

Helen Keller Shows Future of Brain—*Continued*

Laura Bridgman, famous deaf-blind girl of the nineteenth century, had an acute sense of direction.

The difference is traced to the fact that Laura Bridgman had a certain degree of sight in one eye up to the age of eight. Before that time she had guided herself to some extent and had a feeling of space and direction which remained with her in her sightlessness. But Helen Keller's sight was lost through an obscure disease when she was only 19 months old, and the retina of the eye soon atrophied, before she had had time to gain impressions of herself in relation to the world around her.

This difference between the two girls fits in with Dr. Tilney's theory as to a ninth sense. Adding up the senses, there are five well-known guiding senses which make us aware of the world around us, and the two body senses which keep us aware to a certain extent of the skeletal and visceral machinery of the body, and an eighth sense which Dr. Tilney calls the sense of hurt, which warns us against injury, such as extreme heat, a crushing pressure, or a cut. To these, he believes it may be possible to add a ninth sense which would explain the mysterious homing of the

pigeon and the straight, sure flight of birds to their summer and winter homes. Experiments now under way at Columbia University indicate that this ninth sense may prove to be a magnetic sense located in the retina of the eye.

So, to return to Helen Keller and Laura Bridgman, the latter had a retina which may have functioned magnetically even in blindness to aid her a little in sensing direction. Whereas, Miss Keller, lacking this aid almost from birth, illustrates the negative side of the case.

From his study of Helen Keller Dr. Tilney said:

"I concluded that her fundamental primary senses are no better than ours. The great difference exists in her use of the senses by development of the brain."

Just as we fix in our brains the association between a rose and the colors pink, red, and yellow, so Helen Keller has fixed in her brain the distinction between the fragrance of the American Beauty, the LaFrance, and the Jacqueminot roses. She has no short cut to knowing the world by miraculous means. Every association of touch, smell, or taste has been built up in the remarkable storehouse

of her brain, by the same process that any of us acquire a piece of information. And in the neurologist's opinion, "it is impossible for any of us to fool the brain by shorts cuts in the upbuilding of its best associational powers."

There were three questions that Dr. Tilney hoped to answer when he studied this remarkable woman's brain development, and the three questions were answered.

He wanted to know whether the way in which she learned to use her brain would be of any use in ordinary education. He found that her teacher made full use of an important educational principle that is often overlooked. In teaching Helen to use her lips in forming words, to spell, or to do arithmetic, the implements of learning were always recognized as a means to an end. She learned, in the face of difficulties that we can scarcely imagine, because from the first her teacher made her realize that learning was the means by which she could enjoy life more fully.

One incident shows how her mind has absorbed and held knowledge, as a result of her patience, concentration, and her great intellectual interest. At Dr. Tilney's re- (Turn to next page)

Relaxation Cure for Nervousness

Physiology

Complete relaxation, deeper than the average sleep, is the treatment for certain nervous disorders evolved by Edmund Jacobson, research associate in physiology at the University of Chicago. The new treatment is the result of a twenty-year period of clinical observation and laboratory research. Although he is continuing his experiments, Dr. Jacobson will publish his results soon in a book to be entitled "Progressive Relaxation."

The "relaxation," which concerns all the voluntary muscles of the body, is described by Dr. Jacobson as "entirely different, yet related to the popular idea of muscular relaxation." That is, if a person lies down to rest, he relaxes most of his major muscles, but the complete relaxation achieved by Dr. Jacobson on his patients and laboratory assistants really begins at this point. Starting with tension of muscle groups, including the smaller muscles such as those of the neck, eyes, fingers and toes, the individual is advised to avoid all sensation of tenseness. Experiments on the knee jerk and with electrical stimulation in-

dicate that trained individuals are able to achieve a state of relaxation deeper even than that of the average sleeper.

"Insomnia yields readily to this treatment," said Dr. Jacobson, "and all the cases of chronic spastic colon or esophagus to which I have had access, have shown marked improvement or cure."

Spastic colon and esophagus are conditions of the upper and lower portions of the alimentary canal in which nervousness of the patient results in more or less permanent contraction with severe discomfort and pain. X-ray photographs of these regions before and after relaxation treatment reveal the improvement.

"This is a case," said Dr. Jacobson, "in which relaxation of the voluntary muscles induces relaxation of the involuntary muscles. In addition to this undeniable relief for nervous persons, it is my belief that complete relaxation periodically should have a tonic effect upon the entire system with general elevation of health and resistance to disease."

