lo llevó hacia el norte brumoso.

He cerrado los ojos y he querido apoyar mi cabeza en el hombro de Klina, pero Klina ya no estaba.

He querido quedarme en esta tierra, pero las plantas mueren de asfixia.

Así pues, he recogido mi pipa y he seguido la huella dejada por la bicicleta de un cartero sobre la carretera polvorienta.

En la playa, el mar perezoso echa cada vez su última ola, para que el agua borre las formas de tres cuerpos en la arena. Una barca roja ha roto la amarra, pero el mar está cansado y no tiene fuerzas ni para balancearla.

Me he alejado borrando con el pié la huella de la bicicleta del cartero.

Pamplona Enero de 1964

2 POEMS

by Anthony Barnett

San Miguel de Allende

Below the hill
at San Miguel de Allende
stands a bronzed cathedral.

A cobbled street
leads to the summit
of the hill.
Four asses.
Two men, women.
Trees the colour of olive.

The serene cathedral
lies in state.
Everything reflects the sun's colour.

The Tall Ship At Sea

I sit here I sit there
you laughing at me
I crying for you
my feet buried in the earth lapped by the water
your feet stirring the water

of the river
and an entrance to the soul defies me
as a deep-sea plant thrown on to the earth
that suffers on earth
and dies on earth in abundance of air

Even the mast of
the tall ship snapped and
no one is surprised
to see it stay upright
while the vessel heels over

And where is the crew
mysterious and unborn
who had never been to sea before?
For sometimes the river leads to the sea
and the earth to the water

and I sit here and sometimes there
your feet stirring the water
my feet buried in the earth lapped by the water
cherishing my mind
as I would a child

3 Burlas Parnásicas

por Felix de Azua

1 Clasico Relieve

La torre se levanta su silencio luego
más abajo de los pinos enanos está mi asombro
no más que un grito aún naciendo en su pecho tan dulce
tristes quejidos de años ha años nunca vueltos

Cimbellion sonando y el milagro de unas agujas vegetales
el suelo nuevamente encerado de hojarasca
en el pozo está el vómito donde alguien dejó su aliento

Tras el telón de agua viva la imagen ya no ve sino sombras
vigilando el aleteo de las cigüeñas larguisimas larguisimas
anhelando un final imposible para su ya impotencia.

Segovia 1965

2 Cortina Debil

Donde de debajo quizá
tu amor enmascarado ha surgido
tin tan tin tan
un precioso encapuchado
es el amor que late lejos siempre lejos
una cantarinella
fontana nova único tournez-vous-en-rond
vuelta a la derecha mesdames et messieurs

Segundo compas acre
la boda se interrumpe no más arroz
guarda el velo la novia se desmaya
corren aqui y allá los mensajeros de color morado
abajos borlas blancas
encended los cirios

Ya no hay entierro tu cuerpo sigue siendo mio
no más canciones
el viento espera inquieto
va quizá a granizar
remojemos los ramos que las magnolias vivan
vivid creced reproducios y morid

La tierra nos posée
vengan tus besos carne amada
venga tu piel contra mi piel
soplad sobre los candelabros
vuelvan a bailar los camareros

el arroz se ha pisado en el suelo
ahora las flores se levantan
ha terminado el strip-tease

Mi amor que mueres tan lejos
los fantasmas
mi amor que tan lejos mueres
una vez más
una vez más y luego puede volver la lluvia

Londres 1965

3 Cama abandonada

Es veleidoso desaparecer como un domingo
encontrarse la cama nuevamente arreglada
el cepillo de dientes! oh cómo; aún humedo
alguien tuvo el cuidado de abrir una ventana

Desde una esquina donde vive el calor reservado
la mortecina luz quedó sobre la almohada
una ficción apareció y
desapareció
y persiste el deseo por retener la esposa

Ella es libre desde el primer momento
ya cuando sale el cuerpo de su cuerpo
ella corre sin agonia

Madrid 1965

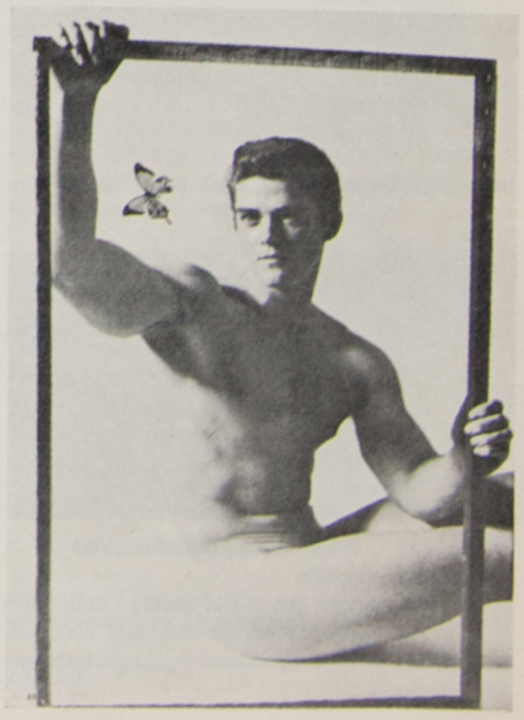
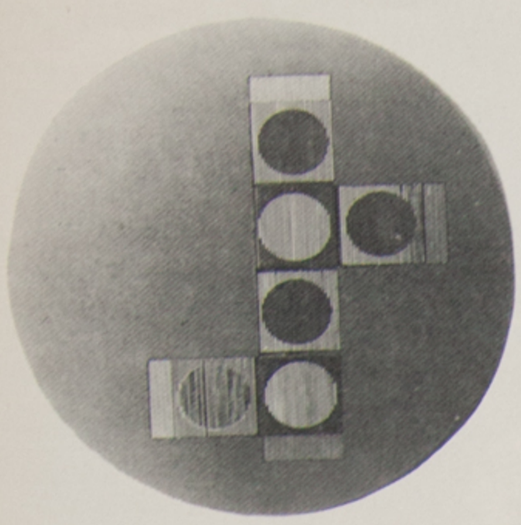
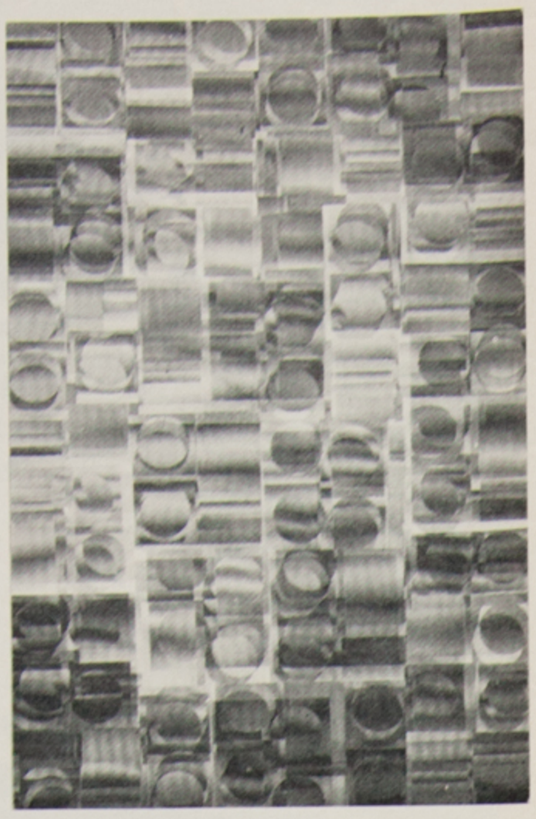


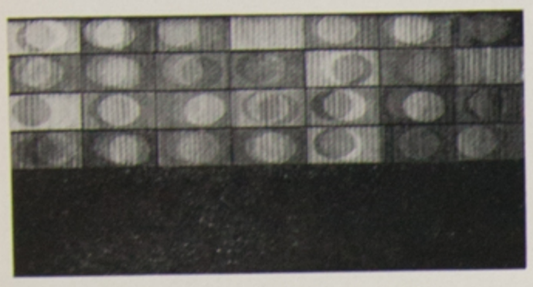
PHOTO-STRIP CRUZ-DIEZ *cont'd from p9*



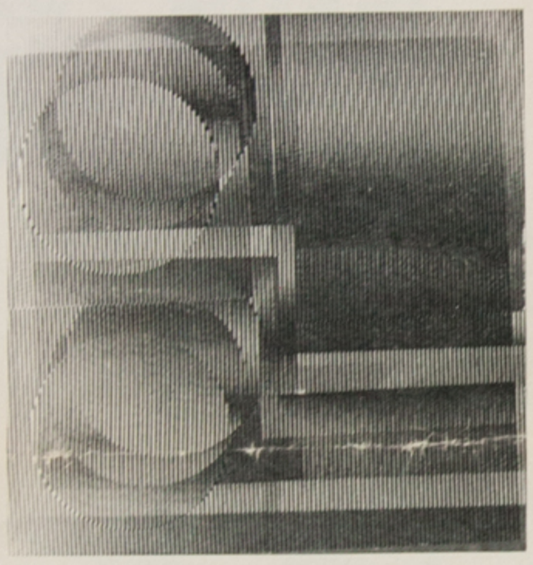
27 — *Physicromie No 92.* Paris, 1963



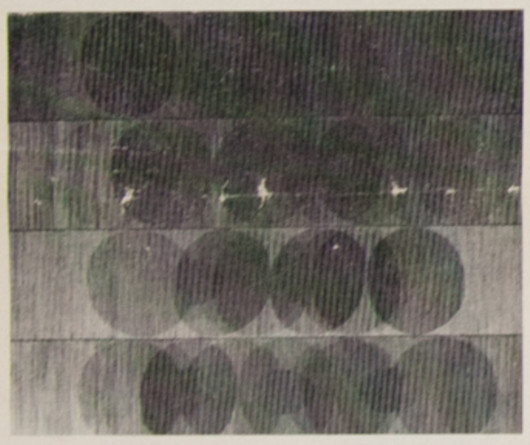
31 — *Interferences.* Paris, 1964
By printing the same frame on two rigid frames, when the viewer changes his position a cyclic change of colour is obtained.



