

Judge Dee and Go Steganography

By Peter Shotwell © 2010

PART I—Judge Dee

An article on steganography and go by the Spaniards, Castro-Hernandez and three colleagues, has been posted on the Bob High Library for awhile. I'd like to add a little to the subject with a look at Robert van Gulik's 1950s book, *The Chinese Lake Murders*. The Dutch diplomat/polymath also gave us the definitive histories of the Chinese lute, ancient sex habits and Ming dynasty erotica.

The Chinese Lake Murders was part of his series of mysteries, which he illustrated himself, that featured Judge Dee, a 7th century AD Tang dynasty detective-judge. Modeled on a real Judge Dee who lived in that period, the cases were written up as they had been done in the traditional Chinese murder mystery *genre*, so there were usually three going on at once. This allowed for many plot complexities which were further multiplied because van Gulik revealed the culprits at the end and not at the beginning, as was traditional. He also borrowed from the much later Ming dynasty judicial system, which meant that a judge-detective was also the prosecutor and jury, besides being the *de facto* head of a province.

The Spanish scientists introduced steganography at the beginning of their article.

The word steganography literally means covered writing. It was coined in 1499 by Trithemius, a monk who encoded letters as religious words in such a way as to turn covert messages into apparently meaningful prayers. It comprises a broad range of different methods for secret communication that conceal the very existence of hidden data. Among these methods are writing over shaved slave heads, or tables covered with wax, knitting, invisible inks, microdots, phrase and character arrangements, combinations of the dots and dashes on letters i, j, t, and f giving Morse codes, null ciphers, covert channels, and spread-spectrum communications.

Steganography is, thus, the art and science of concealing the existence of information within seemingly innocuous carriers (e.g. images, audio files, text, html, etc.) or, as defined in [Johnson et al. \(2000\)](#) "of

communicating in such a way that the presence of a message cannot be detected". The objectives of steganography are quite different from those of cryptography. While cryptographic techniques scramble messages so that if intercepted, messages cannot be understood, steganography camouflages a message to hide its existence and makes it seem almost invisible, thus concealing the fact that a message is being sent altogether. . . . [Today] There are many tools for hiding messages in images, audio files, video, and other not so common media such as text, TCP/IP packets, executable files DNA strands, etc.

The rest of their work can be downloaded in Part II of this article. They describe how information can be encoded into go stones (3 bits at a time using their experimental program) by players on Internet servers, where thousands of games take place and subtle, not-quite-right moves, variation commentaries and game lengths would go unnoticed.

Judge Dee was to encounter "talking" stones in another way, one which seems to lie somewhere between steganography and cryptography. I have substituted 'go' for van Gulik's use of 'chess.'

* * * * *

The newly appointed judge and his entourage had been invited to an evening gathering in a lavishly-decorated 'flower,' or brothel boat on a lake near a town that was not far from capitol of Chang An (present-day Xian). He was talking to one of his assistants:

. . . 'Two months have elapsed since we arrived here, Hoong,' Judge Dee resumed, 'and not a single case of any importance has been reported to this tribunal.'

'That means,' the sergeant said, 'that the citizens of Han-yuan are law-abiding people, Your Honor!'

The judge shook his head.

'No, Hoong,' he said. 'It means that they keep us ignorant of their affairs. As you just said, Han-yuan lies near to the capital. But because of its location on the shore of this mountain lake, it has always been a more or less isolated district; few people from elsewhere have settled here. If anything happens in such a closely-knit community, they'll always do their utmost to keep it hidden from the magistrate, whom they consider an outsider. I repeat, Hoong: there is more going on here than meets the eye. Further, those weird tales about this lake-'

He did not complete his sentence.

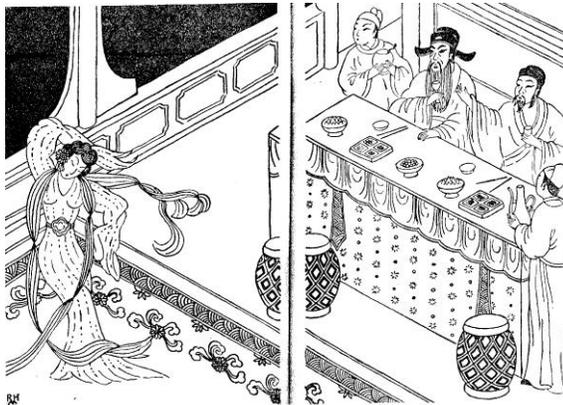
'Does Your Honor give any credit to those?' the sergeant asked quickly.

'Credit? No, I would not go as far as that. But when I hear that in the past year four persons drowned there and their bodies were never found, I—'

The climax of the festivities was to be the beautiful courtesan Almond Blossom's 'Dance of the Cloud Fairy.' However, just before she started, she covertly whispered to the Judge, 'I must see you later. A dangerous conspiracy is being plotted in this town.'

