I did point out in the *Science* article that the procedure was questionable, but limits of space prevented elaboration. Dr. Stanley is correct in stating that my procedure is not the same as a t test following an F test.

Since I utilized statistics in planning and carrying out my study, I naturally disagree with Dr. Stanley's final paragraph. Various sources of heterogeneity were controlled experimentally, the training of examiners, the time lapse between testings, age distribution, representativeness of tests, and two other variables not mentioned in my article, socio-economic background to some extent, and "normality" of emotional behavior. From a methodological standpoint, I believe that all experiments are only illustrations. The only way I know further to show whether my experiment constitutes what might be called "proof" is to have it repeated, perhaps with a more efficient design, as long as the design in the interest of efficiency does not tackle a different problem from that set up here. *Whether or not* the means of groups differed, I should predict that the same general result would obtain, that individuals would differ by more than chance within themselves on different IQ tests.

Dr. Albert K. Kurtz' remarks are partially answered by the foregoing statements. His last paragraph and his Table 1 demonstrate that apparently I did not make the experimental problem clear: "Dreger's little study has, thus, contributed nothing to the problem he tackled: the constancy of the IQ." I was not concerned with that particular problem, which I did mention in passing in the first paragraph of my article. Instead, the question asked was: "What about the constancy of the same individual's IQ as reported on *different tests at approximately the same time?*" (Italics unfortunately are not in the original.)

Kurtz' Table 1 shows IQ's on the *same* test (assuming as we both do evidently that Binet L and M are equivalent) across periods ranging from 20 to 39 months. In the life of a child, the period from 3 to 6 years is a very long time, or even from 7 to 10 (Subject 10). As is apparent, Kurtz' problem and mine are different. An analysis of variance reveals, as in my case, that his Binet tests do not differ significantly from one another (as tested against interaction mean square). But aside from the fact that he is citing the same test used on different occasions, his procedure is not the same as mine. My experiment was set up so that a between-examiner variance would not inflate the differences among tests. I presume that Merrill-Palmer examiners would be different from time to time or randomized by happenstance among subjects and times. Kurtz' results are a tribute to the excellence of the Binet test but are not directly comparable to the results of an experiment employing a different procedure.

One comparison may be made between Kurtz' Table 1 and my Tables 1 and 2. A rank correlation of Kurtz' data, using Kendall's W, yields a coefficient of .81, which by a chi square test (*1*) is significant beyond the .001 point. Such a result might have occurred if only four tests had been used in my experiment, so that all ten subjects could have entered into the rank correlation. With six subjects, however, the correlation was not significant on three tests. With eight subjects on three tests, one different from the last, chi square is just below significance at the .05 point.

Rather than engage in this sometimes fruitless interchange on my experiment, I should rather repeat the experiment. Because of administrative changes, I am not at present in a position to do so, although I expect to be in such a position again. I hope somone will repeat it. If my results are not verified—on the same problem, not a different one—I shall be happy to acknowledge publicly that what I called a "limited answer to the question" is more limited than I am ready now to admit.

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Reference

1. M. G. Kendall, *Rank Correlation Methods.* (Charles Griffin, London, 1948), p. 84.

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Chemical and Physical Characteristics of Delaware River Water from Trenton, N. J., to Marcus Hook, Pa., 1949–52

The Delaware River is the principal source of water for many industries and municipal water supplies in the reach of the river from Trenton, N. J., to Marcus Hook, Pa., and both industry and municipalities use it for disposal of their wastes.

Interest in the quality of the water in the Lower Delaware was manifested in the latter part of 1930 when the natural flow of the Delaware River was unusually low and the salinity of the river increased markedly. Officials of industries that were affected initiated salinity investigations of the stream. A daily sampling program by the U.S. Geological Survey was started in 1944, at Morrisville, Pa.

On the basis of measurements during the period between Aug. 1949 and Dec. 1952, we observed that the mineral content of the water increases from Trenton to Marcus Hook. During protracted periods of low flow (which occurs only during the late summer months) salt water moves up the river along the river bottom and is partially mixed with the river water as a result of currents from tidal action and other factors. This saline invasion causes chloride content to increase sharply at Eddystone and at Marcus Hook, and near its mouth the river water tends to approach the composition of sea water. During these periods, higher concentrations of dissolved solids are observed at the bottom of the river than near the surface.

During normal flow, there is more calcium than magnesium and more sulfate than chloride in the water. This relationship is reversed when the downstream flow is low and ocean water mixes with the river water. At such times, we observed dissolved solids concentrations as much as 4150 ppm at Marcus Hook but only about 250 ppm at Philadelphia-Camden Bridge.

