

protoplasm as the *cytoplasm* from the nuclear protoplasm or *karyoplasm*.

The study of protoplasm coagulated by reagents seems to indicate that it is a mixture of substances rather than a simple chemical compound. Both the cytoplasm and the karyoplasm consist of a more solid substance, the *reticulum*, which forms a network or felt-work, in the interstices of which is a more fluid material, the *enchylema*.\* The karyoplasm, in addition, has scattered along the fibers of its reticulum a peculiar material termed *chromatin* and usually contains embedded in its substance one or more spherical bodies termed *nucleoli*, which may be simply larger masses of chromatin or bodies of special chemical composition. And, finally, in all actively growing cells there is differentiated in the cytoplasm a peculiar body known as the *archoplasm sphere*, in the center of which there is usually a minute spherical body known as the *centrosome*.

It has been already stated that new cells arise by the division of preëxisting ones, and this process is associated with a series of complicated phenomena which have great significance in connection with some of the problems of embryology. When such a cell as has been described above is about to divide, the fibers of the reticulum in the neighborhood of the archoplasm sphere arrange themselves so as to form fibrils radiating in all directions from the sphere as a center, and the archoplasm with its contained centrosome gradually elongates and finally divides, each portion retaining its share of the radiating fibrils, so that two *asters*,

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\* It has been observed that certain coagulable substances and gelatin, when subjected to the reagents usually employed for "fixing" protoplasm, present a structure similar to that of protoplasm, and it has been held that protoplasm in the uncoagulated condition is, like these substances, a more or less homogeneous material. On the other hand, Bütschli maintains that living protoplasm has a foam-structure and is, in other words, an emulsion.