28 — *Physicromie No 114.* Paris, 1964
By changing the material and width of the element that serves as a reflecting screen (the blades), an infinite variety of results can be obtained. When the reflecting surface is transparent, the chromatic atmosphere is coloured in a different manner than when it is coloured by reflected light.

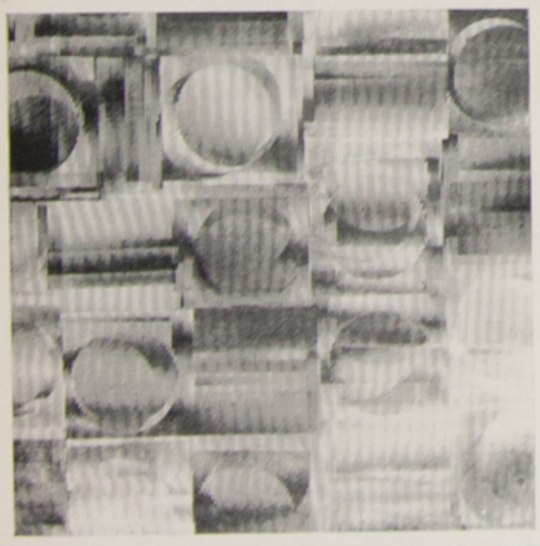


32 — *Colour in motion.* Paris, 1965
Book in motion. This book is for manipulation and is not readable. Six separate sheets where I develop the ideas set forth above.



29 — *Physicromie No 116.* Paris, 1964
When the reflecting surface is white, there is a proposition of reflected colour produced by the shapes inscribed in the background.

END OF PHOTO-STRIP



30 — *Interferences.* (*Manipulable Box.*)
Paris, 1964
This work is the development of the principle set forth in Physicromie No 11. Superimposition of two planes of frames, one of which is manipulated by the spectator. The mobile plane is made by the superimposition of three or four frames of equal frequency but of different colours and with varying slants. The result is a structure of colours that are added or subtracted. The addition of a rigid frame, painted on any transparent material, changes the colour and structure of the mobile frame and produces an effect of 'virtual prism'. By altering the frequency of the frames or their structure any number of different results may be obtained.

● ● ●

from **Il Lavoro** of Genoa
9th April, 1965

Le Operazioni di Cruz-Diez

. . . occupandosi i suoi, in particolare, agli sviluppi della teoria della addizione dei colori ed alle modificazioni delle interferenze cromoluministiche. Scienza ed intuizione artistica sono così poste al servizio dell'uomo sia per un maggiore apprendimento di conoscenza di certe manifestazioni rimaste, fino a pochi anni fa, natrimonio di pochissimi ricercatori sia per le possibilità di applicazione che i resultati potrebbero avere in diversi settori della vita sociale, da quello della grafica a quello delle costruzioni, da quello della progrettazione di oggetti visuamente puri per la communicazione a quello della publicità.

Le opere di *Cruz-Diez* dinamizzano la superficie colorata per mezzo di lamelle le quali, creando tre piani di reflessione, assorbono la luce e la ripropongono con intensità diversa per atmosfere ricche di suggestioni e per una simultaneità che il fruitore 'vede' spostando il suo punto di vista.

L'oggetto statico offre così, secondo il

The Physichromies of Carlos Cruz-Diez

by Frank Popper

The phenomena which relate to visual movement have been investigated, more or less successfully, in the field of physics, physiology and psychology.

An artist who is interested in the same phenomena can approach them in different ways. He can try to control them to the utmost, or, on the other hand, he can give them free play, allowing chance and the spectator to complete the aesthetic process.

Cruz-Diez, in full possession of his graphic means and endowed with a high sensibility towards colour shadings, has managed to adopt a third, more personal attitude. This is an attitude which combines detachment with humour and poetry. He has approached scientific theories with an open mind. Yet he did not fail to see that the aesthetic side had been inadequately dealt with in many of these theories.

An artist of great integrity, Cruz-Diez thinks that science and industry can be at the service of art — and he finds this fact somewhat amusing rather than intimidating. He has based his subtle artistic research on data provided by science, but has adapted it to his own plastic techniques and poetic sensibility.

It goes almost without saying that such an undertaking could only progress by stages which were marked by a number of personal discoveries.

Since 1955 Cruz-Diez has constantly been interested in what he calls 'vibrations'. These were first of an organic nature: the inspiration seems to have come from plant life and more especially from the seasonal changes in the aspects of trees in Europe — by contrast, in Venezuela the foliage of trees is perennial. Cruz-Diez converted these impressions into what he calls 'signes végétaux' and by juxtaposing these graphic inducements he forced the spectator into a state of continuous readjustment of focus: for example, some juxtaposed trapezoids after causing perceptual 'vibrations' through a deliberately faulty construction seemed to produce rhomboidal shapes.

From 1956 to the end of 1959 Cruz-Diez came to grips with the problem of the after-image. He soon became aware that physical phenomena could be given aesthetic functions. What seemed to be colour 'radiations' (still a hotly discussed topic in science) were simply used by Cruz-Diez to colour areas adjacent to the painted surfaces. However, Cruz-Diez noticed that there were two kinds of colour radiations that could be used in this manner: the less intense spreading effects and the stronger emanations going directly towards the onlooker.

1959 was an important date in Cruz-Diez's artistic development. It was at this stage that he learned of Dr Land's writings on colour and the polaroid effects. An article by Dr Land, published in **Newsweek**, dealt with the filtering of the physical colours of red and green and pointed out that the simple addition or subtraction of these colours could produce the whole of the colour spectrum, especially in its application in photographic reproduction processes. Cruz-Diez adapted this technique to his own research. He abandoned the traditional idea of colouring surfaces with paint in favour of the notion of colouring areas and spaces with light. By using these 'natural' projections and reflections Cruz-Diez hoped to dispose of a complete 'physiological' colour scale based only on the 'physical' colours of red and green.

Cruz-Diez set to work by experimenting with the distances that should separate the cardboard blades of his 'pictures'. He finally found that the thickness of 1 mm for each blade gave the best results if placed at a distance of 3 mm from its neighbour. With this arrangement Cruz-Diez obtained coloured **forms** through the radiations from neighbouring blades.

But soon Cruz-Diez decided to go beyond a mere reproduction of forms and started experimenting with colour projections at varying distances. Thus, still in 1959, he made his first **Physichromie** by applying more thoroughly the theory of additional colours. Using his new technique of cardboard blades separated by regular distances, Cruz-Diez took again as his basic colours, red and green, and added white as the principal source of luminous density and black in its role as a 'negation' of light. Cruz-Diez could now realize his intention of creating an interplay between the reflections of great intensity towards the spectator and the spreading effect on to neighbouring surfaces. The interference between these two kinds of radiation will result in the perceived colour, and it is important to note that the resultant colour is quite different from any of the surface colours. Another way of adding to the different possibilities is to vary the material and the thickness of the blades. This led to the introduction of **transparent** blades in some of Cruz-Diez's work from 1962 onwards. Thus, by judiciously alternating transparent and opaque blades Cruz-Diez obtained such varied effects that he considered he was now working with an 'open palette' of infinite potentialities, ranging from relative aggressiveness to soft, tranquil brightness.

In 1963 Cruz-Diez developed the superposition of grids in his works, which again have a close connection with modern colour printing processes. The artist wants to arrive at new colour 'tensions' and also thinks of one of the applications in art: high quality reproduction. His '**prismes virtuelles imprimés**' produce very strong colour interference and represent a very subtle means of mobilizing the spectator's attention in this atmosphere of chromatic light.

Two aspects of the work of Cruz-Diez go well beyond accepted categories and styles. One concerns the fact that the animated elements of his art are interchangeable, which puts it into line with the advanced research of the 'Nouvelle Tendance'. The other relates to the most subtle use these visual inducements are put to in connection with spectator participation: apart from the actual manipulation of some of the **Physichromies**, the spectator is always induced to enhance the optical effect of the coloured light components by making frequent changes in his angle of vision.

It would, of course, be interesting to know what the spectator thinks or feels in front of these pictures.

One is perhaps safe in predicting that many will be attracted by the interplay of light and movement, significant manifestations of our environment.

Others would feel a certain dissatisfaction in observing these ever-changing appearances. Yet an allusion to one's own psychological activity in its autonomous reality could result from this reaction.

At all events, many spectators will be enchanted by Cruz-Diez's 'chromatic propositions' which have introduced a subtle poetical flavour into this trend of kinetic art.

