

ties are now virtually swarming to the field. The human brain has suddenly become one of the most enticing scientific frontiers for ambitious scholars and researchers.

What, then, is the present state of brain studies? The *Nihon Keizai Shimbun* team of reporters working on this "Frontier" series has interviewed those working in the ongoing studies and has been greatly impressed by their liveliness and immense variety. The following is only a sampling of a great many highly intriguing theories.

"Face cell" theory

Up until recently, the brain was believed to analyze the information transmitted from the eyes and form entire images by putting together fragments of information perceived by different brain cells. For example, a cell responding to the concept of "roundness" gets linked with that responding to the idea of "redness" to produce the entire image of a "round, red apple." In the "face cell" theory, however, a single cell or a small group of cells is believed to receive information from the eyes and instantly form entire images on the basis of the information. This theory was advanced last fall by E.T. Rolls, professor at Oxford University.

This theory became a topic of a meeting of a group of a dozen or so scholars, including Shun-ichi Amari, a University of Tokyo professor, held last January at a ski resort in Niigata Prefecture.

"If we are to believe the 'face cell' theory," one scholar suggested at the meeting, "the bits of information handled by the human brain will be limited to 14 billion, as that is the number of cells contained in the human

Computer scientists begin paying attention to long-shunned parapsychological research

Tadahiro Sekimoto, president of NEC Corp., has a pet research theme which he is hoping to see taken up by his company's researchers. Sekimoto himself brought up the theme some 20 years ago, when he was a senior engineer, and had it flatly turned down. The theme is to somehow explain scientifically phenomena which are referred to as the "sixth sense" or "telepathy."

"The study of the sixth sense and telepathy will certainly prove a cornerstone of future modes of communications," declares Sekimoto.

Unknown energy

Telecommunications engineering at present depends on electromagnetic energies and sound vibration energies. Sekimoto believes that there is unknown energy in "the world of the sixth sense" that can be used for telecommunications and that discovery of this unknown energy may very well revolutionize telecommunications systems in their entirety.

"Science today does not fully explain what the electric wave really is," declares Hiroo Yuhara, advisor to the telecommunications gear maker Uniden Corp., and former head of the Posts and Telecommunications Ministry's Radio Research Laboratories, the most advanced of Japan's research organizations in this field. "What we know is that we can

make wonderful communications equipment if we build it on the theories of electric wave engineering. There are many basic matters that require scientific explanations."

Yuhara has for several years been engrossed in studying phenomena defying scientific explanation. He conducted a simple experiment for an NKS reporter. He first placed some name cards and small pieces of paper with names written on them on a table and then brought a bar magnet hanging from a string. When the magnet was placed above the name cards, it started swinging right and left depending upon the name cards. Yuhara claimed that when the name card is that of a dead man, the magnet swings to the left.

To explain this strange phenomenon, Yuhara formulated the following hypothesis: "The human body has a secret sensor in it and the sensor transmits the information about the state (dead or alive) of the man whose name is on the card to the bar magnet."

"In Japan, psychic phenomena and the discipline of parapsychology are yet to be recognized," states Soji Ohtani, professor at the Defense College and president of the Japan Parapsychology Association. "We, therefore, are conducting our research on the subjects completely on our own."

Even among big business

employees, there are some who are secretly engaged in telepathy in the belief that the days when the worth of such studies is fully appreciated are not that far away.

One such person is Masamichi Rokusha, an engineer belonging to Hitachi, Ltd.'s patent section. Rokusha has recently devised, with the use of a personal computer, a system to greatly improve the efficiency of studies of the sixth sense.

Rokusha makes the computer memorize the figures one and zero 100 times at random and has a control to call out the figures before the machine flashes them on screen every two seconds. The "beep" sound is sometimes added to test what effects the sound will have on the control's score.

A computer analysis of vast amounts of data collected show that the scores become poor after the beep sound and that the best scores are concentrated just before the beep sound. Rokusha explains these two phenomena by considering that the controls somehow sense that the beep sound disrupts their intuition so some mysterious power works and improves their scores before the beep sound.

"The day will certainly come sooner or later when studies of psychic phenomena become legitimate," Rokusha says. "I am building up the necessary data and information for such an eventuality."

National project

Hajime Karatsu, technical adviser to Matsushita Electric Industrial Co., speaks of the importance of studies of psychic phenomena in a different manner. "Development of future computers hinges on a full explanation of brain functions," says Karatsu. "In brain studies, phenomena so far unexplained by conventional sciences should also be taken up."

The state also has started moving into the field. The Science and Technology Agency has recently decided to take up man's spiritual activities as a study theme of its Creative Science and Technology Promotion Program as from fiscal 1987.

Although there are many words in the Japanese language smacking of the supernatural, no scientific studies have as yet been undertaken on the phenomena implied by the words. Studies of such phenomena may very well have wide-ranging practical applications, ranging from cures for illnesses to new communications modes.

Sir Isaac Newton, formulator of the theory of gravity, became engrossed in studies of the supernatural in his later years, while Brian D. Josephson, a British physicist known as the creator of the Josephson junction theory, is now fully committed to studies of man's spiritual activities.

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