

The discovery of the various dyes and tissue stains, afforded a wonderful stimulus to the microscopic study of tissues as well as to bacteriological studies. It is hard to conceive of much progress in bacteriology without this aid. Dyes for staining protoplasm were first prepared in 1868. The property of taking up a stain gave rise to the invention of a number of new names for which scientists have as usual drawn freely from the Greek. To designate that protoplasm which stained deeply, we have the term "chromatin." The word "achromatin" has been applied to protoplasm, which will not absorb the dye. Certain rod-shaped bodies situated within the nucleus, which stain more deeply than any other portions are known as "chromosomes."

The Cell In Heredity—Within recent years the subject of heredity has claimed the attention of biologists and its practical application has become of intense interest to the laity, advances in our knowledge of heredity are already producing results. They have revolutionized agricultural methods as shown in the marked improvement of animals and plants. It is impossible of realization what are the potentialities in regard to the improvement of the human race. Eugenics is as yet in its infancy. The past ten years has witnessed the production of voluminous literature on eugenics and its kindred subject heredity.

Smallwood in his latest work states that "Whatever may be the ultimate analysis of the problem of heredity, there can be no hesitation in stating that the transmitted characters exist potentially in the protoplasm of the cell. From the egg of a robin only a robin will develop, from the ovum of an oak only an oak will grow and during the growth each follows its own successive developmental stages even to the minutest details. It has been well said 'nature never yet made two eggs or two sperms exactly alike.' The cells which give rise to new organisms are the germ cells, sperms and ova. These differ greatly in shape and size—some of the sperm cells being but one one-hundred-thousandths the bulk of the ovum and yet the paternal characters are easily recognized in the adult. * * * The cells of the body are divided into body plasm and germ plasm." Germ plasm might be looked upon as the immortal in man in as much as it is continuous. After the germ plasm has given rise to a new individual, some of it is left behind to participate in the formation of a new offspring, so as Davenport puts it, "There is really no inheritance from parent to child but parent and child resemble each other because they are derived from the same plasm, they are chips of the same old block; and the son is half-brother of the father by another mother."

As the cell has been called "The physiological unit," and protoplasm "the physical basis of life," the chromosomes have been proven the physical basis of heredity. They are very definite and important organs. The number which make their appearance at each cell division is the same in all the cells of any given creature and is constant for the cells of the members of any given species.

"The remarkable fact," says Wilson, "has been established that every species of plant or animal has a fixed and characteristic num-