Paris, June 1965

CORRIGENDUM

by A. E. G. Bird

Red buses
grey men
Wet streets neon suns
10
Flicking screens
Dirty plates domestic bliss
9
Sweaty brows
grey men
gamble
8
Baby born
Grandad dead
Grey people in black & white
7
Gamble
With stakes not theirs to play
but in their hands
6
Live.
Life your own
but not yours to keep
5
faites vos jeux
The key is turned
roaring key to eternity
4
Siren,
Stop.
Burrow. Push. Burrow
Heads hidden in the sand
3
Grey men
Big grey men
Hide : no need : they are safe
How lightly the key turned to commit all
2
Fear :
nothing beside threatening oblivion
Silence
1
Today no throbbing roar
Just silence
Wait. Waiting
0
Earth shattering silence
Nothing. Oblivion.
Be-all ends all
All, Then, Nothing,

POEMS BY

Nicholas Snowden Willey

To the princess of Green,
Blue unseen and seen green
And the frisson between
Is of you and is green
And between what has been
And what is yet unseen
A sense that what you mean
Irridescence might mean.

(from an unpublished set of Love Poems)

I shall go. Now I shall arise and go
Out of my mind to where the winds not blow
Lest are the blossoms yearning for their fall
And where the aimless rain comes not at all
Lest the grass is anxious for its own green
And the mystery of the snow not seen
Unless amazing there are children keen
To turn and smile at where their feet have been
I shall go. Now I shall arise and go
Out of my mind to where the streams not flow
Lest are the willows bent upon their weep.
Question and answer shall their deep sleep keep
And I shall wander, being glad to go
Always the first time where I do not know.

(from The Green Tunnel)

I'm on my way to Chalcot Square
In the Weather, in the Weather,
Whether the Weather is blue there
Or whether there is green Weather,
I'm on my way to Chalcot Square,
There is a bell for ringing there
And then for climbing there's a stair,
And often in a blue never,
Green, green, the Weather whatever,
And then if I forget and peer
Through the gathering Atmos Fear,
And then an open green appears
And a Green Tunnel through the years.

(from an unpublished set of Love Poems)

On the surface tension of this bubble
I saw her curved in the curve of a dream.
The trees were curved and there was no trouble
And the trees were curved in the curve of seem.
And as the bubble is broken am I?
Or am I breaking as the trees persist
Straight against the sky?

(from an unpublished set of Love Poems)

I am the pool where I reach out my hand,
Mine is the silent surface that I break,
Myself is certain traces in the sand,
Or uncertain unsolved circles on a lake,
Or certain deft traces that I must make
Inimitable for the cold tide's sake.

(from The Green Tunnel)

In the still Autumn and all alone
In the invisible rain, there watching
A small bird who attends the morning light
At the edge of a friendly pond
And at the tangled edge there come to him
Certain circles passing on the water
And the architecture of the morning
Reminds him of what? Circles on a pond
That echo an event somewhere beyond.

(extract from ' Les Espaces Interieurs ',
from The Green Tunnel)

When Anne was small
And not at all
Was the night like a big dark day
She wondered ' can I play today? '
' No, no,' they said, ' You Only May '
And little Anne
In the garden ran
Through blossom and through weed
That she might play indeed.
Now Anne has grown.
Anne Jones has smiled the night away
Her night is just a big dark day
Her smile has kept her Might at bay
And we are in the month of May.
The blossoms burst as if to say
' Anne
Can! '

(from ' Now Then ', an unpublished set of poems)

Pregnant with images, going home,
The dark sky hurrying me on my way,
I remember a cold November day
And a woman pregnant with children,
Or were they images? And I remember
Another day, this time too distinct,
Transparent sunlight and the leaves were red
Of a passion not the children's own
And the children, who are images of what?
And I remember a cold November day.
A little man waiting in the cold,
Certain when nobody looks his way
He does a little dance which is his way
Of keeping the cold away;
But the sun is dancing on the green,
And the day is great with children.

(from The Green Tunnel)

Seeds,

to our eye invisible, will find
On the rude rock the bed that fits their kind;
There, in the rugged soil, they safely dwell,
Till showers and snows the subtle atoms swell,
And spread th'enduring foliage; — then we trace
The freckled flower upon the flinty base;
These all increase, till in unnoticed years
The stony tower as grey with age appears;
With coats of vegetation, thinly spread,
Coat above coat, the living on the dead:
These then dissolve to dust, and make a way
For bolder foliage, nursed by their decay:
The long-enduring Ferns[1] in time will all
Die and depose their dust upon the wall;
Where the wing'd seed may rest, till many a flower
Show Flora's triumph o'er the falling tower.

George Crabbe
from The Borough *1808-1809*

[1] *' We have the receipt of fern-seed; we walk invisible.' Shakespeare,* Henry IV

Mira Schendel

was born in 1919, grew up in Italy, and now lives in Sao Paulo, Brazil, where her work was ' discovered ' by Sergio de Camargo last spring. Mira Schendel has given several individual exhibitions, mostly in Brazil; she has won several awards, among them the 1963 acquisition prize of the Salon of Modern Art of the State of Sao Paulo, the first prize for drawing at the Bahia University Exhibition in 1952, and the first prize at the Santa Maria Exhibition of Modern Art, also in 1952. Schendel is an excellent designer of book jackets. In 1964 she was selected for the Brazilian representation at the Second Biennial of American Art in Cordóba, Argentina, and this year, 1965, she is participating in the Eighth Biennial of Sao Paulo. Her work was first seen in England in the exhibition **Soundings Two** at **SIGNALS LONDON.** Next year she will give an individual exhibition at **SIGNALS LONDON.**

Mira Schendel started painting in 1949 and now she has evolved a profound personal style. Her mastery of the graphic media is almost without parallel in present-day art.

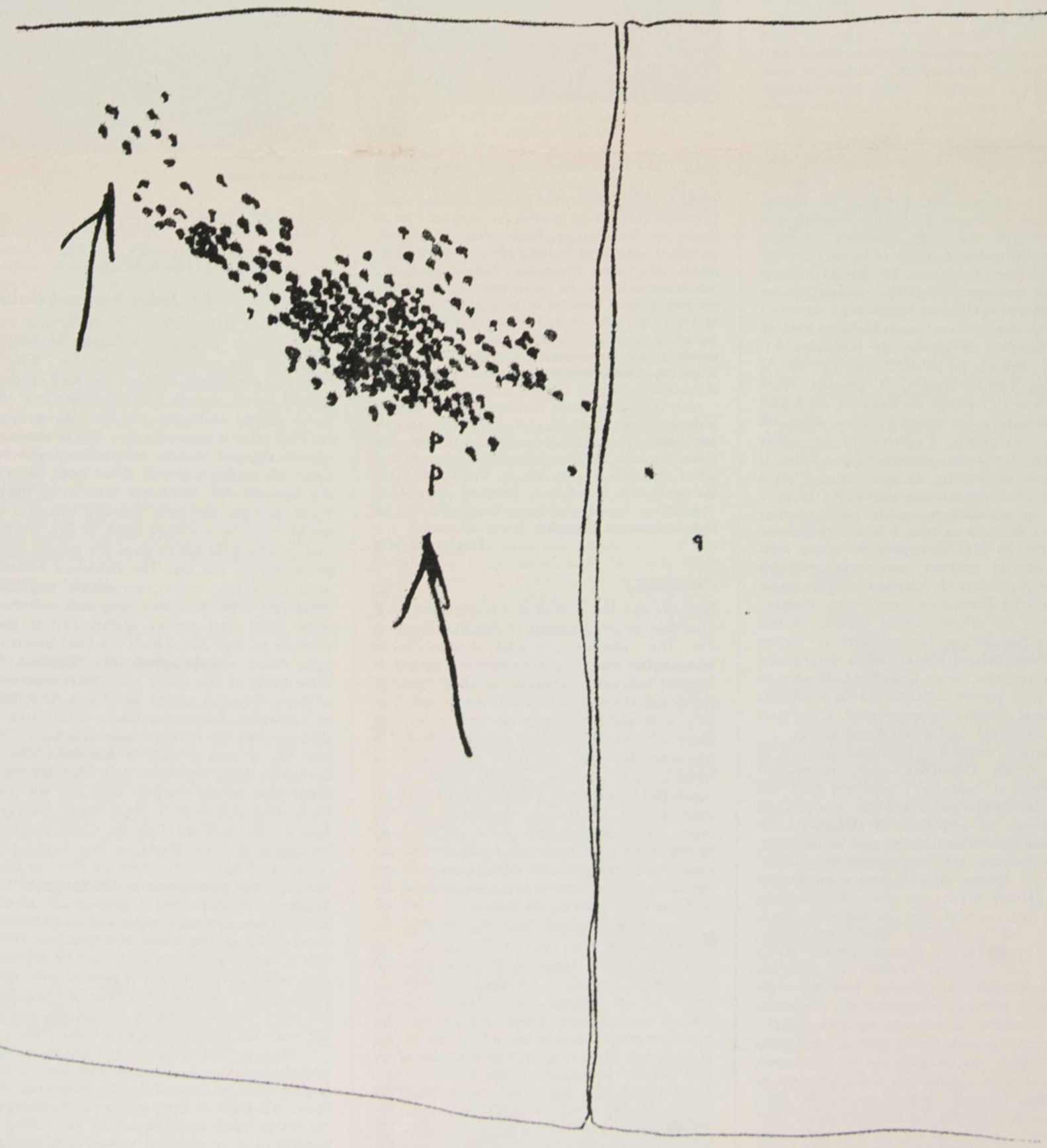
Within a consciously ' restricted ' working area, Mira Schendel has created a microcosmic world of great symbolic power. Her drawings on rice paper at first appear simple, but their simplicity — which is true of all great art whatever its style — is the result of an original technique quickened by a profound vision of existence.

