

developed normally, will, if impregnated by two spermatozoa, develop pathologically.

2. As I have previously stated,¹ the isolated blastomeres of dispermic eggs differ extremely in their developmental potency; but it was formerly not possible for me to follow the single blastomeres in their development so as to be able to assert with complete positiveness that there had not been during the isolation an unequal degree of injury to the blastomeres which might have been the cause of the inequality of the development. This I have succeeded in accomplishing in my new experiments. It has been possible to show that the early development up to the blastula stage proceeds identically in the isolated blastomeres of a dispermic germ, and that only later does one partial germ strike out in one direction, the other in another direction.

3. In connection with this I have studied thoroughly the early development of uninjured dispermic germs and they confirmed the corresponding original similarity and later unlikeness of the single germ areas.

4. A further question concerning the development of dispermic germs was whether the so-called primary mesenchyme cells which later group themselves to form the regular mesenchyme crown for the formation of the calcareous skeleton always occur only in that area of the germ in which they arise, or whether the mesenchyme represents an indifferent material, the cells of which are distributed by accident to the crown of mesenchyme. By means of the difference in size of the cells and nuclei in dispermic germs, it became possible for me to decide this important question in favor of the last alternative.

5. Against the theory which I formerly advanced upon the basis of my experiments on dispermic development of the different valence of chromosomes, the objection might be raised that it was not, as I had suggested, the false combination, but the incorrect number of the chromosomes which was of pathological significance, for it might be said that only when the requisite quantity of chromatin is present

that the proper relation of nucleus and protoplasm can exist which is necessary to the normal functioning of the cell. In order to exclude entirely this objection it must be shown that for any given quantity relation of nucleus and protoplasm in the starting cell, the proper relation of the two constituents can be reached in the larva cell. This could be proven by the rearing of fragments of eggs of all sizes in which, therefore, the amount of the nuclear material remaining constant various amounts of protoplasm were present. These experiments were so carried out that the egg fragments were reared in quantities and in these cultures every thinkable size of normal larvæ was found. Again, various sized egg fragments were measured accurately and reared isolated, and these also developed into normal larvæ of all sizes.

6. The important task which I had set myself was the following of dispermic eggs in which only one sperm nucleus united with the egg nucleus while the other remained independent. I succeeded in rearing twenty-two specimens in which this rare and theoretically especially important type of dispermy occurred. From these I obtained a considerable number of gastrulæ and plutei. These larvæ consist of one part with large nuclei and one with small nuclei, and by this mark it may be determined with complete certainty what part contains paternal nuclear substance and what part contains paternal and maternal nuclear substance combined.

The various experiments enumerated will enable me to finish my work on double impregnation, and I hope that the completed memoir will be published in the spring of 1906.

CHARLES S. MINOT,
Secretary.

THE CONGRESS OF THE UNITED STATES.

ON January 6 a bill was introduced by Mr. Kahn, to provide for celebrating the four hundredth anniversary of the discovery of the Pacific Ocean by Vasco Nunez Balboa by holding an international exhibition of arts, industries, manufactures, and products of the soil, mines, forest and sea, at the city of San

¹ 'Über mehr polige Mitosen als Mittel zur Analyse des Zellkerns,' *Verh. d. phys.-med. Ges. Würzburg*, 1902.

Francisco, California; referred to the Committee on Industrial Arts and Expositions.

On January 8 Senator Smoot introduced a bill for the protection of wild animals in the Grand Canyon Forest Reserve; referred to Committee on Forest Reservations and Protection of Game.

On January 9 Representative Lacey introduced a bill for the preservation of American antiquities; referred to the Committee on Public Lands.

On January 10 Senator Perkins introduced a bill for the protection of animals, birds and fish in the forest reserves; referred to the Committee on Forest Reservations and the Protection of Game.

The bill for the incorporation of the American National Institute at Paris has passed the senate.

SCIENTIFIC NOTES AND NEWS.

DR. WILLIAM RAINEY HARPER, president of the University of Chicago, died on January 10, at the age of forty-nine years. At the funeral exercises at Chicago, on January 14, addresses were made by President Faunce, of Brown University; Chancellor Andrews, of the University of Nebraska; Dean Judson, of the University of Chicago, and Dr. Lyman Abbott, of New York City. It is intended to bury the body ultimately in a memorial chapel and crypt to be built on the university grounds. Memorial exercises were also held at Columbia University, addresses being made by President Butler, President Wilson, of Princeton University, and President Hall, of the Union Theological Seminary.

PROFESSOR J. P. IDDINGS, of the University of Chicago, was elected president of the Geological Society of America at the recent Ottawa meeting.

DR. N. L. BRITTON, director of the New York Botanical Garden, has been elected president of the New York Academy of Sciences.

DR. A. L. KROEBER, of the University of California, has been elected president of the American Folk-lore Society.

PROFESSOR HENRY M. HOWE, head of the department of metallurgy in Columbia Uni-

versity, has been elected a foreign member of the Swedish Royal Academy of Sciences. The other Americans holding this honor are Professor Simon Newcomb, Dr. Samuel Pierpont Langley, President Charles R. van Hise, Dr. Alexander Agassiz and Mr. Thomas A. Edison.

DR. BURTON E. LIVINGSTON has resigned his position in charge of the Division of Soil Fertility of the Bureau of Soils, U. S. Department of Agriculture, to accept a place on the staff of the Desert Botanical Laboratory of the Carnegie Institution, at Tucson, Ariz.

THE resignation of Dr. D. T. MacDougal as assistant director has brought about a reorganization of work at the New York Botanical Garden. Dr. W. A. Murrill, who has been serving as a curator for parts of two years, having succeeded to the position left vacant by the resignation of Professor F. S. Earle to accept the work of directing the Cuban Agricultural Experiment Station, has been appointed first assistant, and the duties of Mr. Percy Wilson, administrative assistant, have been increased. Dr. C. S. Gager, who has pursued investigations at the garden for some time under the direction of Dr. MacDougal, has been appointed director of the laboratories. Mr. R. S. Williams, who has done much field work on behalf of the garden during the past five years in the Yukon Territory, Bolivia and the Philippine Islands, has been appointed an assistant curator. Mr. C. B. Robinson, who has been a student of the garden, giving special attention to the study of the stone-worts, and to the Philippine Island collections formed by Mr. Williams, has also been appointed an assistant curator.

At the annual election of the American Philosophical Society, held on January 5, the following officers were elected for the ensuing year:

President—Edgar F. Smith.

Vice-Presidents—George F. Barker, William B. Scott, Simon Newcomb.

Secretaries—I. Minis Hays, Edwin G. Conklin, Arthur W. Goodspeed, Morris Jastrow, Jr.

Treasurer—Henry La Barre Jayne.

Curators—Charles L. Doolittle, William P. Wilson, Albert H. Smyth.

Councillors—Patterson Du Bois, Samuel Dickson, Ernest W. Brown, William Keith Brooks.