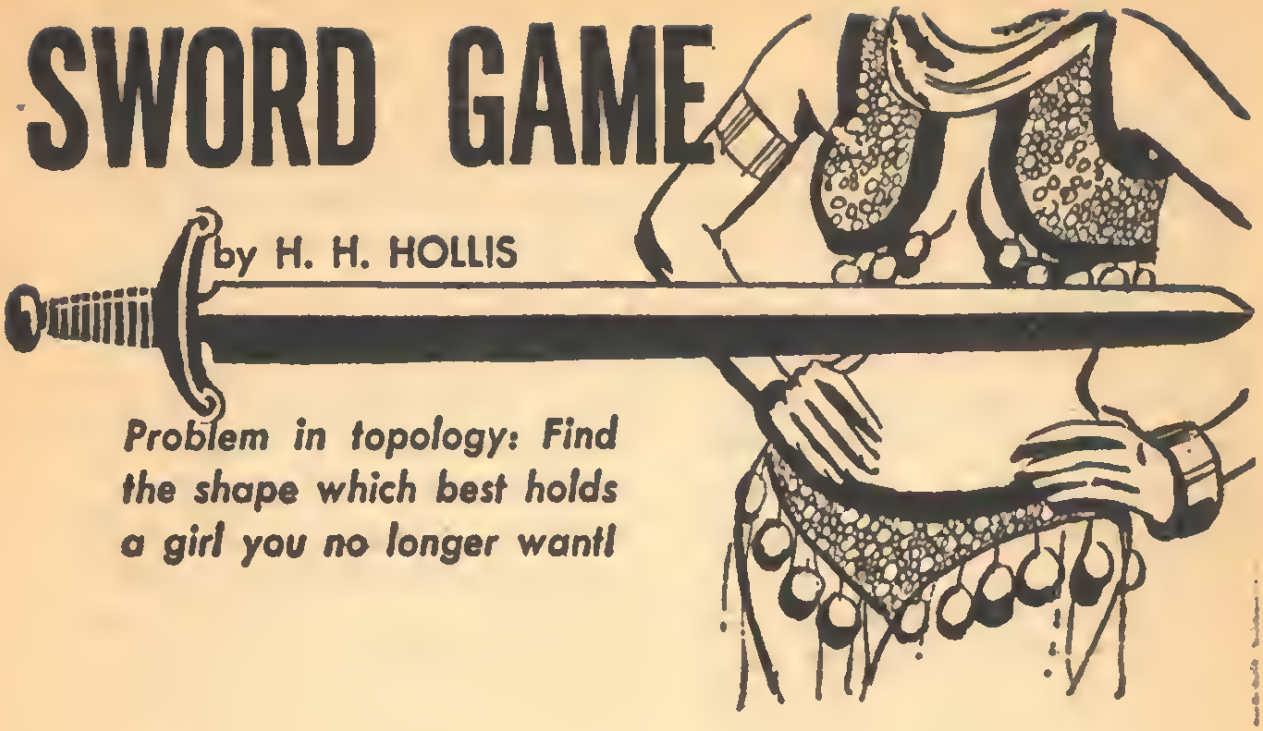
SWORD GAME

by H. H. HOLLIS



Problem in topology: Find the shape which best holds a girl you no longer want!

Late in the afternoon of an ugly fall day, a forty-year-old topologist, employed to teach mathematics at a university he despised, bored by his students and frightened that he had done everything of significance in his life that he would ever do, blundered head down into a group of students handing out flowers and handbills. Before he could retrieve his dropped book bag and move on to continue composing in his head a memorable letter of resignation, his eye had fallen on a grubby teenage girl, and he was hopelessly entrapped.

Thinking to break the spell, he boldly said to her, "Aren't you in my class in elementary topology?"

She licked the raspberry snow cone she was holding and said, without a trace of a smile, "You must be mad. I'm not a student, just a wandering Gypsy fortune-teller." She held out the snow cone for him to take a lick. "Do you have a place where we could go, and I would tell your fortune?"

The mathematician knew she was no Gypsy, for your modern, urban Romany never allow themselves to be as dirty as she was. He was certain she was putting him on, but his mood of desperate boredom was such that he

said, "Cra-a-a-zy, Gypsy! Fall up to my pad, and we'll tell fortunes and other lies 'til the world melts."

They left hand in hand under the eyes of forty witnesses. Within their own sub-culture, however, the rebel students conformed to a rigid code; and they would have died rather than give information to the fuzz or even to the Dean of the Faculty; so the professor's absolute breach of propriety in picking up a student went unremarked and unreported.

When he had taken off her clothes, the girl was every bit as dirty as she appeared to be, but this only made him more determined to take advantage of her. Later, he persuaded her to shower by promising to bathe with her; and she looked, when she left, with her rum-colored hair in two long plaits, like a fresh-scrubbed Girl Scout.

