

# SCIENCE, THE NSS, AND THE *JOURNAL OF CAVE AND KARST STUDIES*: IS IT SCIENCE WITHOUT A JOURNAL?

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Long, long ago in a college far, far away, I learned analytical chemistry from a hard-nosed professor who had no tolerance for sloppy data, sloppy concepts, or sloppy use of language. She would flunk you if you referred to an analytical balance as a “scale”. She would flunk you if you referred to a scientific instrument as a “machine”. And she would flunk you if you referred to a scientific journal as a “magazine”. The NSS publishes the *Journal of Cave and Karst Studies*, which it claims is a scientific journal. Certainly it is not a magazine. From time to time, questions are raised as to what is a journal, anyway, and why is the NSS squandering its members dues by publishing one. In this editorial, I will try to explain what a journal is, how it differs from a magazine, and why the claim by the NSS that it is a scientific organization rests largely on the publication—and reputation—of the *Journal of Cave and Karst Studies*.



The essence of science is communication. Scientific discoveries must be communicated if they are to become part of the large and highly interconnected edifice we call scientific knowledge. Secret discoveries kept in locked file drawers are of no value to anyone. Leonardo Da Vinci wrote his voluminous and brilliant discoveries in secret code in notebooks that he showed to nobody. With his notebooks deciphered and published, today we see him as one of the great geniuses of the Renaissance, but his influence on the science of his day was essentially zero. Maybe, if the scientific journal had been invented in the 16th Century, he would have shared some of his observations and it would not have been necessary for them to be rediscovered later by others. The journal is the primary device for documenting, disseminating, and archiving scientific knowledge.

A journal, somewhat like a magazine, is composed of articles. The articles are written by scientists who use journal publication as their primary mode for communicating their discoveries. Journal articles are accepted for publication based on technical review by the author’s peers, by the judgment of the editor, and by the appropriateness of the article to the subject matter of the journal. Because their primary purpose is to communicate new scientific discoveries, journal articles tend to be highly stylized. There is a statement noting the blank spot in

human knowledge that is being investigated, there is a review of previous writings on the subject, there is a description of the field area and/or the laboratory methods being used, there are the main results—data, maps, photographs or whatever—presented as compactly as possible, and finally there is a discussion of the significance of the results and how much of the blank spot in human knowledge has been filled in. Journal articles are not literature. One learns nothing of the author’s motivations in pursuing an investigation and nothing of his/her feelings and emotions as the study progressed. If one is intensely interested in the specific subject, a journal article may be very exciting. If one is not interested in the specific subject, a journal article will range from the

stuffy to the downright boring. Journal articles are not written to entertain.

Journals have a range of intended audiences and a corresponding range of acceptable subject matter. There are broad audience journals, such as *Science* and *Nature*, that attempt to cover all of science. For articles to be accepted by these journals, they must appeal to a range of fields and, as might be expected, these journals are very picky about the articles they accept. Each field of science has its own leading journal – *Physical Review* for physicists, *Journal of the American Chemical Society* for chemists and the *Bulletin of the Geological Society of America* for geologists. To be taken seriously, physicists, chemists, and geologists must publish at least some of their work in their field’s leading journal. But physics, chemistry, and geology are still too broad and there will be much research that is too specialized even for the leading journals in the field. Thus there are hundreds of subfields, most of which will have one or more niche journals. A niche journal caters to a highly specific subfield of science. The *Journal of Cave and Karst Studies* is a niche journal.

Being a niche journal means only that the subject matter is restricted to articles dealing with the geology, biology, and related aspects of caves and karst, subjects that make up only a tiny portion of the sciences of geology and biology. Niche journal status implies nothing about either the quality of the articles or the quality of the editing. With respect to quality of reviewing and editing, the *Journal of Cave and Karst Studies*

and its predecessor, the *NSS Bulletin*, have had their ups and downs. Some editors tilted toward making the *NSS Bulletin* a magazine—for more reader appeal. Some editors didn't bother with external reviews and accepted more or less whatever showed up in the mailbox. However, for the past decade at least, the publication has followed the norms and standards of scientific journals generally. Based on personal experience with dozens of journals, I can say with confidence that the reviewing and editorial procedures are quite comparable to those of any of the leading journals.

In an age of rapid communication—telephones, e-mail, and the internet—it might reasonably be asked whether or not journals have become obsolete. After all, if communication is the objective, why wait for months for manuscripts to be reviewed, revised, printed, and distributed through the postal system? Why not just post the paper on a website which, indeed, is what is being done with many physics papers? We may be headed in that direction, but we're not there yet. Journal publication implies communication, documentation, and certification. It is the latter that gives journal publication its special status. Once a manuscript has survived review, revision, and editorial scrutiny, the version that is finally printed becomes, in effect, the official statement of what the author intended to say. This is the version that will be built into the fabric of scientific knowledge.

Niche journals at their best are a reservoir of highly detailed information on, for example, caves and karst, that is treated as an important resource by the entire scientific community. At their worst, they serve as a sort of newsletter for the handful of people interested in the topic and are totally ignored by everyone else. Where does the *Journal of Cave and Karst Studies* stand on this continuum? There is evidence that *JCKS* is a niche journal at its best. As anecdotal evidence, I have seen the *JCKS* cited frequently in papers in other professional journals by people who are not part of the cave and karst in-group. A current project of the Karst Waters Institute is to prepare a collection of “benchmark” papers that should be read by every graduate student interested in karst science. The list contains

39 papers. Five are from *Science*, three are from *Nature* (evidence in itself that caves and karst have a broad interest to the scientific community), and six are from the *NSS Bulletin/JCKS*. Some of the most fundamental investigations on caves have been published in the NSS's own journal. Even more quantitative evidence that researchers outside the little NSS-based scientific community read the *JCKS* is provided by the recent decision of the Institute for Scientific Information to add the *JCKS* to the list of journals covered in the Science Citation Index. This index provides a computer-searchable database of all papers published in the most cited of the thousands of journals published worldwide. For a journal to be included on the list means that it has a high citation rate, which in turn means that it is being read and taken seriously by many scientists outside its niche group of authors and readers.

To all of which many cavers may respond: So what? Even if the *JCKS* is a niche journal of the highest quality, does that justify the NSS membership being asked to pay for it? Why should a non-scientist NSS member be asked to pay for a publication—journal, magazine, whatever – that contains little that he/she is interested in reading? There are two answers to this question. One is that the NSS, with its steady support of its journal over the years, can take a great deal of credit for establishing the study of caves as a recognized subfield of science. It is mainly this contribution that permits the NSS to proclaim to the world (and the IRS) that it is a legitimate scientific organization. The second answer is another question. How is it that NSS members, many of whom are doing world-class caving in many places, do not see fit to write descriptions of their discoveries? The *NSS News* is full of outstanding articles describing the exploration. How is it that there is no pressure to write a description of what was discovered? Good cave descriptions are good science. Good cave descriptions are the raw data that interpretation and theorizing follow. *JCKS* has an exploration editor. Make that person work harder. Science would benefit and the non-scientist NSS members might feel that they're getting more for their dues.