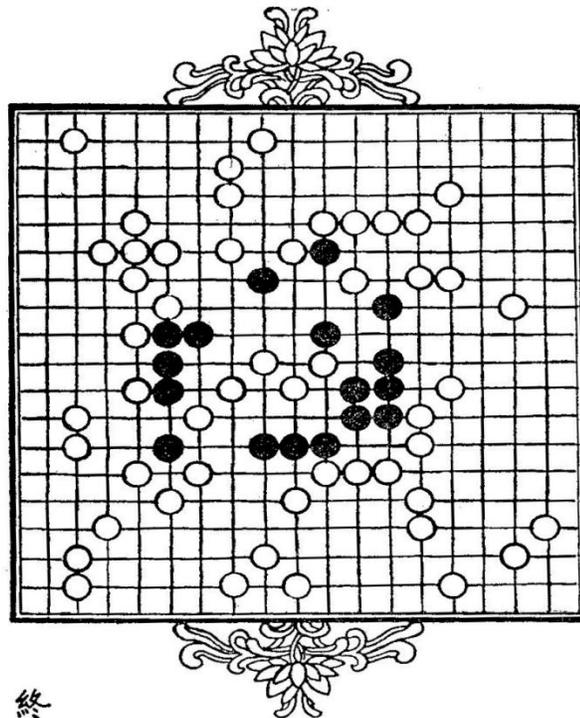
Then she added, as quietly as possible, 'I hope your Honor plays go' before stopping and turning to attend to the host of the party, Han Yung-ha, a local dignitary.

Judge Dee had never seen such a fascinating dance. Her impassive, slightly haughty face with the downcast eyes stressed by contrast the voluptuous writing of her lithe body that appeared to personify the flame of burning passion. . . .



After her dance finished, she disappeared and was found drowned near the boat. She had been struck on the head by a heavy bronze incense burner and it had been put into the sleeve of her diaphanous robe to make her sink. The garment caught on a nail of the gangway, but she lay unconscious, face-down in the water.

In the other sleeve were her red visiting cards and a folded piece of paper that had been torn out of a book. On it was what looked like a go problem.



Readers who know Chinese will recognize that the character in the bottom left means 'finis,' indicating it might indeed have been the last page of a problem book, though any reader who plays go would be suspicious.

After a dead man was found in a vanished bride's coffin and other mysterious events that occurred as the three intertwining plots emerged, the Judge got a break in the courtesan's case when Chiao Tai, another assistant, found the go book. He told the judge,

... 'This afternoon, when the professor was taking his siesta, I had a look at his collection of books. I found a fine old illustrated work on archery which greatly interested me. When I put it back, I saw an old book that had been lying behind it. It was a go manual. I leafed it through, and found on the last page the problem that the dead dancer carried in her sleeve.'

'Excellent!' Judge Dee exclaimed. 'Did you bring the book with you?'

'No, Your Honor. I thought that the professor might become suspicious if he discovered that it was missing. I left brother Ma to watch the house and went to the bookshop opposite the Temple of Confucius. When I mentioned the title of the book, the shopkeeper said he still had one copy, and began at once about that last problem! He said that the book was published seventy years ago by the great grandfather of Han Yung-han [the host of the festivities on the boat], an old eccentric whom the people here used to call Hermit Han. He was famous as a go expert, and his manual is still widely studied. Two generations of go lovers have pondered over that last problem, but no one has ever succeeded in discovering its meaning. The book gives no explanation of it; therefore it is now generally assumed that the printer added that last page by mistake. Hermit Han died suddenly while the printing was still in progress; he didn't see the proofs. I bought the book. Your Honor can see for yourself.'

He handed the judge a dog-eared, yellow volume.

'What an interesting story!' Judge Dee exclaimed. He eagerly opened the book and quickly read through the preface.

'Han's ancestor was a fine scholar,' he remarked. 'This Preface is written in a very original, but excellent, style.' He leafed the book through till the end, then took from his drawer the sheet with the go problem and laid it next to the printed book. 'Yes,' he pursued, 'Almond Blossom tore that sheet from a copy of this book. But why? How could a go problem that was printed seventy years ago have anything to do with a plot that is being hatched now in this city? It's a strange affair!' Shaking his head, he put the book and the loose sheet in the drawer.

Later, after many further convolutions, events, theories and a midnight visit to a Buddhist chapel, at a moment when everyone had left his chambers and he was alone,

. . . Judge Dee pulled out a drawer and took from it the sheet with the go problem. He was by no means as sure of himself as he had made his two assistants believe. But he felt he had to start the attack, to take the initiative. And the two arrests were the only way he could think of to achieve that aim. He turned round in his chair and took a go board from the cupboard behind him. He placed the black and white men in the position indicated in the problem. He was convinced that it was this go problem that contained the key to the plot discovered by the dead dancer. It had been made more than seventy years before, and the best go experts had tried in

vain to solve it. Almond Blossom, herself not a go player, must have chosen it not as a go problem, but because it could be given a double meaning which had nothing to do with go. Was it perhaps a kind of rebus? Knitting his eyebrows, he began to rearrange the men, trying to read their hidden message.

