

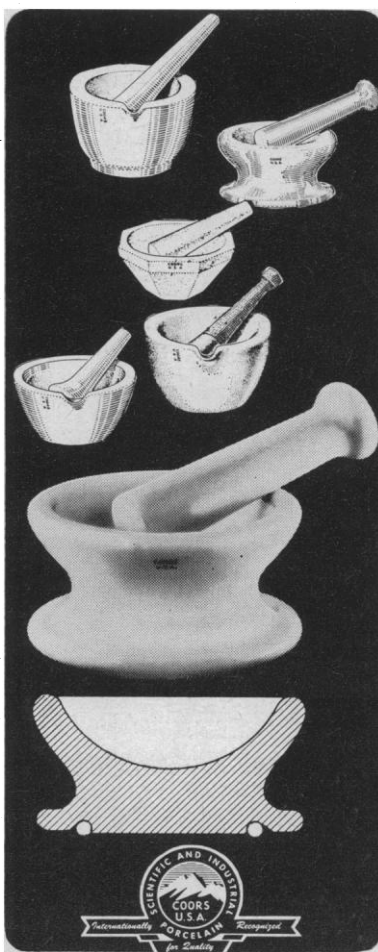
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STANLEY M. GARN  
*Fels Research Institute,  
Yellow Springs, Ohio*

### Federal Aid to Education

In the editorial "Equal but separate," on federal aid to education [*Science* 133, 1043 (7 Apr. 1961)], there are several debatable points—for example, that of the legality under the constitution of federal aid to education and of whether the necessity for this is real (the increase in school construction since World War II has been much more rapid than the large increase in the number of students).

The point that really concerns me, however, is the argument that federal aid is needed because the communities and the property tax can no longer support schools. Does the author of the editorial feel that there are other sources, aside from all the local communities, of federal income, and does he feel that the money the federal government acquires in a community multiplies on its trip to Washington? If this type of fuzzy thinking is representative of the scientific community which *Science* represents, the situation is indeed deplorable.

RALPH S. RIFFENBURGH  
*595 East Colorado Boulevard,  
Pasadena, California*

The editorial entitled "Equal but separate" contains errors in logic and fails to use facts to justify a position. It is, therefore, little more than a regurgitation of some widely publicized views. Such a spurious effort is especially inappropriate for a scholarly publication.

For instance, it is a flagrant *non sequitur* to claim "the deficiencies in education in the United States are serious in the extreme" follows from

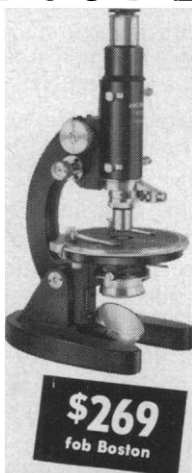
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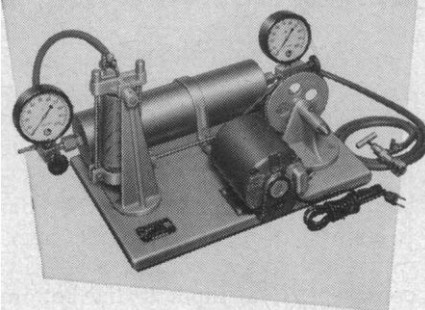
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"... the U.S. Office of Education puts the need at around 140,000 new classrooms, with no expectation that the property tax, the present mainstay of school financing, can even begin to meet this need."

Moreover, the author of the editorial conveniently fails to note that the Office of Education booklet No. OE-10005 also shows, in Table 6, that the "need" for new classrooms declined from something in excess of 159,800 to 132,400 during the period 1955 through 1960. Nor does he mention that the number of graduates per 100 persons 17 years of age has risen steadily to 64.9; that the percentage of the population that is illiterate has fallen steadily to 2.2; that the pupil-teacher ratio has fallen to 25.8 to 1; that the number of pupils in excess of normal capacity has declined 17.3 percent in the last five years; that the total number of degrees earned has steadily risen, to a level of 486,400 in 1960; that total expenditures per pupil for public elementary and secondary schools has steadily risen, to \$446; that total expenditures for education, as a percentage of national income, now stands at 5.39 percent. These data preclude any belief that "deficiencies in education in the United States are serious in the extreme." If present "deficiencies are serious in the extreme," educational conditions heretofore would have to be described as chaotic; I think most of us, including the author of the editorial, would be reluctant to draw such a conclusion.

