dosage of calcium arsenate which is fatal to the larvae of the Mexican bean beetle, no effects on larvae placed on the foliage could be detected. The larvae fed on the treated foliage, consumed as much leaf area as the larvae placed on untreated foliage and molted successfully.

Back and Cotton[2] found that "solutions of Epsom salt are of no value" for moth-proofing purposes.

Conversations with entomologists located in some of the southern states where growers had used magnesium sulfate in the field indicated that the material was valueless as a remedy for the Mexican bean beetle. One of them suggested that the reason some growers believed that benefits had resulted was that the larvae which were devouring the plants pupated shortly after the spraying, and that when observations were made the quiescent pupae only were present. The growers, not being familiar with the biology of the insect, decided that the treatment had killed them, since they were unable to move.

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A MATTER OF TERMINOLOGY

IN a recent number of SCIENCE[1] Dr. Ramaley raises a question of terminology which is often encountered by plant morphologists and teachers of botany, but I am not sure that he arrives at the best answer. He criticizes a recent text in which the terms *male* and *female* are applied to the parts of the sporophyte of a flowering plant, while he would apparently reserve these for the gametophyte.

This latter usage, suggested many years ago in connection with the growth of the idea of the alternation of generations, was supported by most morphologists, who insisted that the monoploid generation be regarded as "sexual" and the diploid as "asexual" or "non-sexual." It is hardly conceivable that any experienced teacher's lapse from this standard to-day should be due to a failure to recognize the two generations and to distinguish clearly between them. Even the poorest of our college teaching is probably too well grounded for that. I believe it is rather because the old distinction between the two as sexual and non-sexual is useless if not actually misleading. If categorical earmarks of the two generations are needed for pedagogical purposes, those based upon chromosome numbers and relations to spores and gametes are probably much more intelligible.

There is much to be said for the idea that the entire life cycle, consisting of both the monoploid and diploid parts, is a *sexual* life cycle, as contrasted with those cycles in which there is no union of gametes. Starting at any point in the sexual cycle, reproduction should be regarded as having been accomplished only when that point had been reached again. It is hardly logical to say that the gametophyte reproduces sexually (by gametes) or that the sporophyte reproduces asexually (by spores). Neither actually *reproduces* in that sense; it only produces something else as the first step in reproduction.

Those of us who had our early training under the strict morphological régime were taught to keep our fingers crossed when we spoke of "male" and "female" flowering plants or flower parts. I wonder, after all, how much logic there was to this inhibition. If there is any homology between plants and animals as far as sex is concerned, it is perfectly consistent to call staminate and pistillate individuals or parts of individuals male and female. As in animals, it is the diploid generation which is concerned, and to say that a thing is male or female simply implies that it is so specialized that it is instrumental in the production of sperms or eggs.

The process is a little more direct in the animal than in the plant, but the two cases are closely comparable. The comparison is somewhat obscured by the extension of the monoploid generation in most plants and by the greater prevalence of sexual differentiation in animals; but these are matters of degree rather than of quality.

The source of the confusion of words is the common one occurring when the application of a term is extended into a new field. The words "male" and "female," or their equivalents in other languages, were applied to animals for a long time before anything definite was known about sexuality in plants. Now, that the latter field is better known, who is to say how the old terminology is to be carried over? The answer comes only through usage; legislation almost universally fails in such cases. Consistency and convenience point toward the rejection of an illogical dictum of morphology and the promotion of a usage exemplified by the expressions which Dr. Ramaley criticizes.

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SCIENTIFIC BOOKS

A BIOGRAPHY OF PEARY

Peary. By WILLIAM HERBERT HOBBS. 502 pp., 27 maps, 13 half-tones, 10 records and diagrams and 36 drawings by the author. The Macmillan Company, New York, 1937.

IN a volume of some five hundred pages Professor

[2] U. S. Dept. Agr. Yearbook, 1927: 467. *Furniture Warehouseman,* 8: 800.

[1] SCIENCE, 86: 36, 1937.

