that formed during the first ten to twenty years of the life of the plant is alive.

The developmental period of stomata in *Carnegiea gigantea* is very short. Material two centimeters from the growing-point contains only well-developed stomata. The developmental stages of the guard cells are found within a few millimeters of the growing-point at the apex of the stem or branches. They reach full size within less than a month, and since plants of this species often live more than a century the life of the plant is more than twelve hundred times the duration of the stomatal growing-period.

A study of the movements of the guard-cells of a seedling seven months old showed them to be wide open at 5:30 A. M., soon after daybreak, gradually closing throughout the morning to a slit at noon. This slight opening remained until after the middle of the afternoon, and by nine o'clock at night they were completely closed. Epidermis from the base of a giant which contained representative guard-cells of great age showed the stomata open at daylight, closed to half the size by eight-thirty in the morning, either closed or with a slit opening at noon, and then completely closed until after ten at night, when they began to open again. This is a program largely in reverse of that shown by leaves of most plants, especially those living in moist regions in the tropics.

The guard-cells of the stomata are larger than the adjacent epidermal cells and open into a wax-lined sub-stomatal chamber which extends entirely through the hypodermal tissue, which may have as many as ten layers of cells in older parts of the stem. The changes coming with age which may affect the guard cells are easily observable. These elements are in direct contact with the turgid cells of the hypodermal layer for the first few years of their existence, and exchanges of water and other material may take place readily. The earlier contact with a thin-walled tissue containing chlorophyll facilitates the reception of material by the active guard-cells. Later the walls of the hypodermal cells thicken and the readiest communication is through the pits to the cortex. The best communication is perhaps with the neighboring epidermal cells. The external walls of the guard-cells also become heavily cutinized with age.

However, in spite of all these changes in the adjacent cells, these guard-cells retain the power of motion for perhaps a century. Then comes a time when some other changes take place which stop the functioning. The waxy cuticle disintegrates and masses of waxlike material clog the stoma and spread in uneven golden brown masses over the epidermis. This is the transition stage and occupies the region of green tissue nearest the base adjacent to the brown corky layers. The stomata disintegrate with the transformation of the outer layers into cortical tissues.

The developmental or growth period of the stomatal cells is not longer than a month; life and activity, including movements of the guard-cells, may continue for a century or more, or twelve hundred times as long as the formative period. The transformations of energy upon which daily action is based and the widely ranging conditions of temperature to which all epidermal elements are subject make the stomatal cells of Carnegiea one of the most remarkable cases of endurance of protoplasts yet recorded. The other epidermal cells which endure for a similar period are hardly less notable.

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PRESS SERVICE

WITHIN the past few years interest in science in the United States has so increased that several of the press associations and even a number of the larger newspapers have appointed science editors whose special duty it is to seek out and to present in popular phraseology information of current interest on scientific subjects.

In appointing science editors the general policy has been to select writers of unusual ability and of proved accuracy rather than to designate as science editors writers with previous scientific training.

This is a wise policy, for a writer must always maintain the closest possible contact with the public whom he serves, and must be able at all times to appraise the ever changing public interest in the varied lines of scientific work unbiased by personal preferences arising from that specialization which is inseparable from scientific training.

While this policy insures the necessary, and indeed essential, closeness of contact between the general public and the science editors, the contacts between the science editors and the great body of scientific workers who represent the source of their material are less intimate than is desirable.

In addition to the science editors there is an increasing number of feature writers who to a greater or lesser degree specialize in science and would do so to a much greater extent if it were possible for them to secure the necessary material.

Recognizing the desirability of bringing about a closer accord between research workers and the representatives of the press, the association at the New York meeting established the American Association Press Service.

The function of the press service is threefold. In the first place, material sent in at any time during the year will be made available to writers with the under-

standing that the articles prepared by them will be submitted for revision to insure accuracy, and carbon copies of the articles as sent to press will be filed with the association. In the second place, writers desiring material for an article on any scientific subject on application to the association will be referred to a recognized authority on that subject who is willing to provide the information wanted, subject to final revision of the completed story. In the third place, any article written by a popular writer may be sent in for examination in regard to its accuracy.

Thus the press service provides a contact heretofore lacking between the research workers and the press. All material sent in will be brought to the attention of the press representatives for their consideration in much the same manner as at the annual meetings. Whether the material is used or not is a matter for the press representatives to decide.

The object of the press service is to provide a channel through which the results of research work may be made public, and at the same time a source of original material for writers. No stories or articles of any kind will be sent out by the press service for publication directly. Writing for the public press is a highly specialized occupation requiring long and arduous training and extensive and varied experience. The press service aims to meet the growing demand for accurate and readable information on scientific subjects, and not through competition to discourage those endeavoring to meet that demand.

It is understood that SCIENCE, the official organ of the association, reserves the right to publish any item or article sent in to the press service; but this does not interfere in any way with the publication of the same item or article, rewritten, in a newspaper or magazine.

The press service of the association represents a line of activity not previously attempted by any scientific body. Through its successful operation the association as a whole as well as the individual members, and, on the other hand, the vast reading public of America, will greatly benefit.

AUSTIN H. CLARK

BOOK REVIEWS IN SCIENCE

THE reviewing of scientific books is the most difficult situation that the editor of SCIENCE must meet. There are now published in English and in other languages so many books that only a small proportion of them can be reviewed in any one journal. An editor can not be competent in diverse subjects. If specialists in each are asked to take charge, as was formerly done, there is difficulty in obtaining from them impartiality, promptness and coordination. They are naturally more interested in their subject than in the journal.

When the field covered is so large, the limited space is a serious difficulty. Comparisons, perhaps odious to our pride, are sometimes made between the reviews in SCIENCE and in *Nature*. It should be remembered that the subscription price of *Nature* is £2/12s. (foreign £2/17s.), whereas SCIENCE is supplied for $3.00. It might conceivably be better to make the membership dues of the American Association for the Advancement of Science $20.00 or $25.00 and spend on SCIENCE $18.00, which would be about the equivalent of £2/12s. in England. Then ample space could be provided and review editors could be found who would give adequate attention to the work.

A large membership of the association and a corresponding number of readers of SCIENCE may, however, be preferable to a larger and more expensively produced journal. The British Association for the Advancement of Science has just now asked the American Association to join with it in protesting against the high cost of German scientific journals. It may be that later the advertising in SCIENCE as the circulation increases (it is now over 14,000) will make improvement and enlargement possible without additional cost to the association. Members can forward this desirable end by increasing the membership of the association among scientific men and by making use of the advertisements when that can be done to advantage. For example, a firm expressed satisfaction when a scientific man informed it that he had ordered for his institution apparatus costing $4,000 owing to an advertisement in SCIENCE.

The financial problem is not the only one in connection with the reviewing of books. SCIENCE aims to be objective and impartial. Articles are accepted on the guarantee of the standing of the scientific man and the supposed value and suitability of the contribution, the editor obtaining expert advice when there appears to be any question. As a matter of fact very few contributions are sent to SCIENCE that do not deserve publication; it is nearly always a question only of limitations of space. Editorial opinions are not expressed as such. In the notes even comparatively innocuous words such as "interesting" and "important" are avoided; they are cut out hundreds of times from contributed news notes. If, as in the present instance, it seems desirable to express opinions the communication is signed and is printed in the department open to any scientific man.

In the case of reviews the situation is different, for the editor must select the books to be reviewed and find the reviewers. Authors and publishers not only urge reviews of their books, but often suggest re-