CYTOLOGY

Chromosome Structure Details Described by Russian

Moscow and American Scientists, Working Separately, Come to Conclusions That Agree in Essentials

INTIMATE details of the internal structure of chromosomes, the tiny but mighty bits of nucleus-protoplasm that determine the course of heredity, are described by Dr. Nicolai Koltzoff of the Institute of Experimental Biology, Moscow (*Science, Oct.* 5.)

Dr. Koltzoff has undoubtedly seen some of the same things that have been studied in America by Dr. Calvin B. Bridges of the Carnegie Institution of Washington and described by him during his recent stay at the Institution's laboratories at Cold Spring Harbor, N. Y. (*See SNL, Sept.* 29, 1934.) Since each man worked independently of the other and used different biological material, there are minor differences in their accounts of what they have seen; but their essential agreements, both regarding things present in the chromosomes and in their interpretations of their significance, constitute strong mutual confirmation and support.

Based on Painter's Researches

Dr. Koltzoff started, as did Dr. Bridges, with the discovery of Prof. T. S. Painter of the University of Texas (*Science, Dec.* 22, 1933; *Genetics, vol.* 19 *pp.* 175-188, 448-469, 1934) that the location of certain dark "bands" on the "giant" chromosomes in the salivary gland cells of yeast-fly larvae corresponded closely to the locations of the genes, or physiological units that govern the transmission of hereditary traits. Dr. Koltzoff notes in his communication to *Science* that in all genetical laboratories throughout the world this phenomenon is now being studied.

He himself became interested in the possible reason for the chromosomes in these particular cells being so large—scores of times the size of ordinary chromosomes elsewhere in the insect's body. He noted also that in many other giant cells, the nuclei which contain the chromosomes were correspondingly enlarged, and that in some of these giant nuclei there were double, quadruple and even eight times the normal chromosome numbers.

When he made an exact examination of the "giant" chromosomes of insect larvae, he found each to consist of the equivalent of sixteen ordinary chromosomes: that is, each was made up of sixteen threads of chromosomal material, running parallel in a gradual spiral. On each thread were bead-like thickenings, which lay side by side, the larger ones together giving the appearance of transverse disks. This is essentially the same picture that Dr. Bridges had seen. Dr. Bridges had worked with chromosomes in yeast-fly larvae; Dr. Koltzoff in his present publication features the structure he found in chromosomes of the related insect *Chironomus*, familiarly known as "bloodworms."

"Genonemes" Name Proposed

For the parallel threads Dr. Koltzoff proposes the new name "genonemes," which means "gene-threads." For the thickenings he retains a term already in existence, "chromomeres." He states that in many cases "it is easy to count the number of small chromomeres not only in stained preparations but even in living cells of *Chironomus* and in photomicrographs of living cells."

Dr. Koltzoff inclines to the belief that the genes lie not in the heavy parts of the thread, the chromomeres, or the "bands" of Prof. Painter, but in the thin places of the thread, or genoneme. But this, he adds, is only a hypothesis, based on some of his previous work.

Science News Letter, October 13, 1934

PAVLOV IN HIS LABORATORY

Dr. Ivan P. Pavlov, eighty-five years old but still a tive in research, is here shown demonstrating an experiment to his assistants. On the occasion of his birthday, Dr. Pavlov was honored by the Soviet Government with an annual pension of 20,000 rubles (about $17,600) and—what may make him happier—a fund of a million rubles ($880,000) has been made available for the enlargement of the physiological laboratories at Leningrad. In addition, five scholarships have been established in his honor.

PHYSICS

Liquid Films Form Delicate Designs

THE delicate tree-like, fern-resembling formations shown on opposite page are not the familiar frost designs on window panes. They are formed in liquid films between two plates of glass which are slowly separated. As the distance between plates widens air rushes in and produces the black portions of the figures. The varied and beautiful designs are the work of Toshimasa Tsutsui, Japanese scientist of Tokyo.

If the liquid used is an enamel with a cellulose base, permanent patterns may be obtained. Metal plates can then be used. After separation over slight distances the volatile material in the enamel is allowed to evaporate and the fern-like design is left on the plates.

The beautiful pictures bear striking resemblance to the photomicrographs of metals although the causes of the two phenomena are quite different.

Science News Letter, October 13, 1934