

Normally the number of chromosomes is reduced by one half when the embryo-sac mother cell divides. In *Alnus rugosa* there is no such reduction. The pairing of homologous chromosomes does not take place so the embryo-sac initial has the sporophytic or diploid number of chromosomes, twenty-eight.

From one to four embryo-sacs may form in one ovule from as many embryo-sac mother cells. Embryos arise in these embryo-sacs from the diploid egg, which, of course, has not been fertilized (parthenogenesis) and by budding of the nucellus. Well-developed embryos appear to have had their origin in the synergids and the antipodals. Such embryo formation would be cases of apogamy. Several very interesting preparations suggest the origin of certain embryos from the endosperm. One ovule, in particular, has an embryo from the diploid egg and another embryo forming in a massive endosperm, being completely surrounded by it and bearing a suspensor, the cells of which merge into the endosperm material. Serial sections show that this embryo is not connected with the nucellus at any point. The initial stages in embryo formation from synergids, antipodals and endosperm have not yet been observed.

One to five embryos may mature in one embryo-sac. Several embryos may mature in each of two embryo-sacs in the same ovule. Germination tests show that two embryos from the same seed can both develop to normal seedlings.

Polymorphism, irregular meioses, parthenogenesis, apogamy, nucellar budding and polyembryony all

point to a hybrid origin for *Alnus rugosa* of the New England region.

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A BOMBARDING DICAELUS BEETLE

I AM writing concerning an experience that I had with a ground beetle on November 3, 1928. While the Pi Chapter of Phi Sigma was having a picnic at Stone Mountain, several of the members were collecting various specimens. I turned over a rock and picked up a species of *Dicaelus*, and while I was holding it between my thumb and forefinger and using the other fingers to unscrew the cap from the cyanide bottle, it gave off a very strong discharge of gas which turned to a dense smoke. This appeared to come from the anterior end of the beetle, instead of from the posterior end as in the genus *Brachynus*. I placed it head first into the bottle, when it gave off another discharge, which also appeared to come from the side of the head. The bottle was filled so densely with this smoke that the beetle was almost entirely hidden; when I took off the cap to show several of the party, the smoke escaped to a distance of over a foot from the bottle. I am very anxious to hear from any reader of *SCIENCE* that has had a similar experience with a beetle of the genus *Dicaelus*. I have known several *Brachynus* beetles to discharge the gas, which always appeared to come entirely from the posterior end of the body.

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QUOTATIONS

THE SEVENTIETH BIRTHDAY ANNIVERSARY OF THEOBALD SMITH

ANNIVERSARIES play an important part in national life as they do in one's personal experiences. They serve not only to arouse retrospect and encourage a review of what has gone before, but also to awaken an interest in the impending possibilities of the future. The experience of the past tends in no small measure to kindle new enthusiasms for what coming years may reveal, or to dampen an ardor for plans and projects that history has indicated to be futile or unlikely to be accomplished. It has become customary to select the centennial anniversary of the accomplishment of some notable purpose or the birth of a distinguished person for the celebration of achievement and the review of its significance and bearing on progress. It seems equally fitting at times to refer to significant contributions before their consequences have become so familiar that the merits of the maker are all but forgotten.

The seventieth birthday anniversary of Theobald Smith, at the time of his announced retirement from

the active directorship of the Department of Animal Pathology of the Rockefeller Institute at Princeton, N. J., affords a welcomed opportunity to hail one of the eminent American contributors to the advancement of science and the development of medicine. The demonstration of the existence of insect vectors in the transmission of disease—a phenomenon that the medical student of to-day, only a generation after the epoch-making discovery, accepts without debate or hesitation—marked Smith as one of those rare pioneers who sense great opportunities, who see what others have persistently failed to observe, and who have the strength and courage to give force to their convictions.