From a sanitary viewpoint, the quality of the river water improved during this period; the number of samples with low dissolved oxygen has decreased. However, the water contains less dissolved oxygen as it flows downstream, indicating that oxygen is being consumed by oxidizable matter. From Philadelphia downstream, there are periods, particularly in the late summer, when dissolved oxygen is barely sufficient to meet the oxygen demands of the pollution load.

Maximum water temperatures are observed in July and August; the highest observed was 88°F. The minimum temperature observed, in January, was 32°F. There is practically no difference in temperature of the river from shore to shore and usually is within 1°F from top to bottom.

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The Chemical Quality of Surface Waters in Devils Lake Basin, North Dakota

For many years the decline in level of Devils Lake in northeastern North Dakota has been a matter of concern. Once a popular resort area in the state, the total area of lake surface had shrunk from about 90,000 acres in 1867 to about 6500 acres in 1940, and had become a shallow body of stagnant, brackish water, unsuited for game fish. A plan of the Department of Interior related to the utilization of Missouri Basin waters includes a proposal to restore Devils Lake to a higher level by indirect diversion of Missouri River water.

The investigations by the Geological Survey of the quality of water in Devils Lake basin from November 1948 to December 1952 included the following considerations: the present salt concentration and properties of lake waters; the extent to which salinity of the waters could be reduced by inflow of fresh water from outside the basin; the volume of inflow and outflow that would be required to maintain tolerable salt concentrations; and properties of the inflow waters.

Scattered records from 1899 to 1923 and more comprehensive data from 1948 to 1952 show a range of salt concentration from 6130 parts per million (ppm) to 25,000 ppm in Devils Lake water. Although the concentration has varied, the composition of dissolved solids has not changed appreciably. Lake waters are more concentrated in the lower part of the basin; for periods of record, the salt concentration ranged from 19,000 to 106,000 ppm in East Stump Lake. The computations show that the probable minimum and maximum concentrations to be eventually reached at lake level 1425 ft are 600 to 1050 ppm for Devils Lake and 690 to 1500 ppm for Stump Lakes. The amounts of dissolved solids in all lakes might total as much as 8 million tons before water is released in the Cheyenne River. It was also observed that because many waterways in this basin have no surface outlets at normal stages, runoff collects in depressions, is concentrated by evaporation, and forms saline or alkaline lakes.

During several years of average precipitation, temperature, and evaporation, Devils Lake and lakes upstream should receive nearly a quarter of an inch of runoff annually from the drainage area of about 300 mi^2. However, the amount of runoff in the basin and the amount retained in upstream lakes varies greatly from year to year; therefore, annual inflow to Devils Lake is extremely variable.

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Modification of the Glacial Chronology of the San Juan Mountains, Colorado

Atwood and Mather (*1*) recognized till of three different ages in the San Juan Mountains of Colorado: the Cerro, of pre-Wisconsin age, the Durango, now believed of early Wisconsin age, and the Wisconsin, now believed of late Wisconsin age. Remapping in the drainage of the East Fork of Dallas Creek, west of Ridgeway, suggests that Atwood and Mather's Durango and Wisconsin tills each represent two glacial advances, and that deposits of two still younger glaciations lie in the cirque heads.

In the area examined, the Cerro till is about 400 ft thick. Its position on an isolated divide, about 1000 ft above the creek, and its very strongly developed profile of weathering are the basis of its correlation by Mather and Atwood with the deposits of the Buffalo stage of Wyoming.

The Durango till comprises two sets of well-developed lateral and partly preserved terminal moraines, each with associated outwash deposits. The outer terminal lies at an altitude of about 7900 ft; the inner at about 8000 ft. Deposits associated with the inner moraine trench the outer moraine in such a way as to suggest that the moraines represent two advances of the ice separated by an interval of erosion. The moraines may, therefore, be considered as upper and lower units of the Durango till and are here correlated with deposits of the first and second advances of the Bull Lake stage of Wyoming (*2*), which I believe to be of Iowan and Tazewell ages.

The Durango till has a relatively strongly developed soil profile that is locally overlain by deposits associated with the next glacial advance. The profile is less well developed than that on the Cerro till but is more mature than soil profiles on younger tills. It is believed equivalent to the Brady soil of Nebraska.

Atwood and Mather's Wisconsin till also comprises two distinct terminal moraines, separated by an interval of erosion. The outer moraine lies at an altitude of 9100 ft, the inner at 9350 ft. They appear to represent separate advances of the ice and may be considered as upper and lower units of this till. I correlate them with deposits of the first and second advances of the Pinedale stage of Wyoming (*2*), which I believe to be of Cary and Mankato ages.