



Fig. 2. Representative trace observed during the phrase [akaka].

were routinely observed during speech production. Thus, pharyngeal diameter changes of the order of a centimeter were common.

Figure 2 shows typical L.P.W. displacement during the production of the phrase [akaka] by a normal speaker. The top trace in Fig. 2 represents the external neck wall, which does not move. The middle trace arises from the lateral pharyngeal wall. A downward displacement of this trace represents movement of the L.P.W. toward the midline of the neck. The maximum displacement of the L.P.W. shown in Fig. 2 is 7 mm. The lower trace shows the synchronous audio signal. The time scale is 0.2 sec/cm. It is evident that each time the vowel [a] is produced the L.P.W. moves inward toward the midline, while during the consonant [k] the wall moves laterally. The L.P.W. moves toward the midline in anticipation of the initial vowel and does not return to its static position until after the cessation of phonation on the final vowel.

All films were measured by at least two individuals and the intermeasurer error was always less than 0.75 mm, except in rare cases of gross error which were readily detected. A typical correlation between two measurers is  $r = .96$ , indicating a high measurement reliability.

Time-motion ultrasound also provides a convenient tool for monitoring L.P.W. movement in patients with cleft palates or who have undergone laryngectomy.

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## Lunar Soil: An Engineering Term

D. L. Johnson (1) requests that the term "soil" be applied to other bodies according to its usage on earth. Unfortunately, his request recognizes only one of at least two main meanings. He presents soil in the ecological sense—that is, soil as a result of or as a medium for plant growth. He ignores soil in the engineering sense—that is, soil as unconsolidated material, such as that found in the earth's crust. He is quite right about the term in the first sense [except that Nikiforoff's (2) article follows dogma untenable even before the article was published]. In the first sense, soil is widely used by soil scientists (pedologists), agriculturalists, ecologists, geographers, and others. Probably even more people, engineers and others, use soil in the second sense. In this sense, unconsolidated material on the moon is lunar soil.

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#### References

1. D. L. Johnson, *Science* **160**, 1258 (1968).
2. C. C. Nikiforoff, *ibid.* **129**, 186 (1959).

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## National Motives and Psychogenic Death Rates

In a recent report (1), Rudin sought to establish that psychological motives might affect the mental health or incidence of psychological disorders in societies. As one part of his study he correlated the incidence of suicide and homicide in 16 nations with the need for achievement and the need for power as rated from an examination of the children's tales of a previous generation. The data only partially supported his prediction that the need for power would correlate with death rates from suicide and homicide. The incidence of suicide was correlated significantly with the need for power but the incidence of homicide was not significantly correlated with this need.

A separate test of Rudin's predictions is possible by using primitive societies rather than the developed nations used by Rudin. McClelland (2) rates 52 primitive societies on their need for achievement and need for power, as determined from their folk tales. Palmer (3) rates the incidence of suicide and homicide in 40 primitive societies. Seventeen societies appear in both these

Table 1. The patterns of correlations obtained in the present study (primitive societies) and in Rudin's study (developed nations). Abbreviations: n-ach, need for achievement; n-pow, need for power.

Behaviors and needs	Rho	
	Present study	Rudin's study
Suicide and homicide	0.45*	0.44*
Homicide and n-ach	-0.16	0.03
Homicide and n-pow	0.10	0.22
Suicide and n-ach	-0.02	-0.09
Suicide and n-pow	0.50*	0.52*

\* One-tailed  $P < 0.05$ .

sources and these constitute the present sample (4).

The incidence of suicide was significantly correlated with the incidence of homicide ( $\rho = 0.449$ , one-tailed  $P < 0.05$ ). The incidence of homicide was not significantly correlated with the need for achievement ( $\rho = -0.164$ ) nor with the need for power ( $\rho = 0.103$ ). The incidence of suicide was not significantly correlated with the need for achievement ( $\rho = -0.020$ ) but it was significantly correlated with the need for power ( $\rho = 0.498$ , one-tailed  $P < 0.05$ ). These results replicate Rudin's pattern of associations completely. The correlations from both studies are shown in Table 1.

The fact that the incidence of homicide does not correlate significantly with the need for power in either Rudin's study or the present study throws doubt on the particular conclusions that Rudin draws from the existence of such an association. His arguments demand the association of these two variables. However, it should be noted that Rudin does successfully predict several other associations.

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#### References and Notes

1. S. A. Rudin, *Science* **160**, 901 (1968).
2. D. C. McClelland, *The Achieving Society* (Van Nostrand, Princeton, N.J., 1961).
3. S. Palmer, *J. Criminal Law Criminol. Police Sci.* **56**, 320 (1965).
4. The societies used were Ainu, Ashanti, Azande, Chagga, Chukchee, Comanche, Hopi, Ifaluk, Kaska, Kwakiutl, Lepcha, Marquesan, Muria, Navaho, Papago, Thonga, and Zuni. I am aware of the inadequacies of the present sample with regard to its randomness and possible historical connections between the societies. However, these inadequacies are shared also by Rudin's study. It should also be noted that Rudin compared children's tales with morbidity rates 25 years later. For the present data from primitive societies, the time interval depends on the particular anthropological expeditions, which differ for each society. In fact, the folk tales should show little variation over time in primitive societies and the problem of the time interval is of less importance if the primitive society is in a relatively static phase (for example, not experiencing stress from contact with more developed cultures).

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