Hobbs has traced the remarkable career of Robert Edwin Peary from his birth in May, 1856, amid the Allegheny Mountains of Pennsylvania, through boyhood and youth in southwestern Maine, restless days as draftsman in a government bureau at Washington, exacting months of service in the Navy as an engineer on exploratory surveys of the Nicaraguan Canal route, on through the long years of heroic struggle in the far north crowned at last by magnificent achievement but marred by the devastating storm of the Cook controversy, and finally to the twilight of wasting disease which ended in death at the Washington home in February, 1920. It is an epic of compelling interest, skilfully told by one whose personal acquaintance with Peary, with his principal aides, with other Arctic explorers and with conditions in Greenland give him special qualifications for the task of biographer.

The early chapters paint a charming picture of Peary as a lad at boarding school, as a college student revealing in verse of real merit the poetic temperament destined later to create those artistic word pictures so abundant in his mature writings, and as a young man tenderly responsive to the charm of childhood. In his early twenties dreams of future accomplishment began seriously to disturb the calm of Peary's life, and in letters to his mother the future explorer poured out the story of his restless ambitions. At twenty-eight the dreams have taken definite shape. As an engineer on his way to explore canal routes in Nicaragua he made an entry in his diary which shows something of his poetic descriptive powers and gives one truly prophetic flash as to his ultimate destiny:

> At four, San Salvador, the land which first gladdened the eyes of Columbus, was visible on the starboard bow, and later the sun set behind it, bringing the low shore with its detached Keys and rounded promontories into purple relief against a gorgeous sky. Birthplace of the new world, purple against the yellow sunset, as it was almost four hundred years ago when it smiled a welcome to the man whose fame can be equalled only by him who shall one day stand with 360 degrees of longitude beneath his motionless feet and for whom East and West shall have vanished—the discoverer of the North Pole.

Thus is Peary's character unfolded in the earlier chapters (Part I) of Professor Hobbs's book. There follows (Part II) the story of his accomplishments as an engineer and his exploratory surveys in the tropics where Peary's capacity for independent action and for leadership won warm approval from his superiors. To this period belong two events of major importance in the life of the explorer. The first was the definitive awakening of his interest in Arctic exploration, stimulated by the reading of a fugitive paper on the inland ice of Greenland which Peary discovered in an old bookstore in Washington and which led to the planning and execution of a preliminary summer expedition to Greenland during an interlude in his Nicaraguan surveys. The second event was his unusually happy marriage to Josephine Diebitsch, who was the daughter of Professor Herman H. Diebitsch of the Smithsonian Institution, and who married Peary with full knowledge and approval of his high ambition to win fame in the strenuous field of exploration.

More than half the volume (constituting Parts III and IV) is concerned with Peary's successive expeditions into the far north. In telling of these high adventures Professor Hobbs quotes extensively from the graphic accounts given by Peary himself in his published works, as well as from the published and unpublished writings of Peary's aides and other Arctic explorers. Part V is devoted to the most tragic event in the career of the great explorer, the astounding claim of Dr. Cook that he had anticipated Peary in reaching the Pole; and to the resulting controversy which convulsed two continents and for a time robbed Peary of the public acclaim he had so richly earned. A brief Part VI records Peary's valuable services in promoting aviation in the United States and in working for adequate preparedness for national defense; and gives details of his last illness and death.

Half a dozen appendices contain a chart of Peary's ancestors; lists of the explorer's publications, of the medals and other honors awarded him, of appreciations voiced by contemporary explorers and associates and of the distance and duration of various dog sledge journeys in the Arctic; and a discussion of the geographic position of Cape Jesup and of the experts' reductions of Peary's observations in the vicinity of the Pole.

Such then is the volume which Professor Hobbs has given us. Any critical estimate of this record of Peary's life and accomplishments must take account of what works we already possess covering the same ground and what useful purpose we might reasonably expect a new biography of the explorer to accomplish.

