suggested by two Argentinian ichthyologists, Szidat and Nani, as long ago as 1951, and later observations by other workers tended to confirm their suggestion. These observations were, however, based on very few fish examined, but the present study of the stomach contents of 401 individuals shows that the habit is widespread in the group. In only one of the six species investigated was the evidence inconclusive. The role of parasite-picker varies with the species involved: the commonest species, *Remora remora*, is an active cleaner, and the mutualistic relationship between fish and host is strong, but the mutualism is less strong in other species. Parasite-picking varies with the size of the individual although not consistently through the group—some are more active when young than when adult, some adopt the habit with maturity, while *Echeneis naucrates* is active as a cleaner in middle age.

BEES

Queens and their Consorts

from a Correspondent

A QUEEN honeybee lays fertilized eggs in worker cells in the bee comb but unfertilized eggs in the slightly larger drone cells. How does she differentiate between them? At the fifth conference of the Bee Research Association held at Grantley Hall in Yorkshire from August 21 to 23, Dr N. Koeniger (Bee Research Institute, University of Frankfurt) reported noticing that when the queen inspects a cell before laying in it, she inserts not only her head into the cell, but also her front legs. By attaching "spurs" of sellotape to a queen's forelegs, Dr Koeniger made it impossible for her to get these legs into a cell during inspection. All the eggs the queen then laid were fertilized, whatever the type of cell, but when the sellotape "spurs" were removed, the normal pattern of laying was resumed. These experiments and others, in which various parts of the forelegs were amputated, show that the queen uses her forelegs in some way to differentiate between the two types of cell, but the mechanism remains a mystery.

Worker bees—infertile female members of the colony—carry out most of the household duties in the hive, such as comb building, food gathering, cleaning of the hive, feeding the queen and the developing brood, and so on. They also seem to control the queen's egg laying to a large extent according to Dr Delia Seager (University of Aberdeen). Dr Seager described how, when a colony is preparing to swarm, egg laying is reduced and the "retinue" of workers stops feeding and grooming the queen. Instead, the workers shake the queen constantly and quite violently, sometimes several hundred times in an hour. The result of all this treatment is that the queen is slim and muscular enough to swarm.

With the distinction between unfertilized and fertilized eggs being so important in the social structure of the bee colony, attention is now turning to the largely unknown mechanism of fertilization. Dr G. Koeniger (Bee Research Institute, University of Frankfurt) described a new technique which throws some light on the process. After two years' experiments she has perfected a method which involves making an incision in an abdominal tergite of the queen (avoiding the flexible intersegmental membrane), lifting a small

flap to give access to the internal organs and replacing the flap, all within 10 to 15 minutes. The queen immediately licks the wound, which heals, and she seems to live a normal life in the colony for several weeks. Using this method, Dr Koeniger has succeeded in removing the spermathecal gland from living queens, who, after the operation, return to their colonies and resume egg laying. When both branches of the gland are removed, only unfertilized (drone) eggs are laid afterwards. In contrast, when only one branch is removed, the queen lays worker and drone eggs normally in the appropriate cells, indicating that the operation itself does not cause the change. It seems therefore that the spermathecal gland must be involved in releasing from the spermathecae the spermatozoa which fertilize the female (worker) eggs.

PLANETS

Primaevial Surface of Mars

by our Astronomy Correspondent

THE latest chart of Mars, published in August by the US Army Topographic Command, is something of a disappointment. For the most part it looks like charts of Mars always have done—a shadowy patchwork of light and dark areas with science fiction names like Panchaia, Memnonia and Xanthe. Two patches showing greater detail in the shape of fuzzily drawn craters hardly do justice to the original Mariner photographs.

It is now more than a year since the close approach of Mariners 6 and 7 to Mars. As with the early Moon probes, the Mariners have revealed some fascinating new features on the surface of Mars but have failed to answer the basic questions that are in everyone's minds. Coinciding with the publication of the new Mars chart, Commission 16 of the IAU dealing with planets and satellites met last week to review the new data.

Electronic processing of the more than two hundred television pictures has provided full-time work for about a dozen people. Electronic noise has been removed from the pictures, they have been corrected for geometric distortion, and enhanced versions to bring out the faint features have been produced in the computers at Caltech.

Even the depth of the icecaps, at one time thought to be a sprinkling of carbon dioxide snow, is now in question. Near-encounter pictures of the south polar region show what are being called "etch pits" apparently tens of metres deep that seem to be in the snow rather than the underlying topography. If the snow is as deep as this, it is hard to see how all of it can be removed during the seasonal cycle. So the Mars mission in 1971 will be on the lookout for quasi-permanent drifts of snow that have escaped attention, possibly because of a covering of dirt.

More than anything else, the surface of Mars seems to resemble a worn-down version of the lunar highlands. The highlands-maria dichotomy is absent, however, and the line being taken by the Mariner Television Experiment Team is that what is being seen is the basic accretion surface. But there are two areas which suggest that internal processes may be beginning on Mars. One is a featureless area in Hellas with no craters down to the 300 metre resolution limit, indicating that only a comparatively short period of time is