A few simple rules may be given here. Assume that $F = S.f/s$.

For the disk patterns:

(1) Sf/s flashes per second produce a pattern of f spots, independently of the value of s.

(2) If s is even, the crosses coincide with the circles.

(3) If s is odd, the crosses alternate with the circles.

For the two-field string patterns:

(1) The number of lines seen in either field is equal to f; when two lines merge into one, that line must be counted twice.

(2) If s is even, the two fields are identical, and appear as a single field.

(3) If s is odd, the two fields are similar but not identical.

It is rarely the case that f/s is a simple ratio. Then, as in Lissajou curves, one sees changing patterns. These can be worked out by shifting the initial position of the disk in the construction shown above. It is just this fact that makes the two-field method so convenient. Assume that a string has been tuned to the frequency F, for which we obtain just one line in either field. If the string starts to resonate to some source, one can usually observe two lines moving in opposite directions. The writer has used a $\times 25$ microscope to observe such resonances.

The changing patterns just mentioned can be worked out by a slow rotation of the disk patterns, as stated. From this it will be understood that a complete cycle of change means that the disk has moved by an angle equal to the angle between two spots of the same set. Or in the two-field patterns, we have made a complete cycle of changes when we return to some pattern in the same way. Then, if the pattern corresponds to a ratio f/s, and there are R complete repetitions per second,

$$\frac{F}{f} - \frac{S}{s} = \frac{\pm R}{fs}$$

Although, for simplicity, we have spoken of strings, the two-field method is adaptable in many ways to the observation of other bodies, *e.g.*, the writer used a Neon bulb in the selection of steel springs which were to vibrate at a frequency of 240.

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REGULATING THE AIR SUPPLY OF MICRO BURNERS

MOST of the micro burners obtainable from supply houses have an inflexible and very often an inefficient adjustment of the gas-air mixture. The usual practise with laboratory workers has been to test a number of burners and then select the best of the lot, without attempting adjustment. Obviously, this is an awkward and somewhat unsatisfactory solution of the problem.

A method, almost as convenient as that used for the Bunsen burner, has been found for regulating the air supply of micro burners. The small burner is connected to the gas line and lit. While the flame is burning, twist with a pair of pliers the metal gas connection which projects from the base, loosening or tightening until the proper type of flame is obtained.

Occasionally a burner will be found which requires further treatment. In these cases the gas connection is unscrewed and, using a small three-cornered file, two flat channels about 5 mm wide and 6 or 8 mm long are filed on each side of the tube. These shallow channels start from the middle of the tube and slant upward, meeting at the pin hole gas outlet on top. The connection is replaced frequently while filing and the gas-air mixture tested as described above, in order to prevent spoiling the burner by too much filing. If necessary, the small gas outlet can be made larger by reaming with a pin. However, it is usually found that the opening is already too large. This can be remedied by filing the sides of the hole rather thin and then pressing the edges inward until the desired opening is obtained.

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SPECIAL ARTICLES

ACCELERATED, EXPERIMENTAL POLIOMYELITIS IN NASALLY INSTILLED MONKEYS

IN a previous communication,[1] attention was directed to the accelerating effect of a second virus injection, after an interval of from 7 to 10 days, in provoking experimental poliomyelitis in *Macacus rhesus*. The earlier report dealt with the phenomenon from the point of view of establishing human strains of virus in monkeys. Since that report was made, additional studies of the subject of accelerated infection have been undertaken.

The first test, made by injecting the human virus intracerebrally and intraperitoneally, were soon followed by the injection of sub-infective doses of monkey virus intracerebrally alone. The results showed that acceleration does not depend on the

[1] S. Flexner, "Accelerated Infection in Experimental Poliomyelitis," SCIENCE, 1931: 74, 520.