CHINA

Scientists Seek Allies in Fight Against Pseudoscience

BEIJING—The invention was billed as a new propulsion system to help large ships navigate in shallow water. Awarded a government patent in 1987, it was listed as a "major scientific invention" in an important technology extension program in China's recently completed 5-year plan. Local and regional investors have poured millions of dollars into this maritime marvel, based on the idea that moving the propeller from the stern to the middle of the ship's hull would avoid eddy current, thereby reducing a ship's draft and increasing its speed.

There was only one problem: The design was never more than a pipe dream of Zhou Jinyu, an untrained laborer from southeastern China's Fujian province. On 27 February the Chinese Patent Office acknowledged that fact by declaring null and void Zhou's patent.

Although that decision marked the end of a vocal campaign by scientists and engineers to expose the flimsy scientific underpinnings of Zhou's invention, it's only the latest example of the uphill battle they are waging against the popularity of pseudoscience in the world's most populous country. "Quite a few of the so-called major scientific inventions [described in the media] are sheer fakes or frauds," declared a group of scientists in an open letter to the *Chinese Science News*, a triweekly publication of the Chinese Academy of Sciences (CAS), following a December 1993 seminar on the topic in Wuhan. "Many scientists have made unremitting efforts to expose their sophistry, but failed to effectively check their spread," the statement continued. "Such pseudoscience has run ever wilder and more rampant."

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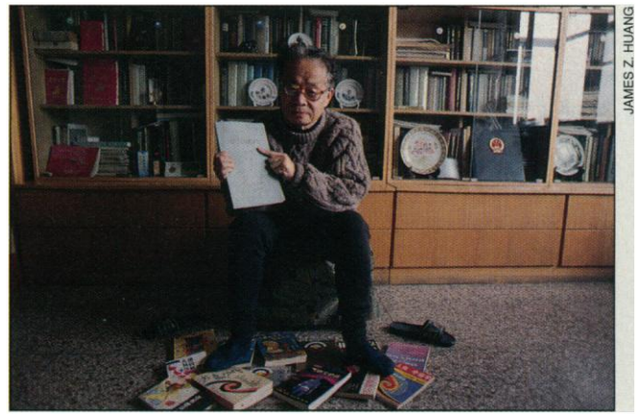
>
> **—He Zuoxiu**

One reason for the growth in pseudoscience is the government's renewed emphasis on science, says Wang Yougong, deputy editor in chief of the CAS newspaper. "As more and more people come to see the value of science," he says, "it's not surprising that some would abuse people's trust in science and cheat them with pseudoscience." In fact, says particle physicist He Zuoxiu, a CAS academician at the Institute of Theoretical Physics in Beijing, some high-ranking officials may be contributing to the problem through ignorance and pride. "They are poorly educated, and therefore more likely to be cheated by slippery inventors," he says. "Once they are taken in and speak in favor of the so-called invention, other people echo their support. Even when they find out later that it is a fraud, they may be too proud to admit they were fooled."

The rise and fall of Zhou's idea is an example of that process in action. Launched in the late 1970s, the idea enjoyed smooth sailing for more than a decade thanks to a flood of self-promotion, favorable press accounts, and official endorsements in line with the government's attempt to encourage entrepreneurship. In 1988 Zhou was even named director and chief engineer of the Fujian Shipping Technology Institute, created by the government to apply his technology. Wang Xuezhong, deputy secretary-general of the Chinese Society of Naval Architecture and Marine Engineering, estimates that the government "has wasted several to tens of million yuan [Y8.3 = US$1]" on the project, which thrived despite the fact that Zhou never described his invention in technical articles nor built anything more than prototypes of his new ship.

The tide began to turn in December 1991, when a group of technical experts attending a seminar in Wuhan on the subject concluded that his "new theory" is "by no means an invention, still less a breakthrough, but only a self-fabricated theory ... that reflects Zhou's ignorance of science." A few months later the shipping engineering institute of the Wuhan Transportation Science and Technology University appealed to the patent review committee to invalidate the patent on the grounds that the idea of a midhull-propeller ship has been around since the 1920s, although it has never been shown to be practical. Even so, in 1992 a panel assembled by the office that runs the government Spark program to foster technology issued a favorable appraisal. "As for the controversy over the quality of the ship," says one official in the project's administration section, "that is the concern of the shipbuilding circles."

