The Case of the "Misplaced" Fossils

A prominent Australian scientist has examined two decades of work on ancient Himalayan geology and alleges it may be the greatest paleontological fraud of all time

JOHN TALENT, a paleontologist at Macquarie University, Australia, always rootles around rock shops when he has the opportunity. So when he was in Paris in August 1986 he visited Alain Carion's famous "Mineraux Fossiles" on the rue St Louis en l'Ile, a virtual Aladdin's cave of fossils. "I bought a number of specimens that day," Talent told *Science*, "including some ammonoids from Erfoud, Morocco, that were to give me quite a shock." That shock was the discovery that the German paleontologist Heinz Erben, one of the world's great experts on ammonoids, had apparently been drawn unwittingly into an affair that Talent concludes may be the biggest paleontological fraud of all time.

That affair concerns the activities over the past 20 years of one man, Viswa Jit Gupta, a geologist at the University of Panjab, India. Gupta, alleges Talent, has inundated the geological and biogeographical literature of the Himalayas with a blizzard of disinformation so extensive as to render the literature almost useless. "And the way Gupta works," Talent claims, "other scientists get drawn in as collaborators, unwitting participants in this extensive scheme."

Two years ago Talent decided to assemble an extensive body of evidence concerning Gupta's work and make it as widely known as possible. Talent first went public at a geological congress in Calgary in August 1987, a year after his visit to Paris. "Many people in the field learned of this business at the 1987 Calgary meeting," says Talent, "but there were many others who didn't. Gupta continued in the same way as before, and more researchers became involved in useless papers with him."

Talent then enlarged the Calgary talk and published it a year later as an issue of the *Courier* of the Senckenberg Museum, Frankfurt. Although the *Courier* is a highly respected publication, its circulation is small, and Talent remained concerned that the information might not reach all those who needed to know. He is therefore publishing a shorter version of that paper in this week's issue of *Nature*. At the same time, *Science* has conducted a series of telephone interviews with Talent and with many researchers who had contact with Gupta at various times.

Joe Vissell

John Talent: *"I am convinced we are not seeing the results of honest mistakes."*

Science also tried to contact Gupta directly from the United States and via an intermediary in India, but has been unable to reach him for a response to the allegations of Talent and others. In the recent past, however, he has characterized the issue as "minor disagreements over taxonomy among experts."

That's not how Talent sees it. About 10 days before the 1987 Calgary conference Talent happened to look at a paper on ammonoids jointly authored by Erben and Gupta, which indicated that the fossils came from the Himalayas. A geologist with a wide interest in paleobiogeography, Talent is familiar with a broad range of fossil types, and was therefore in a good position to evaluate the paper. "I knew that had to be wrong, and that Erben had been deceived by Gupta," says Talent. Talent believes that the ammonoids featured in the paper came not from the Himalayas as claimed, but almost certainly from Morocco, like the ones he had bought in Paris.

"Here was another example of the pattern you see again and again with Gupta's work," says the Australian. "He invites an expert in some particular fossil type to join him in a scientific paper, the expert describing the fossils provided by Gupta, sometimes naming new species, and Gupta giving information on the locality from which the fossil is said to have been recovered." Frequently, alleges Talent, the fossils almost certainly come from elsewhere.

But for Talent the biggest shock was how top geologists became embroiled. "I didn't expect Erben to get caught in this trap," he told *Science*. But if Talent is correct, Erben is in illustrious company. Several dozen prominent paleontologists in the United States, Europe, India, and Australia have during the past 20 years coauthored papers with Gupta, thus contributing to a body of work that exceeds 300 publications, an average of more than one a month. Although some of these papers are in obscure, unrefereed journals, the oeuvre has helped establish for Gupta a position of prominence and power in Himalayan geology in particular and in Indian academia in general. But, according to Talent's interpretation of the information he assembled, that career is founded partly on the embarrassment of other scientists.

"My face is red, no question about that," says Gary Webster of Washington State University, coauthor of nine papers with the Indian geologist. "In the early seventies I asked to see a specimen of species of crinoid he'd published on; it looked interesting, because it was the first crinoid of this species reported outside the United States. He kept sending me more material, and we produced this series of papers."