The crust turned out to be her equivalent of the make-up that squares use; when he came past the common the next day, she was as delectably grimy as ever, and she held a fresh snow cone purple with grape syrup.

The two joined hands and went directly to his apartment. The young woman hardly spoke until late in the evening, after they had showered together. She was towelling her hair, and the information came indistinctly. "I went to the Provost's office today," she said, "and told him about us."

The professor was so uncharacteristically content he contemplated the ruin of his academic career with pleasure. "All right, big mouth, how are we going to live?"

"I'm not really a Gypsy," she said, "but I really was in a carnival once, when I ran away before. I know how to dodge swords in a sword basket. Could you be an East Indian sword magician? We could pick up a show somewhere and travel right along with them."

"By God," cried the topologist. "I can do better than that! It's been a long time since I did any engineering work, but I have a little laboratory curiosity that will just fill the bill. Come with me to the animal house in the basement of the Psychology Department, and I'll show you something you won't believe."

"Try me, baby," replied his inamorata. "You'd be surprised at what *I* can believe."

They repaired to the noisome cages in which the experimental animals were kept, and the professor secured a sturdy mouse. Selecting a few strips of clear plastic from a rack, he lit a burner and uncorked a container of plastic adhesive. In a few min-

utes, the topologist had cobbled up a container which defied the eye to define its exact shape, but which most often seemed to be a lumpy cylinder. In a trice, he thrust the mouse in and clapped the square top down. The mouse could be seen through the plastic, but he seemed to be in a single fixed position, floating in midair with his paws and tail extended just as when he was inserted.

Heating a pointed rod, the professor pierced a hole first in one side of the bulgy cylinder, and then in the other. In a moment, when the long pin had cooled, he introduced its sharp point through the hole again, and having located the mouse properly, skewered the rodent through the heart so that the point of the sharpened rod came out the second hole. Swinging the cylinder over the girl's hand with a little shake, the professor deposited a tiny drop of bright arterial mouse blood on her wrist.

As she looked at the crimson drop, tears appeared, sparkling on her eyelids. "Big deal, big man," she said. "Mouse murder. I don't think a wild mouse would walk into that plastic pipe, do you?"

"Heart of my heart," he replied. "It's not a *pipe*. It isn't even a cylinder, and it certainly isn't a mousetrap. This is a tesseract, as you would know if you had ever read a popular work on topology."

"Oh, all right, I know what a tesseract is: an expanded cube, a cube with a cube on each face. That mouse cage doesn't look like six cubes surrounding a cube to me."

"No, otherwise our mouse would be dead all over. This is a tesseract which is a temporal illusion."

"A *temporal* illusion!"

"Yes, my dear," he said, "a temporal illusion. Topology teaches us that mathematical properties can be quite independent of apparent shape. A circle is still a circle, even though it *looks* like a scalloped pie crust — as it may, if it is drawn on a wavy surface. This mouse cage is a cubed cube which is partly displaced along the dimension of time. That's why it appears formless and shifting. Here, feel it."

Sure enough, to the touch, it was solid enough: a cube with a cube on each face; but even when held in the hand and sensed by touch, the object still appeared to be a rippling cylinder, and the mouse still appeared to be stock still.

"This mouse looks dead. Eccch!" she said.

Deftly the topologist withdrew the tiny sword, pried off the top, and shook Mr. Mouse out in his

hand, where the charming little fellow at once sat up on his haunches and waved his forepaws, as if demanding cheese.

"How did you do that?" cried the girl.

"Simply, really," replied the thinker. "The exterior flickers in and out of this moment of time, because of the subtle twist I imparted to the shape when I made it; but the inside is *fixed* in time, because much of the internal mass is stretched all the way around the very large but finite continuum of space and time which is our universe. This little rascal's 'time' has passed so slowly that the powerful regencrative and repair processes of his body have worked as if instantaneously, and the apparently mortal wound dealt him was no more than a pin prick. Do you think you could get into a large tesseract like this one and let me run a rapier through you . . . knowing it would do you no harm?"

She clapped her hands in pleasure. "Oh yes, lover! That'll be so much more of a mind buster than some old wicker basket that everybody knows I dodge the sword in."

So they hied themselves to a plastic supply house and thence to a dog-and-pony show that was in the neighborhood, and for a long time, every thing went like a guided trip with Tim Leary. Audiences were transfixed by the girl's beauty. She was considerably cleaner under the difficult circumstances of carnival trouping than she had been when soap and water were conveniently to be had, and when the topologist drove a sharpened fencing foil through her lovely body, clad as lightly as local ordinance allowed, the crowds gasped. When the box was rotated to show the point of the sword encarnadined, strong men fainted. Later they would press forward and pay a dollar apiece to examine the tiny wound as it closed up and disappeared, usually midway up her delightfully articulated rib cage.