When one turns to the literature, he is surprised to see how little has been written about Peary. Of books, pamphlets, magazine and newspaper articles dealing with Arctic exploration in general and with the unhappy controversy as to who discovered the North Pole, one may amass a small library. But such works are not biographies, and often contain little material of biographical value. Donald MacMillan's excellent account of "How Peary Reached the Pole," while not pretending to be a biography, throws valuable light on the culminating achievements of Peary's career,

and portrays the explorer as a skilful leader, scrupulously honest and straightforward in dealing with his men. The title of Reverend J. Gordon Hayes's volume, "Robert Edwin Peary," suggests a biography; but the subtitle, "A record of his explorations, 1886–09," defines its more limited scope. Both this work and the same author's later volume, "The Conquest of the Pole," because of their wholesale misstatements of fact and their studied misrepresentations of Peary, can perhaps best be classed as defamatory fiction. Two other defamatory books are Thomas F. Hall's "Has the North Pole Been Discovered?" and W. Henry Lewin's "The Great North Pole Fraud," both of which paint Peary as a dishonest scoundrel. Such scurrilous attacks contribute nothing to legitimate biography, although they may perhaps increase the need for a dispassionate account of Peary's true character.

One book only has been published which can make any claim to be a biography of the great American explorer. This is Fitzhugh Green's "Peary, the Man Who Refused to Fail." Commander Green spent several years in the Arctic among the same Eskimos with whom Peary lived and worked, and thus brought to his task a knowledge of places and people of significant value. To this advantage he added literary gifts of undoubted worth, and the cooperation and approval of Mrs. Peary, who wrote a foreword for his volume. The result is an interesting and valuable narrative of the explorer's life, penned in graphic style.

Yet the critical reader who peruses Green's four hundred pages with genuine pleasure must lay the volume aside with a conviction that it is not a biography that adequately reveals Peary to the world which knew him little and understood him less. The style is charming, but too impressionistic to be satisfying, too sketchy to be always convincing. The treatment is subjective rather than objective, with the result that one gets a reflection of Green's picture of Peary, without seeing the raw pigments out of which that picture was painted. The material presented concerning Peary's boyhood and youth is especially scanty; and when Green quotes more fully from original sources in describing Peary's later achievements, failure to cite the authorities quoted detracts from the value of the volume as an authentic record of Peary's life.

It thus appears that when Professor Hobbs essayed to write the story of the greatest of Arctic explorers, he entered a field but little occupied and one in which the need of an adequate and dispassionate biography was peculiarly pressing. How does his "Peary" fulfil this need? That the author admires the subject of his book is a fact which will not escape the reader's notice. Yet his treatment is not that of a partisan so biased as to see no faults in his hero. Professor Hobbs has ranged widely in his search for material, and has quoted his sources abundantly, documenting his story meticulously page by page. Where the material convicts his hero of egotism, personal ambition, bad judgment, he lets the facts tell the story without excuse or palliation. Where the material convicts Peary's detractors of partisan bias or unblushing dishonesty, again it is the record which is left largely to speak for itself. Indeed, Hobbs's account of Cook and his protagonists omits much which might have been told to their detriment, but which was not required to paint Peary in his full stature. Taken all in all, the verdict rendered by the vast majority of those who have publicly reviewed the work, to the effect that it is fair and dispassionate, seems warranted.

As to the adequacy of the biography, a distinction must be made between two parts so strikingly different that the contrast can not fail to impress any critical reader. The earlier chapters dealing with Peary's boyhood and youth have a freshness and a charm that in places are truly captivating. It is evident that Professor Hobbs here had at his disposal unpublished material of real value and that he experienced peculiar delight in painting a picture of the young Peary which would prove new to most of his readers. More material covering the early part of Peary's life may see the light in future years; but it seems probable that the judgment of the future will be that Professor Hobbs's account of the boyhood and youth of his subject, if not complete, is at least entirely adequate for the purpose of his volume.

As to the remainder of the biography, opinions will differ. With the entrance of Peary upon his public career the character of Professor Hobbs's treatment changes. Peary the man is lost in Peary the explorer. To a certain extent this was doubtless inevitable, for always the public tends to conceal the private life. Yet one misses those flashes of insight into the matured character of Peary which must be somewhere revealed in letters, diaries or other private papers. It is not conceivable that the biographer, who utilized similar material with telling effect in the earlier chapters, would not have drawn heavily upon such material in later parts of the book had it been at his disposal. We are forced to conclude that for some reason Professor Hobbs did not have access to documents he doubtless would have been only too glad to utilize.