Webster recognized that some of the species looked like those known from various other parts of the world, such as the United States, England, Czechoslovakia, Timor, and so on, and made note of that in his reports. "Then I heard Talent's talk at the Calgary meeting. I was aghast. I am now virtually certain that most of these specimens did come from places other than the Himalayas. I certainly should have been more wary."

"Knowledge of the Silurian and Devonian of [the entire region from Kashmir to Bhutan] has become a quagmire," concludes Talent. "Not only does the record include a menagerie of fossil species that probably never inhabited the region, but the pattern

of dates inferred from the fossils for the rock strata is a knotty tangle rather than a neat gradation from old to young," he asserts. The distribution of fossil types around the globe has to make sense in terms of the history of the continents, and a coherent pattern usually emerges. For the Himalayas the pattern has become scrambled, both in place and time: "biostratigraphically and biogeographically bizarre," is Talent's description.

"Gupta's large number of publications significantly influenced thinking on the stratigraphy and paleontology of the Himalayas," comments Willi Ziegler, director of the Senckenberg Museum. "It is now necessary to revise the data completely." Alleges Art Boucot of Oregon State University: "The information published by Gupta since the early 1960s has to be checked piece by piece—the bulk of it is totally false."

How could such a thing have happened? How was it that so many experts were apparently so completely duped? And why would it take so long to unravel?

The Himalayan region is fascinating to geologists, being an area of active mountain building as the Indian subcontinent continues to be rammed into Asia. For political reasons, however, much of it is virtually inaccessible to foreign researchers. When Talent and his colleagues went there in 1971, 1972, and 1975 they were among a very few outsiders with an opportunity in recent times to examine fossil localities at first hand.

"The first thing we did on the ground just happened to follow up something Gupta had published on," Talent told *Science*. "The trouble was, nothing matched up. In 1966 Gupta had reported finding graptolites from this locality, in a paper with Bill Berry at Berkeley. When we looked, not only did we infer quite a different age for the rocks, but it was clear that no fossils could have come from there. The rocks were intensely deformed, so that no fossils were likely to have survived, least of all the fragile little graptolites." Right from the beginning, according to Talent, the Gupta pattern was set: "suspect fossils, spurious age determinations, doubts about the localities."

When a paleontologist reports a fossil find, the routine is to give very specific bearings for the locality, or source of the material, so that others may later locate the spot and collect their own specimens. "Gupta's descriptions of localities are often extremely vague," says Talent, "so vague as to make relocation impossible." One of these locality specifications, said to be the source of some Jurassic ammonites, was effectively 130 kilometers of a Himalayan valley wall, a degree of imprecision that virtually precludes relocation by other scientists.

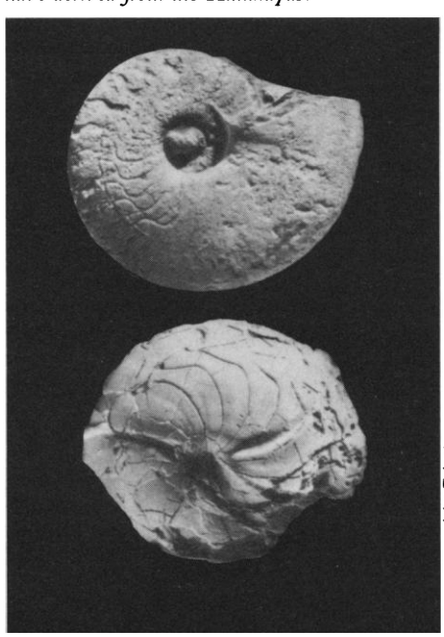
Encouraged by Boucot on one occasion to be more informative about a graptolite locality, Gupta explained that he was being deliberately vague because other geologists were working in the area and might try to preempt his publication if they found the fossil site. "This was unusual practice, to say the least of it," comments Boucot. Because of the unusual and uncertain nature of the locality information Gupta provided him, Boucot finally declined to collaborate on a joint publication.

Philippe Janvier, of the Museum of Natural History, Paris, had a different experience. Coauthor of three papers with Gupta, he asked Gupta if he could see some of the localities from where the fossils had come. "He said it wasn't possible, for political reasons, it's dangerous, and so on," Janvier told *Science*. "Finally I was able to go to the localities on my own, and they didn't correspond at all with the way Gupta had described them to me."