On a small upright rectangular absorbent surface she inscribes (by a method akin to carbonpaper-transference) signs and symbols — not of any identifiable past : though sometimes they are evocative of the petrographic remnants of long-vanished civilisations — but signs and symbols of a gently vibrating, secret and pervasive *Now*. . . . Here and there, among her drawings, one will find the presence of barely discernible words, half-obliterated phrases, letters removed from their usual linguistic context, letters and numbers dancing in space among simple geometric configurations, circle, triangle, square, and up and down aerial structures, the while tracing the rhythms of their dances. . . . Thus her drawings could be regarded as the beginnings of a highly-charged graphic language in a poetic Future. . . .

Life, for the artist, is primarily a unique conception of space and an intense, *coherent* perception of the light which inhabits and animates space. Mira Schendel's drawings are **seismograms :** they are *instantaneous* records — in ideographic form — of interior rhythms set in motion by direct contact with the pulsations of light. . . . Her ' black ' drawings' resemblance to photographs of the paths of atomic particles may or may not be fortuitous, but the resemblance is there and is perhaps indicative of her proximity to the interior forces of nature. . . .

In physical scale her drawings are small, but in the eye of the perceptive spectator they *present* a symbolic space of illimitable dimensions. . . . Beneath their self-assured elegance one is aware of a sensibility who has seen the risks and taken them, to create visual poems, *circle, triangle, square,* from the chaos of existence. . . .

David Medalla



Mira Schendel : Drawing on Rice-paper 1965

Francesca Fischer: Space Suit, 1965

✪ Space Suit by Fischer Parangolé by Oiticica ✪

The drawing above is a design for a space-suit by Franziska Fischer, a Hungarian-born, Paris-based dress designer. It was commissioned from Miss Fischer by Takis last May, 1965. It is Takis's second space-suit; the first one he designed himself in 1960 for his magnetic manifestation. Miss Fischer's design clearly shows the influence of Courrèges, a great dress designer and one who merits the name *artist* perhaps more than many so-called "artists' today. Fischer's design is radical in conception, with no concession to pretty taste. The bare areas around the shoulder-joints, knees and elbows allow for a maximum freedom of action. The diagonal zipper-bands serve both a functional and a decorative purpose, modulating the verticals of the torso, arms, neck, legs, right thigh and right pelvis, while giving the spaceman a decidedly *suprematist* character.

Dress design as a medium of artistic expression has been practised with great success by some of the pioneers of modern art. It was usually undertaken by artists in connection with the dance: the costumes designed by Robert and Sonia Delaunay using the *orphist* principle, the designs for Honnegger's *Le Roi David* by Fernand Leger, and the costumes designed by Oscar Schlemmer for his own productions at the Bauhaus, are real works of art, combining both function and decoration within truly kinetic principles.

The cape, rather than the dress, is the starting point for Helio Oiticica's **parangolés** (*see other photo*). These controversial works are virtually spacial sculptures in which changing forms are created by the motions of the spectator: *the spectator's physical presence:* the actions of the wind when the spectator twirls the cape to the tune of a dance. The brilliantly coloured **parangolés** were presented for the first time to the public at the Museum of Modern Art of Rio de Janeiro, in a collective exhibition organised by the art critic Ceres Franco, which opened last 11th August, 1965. The exhibition caused great controversy (which is still raging in Rio) and disturbed the artistic establishment of Brazil.

At that exhibition the audience were invited to participate by dancing with the **parangolés** to the tunes of the **samba de Mangueira,** one of the greatest schools of the Brazilian samba. The

Helio Oiticica: Parangolé no 2, 1965. Eduardo Ribeiro drapes the cape

artist himself was a 'passista' in the manifestation, *i.e.*, one who makes improvisations throughout the dance. The jaded *habitués* of Rio's art galleries were scandalised by the entire demonstration, and at one point the police were nearly called by the stuffy museum officials to stop the demonstration. The people who entered the spirit of Oiticica's work with great enthusiasm were those from the **favelas,** the slums of Rio de Janeiro. Unhampered by the sort of self-consciousness which inhibits 'arty' people, the people of the **favelas** danced the samba, twirled the capes, created aerial sculptures.

The question, whether the **parangolés** of Oiticica belong to the realm of art or not, is an academic one. One may, if one wishes, see them in an historical context: as an extension of the ideas of Yves Klein and Lygia Clark — Lygia Clark's articulated sculpture which depend for their kinetic realisation on the spectator's manual actions, and Yves Klein's paintings made from the spontaneous impression of naked human bodies on the canvas. These ideas of a truly social art have been brought forward by Oiticica into a new, lyrical dimension: the **parangolé** and the dancer become one to the tune of the samba; the old division between art-object and spectator is abolished; the cape and the individual are united in dynamic rhythms, creating new and unpredictable experiences of forms in space: billowing forms, enveloping forms, and colours in motion.

Jean Boghici, director of Rio's Gallery Relevô, summed it up when he said: 'Helio Oiticica is our Flash Gordon. He doesn't fly through the sidereal spaces. He flies through the layers of our social structure. . . .' We at **SIGNALS** hope Oiticica's work will help in breaking down those constricting layers, divisions, boundaries of an uneven, unequal, unhealthy social structure.

David Medalla

Cruz-Diez

Paris 1963

Sur un fond géométrique, blanc ou foncé, sont incorporés des formes, des structures géométriques où seule la finesse des couleurs adoucit la composition sévère. Malgré cet aspect un peu rigide, les œuvres 'physichromistes' de Cruz-Diez se révèlent très sensibles. Ses tableaux, aussi surprenants que convaincants, sont le résultat d'une expérience hardie et de recherches poussées à fond pendant des années.

Sor point de départ dans cette nouvelle voie fut le procédé additif de la couleur. Il commença par prendre le rouge et le vert comme seules couleurs primaires, les blancs comme source de pouvoir réflectif de couleur, et les noirs comme négation de la lumière.

Ses premières œuvres furent realisees avec de minces lamelles de carton, de longueurs différentes, collées perpendiculairement sur le fond. Au commencement, il donnait toute l'importance au mélange des couleurs, mais, bien vite, la structure des formes s'imposa. Alors, les couleurs changèrent d'aspect — et en même temps les structures géométriques — selon la lumière et la position du spectateur. C'est à partir de ce moment que commença la purification et l'enrichissement de son art, pour aboutir à des œuvres tout à fait surprenantes.

A partir de 1962, il opposa des plans vides aux structures colorées, maintenant réalisées avec des baguettes de plastique. Cette opposition enrichit énormément son champ d'expérimentation, car d'une surface établie, choisie, il anima des parties aux couleurs et formes changeables. Partant d'une surface déterminée, on peut toujours, selon **Cruz-Diez,** obtenir un équilibre; la grande difficulté est de rendre les deux zones vivantes et expressives. C'est alors que la sensibilité de l'artiste entre en jeu.

Les parties colorées — problème essentiel et primordial de **Cruz-Diez** — sont maintenant intensifiées et infiniment nuancées par des formes complexes qui créent des changements chromatiques et amplifient la structure; rien n'est stable, rien n'est définitif, sauf les contours. Chaque tableau est une succession ininterrompue de formes-couleurs, une sorte de film qui se déroule devant nos yeux. Ses dernières œuvres sont rèalisées avec des baguettes transparentes où la lumière rend l'atmosphère radieuse, profonde et presque irréelle, car la variété des nuances devient virtuellement illimitée. Placées sur un large fond noir, par exemple, la partie colorée prend une expression lyrique, illumine les noirs et les rend actifs.

La façon très personnelle dont il crée la succession infinie des couleurs est un phénomène particulièrement important dans l'œuvre de **Cruz-Diez.** Naissant dans la zone vide entre les baguettes colorées, les couleurs qu'on aperçoit ne sont pas celles qu'il utilise, mais celles que le mélange optique produit. Lest structures géométriques ne l'intéressent qu'en fonction de leurs facultés à rendre ce mélange intense, vivant et poétique.

Karl K. Ringstrom

CRUZ-DIEZ

Nobody can fail to notice the importance of the **filter** as an element in South American life. The repeated parallel shafts of the **brise-soleil** make up the characteristic surface of modern buildings, as they have of buildings throughout South American history that were not put up solely for the glory of god. Screens of every kind stand between the sun and man, creating from nothing the shadow which is an inexhaustible entertainer. Writing about modern architecture in Brazil, Henrique Mindlin says: 'The **brise-soleil** gives to the play of the volumes infinite richness of modulation, in a sense a fourth dimension, through the constant shifting of shadows across the surface from sunrise to sunset.'