Liu Fei-po [a wealthy local merchant] had disappeared, but Han Yung-han [the host at the party] was still available. He would arrest Han now, and question him under torture. There was insufficient evidence for such an extreme measure, but in this case the security of the State was at stake. And the go problem pointed straight at Han. Doubtless his ancestor, Hermit Han, had in the olden days made some important discovery, found some ingenious device, and hidden its key in the go problem—a discovery that was now being utilized by the Hermit's depraved descendant for his own nefarious scheme. But what could that discovery have been? Besides being a philosopher and go expert, Hermit Han had also been a good architect; the Buddhist Chapel had been built under his personal supervision. He had also been extraordinarily clever with his hands: he had engraved the inscription of the jade plaque in the altar with his own hands.

Suddenly the judge sat up straight in his chair. He gripped the edge of the table tightly with both hands. Closing his eyes, he visualized the conversation in the Buddhist Chapel, in the deep of night. He called up before his mind's eye that beautiful girl as she stood there opposite him, pointing at the inscription on the altar with her slender hand. The inscription occupied a perfect square, that he remembered clearly. And Willow Down had said that every word had been engraved on a separate piece of jade. The inscription was therefore a square, divided into smaller squares. And the other relic of the old Hermit, the go problem, consisted also of a square divided into squares...

He pulled out a drawer. Throwing the papers inside carelessly on the floor, he searched with feverish haste for the traced copy of the inscription that Willow Down had given to him.

He found it rolled up in the back of the drawer. He quickly unrolled it on his desk and placed a paperweight on either end. Then he took the printed sheet with the go problem and laid it next to the text. He carefully compared the two.

The Buddhist text consisted of exactly sixty-four words, arranged in eight columns of eight words each. It was indeed a perfect square. Judge Dee knitted his bushy eyebrows. The go problem also was a square, but here the surface was divided into eighteen columns of eighteen squares

each. And even if the similarity in design had a special meaning, what could be the connection between a Buddhist text and a go problem?

The judge forced himself to think calmly. The text was taken verbatim from a famous old Buddhist book. It could hardly be used for concealing a hidden meaning without substantial alterations in the wording. Therefore the clue to the relation of the two, if any, was evidently contained in the go problem.

He slowly tugged at his whiskers. It had been established without doubt that the go problem was in reality no problem at all. Chiao Tai had observed that the white and black men seemed to be distributed over the board at random; especially, black's position didn't make any sense at all. Judge Dee's eyes narrowed. What if the clue were contained in the black position, the white men being added afterward, merely as camouflage?

He quickly counted the points occupied by the black men. They were spread over an area eight by eight square. The sixty-four words of the Buddhist text were arranged in exactly the same way!

The judge grabbed his writing brush. Consulting the go problem, he drew circles round seventeen words in the Buddhist text, occurring on the places indicated by the black men. He heaved a deep sigh. The seventeen words read together made a sentence that could have but one meaning. The riddle was solved!

He threw the brush down and wiped the perspiration from his forehead. Now he knew where the headquarters of the White Lotus sect were located.

Later, in the darkness of the Buddhist Chapel, by candlelight, the Judge read the deciphered message in the jade panel that Hermit Han had carved 70 years before.

'If ye understand My Message and depress these words ye shall enter this Gate and find peace.' That can only mean that the jade panel is a door that gives access to a secret room. You hold the paper!"

The judge pressed his index on the jade square with the word "if" in the first line. The square receded a little. He pressed harder, using both thumbs. The square receded half an inch; then it would go no farther. The judge went on to the word "ye" in the next line. That square also could be pressed down. When he had pressed the word "peace" in the last line, he suddenly heard a faint click. He pushed the panel and it slowly swung inward, revealing a dark opening of four feet square.

The underground passage led to a large, darkened room where, among other objects, a human skull and empty bags that once held gold were found. In the end, it took Judge Dee more than ten pages to unravel and explain to his assistants what had actually happened between Almond Blossom's murder and his discovery of the letter lock—and then what happened before and after—so it won't be repeated here. However, readers are invited to read the book at <http://lib.ololo.cc/b/129420/read> and learn more about Robert van Gulik at http://en.wikipedia.org/wiki/Celebrated_Cases_of_Judge_Dee#mw-head and <http://www.friesian.com/ross/dee.htm> .

There was also a 1970s TV movie, *Judge Dee and the Monastery Murders* which is available at <http://www.torrentdownloads.net> . It was based on a van Gulik story while the recently released movie *Judge Dee and the Mystery of the Phantom Flame* was not. Here Judge Dee is young, sexy and a martial arts master, as played by Andy Lau. Directed by Tsui Hark, it is a return to his late twentieth century roots in the Fant-Asia genre (*Zu Warriors*, *The Magic Mountain*, *A Chinese Ghost Story*, etc.)—except now he has Computer-Generated Imagery at his disposal. The DVD is available at Amazon.



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PART II—Go Steganography

<http://www-users.cs.york.ac.uk/~jet/papers/2006cosec.pdf>