

how to capture a bat – underwater – with a PI tape recorder



To satisfy a yen for sea food, a particularly interesting member of the bat family catches fresh fish by reaching beneath the surface. In studying these bats, Harvard Professor Donald R. Griffin captures the bat's "radar" with a microphone in the air and a hydrophone in the water. The pulses of sound are recorded on alternate channels of a PI tape recorder, and played back at reduced speeds so that the original frequencies, 15 to 200 kilocycles, become audible.

In other studies, Professor Griffin has captured bat sounds in stereo. Using a pair of microphones located at different points, he has recorded and measured the arrival time of sound pulses to determine the bat's changing position with respect to the two microphones.

For capturing bat sounds and other dynamic phenomena for conversion to electrical form, PI recorders offer a number of distinct advantages over conventional instrumentation magnetic tape recorders. A brief note from you will capture the details.

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Letters

Expediency for Latin America

You ought to be congratulated for publishing the survey "U.S. assistance to Latin America" [*Science* 132, 1936 (1960)]. I cannot help but offer some comments on what appear to me an array of contradictions.

Contradiction number 1. "The Act of Bogotá talks of very much the same . . . things: schools, literacy campaigns, low-cost housing, roads in the country districts. . . . None of these things, any more than any of Castro's original reforms, contributes much to real economic development." If the illiteracy in Latin America is to continue at the level of 50 to 90 percent, if the people are to continue to live in mud huts, sick and undernourished, and if whatever produce is extracted from worn-out soils cannot be taken to the market, how, I ask, can one reach the absurd conclusion that none of the things talked of in the Act of Bogotá contribute to real economic development?

Contradiction number 2. "A real program of development necessarily requires, for one thing, a drastic rise in tax rates, which in every Latin-American country are now far below those in any of the more developed countries." Taxation works wonders in countries with strong middle classes. Latin America, with the exception of Uruguay and Costa Rica and possibly Argentina, is characterized by the "have nots," with incomes of \$100 to \$500 per year, and the "have everything," with incomes which approach the national budgets. I do not believe that the oligarchs will ever vote to tax themselves even at the existing rates, and even if they were to pay 1000 percent of what they pay now, the revenues would not be enough to solve any of the basic problems. What is needed first of all is a drastic rise in productivity and incentive to consume. To attain these basic goals, there must be technical know-how and literate, healthy workers. It is an irony to talk about democracy when the elementary ingredients of a decent living are denied the great majority of people.

I could go on analyzing the contradictions which appear to originate from ignorance of the real social and economic problems of Latin America. How can a government be progressive and popular and be able to institute sound economic programs if it does not (i) provide elementary education for the large masses of children who remain illiterate for the lack of schools, work for chronically unemployed people, a little sanitation and modest housing for the

have-nots, and roads to open new areas to productivity; (ii) find democratic formulas to institute land reform in countries where 100 families own 95 percent of the productive land; and (iii) obtain technical aid from the advanced countries and long-range, low-interest loans for broad economic development?

To formulate realistic policies of assistance, it is essential that the experts stop reading government reports, which are invariably colored by national pride, and go, instead, to see for themselves, not Buenos Aires, Caracas, or Quito, but the "people" in the "real countries." Policies based on expediency will bring only disaster.

L. A. ROMO

DuPont Company,
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Racial Differences

The recent letter of Leon S. Minckler [*Science* 133, 202 (20 Jan. 1961)] on racial differences points out the need for distinguishing between the scientific problem and the applications to daily life.

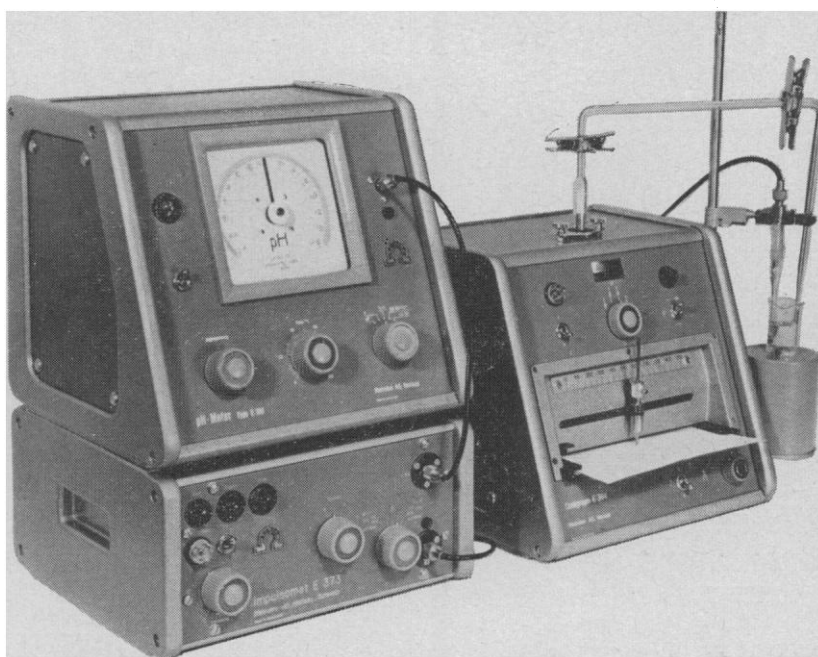
With regard to the scientific problem, Minckler admits that H. E. Garrett's opposition to the "equalitarian dogma" is probably justified, although the examples he gives have not been adequately studied. Concerning the problem of intelligence, with which Garrett is primarily concerned, nothing is said. Yet this is the crucial problem of the equalitarian dogma. For the results of mental tests almost invariably indicate significant differences in favor of whites, yet are disregarded by upholders of the dogma, who believe the differences to be due to differences in environment. What makes the problem especially difficult is (i) that we do not know how unfavorable an environment must be to stunt mental growth, and (ii) that, as Shuey has shown, the differences are greater at the upper socioeconomic levels, where the stunting effects should be the least.

As for the problem of application, I do not believe that Garrett or any other responsible psychologist would use racial differences as an "excuse for intolerance or discrimination." While Minckler does not give any example of his contention, it is probable that he refers to the question of school segregation, as that is central to the question of racial mental differences. But this problem is not as simple as it appears to be at first sight. For it is assumed that segregation is discrimination in favor of the whites, whereas the possibility that segregation could also help the Negro is entirely overlooked. Where

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