If, as a result of the limitations thus imposed, the biographer has failed in revealing to us quite as fully as we could wish the Peary of middle and later life, he has nevertheless painted an illuminating picture of a man of truly heroic mold. It is the picture of a man who consecrated his life to a single great objective,

pressing toward it in the face of countless discouragements and disappointments, enduring indescribable physical torture and defying peril of imminent death until his goal was won. It is the picture of a man ambitious, brusque, forceful, rugged, resourceful, indomitable; yet a man honest and sincere, devoted to wife and children, considerate of his men and posessing a keen appreciation of the beauties of nature; on the whole a man who was an able leader of expeditions rather than a popular leader of men, a man to admire and honor, rather than to love. If the more engaging qualities which inspire popular affection were latent beneath the mature man's iron exterior, they were quickened only by his intimates, and do not color strongly the pages of Professor Hobbs's book.

From the literary standpoint the volume is well written, and the author's forceful style holds the reader's attention throughout. One notices occasional repetitions of phrases, and the smoothness and unity of treatment suffer in some measure from introduction into the text of the many quotations prefaced by the oft-repeated words "wrote Peary," "Peary writes," and similar expressions. But these minor defects are more than offset by the general excellence of the text. And it is only fair to add that the value of the work as an authentic record of Peary's life is enhanced by the numerous quotations from authoritative sources, and that despite their frequent occurrence the story as a whole moves continuously and with unflagging interest to its dramatic close.

The student of polar history might prefer to see the chapters on the Cook controversy excluded from the book. This view would be understandable, for since Cook was never near the Pole and added little to the technique of Arctic exploration, why should the hoax he perpetrated on a gullible public be detailed at length? But such a view would be to forget the purpose of biography. The Cook hoax was the supreme tragedy of Peary's life, and must occupy a prominent part in any adequate account of that life. Freeman could not write his monumental biography of Lee without dealing fully with the insubordination of the sulking Longstreet, however disgraceful and humiliating the story. No event in Peary's life has greater public interest than the controversy of which he was the innocent victim. The fact that a very large proportion of the published reviews of Professor Hobbs's book have cited those chapters dealing with the Cook-Peary controversy as the highlight of the volume bears witness to this truth.

It is significant of the public welcome accorded Professor Hobbs's book that many of its reviewers have hailed the volume as the final and definitive biography of Peary. The present reviewer would hesitate to venture far into the realm of prophetic appraisal, particularly in view of the fact that Peary's diary covering his later and greatest achievements has not yet been placed at the disposal of any biographer. He would prefer to say that Professor Hobbs has given us an excellent life of the famous explorer, the only adequate biography yet available, delightfully written and fully documented, a book of real and permanent value.

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SPECIAL ARTICLES

USE OF DEXTROSE BY EXCISED TOMATO ROOTS

IN a review of plant tissue cultures White[1] states that excised tomato roots require sucrose and are unable to utilize dextrose under the conditions studied. The implications of such results for the metabolism of cane sugar by tomato roots are obvious, and White briefly discusses their significance.

However, our observations, in contrast to those of White, show that excised tomato roots are able to utilize dextrose. Since the ability or inability of tomato roots to utilize dextrose is of considerable interest from the standpoint of carbohydrate metabolism in general, a brief report of our results is made at this time.

We have grown excised tomato roots in White's solution in which dextrose was substituted for cane sugar. Two samples of dextrose of high purity were used as follows: Dextrose C. P. anhydrous Pfanstiehl lot No. 380 with an ash content of 0.008 per cent. and Cerelose with an ash content of 0.004 per cent. from the Corn Products Company.

Excised tomato root tips were transferred on July 18, 1936, from White's solution containing cane sugar to the same solution containing 2 per cent. Pfanstiehl's dextrose instead of cane sugar. These solutions had been sterilized at six pounds pressure for thirty minutes. The excised roots grew well, though the branches were longer, more slender and less numerous than in the solutions containing cane sugar. They were also less white, more translucent. We are not certain whether these differences in growth in the cane sugar solutions and in the dextrose solutions are due to the difference in the sugar or to the small quantities of impurities which are present even in these highly purified sugars.

[1] P. R. White, *Botanical Review*, 2: 419–437, 1936.