As it happens, those circles were eager to take up the challenge. In December 1995, four shipbuilding experts invited to meet with a high-ranking official of the State Science and Technology Commission said that Zhou's ship should not go into commercial production and that the state should allocate no more money to the project pending an objective appraisal. In February of this year 27 senior figures in the shipbuilding industry wrote to the central government declaring their opposition to the idea and echoing earlier complaints that "nothing really practical has ever come out of this 'invention.' " Cancellation of the patent, says a recent issue of the shipping institute's newsletter, means that "the case is closed."



JAMES Z. HUANG

On top. He Zuoxiu puts his foot down on pseudoscience tracts.

While Zhou's idea is expected to sink beneath the waves, a bus driver's claim to have invented a way to convert water into a flammable fuel is still trying to stay afloat despite growing opposition from scientists and the media. "Since water is composed of hydrogen and oxygen, why can't we make water burn without breaking down the elements beforehand?" is how Wang Hongcheng of Harbin in northeastern China's Heilongjiang Province, a former soldier with a ninth-grade education, has explained his idea to reporters. Those who watched a demonstration wrote glowingly of a clean and odorless flame that burned for several minutes after a drop of Wang's "mother liquid" was mixed with gallons of regular water and then ignited. Unfortunately, Wang has declined to reveal its ingredients, what it costs to make, or any details of how it functions.

Although the fuel has never gone into commercial production, Wang is believed to have raised nearly $50 million from investors since announcing his discovery in 1983. "In a sense, this is the number-one case since the founding of new China in 1949 in terms of resources wasted on a so-called invention," says He.

Last year, after Wang refused to cooperate on a scientific appraisal of his invention, He

and 40 other scientists publicly asked the country's top legislative body, the People's Political Consultative Conference, to investigate Wang's claims. "This is a golden opportunity to affirm how science works," says Sheng Hongzhi, a researcher at the academy's Institute of Mechanics and a member of the panel appointed by the State Council to conduct the appraisal. Although the publicity appears to have silenced Wang and his supporters temporarily, the appraisal has yet to be carried out.

In addition to fighting such unsubstantiated claims, scientists are also trying to reform the system that allows such claims to be seen as credible. New products intended for the public are appraised by an independent panel of experts before being sold to the public, and the government has promised to make that system more rigorous (*Science*, 7 April 1995, p. 23). In addition, there are efforts to give scientific experts a greater voice in legal squabbles involving technical issues. The latter stem in part from a judge's decision last year to overturn a verdict against five scientists who had been sued for slander by an entrepreneur who was producing a raticide made with a banned substance that kills other species and damages the environment (*Science*, 5 May 1995, p. 645). The idea of setting up science and technology courts has won the endorsement of Wang Wenyuan, deputy procurator-general of the Supreme People's Procuratorate, which oversees law enforcement in China, and He says discussions are being held to decide who should be eligible and what authority they will be given.

Although most officials seem to support efforts to root out pseudoscience, the government occasionally sends mixed signals to journalists and public-spirited individuals who are active in the fight. An article critical of Wang's water fuel was pulled at the last minute, says a senior editor for *Guangming Daily*, a leading national newspaper, after a high-ranking official ordered editors to avoid the controversy. "We lacked the guts" of other publications that have run stories, he confessed, "but we had to obey."

Indeed, He says that a successful campaign against pseudoscience may also require an end to corruption. "It's really strange that it is more difficult to tell the truth than to tell lies," he says. Some officials and some journalists may have a stake in these so-called inventions, he speculates, and "exposure will cost them dearly."

–Zhou Meiyue

Zhou Meiyue is a reporter for China Features in Beijing.

National Academy of Sciences Elects New Members

The U.S. National Academy of Sciences last week elected 60 new members—11 women and 49 men—and 15 foreign associates. Those elected last week bring the total number of current active members to 1848, 103 of whom are women.

Newly elected members and their affiliations at the time of election:

Arthur Ashkin, AT&T Bell Laboratories, Holmdel, New Jersey; **Cynthia M. Beall,** Case Western Reserve University, Cleveland; **Joseph A. Beavo,** University of Washington, Seattle; **Enrico Bombieri,** Institute for Advanced Study, Princeton, New Jersey; **Karl W. Butzer,** University of Texas, Austin.

Roger A. Chevalier, University of Virginia; **Maarten J. Chrispeels,** University of California, San Diego; **Robert N. Clayton,** University of Chicago; **Thomas W. Cline,** University of California, Berkeley; **Carolyn Cohen,** Brandeis University; **Charles S. Cox,** Scripps Institution of Oceanography, University of California, San Diego; **Carlo M. Croce,** Thomas Jefferson University, Philadelphia; **Herman Z. Cummins,** City University of New York; **James E. Dahlberg,** University of Wisconsin, Madison; **Alan M. Dressler,** Carnegie Observatories, Pasadena, California; **Thaddeus P. Dryja,** Harvard Medical School and Massachusetts Eye and Ear Infirmary.