Trouping the carnival together was an idyll. Still, even if forty years is not *old,* neither is it young; and the doctor of mathematics at last realized that he was bored again. The girl's vocabulary never enlarged itself appreciably, and the snow cone remained her favorite confection. The difference in their ages was sufficient for their basic sex attitudes to be irreconcilable. For him, a certain overtone of the forbidden gave carnal love its highest stimulation; but for her, sex was just another natural function, like perspiring or excreting, so that the level of their love-making remained at mere technical proficiency.

After the fashion her generation had adopted, she was faithful. There might be others later, her manner implied by its playfulness; but for now, she did not share her favors out. He was denied even the sour spice of jealousy.

At the end of their last appearance each evening, she was often wearing only transparent pantaloons and a shiny little brief, and when they had walked back to their quarters, she would hold up her arms and, stamping her naked feet softly like a harem dancer, say, "Help me get ready for my bath, lover." If he approached and began to roll down the waist band of her sateen pants, she would drop her arms and begin to undress him too. Later they would bathe each other.

They had almost no other conversation.

At last the idyll became an enslavement to the professor. He found some respite when he learned that a Hindu tortureman, their neighbor in the show, who slept on nails, poured boiling lead in his eyes, and so on, was a Failed M.A. in Mathematics from the University of Rawalpundi. By talking to him, the topologist was able to keep from going quite mad. Still, he was a little off. He loathed the girl and dreamed only of what he would do when she left him; but she would not leave and continued to raise her arms to him and stamp her feet, as exquisitely irritating as a kitten which continues to claw one's sock after one has done playing with it.

He began to do everything badly, even their turn in the show, which had never much interested him after he put the big tesseract together. Once he missed the hole with his thrust, and the plastic deflected the point of the foil into his toe. This was a real wound, in real time, not spread along the space-time continuum, and was extremely painful for a week. Each time he limped, the pain made him more resolved to be quit of her, until at last his fertile topological mind saw the way.

He had a regular armorer's store of swords with which he made play in their act, and one evening he laid handy, next to their bed, a very passable imitation of a Roman short sword. In its day, that design had been a great technological breakthrough for the weapons makers, and it was beautifully shaped to destructive stabbing.

When they came in that night, he skimmed off her tawdry cape with a flourish, and as she lifted her round arms and stamped one foot, he peeled the bottom of her costume off in one extravagant

gesture, and then gave her the pleasure of chasing him and tearing off his garments. As they were towelling each other after their ritual coupling and bathing, he kissed her, tender but preoccupied, as it were, and said, "My dear, would you mind letting me practice that last pass in the act? I just don't seem to be putting that foil home right."

She was so pleased to have him pleasant again that she scampered into the spare tesseract they had in the quarters, a few drops from the bath still glistening on one flank. She turned her face up to him with a grin that almost made him reconsider the irreversible act he had planned. Then he remembered the months of boredom and hardened his heart. Decisively, he tapped the top home. Without a tremor, he put the Roman sword as nearly into her heart as he could judge its location through the subtle time shifting in the plastic. With that, he snapped off the blade, so that the sword *also* was within the spread, slowed effect of the moving time field; and gave the construction a knowledgeable kick or two which caused it to collapse into itself. Instead of a knobby cylinder, as it had appeared when it was an expanded cube blurred by time, it now appeared to be a single cube about six inches on a side, with an abstract pattern in each face.

The collapsed cube was much heavier than it looked, but not nearly as heavy as the girl, for a substantial part of her mass was distributed along the whole of the cylindri-co-spherical space-time continuum. As he gazed at the mirror-like surface of one square face, an eye and eyebrow slowly spread flatly across the plane; but there was neither panic nor recognition in the eye as he stared into it. He realized that to the occupant of this peculiar box, his movements were so fast in appearance as to be a mere blur. Whistling, the professor packed the weighty cube into his bag, and strolled off the lot, casually remarking to his Hindu neighbor, "So long, we're jumping this flea circus."

By changing into one of his old natural shoulder suits at the bus station, he simply disappeared as Grax, the Swordsman of Time (his carnival billing), and reincarnated himself as a topologist of considerable talent who had been vaguely on sabbatical for a while.

The frustrations that had so nearly consumed him before his adventure seemed to have been burned and purged away. He settled with pleasure into a new academic routine and be-

came expert in its execution. Once in five years, perhaps, he had a really promising student; but the scarcity no longer bothered him. As he advanced up the ladder of academic tenure and preferment, he was able to place a few brilliant people about himself, and life was as good, he now knew, as it was ever going to be.

