Xenakis
talks to SIMON EMMERSON

AT THE ROUND HOUSE on May 2 Sylvio Gualdo, the French percussionist,
will premiere Psappha (Sappho to us) a new work by Xenakis
commissioned by the English Bach Festival with funds from the
Gulbenkian Foundation. The same programme includes the UK premiere
of Jean-Pierre Drouet's Ball, also for solo percussion, but this
work in addition includes a part for dancer, which role will be
taken by France Merovak.

SIMON EMMERSON: I want to talk primarily about the pieces you have
written in the last few years. I have heard about the new audio-
visual computer setup that you are hoping to develop at the Centre
d'Études Mathématiques et Automatique Musicales. I wonder if we
could relate these ideas to the pieces that we have heard in London
recently and to the new work which you have written for the English
Bach Festival this year.

IANNIS XENAKIS: The new piece is for percussion solo. It is a purely
rhythmical composition, which means that colour is used only to
render more clearly the polyrhythmic construction. The instruments
used are entirely untuned, and are basically divided into two
categories: skin and wood, such as large African drums, on the one
hand and metal on the other --- not tam-tams, but rough metal such
as railway lines and pieces of iron or steel.

SE: This is a relatively undefined area in terms of sound. Have you
particular sound-qualities in mind with these metal objects?

IX: Yes. I want something which is not musical in the traditional
sense; something which does not remind one of some other instrument
or which even has other associations: just a category of timbre
which could be replaced later on by some other. The basic problem is
the construction of the rhythmic pattern, the polyrhythmic aspect of
the composition.

SE: How are these polyrhythmic ideas related to earlier stochastic
ones? How are they built up?

IX: They are not derived from stochastics, but rather from the
'Sieve Theory' that I have developed. Time is considered as a
continuous horizontal line, on which you place dots that correspond
to the attacks of percussion. On the relationships of the intervals
of the dots is based the rhythmic organisation.

SE: It's polyrhythmic rather than polymetric. Is there a distinction
there?

IX: Rhythmic in my sense is something which is larger than metre.
Metric means in metres or units of rhythm. I do not start with a
rhythmic cell and try to develop it, or an element and amplify it.

The solution is not really calculated or computed, but is a thought-out intuitive approach to the rhythmic problem, but with all previous experience as an aid.

SE: Is this the first extension of the 'Sieve Theory' into the rhythmic domain?

IX: No, it exists also in Persephassa for six percussionists, written for Les Percussions de Strasbourg. The pieces are related to a point, but in Persephassa I have the use of richer timbres. Also I have sounds moving around in the space between the percussionists who surround the audience. Here there is no space, so the piece concentrates purely on rhythm. Moreover it is a reaction to many aspects of contemporary percussion, which gives us so many timbres, but in which rhythm itself is vanishing --- like a kind of orchestra of noises, some pitched, some not. I wanted to insist very much on the real time-problem.

SE: In the sense of polyrhythm in the other composers' work, one thinks of periodicity. Does this relate to your work?

IX: You always have some form of periodicity if you do not have a stochastic distribution of points on a line, attacks in time. The contradiction or periodic and aperiodic is one of the fundamental games of systems.

SE: How is the piece notated?

IX: Using horizontal lines with vertical strokes to mark point of attack which define the rhythms. The sounds are usually short so the durations are not important.

SE: Polyrhythm also implies different layers of rhythm. How is the layer structure of the piece built up?

IX: The long rhythms in this piece are played on low big-volume instruments, such as bass drums. You cannot hear fast rhythms clearly on low instruments. The faster speeds, the higher linear densities, are therefore played on lighter instruments.

SE: Are these layers like the branching structures, the 'arborescences' of other recent works?

IX: No but the lines are inter-related, Each line has its own rhythmical pattern. Changes, metabolae as I call them in one layer, trigger changes in other layers. There is a variable number of layers. Starting with three, three more are introduced for a short while. The piece expands and then diminishes, with smaller ups and downs in density, quantity of lines.

SE: How about the medium level --- the 'Sieve' idea --- how is this put into effect?

IX: It is not used in a formal way because I didn't want to repeat

myself. Based on my experiences I used a more immediate, intuitive method. Intuition together with experience creates new ideas. So I can't explain exactly everything which is written in the score. This should be understandable from the music itself, from the result.

SE: In this respect it is less deterministic than the Sieves you have described at work in, say, Nomos Alpha.

IX: Everything is notated and is in that sense deterministic, but the construction which has produced this notation is not deterministic, it is not produced by repetitive interlocking mechanisms, like the groups I have discussed.

SE: Is this a particularly new [25] development? How does this relate to other recent pieces?