In addition, even the author's basic premise is faulty! The property-tax structure certainly is capable of being increased considerably; property taxes are on the rise and have been for many years. Furthermore, there are other state, county, city, and miscellaneous local sources of tax revenue untapped as yet. Is it too much to ask that editorial writers recognize that federal funds for education arise from the same sources as do local funds for education?

Consider for a moment that in 1940 the size of the U.S. economy, measured by gross national product, was \$100 billion; today it is \$500 billion. In 1940 the federal government was getting from taxes about \$5 billion, or 5 percent of the nation's economic wealth. It is now getting \$80 billion, or 16 percent of the economic wealth. I submit that the federal government, not local government, has reached the point of diminishing returns on tax

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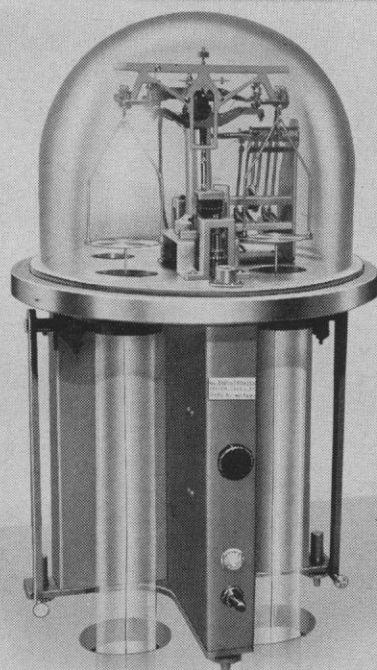
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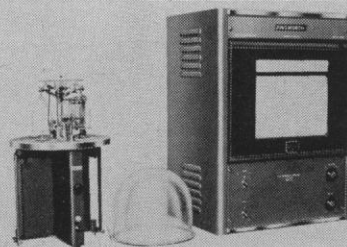
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yield. What magic spell will the federal government weave to create greater support for education? And where is the evidence validating the real need for federal support on an expanded scale?

The editorial seems to imply justification for federal aid to education by saying, "One of the bitter truths about education is that opportunities are not equal for all students. Difference in level of income is a familiar source of inequality." But, here again, the editorial fails to recognize that differences in intelligence, in physical stamina, and in parents also are familiar factors intimately related to inequality of opportunity for education. The really perti-

nent question is whether true equality of opportunity for education can ever be attained while the noneconomic, human factors determining an individual's level of income remain unequal. Indeed, singling out income as a variable appropriation for federal subvention is specious reasoning.

Is it, in fact, a "bitter truth" that opportunities for education are not equal for all students, as is claimed by the author of the editorial? Perhaps my thinking is conditioned by the fact that I was able to earn advanced degrees from a state-supported university (Illinois) and a private university (Chicago) with absolutely no parental or scholarship financing. I do believe

a good case can be made for the value of overcoming obstacles in obtaining an education. At all events, the "opportunity" to work one's way through school still exists, regardless of the merits of the procedure! Moreover, there are today far more student "opportunities" for scholarship and loan assistance than was true just a few years ago. We surely recognize, do we not, that rapidly rising personal incomes are ever more widely distributed among the population and are powerful equalizers of opportunity for higher education? Greater equality of opportunity now exists regardless of the parent's absolute level of income. Last, but by no means least, the Conant report shows clearly there is *no* difference in the quality of secondary education obtained by students attending the "better" schools—that is, those with greater financial resources. One must conclude that the advantage supposedly accruing to the more affluent parent is illusory. A valid summation of educational opportunities is that they are more widespread than ever before; the only "bitter truth" is that for certain people it is "easy" to obtain an education.

