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tion if a separate buzzer is substituted for the red and green lights. Each buzzer tells of another six feet gained or lost. Lights set where the pilot sees them out of the corner of his eye might be just as good as a buzzer—the eyes would not be used primarily for viewing the variometer.

It would be desirable if one of the indicating needle types of variometer (continuous venting) could have an audio system installed so the instrument could be used either for visual reference with numerical values or audio reference for relative values. A direct approach to this has been successfully tried. An aluminum semi-circle is affixed to the indicator needle, and another semi-circle glued to the cover glass. Together, the two plates comprise a condenser whose electrical capacitance varies with the rotation of the needle. The capacitance forms part of an oscillator which is beating against a second oscillator. The audio beat note is heard in earphones; its pitch varies as the needle moves. The unit has one miniature tube and two subminiature, making it economical with batteries. It fits in a 2x6x10" box. Only "up" readings need be considered for audio variometers; when descending, one might as well look at the needle.

The physiological effect of the continual varying tone has not yet been investigated.

Sensitivity versus Altitude

The sensitivity or calibration of a variometer varies with altitude, but contrary to popular belief, the indication may be too large at a high altitude instead of too small.

It is commonly assumed that since a given pressure change corresponds to more feet at high altitude than at low, to give the same indication a variometer will have to be moved upward more rapidly at the higher elevations. This is not true, except for the Temple type variometer.

It turns out that for the standard atmosphere, if the change of viscosity with temperature is considered, the variometer sensitivity increases only about 0.17 per cent per 1000 feet. This is the figure for all continuous leak types, under the assumption that the variometer is at the same temperature as the surrounding air. If it is considered that the inside of the sailplane always remains at sea level temperature, the viscosity effect goes

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Spiraling with E. J.

"PORT HEADS COOL TO GLIDERS" reads a headline from a Cleveland, Ohio, newspaper which SSA member and long-time soaring enthusiast Bill Pagan sends us. The article by reporter and columnist Helen Waterhouse, goes on to say—"Local airport managers are taking a dim view of the announcement by Lt. Gov. Brown (Ohio) that the state will open a glider training school at Kent State University."

"B. E. 'Shorty' Fulton of Akron (Ohio) Municipal and Ray Van Devere of Kent State Airport, are both cool to the idea. 'Tow lines are vicious things' said Fulton who had plenty of experience with them during the early days of gliding at his own field. He tells stories (Brother, and how!—EJ) of tow lines snagging on buildings and wrecking other planes during glider launchings. Another objection of the Kent State field site is that there are no high hills near the airport from which gliders could be launched without tow lines."

There you have it folks—if that don't knock you for a row of T-type outhouses I don't know what would.

I would reckon that of all the bird-brained stupes left running around this country, most of them surely can be found somewhere masquerading as airport managers. And be sure, gentle reader, to understand that the Buckeye State is probably burdened with no more than the average number of this ivory type—they abound in other states as well. This is not to say that all people managing airports are so stupid, for many of them, like the thousands of us outside aviation as a business, have come to recognize the fact that private aviation in particular and all other branches in general have all but lost the American youth.

Then to see a programme so noble and intelligent as that proposed and supported by Lt. Gov. Brown and others in Ohio, receive this reception from the very people who are certain to benefit immediately—one can but wonder at their ignorance. And be reminded at the same time that the most difficult problem in aviation in America is still the pigheaded people who by some unfortunate chance have some control over our private and public owned flying fields.

For all these fifty years aviation in this country has bucked this headwind and been retarded by this type of parasitic drag. Now, today, and after the most powerful impetus given the movement by War II, we see private and municipal airports closed by the score and potential customers of aviation staying away in droves. We hear constantly of our military establishment's difficulty in securing interested and semi-skilled aircrewmen, and industry's anxiety over the shortage of new prospective technicians for their designing rooms and shops.

How can it be otherwise when we are faced with the spectre of headlines and quotes as mentioned first herein?

But we in motorless flight shall press on and I dare say we shall make a successful crossing—even with mill-stones like 'Van' and 'Shorty' tied about our necks. And finally a day will dawn bright and clear, after these reactionaries, who will probably be remembered most for the stumbling blocks placed in our paths, have passed on to wherever people like this pass (I can think of a place). Fortunately they are a breed that is dying out and soon we hope they will be as extinct as their Patron Saint the Dodo bird. Then, and only then, can aviation in America enjoy the smoother sailing.