IX. It is a 'kind of liberation from the 'Sieves', In Empreintes, which I wrote last year, the last section is constructed from a kind of Morse language made by the instruments of the orchestra. Before that there was a similar idea in Evryali for piano, but there it is at a much greater speed than in Empreintes. The same applies to Phlegra, which I wrote for the London Sinfonietta. Yet in this percussion piece it is in a pure form. I said 'free from the Sieves', because I wanted to work in a freer way, without admitting and constructing mechanisms.

SE: This is taking some of the methods you have described in your book as absorbed and then used as part of your experience and knowledge ——— 'freely' is the wrong word, as they obviously play a deterministic role.

IX: Absolutely. This is not the first time I have worked this way. Most of my works are done without calculation. Although I look as if I always work with a slide rule, this is not the case. Sometimes I have to calculate if I am organising things, but when I have conquered that domain, then up to a point I can forget the calculation and feel at home.

SE: We have been talking without even using the name of this new work!

IX: It is called Psappha, which is the archaic name for the poetess Sappho. It is kind of dedication to her, as she was the first to introduce changes or metabolae in the rhythmical patterns she used ——— not only in the poetic sense, but in the semantics also. In addition because I like her as a poet.

SE: In Psappha you are working more directly with the material. In the deterministic structures of some of your earlier works, you build up a vast repertoire of possibilities, out of which you then choose certain patterns, all outside time initially, then placed into time and temporal notation. Here, are the outside time possibilities reduced? Working more directly you are making choices of possibilities simultaneously as creating the repertoire, which

must therefore be smaller.

IX: In this case the result might perhaps be richer than when calculated. First you only control your limits in an indirect way. You do not make a catalogue and then reject any possibilities that are not in the catalogue. I could add anything which fitted at a particular instant, the boundaries are wider.

SE: Are the 'Sieves' you are using part of this boundary-creating process?

IX: Yes, but only their inner properties are left. The abstract image of 'Sieves' is of lines with short marks; they are then realised in rhythm.

SE: At what level are we talking about a freer attitude of organisation?

IX: Perhaps the 'in-time' rather than the 'outside-time' construction in this case. By construction we mean the choice of the time-intervals, a repertoire. But when putting them into time, to build up these layers, I did not use a 'computing mind'.

SE: Can we turn to this instrumentation. Exactly what freedom is left to the performer?

IX: As I said, there are families of percussion instruments, but they are not as standardised as other instruments. If possible I would like to define the sounds accurately, for instance I can try to indicate 'sharpness' of sound in the score --- perhaps three or six domains of sharpness, corresponding to pitch complexes. I have two categories, skins with clear harmonies, and metal with complex harmonic colours, though without definite pitch.

SE: You have defined categories. Is it up to the percussionist to saw up his railway lines?

IX: The important thing is to give him a model. Perhaps after I have worked with Sylvio Gualdo I can decide on the closest possible choice of timbre. Then perhaps I will make a tape as I have done for other vocal and instrumental pieces, which can then be used to help other performers.

SE: This is a kind of aural tradition. Perhaps we could discuss the relation of the written and the aural traditions in music. Your scores are in most instances traditionally notated. We now have electro-magnetic storage possibilities, and with computer decks near-random access even to a spool. To what extent should the aural tradition act as much of a determinant of music as the written tradition?

IX: The written tradition, essentially a graphic notation, is very poor. It is impossible to express the beauty of the sound of a traditional instrument or to notate the differences between players.

This is a higher level, the artistic or aesthetic sensation of the sound. If you want to notate a specific type of attack, a kind of pizzicato-like sound for woodwind or brass for example, and the player has no direct experience of this, then you will not get what you want. You have to explain to him, and if you are not there you have to send an ambassador --- a tape. This is especially necessary when you want instrumentalists to reconsider the way their instruments are played.

SE: Can this be related to electro-acoustic music? Do you in fact notate any of your works in this area? Do they exist on paper?

IX: No, only some rough sketches.

SE: Analysis still seems bound up with traditional notation. I am interested in problems of analysis and criticism in an aural tradition, applying especially to electro-acoustic music, but also in instrumental music. You put forward some ideas in your book about possible approaches, but they don't seem to have been followed up.

IX: Perception is so subjective, words are difficult to use to make meaning clear. There is no tradition of description. Maybe in three generations a standard description might be started, in which terms of reference are agreed upon. I have tried for example to demonstrate degrees of disorder, but they are very difficult to measure.

SE: So we are stuck with analysing the a priori instead of the resulting sounds. This raises the approach to analysis in your sense, existing to clarify the outside time structures, such that we can enrich them, knowing what we have already and finding possible ways of expansion.