For the past 185 years we have had an expanding educational system that makes education increasingly available. Ever more students, in total and on a per capita basis, take advantage of these benefits. Our educational system has evolved with minimal federal aid (3.5 percent of the total financial support of primary and secondary education.) Rather, massive *local* aid to education has made our educational progress possible. I submit that we are quite capable of improving and extending this system without the alleged panacea of federal aid for public school construction and teachers' salaries.

May I suggest that in the future the editors of *Science* editorialize on matters of natural science, not sociology. Readers are more willing to accept your competence here, and your editorials are apt to be valid.

E. H. VAUSE

*Charles F. Kettering Foundation,  
Hinsdale, Illinois*

These communications offer many criticisms. In reply, I should like to offer two reasons why the old reliable property tax as a source of funds for schools is of limited use. (i) The distribution of children through the country is not well correlated with the dis-



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tribution of valuable property. On a variety of scales, from city versus suburbs to this region of the country versus that region, the children are one place and the money is another. (ii) The property tax is very regressive. According to testimony by the National Education Association in support of federal aid to education, "this tax hits incomes under \$2000 almost three times as hard, percentagewise, as it does the incomes of \$15,000 and over."

I am not pretending that these arguments are original. As Vause says, the views expressed in the editorial are "widely publicized." I am merely suggesting that these views, if well known, have also been well defended.—J.T.

## Satellite Orbits

I. I. Shapiro and H. M. Jones, of the Lincoln Laboratories, and R. W. Parkinson, their collaborator, now at Aeronutronics Inc., have raised the question of priority with respect to the publication of calculations on the effect of radiation pressure on satellite orbits.

I am more than pleased to put on record the fact that our interest in this subject was stimulated by reports of the work of Shapiro, Parkinson, and Jones, which they subsequently published [*Science* 131, 920 (1960)]. These reports led me to suggest to Peter Musen of our division that he might undertake an investigation of this same problem. As a result of my suggestion Musen developed an independent theory of the effect of radiation pressure on satellite orbits, which he and his collaborators applied shortly thereafter to the orbit of the Vanguard satellite [Musen, Bryant, and Bailie, *Science* 131, 935 (1960)], demonstrating that the discrepancy between theory and observation for the Vanguard orbit was removed by the allowance for this effect.

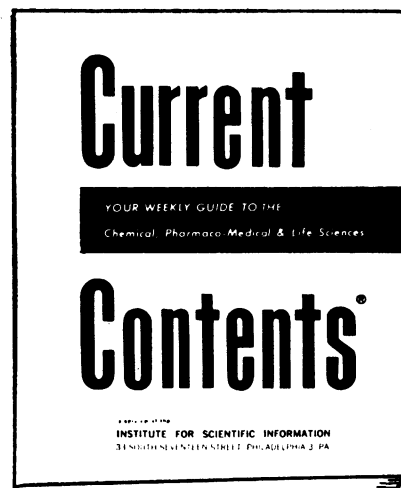
ROBERT JASTROW

*Theoretical Division, National Aeronautics and Space Administration, Silver Spring, Maryland*

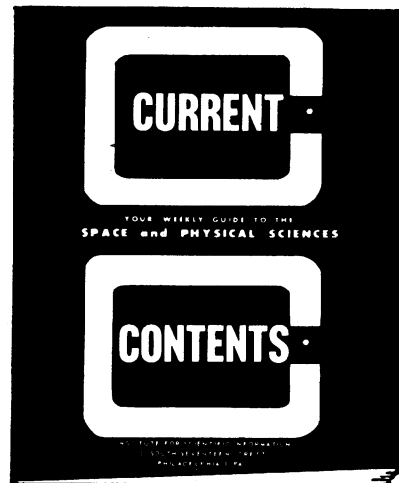
## Aims of a Scientists' Association

Theodore C. Kahn's letter of resignation and protest [*Science* 133, 656 (3 Mar. 1961)] will undoubtedly bring many responses. I think that I am with the majority of members of the AAAS in believing that our association is not

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