Cruz-Diez's reliefs are also filters. He never allows his images to be harshly stated or fixed. Invisible louvers withhold the image, reveal it, withhold it, reveal it again in an altered form. The image is always somewhere inside, deeply inviting like the cool interior as we pass in the blazing sun. And it is only to the passer-by that this is revealed; when he has gone past and looks back, he sees that the shutters have already closed behind him. Cruz-Diez's is an art of hide and seek, of covering and uncovering, of the mysterious phases through which geometry passes on its way to becoming a free sensation of colour.

Gerald Turner

London 1965

from **The Guardian**

4th August, 1965

SIGNALS LONDON, at 39 Wigmore Street, London, W1, has been in action for a little over a year. In a quarter full of doctors, opticians, and dentists, it has three good floors of exhibition space with good lighting and facilities for demonstrating kinetic devices dependent on electricity, magnetism or motors.

The atmosphere of the place is youthful, evangelical, and prosperous. Exhibitions are supported by a large and lively newspaper which has reached its eighth number and now has sixteen pages of pictures, poems, theories, thanks, and congratulations. The promotion has force and naturally tends to induce an equal and opposite resistance in those of us who are counter-suggestible. The current exhibition, called **Soundings Two,** is the first half of a house miscellany to which examples of the work of some of the best non-figurative artists of the last fifty years have been added.

The inference is that kinetic and optical artists, makers of mobiles and bubble-machines and articulated variable sculpture are in a continuous tradition of development from the pioneers of abstract art, from constructivists, Dada, Merz, Suprematism, and the onward march of science. This I in no way believe. But then I remember that Henry Moore once let himself be called a surrealist. It is a curious thing that the further artists take their work towards a 'purity' of line, space, remembered sensation, the more words are supplied to wrap around them.

Let us return to the objects exhibited. You may see here by the old masters of half a dozen modern movements a light and most beautiful linear construction by Naum Gabo, a very fine Ben Nicholson, a grey-black-blue Kandinsky, several Schwitters, a small Malevitch, and a difficult Moholy-Nagy. There is also a tiny Alexander Calder — a strangely small representation when you consider how much his work stopped people talking about 'toys' and stuffed some American museums with the wearisome engines of his imitators.

Connecting Schwitters with Camargo, Arp with Takis, Gabo with Pol Bury demands a kind of metaphysical knitting for which I am untrained. Anyway, why should the avant-garde be expected to keep on even roughly the same compass-bearing? Or why should artists be movements?

The house name of **SIGNALS** comes from Takis who uses magnetism, flickering lights and the interaction of gravity with other forces to make patterns in the air. I take pleasure in his groups of tall wires with relevant bits of steel on the end, but find that irregular lamps and balls that swing unpredictably around magnets mean nothing to me. Nor can I take much interest in nails held faintly quivering in the air. Still, a Takis has in common with a scientific experiment that it either adds to experience or is quite null.

Pol Bury is here represented by a thing of creeping and clicking nails and a slightly more comprehensible set of black balls emerging irregularly from a black box. They tick, too, and I don't know why, or greatly care.

Sergio de Camargo of Brazil is known for white on white wood reliefs made up of forms as simple as cut corks in patterns of great complexity made more remarkable by shadow. An impressive one called 'Aerial Landscape' could be representational. Possibly, also, a spiky and pitted figure in the round of his could have to do with an owl. Alberto Guzman from Peru welds sticks and slabs of iron into constructions as light as a bird's nest — but useless and original.

There are strictly abstract reliefs in white or red by a Chinese artist, Li Yuen-Chia, whose regularity is broken or emphasised by apparently casual spots or splashes. Some poor devil will one day write a long chapter on art history about the interaction of straight-edge and spatter and their Kleinian significance. He might, of course, say hard-edge and tache if those words are remembered.

Antonio Asis plants vibrating springs in red or blue on walls of the same colour — which look well. So do Lygia Clark's arrangements of hinged steel and troubling intelligence-test-like rectangles made of geometrical jigsaw pieces.

The most considerable of the new inventions come from the Venezuelan J. R. Soto, who adds vibration to strange colour superimpositions. Equally astonishing, though kinder to the eye, are the **physichromies** of Carlos Cruz-Diez, another Venezuelan. These create changing illusory colour as the observer moves, are not to be plausibly described in words nor, I suspect, easily imitated. Worth seeing, as the whole show is, if you just look.

Frederick Laws

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Paul Keeler will give a talk on recent developments in art before the Penwith Society of Arts, St. Ives, Cornwall, on September 27, 1965. David Medalla will give a talk on elemental art before the Alexander Cozzens Society of Eton College, Windsor, on September 30, 1965.

A school of saupes

Phosphorescence in the Sea

by John Stewart Collis

At the close of his account of the Cataracts of the Orinoco in his **Aspects of Nature,** Humboldt speaks of the countless insects that 'poured their red phosphoric light on the herb-covered ground, which glowed with living fire as if the starry canopy of heaven had sunk down upon the turf'. Yet it is not the fiery flies of the East, nor the massed mycelia of the fungi glowing upon the rotting barks of fallen trees, nor yet the bacteria that illuminate their living hosts, which provide the most splendid spectacle of earthly light. It is a mere speck of jelly smaller than a pin's head which gives the greater glory witnessed on the sea. The **Noctiluca Millaris,** or Night-Light, when very much magnified looks like a peach with a long stalk, which it wags about and pushes against objects that come in its way. In its body are little points of light which rapidly appear and disappear. In some parts of the world twenty-five thousand of these creatures can be found in a cubic foot of sea-water. When the whole of an area is thus covered we have a memorable sight. The Red Sea is such a soup of **Noctiluca** that it derives its name from their hue. They are more often seen in the warmer seas, and we read many descriptions of it, from Father Bourges, who in 1704 said that 'on the Coast of Brazil the Shore was one Night so very bright that it appeared as if it had been on Fire' to Darwin's somber observation in his **Voyage of the Beagle** — 'While sailing a little south of the Plata on one very dark night, the sea presented a wonderful and most beautiful spectacle. There was a fresh breeze, and every part of the surface, which during the day is seen as foam, now glowed with a pale light. The vessel drove before her bows billows of liquid phosphorus, and in her wake she was followed by a milky train.'

Europeans need not go so far afield to witness phosphorescence. It is quite common in the English Channel, and Phipson claims that he found **Noctiluca** in such prodigious numbers in the damp sand in Ostend that, on raising a handful of it, it appeared like so much molten lava. It is by no means rare in the south of Ireland. Many years ago, on a hot summer evening, I went to bathe with my brother[1] on the coast of Kerry. We turned out of a dark lane to a bay, with crags at each end of the horseshoe. It was a very dark night. At such times water looks blacker than the darkness — an element most alien and fearful. What we saw now, coming suddenly from the lane, was very different. As the waves fell lightly on the shore they broke in scrolls of phantom fire. The crags looked like ships floating on a sea of flame whose waves broke in sparks before their prows. Some fishermen were at work, whose nets beneath the water looked like silver webs and the wriggling fish like tongues of writhing flame. Their oars dripped fire into the fire. We waded out into it and we encountered a seal with phosphorescent whiskers. I saw my brother as a man in flames — not feeling it. I looked at my arm — it was a fire-brand. Above, the dark night implacably roofed us. It was as if we were being shown that life calls for light and must needs be linked with it, and that here again, as with bacteria, as with mycelia, the humblest of all the children of earth are seen to assault and prevail against the powers of night.

From **Paths of Light** by John Stewart Collis, first published in 1959 by Cassell & Company Ltd, London. Reprinted by kind permission of the author and the publishers.

[1] Dr Robert Collis

from **The New York Herald Tribune**
International Edition
17th August, 1965

At this moment of summer, London galleries specialize in mixed exhibitions. This is a statement of fact, not a criticism. Such miscellanies often provide a welcome perspective.