Science News-Letter, September 8, 1928

"Denicotined" Tobacco

Chemistry

"Denicotinized" or "denicotined" tobacco which has recently appeared on the market in the form of cigarettes, cigars and smoking tobaccos, is little more than a fraud, according to a report of experiments made by chemists of the Connecticut Agricultural Experiment Station. Samples of these "denicotinized" brands showed, on analysis, 72 per cent. of the amount of nicotine contained in the average unprocessed brands.

Some of the popular brands of cigarettes and smoking tobaccos actually contained less nicotine than some of the processed brands. Nine kinds of widely advertised and well known cigarettes, three kinds of cigars and four kinds of smoking tobacco were examined and compared with the alleged "denicotinized" brands.

The term "denicotinized" or "denicotined" is naturally taken to mean practically free from nicotine, whereas in the brands sold under that description, the cigarettes contained from 2.32 to 0.94 per cent. of nicotine. The popular unprocessed cigarettes examined showed from 1.28 to 2.89 per cent. Un- (Turn to next page)

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quest, she wrote him a long letter about the sense of smell. In it, she quoted passages from the old Greek philosophers, from Shakespeare, from Pierre Loti, and other authors who have expressed themselves on this unpopular sense. The quotations were brought in casually from memory, and at the end she recalled that the Bible contained many passages on the subject of smell which she would like to comment upon sometime.

The neurologist concludes that Helen Keller's education does set a standard for normal children in a number of ways, and he summarizes them as follows:

"Education is a continuous process of associations being formed in the brain. Teachers should distinguish clearly between the implements necessary to learning and the useful and toward which the child is working. Education should foster curiosity and expand with the growth of curiosity. There should be pleasurable interest in learning. Education should cultivate the process of concentrated attention. And education should produce the fullest adjustment to life."

The second question that the neurologist set himself to answer with

"Denicotined"—*Cont'd*

processed cigars ranged from 1.16 to 1.90 per cent., the "denicotined" from 0.67 to 1.07 per cent. Smoking tobaccos unprocessed, contained from 1.45 to 2.09 per cent., the "denicotinized" from 0.97 to 2.26 per cent.

Obviously it is better to buy the standard unprocessed brands which are known to have a low nicotine content, especially as the purchaser will then have no false sense of security to lull him into the consumption of a greater amount of tobacco, the report recommends.

Science News-Letter, September 8, 1928

In a government survey of time lost from work by 5,000 women employed in cotton mills, it was found that women who work 55 hours a week were absent from work 13 more days in a year than women who work 48 hours.

The International Boundary Commission is to set about preparing maps and reports showing the exact latitude and longitude of the entire 4,000-mile Canada-United States boundary line, so that the facts may never be questioned.

Miss Keller's help was: Does she demonstrate that humanity in general has not yet begun to make the best use of its brain power?

That question was answered plainly by the tests, and the answer was summed up in the arithmetic problem, showing that man's brain of which he is so proud is just about 20 per cent. efficient by the standard Miss Keller's brain has set.

The third and last question was: Does she demonstrate that further development may lie before the human race when the unutilized gifts of the brain are actually realized?

The answer to this is, yes, he concludes: "There is a mechanism in the brain for much more ample understanding of the world in which we live."

"The pessimist," says Dr. Tilney, "may have some justification for saying that there has been little real progress in man's brain during the several thousand years of historic record. But to my mind the real process of man's development, including brain power, is a matter of evolution. It is entirely demonstrable that man began with a small and poor brain, as shown in the ape-like man of 500,000 years ago. And he

has developed step by step a better brain so that the modern man has a far more efficient brain than the brain primitive man began with.

"There is no reason to believe that the brain of today is a finished product, as many people do think. It is much more likely that it represents an intermediate phase in evolution."

Besides the visible evidence of man's progress from the little 940-gram brain of his oldest known ancestor up to the modern brain which weighs some 1,300 grams, there is a new force in evolution, Dr. Tilney points out.

"For millions of years," he says, "the evolutionary process has been going on in its own way. But now, a new power has stepped in, namely, intelligent men and women have begun to recognize that there is a process of evolution. When they understand more fully the nature of the process, they may be able to apply it to the future development of the master organ of life—the human brain."

Science News-Letter, September 8, 1928

Bird life is less abundant in the wilderness than in regions cultivated by man.

A study of deaths in Illinois showed that only four diseases took more lives than accidents.

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