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■ The American Association for the Advancement of Science was founded in 1848 and incorporated in 1874. Its objects are to further the work of scientists, to facilitate cooperation among them, to foster scientific freedom and responsibility, to improve the effectiveness of science in the promotion of human welfare, and to increase public understanding and appreciation of the importance and promise of the methods of science in human progress.

COVER Computer simulation of the vortical flow over a delta wing at a high angle of attack. The wing shape is similar to that of the Lockheed SR-71 reconnaissance aircraft. See page 361. [Calculation made with the FL067 computer program by A. Jameson, Princeton University, Princeton, NJ 08540. Graphic visualization by G. Volpe and M. Siclari, Grumman Corporate Research Center, Bethpage, NY 11714]

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The Underrepresentation Syndrome

"Birds of a feather flock together" is a truism that applies to scientific publishing. Authors like to see articles in their field in a journal to which they are considering sending the products of their research. In a magazine like *Science* that can create a problem. Our interest is to publish the cutting edge of research in every branch of science as well as to present research that will interest readers ranging from physicists to social scientists.

Because of that range of disciplines, a phenomenon, which we call the "underrepresentation syndrome," arises. If an article in a well-represented field is turned down, the author may feel aggrieved but there is no generalization to his field, whereas the author of a paper in a less represented area frequently concludes that the subject area was the reason for the rejection and decides not to submit any more papers to *Science*. That perception can create a vicious cycle in which represented areas become more and more dominant and underrepresented areas less and less so. The problem is compounded because readers also tend to discount as representative of their own fields papers that are in different subspecialties of that field.

The chance of being published in *Science* is approximately the same for all fields of research, and the composition of the magazine reflects the percentage of articles received in each field, rather than a selection of certain favored areas. Articles at the frontier of any discipline are desirable but the journal recognizes that it is more unusual to report breakthroughs in mature fields than ones in which new technologies, such as computers, molecular techniques, and tunneling microscopes, are used. The advent of space travel and satellites has dramatically changed the contents of reports in astronomy and earth and planetary sciences, but the percentage of articles in these areas has not changed much over the years. We expect to be increasing pages to get more representation. But *Science*, because it is a weekly with large circulation, must limit its total pages to approximately 5000 per year in order to remain readable and portable. One of our goals is to maintain subject balance, and, all other things being equal, we tend to favor a paper in physical or social science over one in biology. After initial screening, articles with extremely favorable ratings go to a space meeting in which the best are selected. This means not only that they are highly regarded within their specialty, but that they also fulfill balance criteria and are of interdisciplinary interest. Thus it is possible for a paper to receive two excellent reviews and still be rejected. It may be competing for space with another excellent article that is either in an underrepresented field or of greater interdisciplinary interest.

Science serves a function by providing specialized scientists with developments in neighboring areas. The volume of the modern literature makes it ever more difficult to keep up in one's own specialty, but the impact of one discipline on another is also increasing. Scientists, therefore, will need to know what is happening in other fields. DNA sequencing is no longer of interest just to molecular biologists; it expands into forensic medicine, evolution, and disease diagnosis. Tunneling microscopes are not just interesting to physicists, but to chemists, students of ceramic and solid-state surfaces, and biologists as well. No scientist can be an island, and therefore *Science* performs a service by presenting in one place major advances on all frontiers.

Science also tries to serve the scientific community by hastening the recognition of areas that have not yet gained a great deal of exposure. For example, ecology played a very distinguished role in biology for a period of time, then seemed to diminish in interest because many of the studies were repetitive or inconclusive. But now, grave threats to the environment make that science ever more important. Low-energy physics, in the limelight because of superconductivity, continues to make advances which have practical application, not only commercially, but also to other scientists. These are only a few of the many areas that are particularly appropriate for a magazine like *Science*.

We receive many more manuscripts than we can possibly publish. But we wish to improve the fare for our readers and help the advancing frontiers of all science. Winston Churchill said, "Remember the turtle, he only makes progress when his neck is out." There is credit for being a lonely pioneer as well as for being a participant in the gold rush.

—DANIEL E. KOSHLAND, JR.