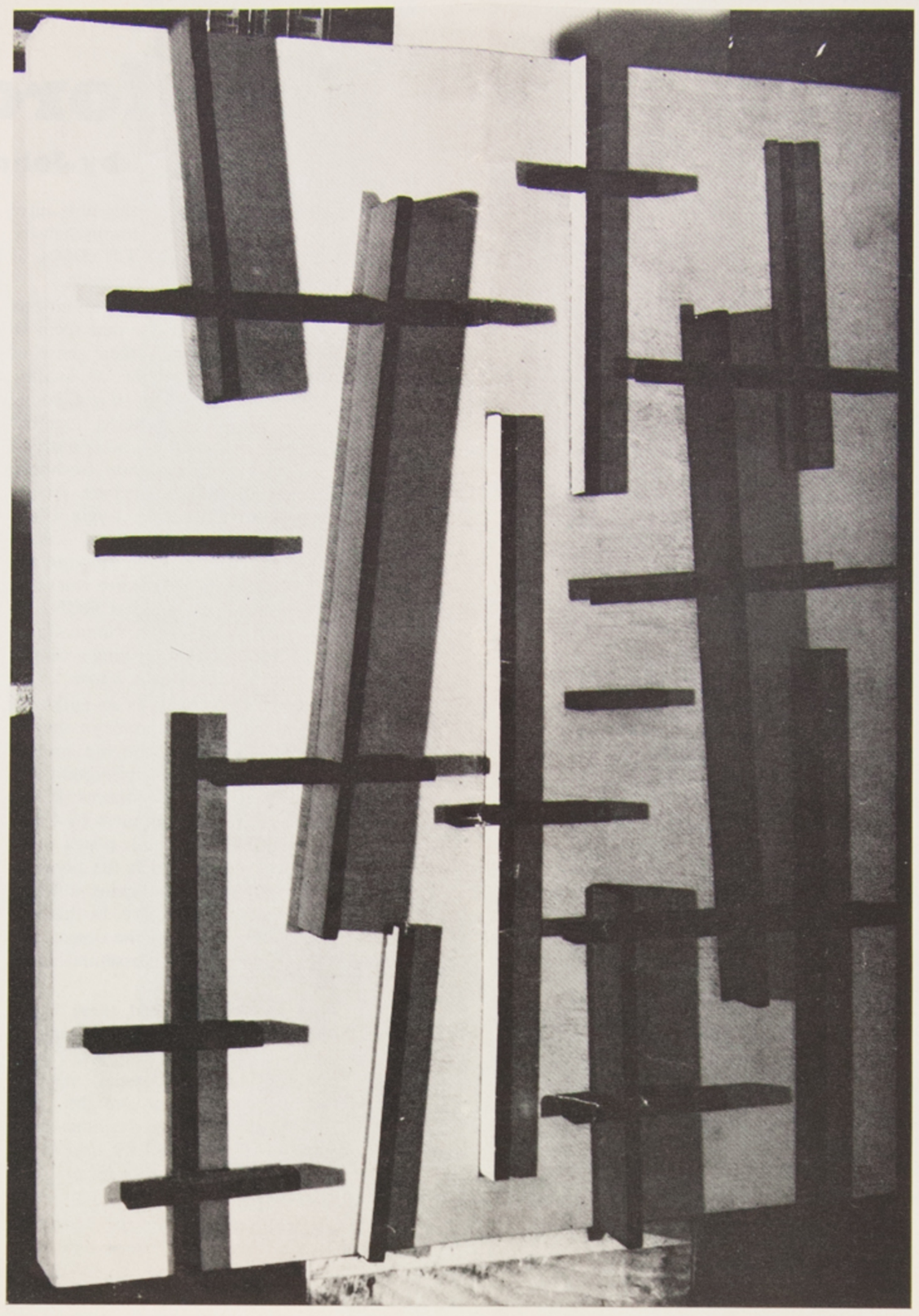
SIGNALS LONDON, filling three floors with op, kine and movement, for instance. It is not often that one has the opportunity of seeing Ben Nicholson, Schwitters, Henry Moore, Gabo, Calder and Kandinsky in company with the Young Turks of the next stage.

Great care has been taken to make **Soundings Two** a well-selected show. There is an early Moore marble — like an Aztec fragment — of compelling beauty. Gabo's small, linear construction 'Suspended' (1957) is a watershed work, a pointer toward his latest development.

Minute collages from Kurt Schwitters look like artists' prints. They blend in pleasantly with the latest from Formosa: the Li Yuen-Chia plaques — one-tone paintings with a tiny spatter of colour contrast which Li calls the 'germ of life'.

It is also good to see Lygia Clark (from Brazil) in company. Her remarkable range (the manipulative sculpture, the two-tone panels and the random auto rubber and ribbons of copper) was inclined to be overpowering in the personal exhibition she held here a few months previously. Seen alongside Soto's twinkling wires and Wayang-Klitik shadow play, they cease to become mere clever artifacts. Miss Clark is a fast-moving pioneer, reputedly the prime influence of most of Brazil's youthful artists.

Sheldon Williams



CARLOS CRUZ-DIEZ: Project for a Mural, relief, 1954, Caracas

from **The Arts Review**
7th August-21st August, 1965. Vol XVII No 15

However much the concept of 'avant garde' has changed and its very existence challenged, we are still startled, from time to time at least, out of a complacent acceptance of novelty by the creations of sculptors perhaps more than painters. Yet, in spite of the apparent chaos of individual experimenting today, this exhibition, which contains work of some of the pioneers of abstract art as well as its contemporary exponents, demonstrates how even its extreme creations are deeply rooted in the ideas and forms of those pioneers. Among those represented here, Malevitch, Arp, Gabo and Schwitters, all born within twelve years of each other into that marvellously inventive generation which dwarfs our own, pointed the way followed by our contemporaries.

The small sculpture by Arp, the organic growth of natural form flowing into bronze, alone seems strangely out of place among the other exhibits that are so essentially a part of the machine age. Pol Bury's work is the most closely related to it; the slow balls sliding over a plain surface and the cluster of sensitive antennae groping the air are like larvae extruded by some alien form of life. Among the surrounding kinetic and optical art, only the assemblages of Lygia Clark, the *Climbing Grubs* made from branches, metal ribbons and strips of tyres, the detritus of life, have any evocative associations. It is a curious paradox that the art which has developed from Dada and Schwitters' *Merzbilder*, using the ready-made industrial product, should possess an emotional content that is quite absent from the constructions which are the artistic reflections of science and technology.

This impersonality was inherent in the work and ideas of Malevitch and in the constructivism of Gabo and Pevsner, whose Realist Manifesto of 1920 first evolved the aesthetics of the age of technology. Malevitch's dynamic little pencil drawing here exhibited might be the draft for an abstract construction, but his famous black square on a white ground of 1913 which he described himself as 'the experience of pure non-objectivity' was equally pregnant with the art of today. It was an act of artistic annihilation, the end and beginning of absolute painting. Takis's telemagnetic constructions have fulfilled a similar function for sculpture; they are the annihilation of material sculptural form and the creation of the invisible sculpture of movement. The electrical machine, the electromagnet and the ball swinging over it are an unfortunate necessity and ideally would not exist, leaving only the absolute sculpture of pure movement, the pattern of the ball over the electromagnet. The sculpture of three nails on nylon threads held taut in space by the lines of force of a magnet is probably the barest statement of the idea of tension that has ever been made.

Withdrawal from this frontier of art and pure abstraction to the forms deriving from the ideas in the Realist Manifesto is also a return to a world of refined visual beauty, which Takis's *Signals* and early works possess but which seldom appears in the machine accessories of his latest ideas. Constructivism has succeeded more surely than any other modern movement in reflecting the machine age if only for the linear purity of its creations, quite apart from its materials, and kinetic and spatial notions. The fluid lines of a recent linear construction by Gabo himself is the counterpart of an air-borne Caravelle or a Jaguar Mk X in movement. It has been appropriately illustrated [on the cover of the gallery newspaper] as the symbol of **Soundings Two,** for although movement is only implied in its intersecting planes and concentrated, centripetal tension, Gabo's first kinetic sculpture dates back to 1920. The clashing, contrapuntal rhythms of Soto's huge vibrating mural, Cruz-Diez's screen in red, ochres and vermillion, which turn to deep blues as the observer moves in front of it, Asis's vibrant pink board fixed with sixteen quivering hair-springs that swing into a circular dance motion with their own shadows, are the joyous creations of light, movement and colour. It is difficult to imagine living with a great many of these restless, disturbing optical and kinetic works, especially the electrically driven movement of a Bury or a Takis; but, however quiet and contemplative a painting or sculpture in one's sitting-room or bedroom may be, even a cold, silent relief by Camargo, which is a still point in the turning world of **SIGNALS LONDON,** it is a live thing that can never be ignored but elicits some emotional response whenever the eye lights on it, and the time may soon come when Takis's swinging balls will be an acceptable part of our everyday environment.

Bettina Wadia

from **What's On in London**
6th August, 1965

SIGNALS. There are even more startling 'opticals' on show in the mixed exhibitions at this gallery. One occupies a whole wall with a vibrating waterfall of free-hanging verticals over an immense army of vertical black lines. This is a stupendous — ignoring of facts! One is decentralised, lost in a great shimmer in which love is no longer apoplexy. Soto has created another of these Monumental Vibrations for the Stedelijk Museum in Amsterdam, and the Dutch one incorporates a tree!

Carlos Cruz-Diez is also showing some dazzlers, pictures in thrilling colours which change their consequence as one moves one's eyes. (The side-painting-of-vertical-strips illusion.) There is an itinerary here into some freshly defined golden age. Then Antonio Asis confronts us with a rose-red board on which are placed rose-red spirals that vibrate like the springs of old bells that summoned footmen and page boys. One is startled in the right sense . . . and summoned.

Li Yuen-Chia adds to the severity of geometrical austerities two or three flicks of contrasting colour which turn an old exercise into something newly exquisite. Guzman presents an intriguing metal sculpture like a tumbled bird's nest. But it is impossible to list all the stimulations, especially as the gallery has now opened a third floor. So much is being shown that was once only imagined.

Oswell Blakeston

from **The Financial Times**
9th August, 1965

Following hard on the heels of the Marlborough Gallery's recent review of the 1930s a further tribute to **Circle,** that elusive publication which sought to bring together the sculpture, architecture and painting of a decade, is presented by **SIGNALS LONDON. SIGNALS** pursues a consistently single-minded course as patrons of kinetic art and the largely untapped wealth of South American art, though all too often weaving a web of bombastic mystery around their enterprises.