As the years passed following his first visit to the Himalayas, Talent watched as the avalanche of papers flowed from Gupta's pen, gradually engulfing the meager semblance of order that existed for the biogeography of the area. Reports on two types of fossil—conodonts and ammonoids—illustrate well the kinds of problems that emerged.

Gupta reported Himalayan conodonts first in 1967, and has continued to do so at frequent intervals throughout his prolific publishing career, usually with Indian or European collaborators. These complex little tooth-like fossils, which probably belonged to some ancient marine fish, are powerful tools for geologists, particularly for indicating the age of sediments in which they are found. Changing almost metronomically through time, conodont species can be used to pin down the age of strata to within a million years.

Ammonoids: *Obtained from a rock shop in Paris, these Moroccan fossils are identical in preservation and weathering to ammonoids said to have derived from the Himalayas.*



John Talent

Given the abundance of conodont discoveries reported by Gupta, the early fossil history of the Himalayas should have been neatly stratified, a logical time structure into which other fossils would fall. "Instead," says Talent, "there is a striking inconsistency, with all kinds of ages being attributed to the same fauna." No neatly separated time lines, just a temporal tangle.

In one case the tangle tied itself into a knot, according to two fossil experts, when Gupta reported in two different papers, both published in 1975, the occurrence of the same conodont specimens—not the same species, the very same specimens—at two different localities, separated by 600 km.

"I came across this extraordinary state of affairs in 1978 when I visited Willi Ziegler, who was then in Marburg," recalls Gilbert Klapper of the University of Iowa. "At this moment we suspected curious irregularities," Ziegler told *Science*. Gupta approached both Ziegler and Klapper at different times with a view to collaborative publication, but, their suspicions aroused, they declined.

Like conodonts, ammonoids provide paleontologists with a fossil clock, again checking off intervals of about a million years. Gupta has reported ammonoids from various Himalayan localities, sometimes by themselves, but once in the same locality as conodonts. In this case, where the two types of fossil are said to occur together, there is a distinct clash of paleontological clocks, according to Talent's interpretations: ticking precisely as they do, the conodonts and ammonoids at this locality give ages 15 million years apart. "That's biostratigraphically bizarre," observes Talent.

But the conodonts and ammonoids on which Gupta and his coauthors have published have other things in common, besides being good paleontological time pieces: they are highly characteristic of known localities outside the Himalayas. The same fossil species from different parts of the world will often have different, very distinctive preservation characteristics, such as color, texture, and associated matrix. So it is with the conodonts and ammonoids that Gupta has at various times sent to researchers around the world, saying he found them in Himalayan localities.

"The conodonts look just like the North Evans fauna," says Klapper. The North Evans conodont faunas come from a limestone deposit in Amsdell Creek in New York, and

have characteristics of preservation and species composition that represent a virtual paleontological fingerprint. "In the nature of things it is impossible to be 100% certain that the conodonts Gupta reports on come from New York and not the Himalayas as he claims, but I am as certain as I can be."

Similarly, the ammonoids that Gupta reports from the Himalayas bear the signature of a different characteristic locality, Erfoud, Morocco—and that's what struck Talent in Alain Carion's Paris rock shop back in August 1987. "There's a lot of movement of iron into the fossils at Erfoud," explains Talent, "and this gives them a shiny, reddish-black appearance. And the weathering of the fossils is typical of tropical regions, and not with the effects of frost, which is what you get in the Himalayas. The coloring and weathering characteristics of the Erfoud ammonoids and the ones reported by Gupta as coming from the Himalayas are identical."

C.McA. Powell

Chandra Valley, India: *Lighter area at left is the Tandi limestone, from which Gupta reported Triassic conodonts.*

The cases of the conodonts and the ammonoids exemplify the sort of problem associated with Gupta's work. Talent's 50-page *Courier* paper, which he coauthored with two colleagues from India and one from Australia, documents these and more than 100 other incidents in which Gupta's use of scientific information is said to be suspect.

In the *Courier* and this week's *Nature* papers Talent acknowledges that "it is possible to construe the evidence as being consistent with a concatenation of curatorial disasters"—in other words, a series of honest but unfortunate mixing up of fossils in the laboratory. "But, on this scale, it is extremely unlikely," adds Talent. He does point out that many of the fossils in question—such as the ammonoids—can readily be purchased from rock shops, while others are widely available in even moderately equipped paleontological laboratories around the world. "I am convinced we are not seeing the results of honest mistakes," Talent told *Science*.

