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p.8

Secrets of pan uncovered

THE EDITOR: The following is in response to the growing concern expressed in your newspaper and elsewhere, that Trinidad and Tobago may have to play "catch-up" with the rest of the world with respect to further development and research on the steelpan.

I also take this opportunity to break my two-year silence on my work with the steelpan and to apologise to all those whom I have kept in waiting. All steelpan makers, pannists, tuners and pan-lovers generally, should feel reassured by this short article.

It is not my style to use the news media to communicate the results of scientific research, but with our national instrument at stake, I must make an exception. Pan is close to the heart of all of us and we have used its unique sound and music as an effective means of expression.

But pan, being of local origin, can easily be taken for granted. It is not true however to say that no meaningful research (scientific or technological) has been done locally on the steelpan.

First of all, with drums, hammer, some wood and matches, together with a keen ear for music, the early pan-maker began the experimental work in

their backyard that led eventually to the modern steelpan.

This is a major technological feat. Most of the scientific work has already been done by these talented men but the results were tucked away in the pan itself. The secrets of the "experienced tuners" were hidden not only in their minds but also in the instruments they have given us and the world.

How close to perfection, as a musical instrument is the properly constructed and tuned steelpan? What are the secrets that generated the notion "pan is beautiful"? Is pan just a backyard science?

With "out of pocket funding" I began the difficult search to discover the basic mathematical formulism, the underlying physics, and the mechanical properties of the steelpan. The results of this work are contained in (i) a 1993 TT Patent on "The Tunable Steelpan", (ii) a series of research papers published and in press, and (iii) unpublished manuscripts prepared for a textbook.

In order to remove any feeling from the general public, that all may be lost, I will list or briefly describe through this communication, some of what they need to know of the results of this work.

The correct and full mathematical basis for the steelpan (tenor to bass) has been found. The mechanical processes that convert the drum into a steelpan during construction and tuning, and the physics that describes the pan while being played by the grooves and the skirt (as examples), have all been investigated and reported upon.

It is now possible to use mathematical equations to explain and to model the steelband with all its subtleties of note and skirt interactions.

For example, the most interesting single note rendition on the pan is the "roll". The musical differences between the "crescendo roll" with its steadily increasing brightness and the "diminuendo roll" with its gradual rounding of the tone, can be fully explained by the equations and reproduced on synthesis.

Not only is the real pan of steel local in origin but now, so too is its "cyber-space" version modelled exactly by these equations on a computer and piped through a sound system. This is the first musical instrument to be modelled (mathematically synthesized) entirely by exact mathematical equations (without wave tables or pre-recorded sound). The world will one day receive

this version of pan on the Internet if only to show that we are not lagging behind.

A simplified "Panmaker's formula" can be given to describe the note-shaping and tuning process (useful for teaching the basics of pan in the school). There are some interesting phenomena that have been discovered on the steelpan but these must await their turn to be made public. In the near future, and at the appropriate forum, the full results will be publicly presented.

If this article whets the reader's appetite, then that is the nature of pan, be it at the Panorama or at the computer. Before my eyes, the pan has changed from an object of curiosity to a mathematical object, but always remaining an instrument in which the Trinbagonian personality is reflected, not in its chrome but in its unique tonal qualities.

I believe that we, as a people, are just as beautiful. Finally, what the pan-makers have done on the pan with the hammer and fire, have proven to be scientifically correct. They deserve our highest commendation.

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