A popular writer has remarked that it was Theobald Smith who made mankind turn a corner. "He was the first, and remains the captain of American microbe hunters," showing men an entirely new and fantastic way in which a disease may be carried—by an insect. It is fortunate as indeed it is gratifying that with the progress of popular education the significance of such a discovery may to-day be thoroughly appreci-

ated by thinking people and that they may share in expressions of congratulation and the heralding of well-deserved honors. Thus, in reviewing the achievement of the unostentatious investigator on the scientist's birthday, the *New York Times* has offered this editorial tribute:

A world accustomed to accept such facts as the communication of disease by insects can scarcely appreciate the significance of Dr. Smith's discovery in 1893 of the transmission of the so-called Texas fever of cattle from one animal to another by means of ticks. For seven years he had been experimenting with this disease, and discovered that it could be carried even by ticks which had never been in contact with infected cattle, but which had acquired the virus from their parents. This opened up an entire new field of thought and lent moral courage to those who made the test which finally proved that yellow fever was transmissible by certain types of mosquitoes.

In like manner the connection between the spread of malaria and mosquitoes was discovered, and between sleeping sickness and the tsetse fly.

Dr. Smith's achievements are by no means completely covered by reference to his studies of Texas fever in cattle and all that this implies. He was among the earliest students of the phenomena that are now designated by the comprehensive term anapylaxis—mysterious manifestations that are concerned in the genesis and the control of many maladies of mankind. But this is not a review. American medicine—indeed, the scientific world and the layman as well—rejoice in recalling the part that Theobald Smith has played in the advancement of learning and the promotion of human and animal welfare.—*The Journal of the American Medical Association*.

SCIENTIFIC BOOKS

Incomes and Living Costs of a University Faculty.

Edited by YANDELL HENDERSON and MAURICE R. DAVIE. Yale University Press. 1929.

THIS admirable report on the academic standard of living, based on adequate returns of a representative community, takes the question out of the sphere of "academic" discussion into that of statistical evidence. It does not stand alone. There is the similar study by J. B. Peixotto for the University of California, and the General Education Board has collected data of a wider range though less complete. The conclusions of all are closely in accord so far as the bearing of condition upon desirable provisions go. The day is past when one can speak casually or earnestly of the underpaid professor and let it go at that. The problem of the colleges and universities in the United States is a very complex one; serious influences of many-sided origin are in operation making unmistakably for decline. The blind optimism and complacent acceptance of mediocre standards and still more the bid for popularity under the pressure of unenlightened influence in their combination is itself one of them. Consequently the redemption of the universities by providing adequate incomes on a just scale of compensation is but a partial solution of a grave situation. Yet it is in itself so vital, so definitely critical to one phase of the academic maladjustment that its importance is convincing.

Selecting the practical issues rather than the statistical basis for them as a basis of comment, we are understating the case in saying that the average member of the Yale faculty—doubtless more fortunately situated than the average member of high-grade fac-

ulties in general—has about half the income necessary to maintain himself and his family in comfort and security and enable him with reasonable freedom from care to devote his energies whole-heartedly to his profession. The very paradox of the situation appears in the statement that only by "excessive curtailment of the budgetary needs" can the college professor "buy for his children such education as he and his colleagues produce." The ultimate and actually operative effect of this situation is that high-grade men are dissuaded from entering what should be a high-grade profession; the quality of the personnel of even the best-manned faculties (certainly of all but the very best) is declining. The promising candidate for the academic life may now read in these objective statistics about what he may expect if he decides to trust his fate to university conditions. Unless his youthful enthusiasm places himself in the rôle of the very few who escape the common lot of the barely successful professor, or he finds himself with some private means to offset the struggle, he may well decline the venture, however enthusiastic his devotion to learning. He is likely to be guided in his decisions by comparison with the economic position of other high grade professional callings; the statement that "the American university teacher in many cases lives essentially as do men of the skilled mechanic class" is discouraging even to one who has a high regard for mechanical skill and no more snobbery than is democratically acceptable. There are professional standards of self-respect that are socially reflected; there are limits to the correlation of high thinking and plain living.