Their current show is as novel as their first show two years ago at the **Ashmolean Museum,** presenting a number of artists, linked by the nexus of Paris, who deserve to be seen more of in this country. J. R. Soto, true pioneer of optical art and surprisingly omitted from the recent *Responsive Eye* show at the **Museum of Modern Art, New York,** dominates one whole wall of the gallery with his amazing Wall. This is a shimmering, tantalising construction of lightly suspended glass rods, curtaining vertical slats of black and white. This one piece alone, sent by the **Stedelijk Museum, Amsterdam,** from its Soto room, makes a visit a must.

Of the others who make up this unusual consortium, Carlos Cruz-Diez and Alejandro Otero, both from Venezuela, are the major contributors, with Takis and Camargo, who have both shown before, maintaining their unassailable position as masters of new forms of construction.

Cruz-Diez has been working for some years on what he calls **physichromies,** an adaptation of the principle behind Victorian glass paintings, with two separate images appearing when viewed from different angles. The result is superficially similar to Soto but with a more lyrical range of colour. Otero deploys bold colours against black panels in Mondrianesque symphonies; these **Colour-Rhythms** are remarkably successful as attempts to define pure colour by linear references.

Among the other numerous artists on show Antonio Asis has some fascinating reliefs of vibrating springs which throw shadows on a matt surface, and Chillida, probably the finest sculptor, continues to enclose the force of the four winds in simple straining metal ribbons.

Anxious to stress the continuity of abstract art since the great innovations of the Thirties, the organisers have included a number of relatively minor works by Gabo, Schwitters, Lissitzky and others, some being little more than sketches or maquettes. To look back to the Thirties and forward to the Seventies at the same time is a Janus-like manoeuvre which would tax the resources of any gallery.

Paul Grinke

from **The New York Times**
International Edition
3rd August, 1965

Soundings Two, at **SIGNALS LONDON,** is an unusually interesting summer exhibit. Paul Keeler has bravely pioneered the most avant garde gallery in London, devoted to every form of optical experimentation, where Takis, Pol Bury, Camargo, Soto, and a host of interesting South Americans, have found an English shop window.

The current show is a fascinating potpourri, with serious intentions since it attempts to trace the origins of much current work in this field. Thus we are shown drawings by Lissitsky and Malevitch, early compositions by Kandinsky, Moholy-Nagy, Gabo, Schwitters, Calder, Arp, Ben Nicholson — all of which stem from the cubist, constructivist experimentation of the early part of the century, leading the way to the more esoteric optical illusions of the present generation.

Perhaps the most arresting work at **SIGNALS** is the mural by Soto, a black and white striped wall, before which a line of metal rods freely hang. The shimmering effect of light and movement is beautiful. Carlos Cruz-Diez's long triptych of ribbed lines, painted each side, results in brilliantly-coloured, changing diamond patterns. Camargo makes sculptural reliefs, from sawn parts of wooden poles, painted in flat white. The encrusted, organic nature of the compositions are superbly realized.

Charles S. Spencer

from **The Jewish Chronicle**
3rd September, 1965

In the mixed exhibition called **Soundings Two,** that pioneering gallery, **SIGNALS LONDON,** continues its concern with optical and kinetic art, art forms that yield more in the way of mechanical ingenuity than of spiritual depth.

The curtains blowing in the wind seem part of the show, nature's direct contribution to the scientific toy shop.

The Venezuelan, Soto, covers twenty-seven feet of wall with thin, closely spaced vertical stripes of black and white; in front he hangs a curtain of thin metal rods suspended from thread. As one moves about the room there is a continuous shimmer, and the wind that makes the curtain mobile gives the illusion that the rods are moving up and down.

Another Venezuelan, Cruz-Diez, has a long panel of shallow slats on which appear, as one moves, diamond shapes of changing colour. Pol Bury, of Belgium, motorises a bunch of white-headed pins on a black board, so that they twitch one by one.

Antonio Asis, of Argentina, sets vibrating metal springs equidistantly on a self-coloured board. The Greek, Takis, uses magnetism to keep a ball hanging from the ceiling in perpetual motion, and to keep three nails secured at the head by nylon thread in perpetual tension horizontally in the air.

Ingenious toys all of them. The objects that neither move nor appear to move must have more than ingenuity. A concretion by Arp has the pulsing warmth of humanism; the reliefs of white-painted diagonally cut wooden cylinders by Camargo grow monotonous with familiarity but perhaps not to all.

Lygia Clark is a decorative assembler of bits of trees combined with ribbons of metal, an adroit pioneer of rubber sculpture stripped from tyre, and a delightful animator of articulated sheets of metal.

There is a tensed linear construction by Gabo of exquisite subtlety as it intersects its planes; a quiet Kandinsky that seems to be feeling towards black and white optics; and a Moholy-Nagy with a similar feeling towards mobiles; a Henry Moore reclining figure (alone and palely loitering?); and a kaleidoscopic still painting of coloured dashes on a dark ground, executed by Otero.

Peter Stone

'My joy knows no limits'

— that is what they say, these Physichromies *of Cruz-Diez. Where colour knows every transport, light every ecstasy, where form is an apparition dressed in light that alters its appearance with every instant. For a moment it seems to succumb to the labyrinthine birth, but it cannot stop itself and time will both ensnare and rescue the form from forests of lines within lines. It returns transfigured. Joy intact. Light filters through, is rejected, pursued, almost trapped, but the next instant will show it again, laughingly, in a changed light. Such are the paintings of Cruz-Diez. Aware of their destiny, with no qualms or questions, they settle between light and time, space and colour, trace and image, shadow and light. The whole inhabited by pure fantasy. The work of art that could trace the conquest of happiness — as Camus wished it — could well be one of these.*

Clara Diament de Sujo

from Suite, V
by Alexander Blok

June 1909

There exist moments of great calm:
winter's sketches on the windowpane;
our thoughts seek involuntary escape,
bored and tired in the damp room. . . .

And suddenly — the mist patrolling in the
dripping garden,
the metallic bridge straddling the rivers and
the streams,
then the grey gateway all draped with roses in
flower,
and a blue assembly, blue with glances. . . .

What are the violins murmuring about,
why is the head turning?
Your kisses, little peasant-girl, bird,
your words which rise up warm in your
throat. . . .

English translation by Sebastian Brett

SIGNALS sends greetings to SERGIO DE CAMARGO on the occasion of his winning the national sculpture prize of Brazil at this year's SAO PAULO BIENNALE. ✪ ✪ ✪

TANGIER TELEGRAM /

TWO WAY CONSCIOUSNESS
TO KNOW QUICK BRANCHES
FORESTS OF EYELIDS HERONS
OF BRIGHT POWER DO NOT
NAME BORNE PENINSULAR
PLACE I HAD SWITCHBOARD
WORD OF SULEIMAN BELIEVE
ME OPENING SPIRIT LOCKS
ACROSS BODY THE WILL TO
COMMIT HEARTSLIDE AS BIG
AS A TABLE GOODBYE TO
PREVIOUS ACTIONS FOR A
TIME I LISTENED SPOKEN
WISHES HOLLOW MOMENT TO A
RENDEZVOUS . . .
STILLNESS . . . GRADUALLY
INDIVIDUAL ATOMS SCREAM
WASHED REFLECTION
REFRACTS RADIANCE MOVING
CLOSER BETWEEN STARS THE
ONEWAY HIDDEN RADIANCE
BLOODBURST IN CLOUD AND
THE WHOLE HOUSE IS READY
MAKE WAY FOR LUMINOUS
CANDLE FLICKER OF
MYSTERIES ASTRAL CASCADE
ENDOW LIGHT ERECTION OF
ALL THINGS CONSCIOUS
CRENATION TO KNOW ME IN
THE VACUUM NEW FLOWING
TEXTURES TO HYDROGEN
TENTS & JEWELLED PASSAGES
MONGREL BREATH AT DAWN
ETERNITY HAS MY EYES
FOREVER UNDER UNNAMEABLE
OBSTACLES I SEE A WORLD
OF FROZEN STILLNESS HANDS
IN BALANCE SEEDS LEFT
INSIDE SELF AWAKE SOARING
BECOME SHADOWS IN
PROCESSIONS OF LIGHT &
HORSES GREAT SHEARS OF
LIGHT IN THE SKYBORNE
PENINSULA MY LIPS THE
SOUL IN DARKNESS DOING
EYELESS VISION. TRICKS
MOVING CLOSER TO THE
STARS AGAIN I MYSELF IN
THE DARK ROOM INFORMED
WITH ALL VOICES A STELLAR
SHADOW FALLS OVER PLATE
GLASS FLAMES IN SILVER
BOTTLES HALLUCINATORY
WHISPERS ITS NEVER BAD TO
KILL I AM THIS SYMPHONY
IN MY TEMPLE ON HILLS I
RESPOND TO HEARTS HIDDEN
GARDENS TOUCH ON LEAFY
PLACES I AM THE HAZARD
AND THE FORM I SEE
FLOWERING BOUGHS OF
UNKNOWN BLOOD BEYOND
FAMILIARITY THERE IS A
RIVAL SPLENDOR IN
BARBARIAN FLAMES
PRODUCING MORE
CARNIVAROUS IDEAS