The heavy cube was a paperweight on the desk in his apartment. No one else ever recognized the shifting abstract patterns in its silvery sides as the topologized contours of a dead human being. At great intervals, there would drift across one face or another of the prism some recognizable anatomical feature with which the professor was intimately acquainted, and he would feel a vague regret for his act and a light stirring, as of the ashes in a cold grate, of his appetite for the one adventure of his life. He would stuff his pipe, turn the pages of the *Journal of Topology* and immerse himself once more in the calm, sweet life of the university.

When he was sixty years old and almost bald, there appeared in his classes the student of his dreams, who understood everything he said in his arcane specialty and replied with fresh and elegant insights into the intuitive sort of math in which they both delighted. Objectively, he knew the boy was neat and trim rather than handsome, yet subjectively (and privately, of course: he was very proper now), he always felt the boy was "good looking." This feeling puzzled him until one day he had to move a stack of old college annuals and, browsing, as one will, he suddenly came on his own senior picture. His best student was enough like his youthful self to be a double, or at least a younger brother.

Shortly after that, the professor confided the story of his escapade to the boy. He could not have said why he did so, and it certainly was not wise; but the student was beginning to betray the same weird talent the professor had for translating topological abstractions into hardware that did peculiar things; and somehow the tale just told itself. He had become very fond indeed of his disciple. The boy, who affected the total amorality which was the fashion of *his* generation, was nevertheless shocked; but he was also intrigued. He picked up the box and shook it. "Maybe she's alive," he said. "After all, inside it's only been an instant. Let's unlock it."

"Don't be ridiculous," the professor said, taking the cube back and setting it on his desk in a definite manner. "In the first place, she's not alive. While she's

in the construction, there's no evidence of the crime. Second, if she were alive, she might go to the police; or worse yet, she might expect me to take up that dreadful, boring liaison with her again. And in the third place, we *can't* unlock it. That was the whole point of breaking the sword. The cube's a closed system now, and no part of the interior is available to this aspect of time and space. Eventually she'll be equally distributed through the entire universe. Absolutely not! I forbid you to think about it. When are you going to give me that paper on topological re-intervertebrates?"

Conversation languished, and the student shortly took his leave. A day or two later, the professor found the boy fiddling the edges of the cube with a device made of mirrors, and they had a genuine quarrel, but gradually fell back almost into their former sympathetic teacher-student relation.

One day the student appeared in the professor's apartment with a tiny glittering piece of metal in his hand, the shape of which was extraordinarily hard to see. The whole thing seemed to flicker in and out of the mathematician's sight. "What the hell have you got there?" he asked the boy in irritation.

"It's a chrome-plated, self-powered, retractable, inverted, universally jointed and fully gurgitated mobius strip," the young man said.

The professor laughed. Every schoolboy knows a mobius strip is a band one end of which has been given a half twist before joining it to the other to make a circlet. The consequence of that little twist (try it) is that the mobius strip is a geometric figure which has only one side and one edge; though common sense, looking at it, can plainly discern two sides and two edges. However, a pencil drawn down the center of "one side" will meet its own mark and there will then be seen to be a line drawn on "both sides" . . . because there *is* only one side, you see?

But every schoolboy knows that's all a mobius strip is: just a curiosity. Anything else you do to it changes it from being a mobius strip. So it can't be improved by chroming it or powering it or anything else. The professor pointed all this out to his student in a rather overbearing manner. He finished by saying, "And I suppose you're going to tell me it has some practical application."

"Yes," said the boy, "it has." And before the professor could stop him, he had reached across the desk, penetrated into the shiny cube with one half of the

glittering mobius strip and fished out the shattered remnant of a short Roman stabbing sword.

In an instant, the old familiar bulgy cylinder was present on the desk, full size, and in another, a completely naked young woman had leaped out of it onto the floor. In stupefacation, the professor saw a pink, three-cornered scar, obviously just healing, on her rib cage, and noticed there were still drops of water glistening on her flank.

"Sweetheart!" she cried, "what was that *butcher* knife? I had to dodge like crazy!" And she engulfed the student in a squid-like embrace. A moment later she saw the professor and recoiled.

"Who is this bald-headed old creep?" she said. "I draw the line at voyeurs, honey." And with a wink and a nod, she and the student dumped the professor into the expanded cube and collapsed it about him.

Even in the endless instant which is the inside of his device, time has begun to seem long to the topologist. He knows the girl and the student are long since dust in the whirling, kaleidoscopic world outside. He is beginning to be transparent, so he knows his substance is slowly plating out along the entire cylindrico-spherical space-time continuum. He has realized that when he is fully distributed, the universe will be at an end; and he has composed a most astounding paper in his head explaining the whole phenomenon. His only regret is that he will never be able to send it to the *Journal of Topology* for publication.

—H. H. HOLLIS