Zachary Fisk, Florida State University, Tallahassee; **Victoria A. Fromkin,** University of California, Los Angeles; **Elaine Fuchs,** Howard Hughes Medical Institute (HHMI) and University of Chicago; **Elisabeth Gantt,** University of Maryland, College Park; **Ulf L. Grenander,** Brown University; **James E. Hansen,** NASA Goddard Institute for Space Studies, New York City; **William Happer Jr.,** Princeton University; **Henry C. Harpending,** Pennsylvania State University; **Richard O. Hynes,** HHMI and Massachusetts Institute of Technology.

Yuh Nung Jan, HHMI and University of California, San Francisco; **Richard V. Kadison,** University of Pennsylvania; **Margaret G. Kidwell,** University of Arizona, Tucson; **Elliott D. Kieff,** Harvard University and Brigham and Women's Hospital, Boston; **Nancy J. Kopell,** Boston University; **Brian A. Larkins,** University of Arizona, Tucson; **Johanna M. H. Levelt Sengers,** National Institute of Standards and Technology, Gaithersburg, Maryland; **Jane Lubchenco,** Oregon State University, Corvallis.

John F. Nash Jr., Princeton University; **Jeremy Nathans,** HHMI and Johns Hopkins University; **Jerry E. Nelson,** University of California, Santa Cruz, and Lick Observatory, Santa Cruz; **Maria I. New,** Cornell University Medical College; **Kyriacos C. Nicolaou,** Scripps Research Institute and University of California, San Diego; **Neil D. Opdyke,** University of Florida, Gainesville; **Larry E. Overman,** University of California, Irvine; **Marcus E. Raichle,** Washington University School of Medicine, St. Louis; **John B. Robbins,** National Institute of Child Health and Human Development, Bethesda, Maryland; **R. Michael Roberts,** University of Missouri, Columbia.

Robert T. Sauer, Massachusetts Institute of Technology; **Thomas E. Shenk,** HHMI and Princeton University; **Edward E. Smith,** University of Michigan, Ann Arbor; **Christopher R. Somerville,** Stanford University and Carnegie Institution of Washington; **Timothy A. Springer,** Harvard Medical School; **John W. Suttie,** University of Wisconsin, Madison; **Clifford H. Taubes,** Harvard University; **Susan S. Taylor,** University of California, San Diego; **Alvin V. Tollestrup,** Fermi National Accelerator Laboratory, Batavia, Illinois; **Erik Trinkaus,** University of New Mexico and National Center of Scientific Research, University of Bordeaux, France.

William S. Vickrey, Columbia University; **Andrew J. Viterbi,** Qualcomm Inc., San Diego; **Richard A. Webb,** University of Maryland, College Park; **William T. Wickner,** Dartmouth School of Medicine, Hanover, New Hampshire; **John R. Winckler,** University of Minnesota; **John T. Yates Jr.,** University of Pittsburgh; **George Zweig,** Los Alamos National Laboratory, Los Alamos, New Mexico.

Newly elected foreign associates, their affiliations at the time of election, and their country of citizenship:

Setsuro Ebashi, National Institute for Physiological Sciences, Okazaki, Japan (Japan); **Samuel F. Edwards,** University of Cambridge (U.K.); **Michael Elliott,** Rothamsted Experimental Station, Harpenden, Herts. (U.K.); **Jacques L. Lions,** College de France, Paris (France); **Hartmut Michel,** Max Planck Institute for Biophysics and University of Frankfurt (Germany).

Venkataraman Radhakrishnan, Raman Research Institute, Bangalore (India); **Andrew C. Renfrew,** University of Cambridge (U.K.); **Alan M. Sargeson,** Australian National University, Canberra (Australia); **Reinhard Selten,** University of Bonn (Germany); **Michael Smith,** University of British Columbia, Vancouver (Canada); **Hans Thoenen,** Max Planck Institute for Psychiatry, Munich (Switzerland); **Shirley M. C. Tilghman,** HHMI and Princeton University (Canada); **Koichiro Tsunewaki,** Fukui Prefectural University, Fukui, Japan (Japan); **Andrew John Wiles,** Princeton University (U.K.); **Rolf M. Zinkernagel,** Institute of Experimental Immunology, University Hospital of Zurich (Switzerland).