IX: The 'outside-time' aspect is important because all our musical life and understanding relies on memory. Memory is outside of the flow. We can reconstruct in memory sounds which have been in time, Then comparisons and judgments of what we have stored in our memory are themselves stored, so they are frozen, although they do change and deteriorate. I don't think the description of the characteristics of any sound are deep in tradition. We have pitch and intensity, which are elementary, but besides that we have other characteristics such as density --- one of the most fundamental and immediate to the perception --- and disorder. Also timbre, depending not only on spectrum analysis, but on transients which we cannot yet describe accurately; we can distinguish simply similarities and differences. We have no adequate tools to deal with them.

SE: Can we turn to your recent work in the field of computers?

IX: The project consists of putting together peripheral devices and a computer, such that one can produce music essentially by two types of notation: first a graphic notation with sound decoding, drawing a sound and then listening to it: secondly a symbolic notation, writing a specific shape on your electronic board which connects the

visual representation through the computer reading and translation into sound. It is difficult to notate directly into sound, as we always tend to work visually out of habit. You can observe many composers who prefer to play their music with some action on the scene or stage. I am against that. To perform music with visual actions, that's treason!

SE: Music is entirely aural? Music-theatre is treasonable?

IX: It should be, yes. At best it achieves something interesting in both domains individually.

SE: You see the autonomy of sound in this respect, not sound as a social phenomenon.

IX: If we had ways of notating with sounds, can you imagine how we could replace all books with sound books? It's a symbolic language.

SE: An analogy principle again.

IX: Yes. In this domain sound is much more than sight. Probably in the beginning the aural tradition was much more important than the visual. After the invention of writing, things changed. In ancient times, when writing was very rare, people were trained to memorise discussions word by word, often to repeat them months later. This is why Plato's dialogues are so artificial. That was a necessity which disappeared with writing and especially printing.

SE: This is still carried on in parts of Africa today, where whole genealogies are [26] memorised. You therefore take as axiomatic the autonomy of the sound world.

IX: Yes. That is fundamental.

SE: In what ways are the visual and aural related in the Polytopes?

IX: One can say different things in these two media.

SE: But do you use symbols in the visual medium analogous to those in the aural? Are they autonomous?

IX: Up to a point they are analogous sometimes. What is much more important is the structuring of them. That is the underlying forms of thought beyond the senses and the immediate perception. For example the notion of density, the organisation of clouds, can be done with sounds or with light.

SE: The relationships are the same --- or perhaps even the symbols themselves as only a translation procedure is used to manifest these, aurally or visually, with the particular sources you are using. Do you therefore think that there are universal forms of thought, are you a 'structuralist' in this respect?

IX: I think so. yes. My experience is that everywhere in the

universe people count in the same way, they can beat time in the same way. Where does this come from? Ordered mental structures of time.

SE: Time is universal?

IX: It has a structure which seems universal, but I don't refer to psychological time or higher-level experiences.

SE: This phenomenon is presumably filtered through sociological organisation to produce the in-time structures of cultural music.

IX: Yes, above that you have all sorts of psychological time, which in some cases might permute events: instead of one event happening after another, your mind might invert the experience because of disturbance of the memory.

SE: In the pitch domain the underlying structures are not nearly so clear, witness the many different scale systems from
India, Greece etc.

IX: But these connections are already above something more universal, the ordering structure again. If you were to ask anyone on earth to classify three sounds with distinguishable pitches, he will do it the same way. The ordering will
be the same whatever the descriptive language used, given that you define some characteristics of the sound verbally.

SE: We may say high/low, but 'sharp/flat' would do as well to establish the order.

IX: Children often turn things upside down; that is the property of such structures.

SE: Then your ideas in the area of universal structures are in the domain or ordering rather than in terms of absolute
physical quantity?

IX: Not entirely, that is only one aspect. There are not only questions of order, but the ability to classify things. Timbre for example is a quality not orderable, but classifiable.

SE: There are three stages of ordering: nominal, ordinal, numerical. First you can distinguish two things, A and B; then you can say A is greater than B, finally you can assign definite values to A and B. This I heard recently as an agreement against some of the more generalised aspects of electro-acoustic music. Composers have moved away from valued orderings such as pitch to much broader bands of sounds. This, so the argument runs, reduces the ordering possibilities and hence the perceptions of shape and 'subtlety' of argument.

IX: Noise-like sounds have not been investigated much.

SE: So we could come to much finer orderings of these if we were to explore them properly.

IX: Maybe not ordering, strictly speaking, but greater differentiation. This is another category of mind, the similarity of one thing to another and criteria of pattern recognition. Comparisons can be made, especially in colour for example. Equivalence classes were discovered not by the psychologists but by the mathematicians in the 19th century.

SE: Perhaps this was determined by the paradigm of the situation, only this century have psychologists become interested in this kind of structuring.

IX: I don't know why, Perhaps they wanted first to clear the terrain from the for verbal distortions of the 19th century.