

FOR MORE NEW SOUNDS

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FOR several years a small but growing number of composers in America have been writing compositions for percussion instruments alone. Orchestras now exist, one in San Francisco, the other in Chicago, for the performance of these works. The instruments used are in many cases those found in the percussion section of the symphony orchestra, or in typical Oriental, Cuban and hot jazz ensembles. Many objects not originally intended for musical purposes, such as automobile parts, pipe lengths, and sheets of metal have been used. In some cases, the word, percussion, has become a misnomer, the sound being produced through other means than hitting. Shells and whistles are blown; dials turned and buttons pushed; needles are lowered to records.

Elements of sound and rhythm have been used which may, with good results, be combined with the resources of the symphony orchestra. On the other hand, the similarity between the instruments of the percussion orchestra and the sound effects of the radio and film studios suggests the development of what might be called a radio or film orchestra. Such a development would be quite modest compared with some speculations put forward during the last twenty years by musicians and sound engineers alike.

In an article which appeared in the *Journal of the Acoustical Society* in 1939, Dr. Vern O. Knudsen wrote the following: "Certainly the acoustical engineer can devise instruments for percussional or frictional sounds which composers, musicians, and the large listening public will prefer to such 'instruments' as a fireman's axe in a bucket. What appears to be needed is an instrument similar to that developed by Bell Telephone engineers for the artificial production of speech, — a type of 'Voder' which not only can imitate or suggest the sounds of nature . . . but also can produce myriads of sounds heretofore unheard or even unimagined. Some of these new sounds fashioned from thermal noise could be made definitely musical

by filters which select tonal bands forming a harmonic series; varied transitions from the tonal and harmonic to the atonal and inharmonic could be made continuously or by discrete steps." In the same periodical in 1934, Dr. Harvey Fletcher mentioned the need to select apparatus so that the intensity of the tone produced, its frequency and its overtone structure, could be varied throughout the audible range.

Many musicians, the writer included, have dreamed of compact technological boxes, inside which all audible sounds, including noise, would be ready to come forth at the command of the composer. Such boxes are still located somewhere in the future. At present the choice is either to wait and lament the fact that they aren't available now for experimental and musical purposes, or to continue to work with what "axes and buckets" can be found or made.

Recently the percussion group in Chicago had access to the sound effects collection of a Chicago radio station. An audio frequency oscillator was used in combination with electric buzzers, muted gongs, tin can xylophones, marimbula, a coil of wire and recorded sounds. The coil of wire was connected through a phonograph pick-up arm to an amplifier and loudspeaker. This arrangement had been devised by a sound effects expert in order to represent various explosives and rumbling sounds of nature and war. The loudness and presence of high or low overtones was controlled by dial. It was possible to shift from the greatest loudness to complete silence and vice versa by pulling a switch. Frequency records and the recording of the whine of a generator were used on turntables, the speed of which could be varied, thus making sliding tones available. To produce the sound, a needle was lowered to the record, although this sometimes resulted in a blurred attack. A button arrangement was preferred, whereby it was possible to have the needle on the record before a required entrance, sound or silence being produced by the position of the button. Here again, the loudness of the sound could be controlled very exactly. One player can operate several turntables and perform a single line written for the sound of a landslide, that of rain, of compressed air, or any other recorded sounds. A small contact microphone, such as was used with the marimbula, transforms slight sounds into ones that have an imposing quality and character.

These instruments are by no means the ultimate ones dreamed of, but they are available and useful and constitute at least a step into the "hitherto

unheard or even unimagined." It is possible, but with some difficulty, to transplant them from the radio studio to the concert hall. Loudspeakers, amplifiers, and turntables must be set up in the midst of a fantastic assemblage of wires and electrical connections. In using this material for musical purposes it would be easier and more natural to do so in the radio studios where the material has been developed. Organizations of sound effects, with their expressive rather than representational qualities in mind, can be made. Such compositions could be presented by themselves as "experimental radio music," or for the purpose of heightening dramatic effects in connection with a radio drama. Parallel possibilities exist in connection with the use of sounds recorded on film, film phonographs and organizations of such material for the moving picture.

In writing for these sounds, as in writing for percussion instruments alone, the composer is dealing with material which does not fit into the orthodox scales and harmonies. It is therefore necessary to find some other organizing means than those in use for symphonic instruments. The sounds cannot be organized through reference to an underlying fundamental tone since such a tone does not exist. Each sound must be considered as essentially different from and independent of every other sound. A method analogous to the twelve-tone system may prove useful, but, in such a case, the "sound-row" would contain any number of elements. However, because of the nature of the materials involved, and because their duration characteristics can be easily controlled and related, it is more than likely that the unifying means will be rhythmic.

As more experimental orchestras are established (inside and outside radio and film studios) and as more composers enter this field, more of its problem will be solved. In proportion to the exchange of ideas and experience that will take place, we can expect the finding and invention of further instrumental resources, the development of an occidental theory of rhythm, and the establishing of another valid form of musical expression.