It is evident that the Australian paleontologist is not alone in this conviction, although no one can prove absolutely a single case in which fossils said to have come from the Himalayas in fact derived from elsewhere. The difficulty is in pinning anything down with certainty in Gupta's case, as is well illustrated by an episode recounted to *Science* by Janvier.

"Gupta was visiting me in Paris, after a trip to China," recalls Janvier. "He told me he had a magnificent fossil fish skull, and showed it to me. I could see it was a new species, and agreed to write a paper with him. Shortly after that I went to Sweden on a trip, and visited the paleontological museum, where I met Zhang Miman, who is director of the Institute of Paleontology in Beijing. Zhang was working on some fish fossils which she had brought with her from China, and I immediately recognized a specimen of the same species that Gupta had showed me—same color, same matrix, everything. I was shocked, but didn't say anything immediately.

"I returned a few weeks later and asked Zhang about the fish. She told me that they were relatively common in China, and they were frequently offered to visitors as gifts. I immediately telegraphed Gupta, telling him to drop the new species name for the fish. Now, there is no evidence that Gupta brought the fish fossil with him from China, but I'm 99% sure he did. Many people have been had by Gupta in this way."

If it is true that Gupta has systematically entrapped eminent researchers as victims in a fraudulent enterprise, then perhaps it can be said that the collaborators were too willing victims. "Yes, I think the coauthors in this case bear some responsibility," says Talent. "Coauthors associated with [Gupta's] publications should have assured themselves as to the reliability of the data, checked for internal consistency and, at the very least, they should have insisted that precise locality and stratigraphic information was given. Having had a sloppy approach to the primary facts, they must take mutual responsibility for the defective products. The integrity of the science is weakened by carefree coauthorship of substandard papers lacking in rigor."

"I wasn't wary enough," admits Webster, "but it's easy to say that with hindsight. I had got involved with Gupta because he reported collecting crinoids from the Himalayas, and that was potentially very exciting. Anything from the Himalayas is likely to be new and interesting, and I knew it was unlikely I'd be able to go there myself. Also, I thought I was helping the guy out. This business is supposed to work on trust between scientists."

Walter Sweet, of Ohio State University, agrees. A target of Gupta's solicitations but never a coauthor, Sweet says, "If a colleague sends you a specimen and says it comes from such and such locality, you don't immediately suspect it might not be true." Boucot sounds the same theme: "We are not trained to think in terms of dishonesty in science—it's an absolute no no. If someone sends me a specimen from, say, Paraguay, it doesn't occur to me to check on what he says. We are pretty innocent in this regard."

The fact that most of the coauthors were never able to visit the localities clearly contributed to the ease with which they may have been duped. So too does each researcher's specialization on a narrow section of the fossil record, focusing only on graptolites, ammonoids, conodonts, and so on. Anomalies certainly emerge from the body of data reported for each fossil type, but the problems are perceived most clearly when the body of information is scrutinized as a whole. With his access to the field and, given his interest in global paleobiogeography, a much wider view of the fossil record than that of most paleontologists, John Talent was perhaps in a better position than most to recognize the scope and potential impact of Gupta's activities.

Most of that potential impact concerns the current body of knowledge about Himalayan geology and those who try to make use of it. "The database for the Silurian and Devonian of the Himalaya has become so extensively marred by error, inconsistency and implausibility as to throw grave doubts on the scientific validity of any conclusions that might be drawn from it," conclude Talent and his colleagues. "An appropriate way to approach this problem and clarify many of the questions raised would be through an independent fact-finding commission set up to probe most of the legions of paleontologically anomalous and suspect reports." ■ **ROGER LEWIN**

ADDITIONAL READING

J. A. Talent *et al.*, "Silurian and Devonian of India, Nepal and Bhutan: biostratigraphic and palaeobiogeographic anomalies, *Courier Forschunsinstitut Senckenberg*, no: 106, 1988.

J. A. Talent, "The case of the peripatetic fossils," *Nature* **338**, 613 (1989).