/ MEL CLAY & IRA COHEN

carlos cruz-diez:

p h y s i c h r o m i e

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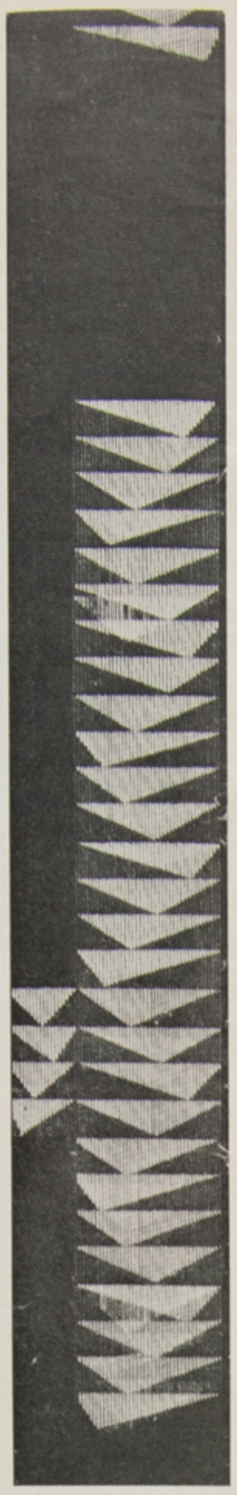

Sonia Sanoja

'El arte de Sonia Sanoja me ha impresionado por su inteligente plasticidad, por su novedad tan singular. Esta admirable danzarina logra comunicarnos los ritmos que animan su cuerpo y que elle transmite a toda su escuela. Sonia Sanoja devuelve al arte coreográfico su carácter sagrado y logra hacer de su propia danza, de una expresión muy aguda y muy flexible a la vez, una inolvidable figura cuy diseño y cuyas formas seguimos con deslumbramiento. Sonia Sanoja es, a mi juicio, una de las más emocionantes danzarinas de nuestro tiempo.'

Pierre Courthion,
vicepresidente del centro internacional de críticos de arte

from **The Observer**
8th August, 1965

From North to South

by James Fox

Last year it was **North** American artists who seemed to be making all the going on the London gallery scene; this year the **Latin** Americans are having a look in.

There's a chance to see some of them at **SIGNALS LONDON** in Wigmore Street. Of the forty-three artists on show in the current international exhibition, fourteen are from Brazil, Venezuela, Argentina, Peru or Mexico — breeding ground of very modern art, mainly kinetic or op.

The Venezuelan Cruz-Diez explains the reason for the pioneer spirit over there: 'There is nothing to stop you from inventing. The only artistic traditions are from the Inca and Peruvian areas — there is no real tradition in Venezuela, Brazil and Argentina, and so one is free to accept the new generation of kinetic researchers.'

None the less, like several other South Americans, he has moved to Europe (he went to Paris in 1960). 'I wanted to integrate myself into international art. If you make your experiments over there, it's difficult for your work to be internationally valid.' Inspiration, but not much outlet.

He's sent a 'Physichromie' for the show, a long panel of overlapping colour ovals made of hundreds of thin lines of colour, which develop through infinite colour variations into deep submarine blues as you walk by it. 'It changes its appearance like the sky according to how much light is thrown on it.'

The Stedelijk Museum of Amsterdam has sent a giant mural, twenty-seven feet long, by another Venezuelan living in Paris, J. R. Soto. It's an op work (Soto founded the movement), a simple construction of thin plastic rods hung in front of black and white stripes — the whole wall looks like a shimmering sea.

Alejandro Otero, of the Venezuelan Institute of Fine Arts, one of Latin America's first abstract artists, is also represented. The faculty of architecture at University City, Caracas, was built with polychrome panels and walls made by him.

Paul Keeler, the gallery's director, says: 'The South American continent seems to be making the most dynamic contribution to modern art.' Starting September, he's arranged three more shows by South American artists — **Cruz-Diez**, **Soto** and **Otero**.

from **The Scotsman** **4th September, 1965**

New forces in art

by John Dunbar

Most of the London galleries at this time have an exhibition representing a comprehensive range of their artists. **SIGNALS LONDON,** at *39 Wigmore Street, W1*, is no exception.

However, whereas most galleries present one with a series of works by artists that seem to have very little in common in their sense of awareness, unity of direction or of quality, **SIGNALS,** under the direction of its young director, Paul Keeler, has gathered together artists from many parts of the world, most of whose works have an extraordinary freshness, combined with a vital sense of purpose. Artists such as Takis, Soto, Cruz-Diez, Lygia Clark and Camargo each have contributed several outstanding works, while scattered amongst the work of **SIGNALS'** 'own' artists are works by some of the pioneers of the art that **SIGNALS** is interested in, such as Malevitch, Naum Gabo, Schwitters and Kandinsky, thus giving a certain perspective to the exhibition as a whole.

For many of the works there is an emphasis on the participation of the observer in the act of creation, either by simply moving himself (or merely his eyes) to differing viewpoints, or by actually manipulating part of the work.

For example, a series of sculptures by Lygia Clark consists of hinged metal plates of a simple, geometrical shape, which the observer is invited to manipulate creating many different variations on the original structure. In this way one is drawn into the sphere of the object, and one obtains an insight into the essential structure and feeling of the sculpture.

Lygia Clark, in talking about these sculptures, has said: 'There is . . . a dialogue in which the "animal" [the sculpture] gives to the spectator's prompting, well-defined answers. This relationship between man and the "animal", up to now abstract, thus becomes real.' (*From the* **SIGNALS Newsbulletin** *devoted to Lygia Clark, volume one, number seven.*)

It is the participation of the spectator that establishes a relationship with the 'animal'; the 'animal' itself retains its independent identity and integrity. The observer, in moving the plates, also brings the sculpture to life, through the actual process of movement, making the sculpture **kinetic**; though dependently so.

Takis, on the other hand, exhibits several sculptures that derive their kinetic qualities independently of the onlooker. There are two *'Ballets magnètiques'* by Takis, consisting, in one case, of a single large sphere, suspended from the ceiling, that is swung around by a magnetic field.

The movements seem arbitrary, sometimes frantic and sometimes leisurely, but always interesting and mysterious, as they describe the invisible force-lines of gravity and magnetism. Most of Takis's sculpture embody machines of a kind; machines that are necessary to create the forces that Takis works with. Magnets or electro-magnets creating magnetic fields, particles of functional iron, such as nails, are suspended in these fields.

There is an interaction of forces, gravity against tension in a wire or thread, gravity in conjunction with a magnetic field. Variations occur in invisible but structural lines, which extend from the confines of physical limitations into levels of pure experience; and it is in this sense that his work has a close parallel to the sound of a Buddhist Mantra. In a similar way, if one does not put up barriers before an experience of elementals, they are bound to be felt and to penetrate.

His sculptures are visual harmonies of a simple and direct nature, extending planes of experience and suggesting directions, until there is an eventual realisation of a permanent, structured space. Takis, however, does not always use synthesised force-fields in his sculptures, and there are several examples of his work that have practically no mechanical connotation at all. These consist of thin, swaying rods, planted in a heavy base and surrounded by various 'knobs'; displaying a beautifully ominous lyricism.

Soto (the father of optical art) and Cruz-Diez are with little doubt the most exciting of its [optical art's] exponents, and they are both well represented at this exhibition. One whole wall in the main room of **SIGNALS** is taken up with Soto's 'vibrating wall'. At first this is physically very difficult to look at; one experiences violent eyestrain as the whole wall flickers in linear sequences. Yet it is an incredibly beautiful object that has an hypnotic fascination, almost making its presence felt when one looks in the opposite direction.

Another very beautiful exampie of his work which achieves its optical effect in the same sort of way consists of a thin wire sculpture pinned against a background of pin-striped (black & white) board, and this breaks up the outline of the wire, making a fantastically delicate and slight pattern of great charm.

The works of Cruz-Diez are constructed in a very low but close-lined relief of plastic rods. Underlying the rods are various geometrical coloured shapes, which change as the viewpoint of the observer changes. The concrete and unchanging elements are the linear components (the plastic rods) while the chromatic relationship of colour, light and shade vary in intensity and expression as one moves. *Physichromie No 110*, his largest picture in the gallery, is about ten feet long.

It is a revelatory experience to walk along watching the shapes and colours merge, shift and change in intricate sequence; a visual poem of great profundity and intelligence.

The white reliefs of Camargo are not objects of immediate visual impact; at least not when surrounded by the forceful works of Soto and Cruz-Diez. They require a close and detailed contemplation. They are composed of bits of dowling, cut off obliquely at both ends and stuck on to a board, which, with the cylindrical bits of woods, is painted a uniform white. The final effect is that of a crystal growth — crystals of a circular cross-section growing out of the base in different directions. In some works these slanting growths have been set almost arbitrarily, leaving spaces or depressions of plain baseboard.

The fascination that these shapes and textures exhort is very strong and is never spoiled by over-complexity, for every chip is in its natural place. Camargo certainly deserves the international sculpture prize that he obtained at the last Paris Biennale.

Perhaps one of the most common complaints assumed against such kinetic, optical and elemental art, is that it tends to be cold, and so abstracted from normal frames of reference that it remains isolated within its own small sphere of quasi-intellectual justification. However, as with any art label, there are bound to exist within its meanings artists of varying statures and the majority of the contributors to the **Soundings Two** exhibition show how false this kind of assumption can be.