three[2] species of mollusks had been named *newberryi*. One of them, *Melania newberryi* Lea, is not an air-breathing mollusk, and belongs to a family not included in the scope of Binney's work. This leaves two species for consideration: *Ancylus newberryi* and *Planorbis newberryi*. *Ancylus newberryi* Lea was duly enumerated by Binney among the Ancylinæ (p. 11) and is thus eliminated. *"Carinifex newberryi* Lea" was placed by Binney in the Planorbinæ, and could be nothing else than *Planorbis newberryi* Lea, which does not otherwise appear in the list. Nobody ever thought it was anything else. The name *Carinifex* passed into general use, and has appeared in hundreds of papers, here and abroad. It was never questioned before.

The name *Megasystropha* Lea for *Planorbis newberryi* was published in April, 1864. It was proposed "provisionally" by Lea, probably in the belief that as *Carinifex* had not been *defined*, it could be displaced. It was an era of scant courtesy between systematic conchologists.

While Binney's way of introducing a new generic name is not to be commended, it appears to me a needless disturbance of nomenclature to replace *Carinifex* by the later, still-born and clumsy name *Megasystropha*.

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BOWMANVILLE LOW-WATER STAGE OF GLACIAL LAKE CHICAGO

IN Dr. D. J. Fisher's very interesting account of the geology of the Joliet Quadrangle[1] (page 102) a low-water stage is described as occurring between the Glenwood and Calumet high-water stages of Lake Chicago. It is gratifying to have this low-water stage again affirmed, as the writer showed evidence of its existence a number of years ago[2] following the earlier statement of its existence by Dr. Andrews.[3] The name given it by Dr. Fisher can not be used, however, as the writer gave this stage a formal name in 1920—the Bowmanville. Evidently Dr. Fisher has not seen the writer's "Life of the Pleistocene," in which the history of the life of Glacial Lake Chicago is described in great detail, based on a study of the entire length of the North Shore Drainage Channel, which cut longitudinally through the bed of old Wilmette Bay. The stages of the glacial lake there outlined are as follows: Glenwood, Bowmanville (=Evanston), Calumet, Toleston, Sag Low Water, Hammond, Englewood. The name Bowmanville is formally described on page 69 of the volume, "Life of the Pleistocene."[4]

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[2] Not four species, as stated in Opinion 87. *Goniobasis newberryi* Lea, 1863, is not a fourth species, but only a change of the generic name of *Melania newberryi* Lea, 1858, as a reference to Lea's paper will show.

[1] Bull. Ill. Geol. Surv., No. 51.

[2] Trans. Ill. Acad. Sci., IV, p. 110.

[3] Trans. Chi. Acad. Sci., II, pp. 1–24, 1877.

[4] Univ. Ill. Bull., Vol. XVII, No. 41, i–xiv, 1–476, pl. i–lvii, 1920.

INHERITANCE OF ACCESSORY MAMMAE

In *Science* for June 11, 1926, Dr. W. W. Keen cited a case of the transmission of extra nipples and breasts from father to children, and states that "it would be very interesting to learn whether this peculiarity was passed on to his grandchildren." Some references to the inheritance of the anomaly are given by Deaver and McFarland in their book, "The Breast" (Philadelphia, 1917), including the study of Marie on the incidence of polymastia in four generations of a French family. A similar complete and equally remarkable case, also involving four generations, has recently been published by Klinkerfuss (*Journal of the American Medical Association*, April 19, 1924, p. 1247). More remarkable still are the experiments of Alexander Graham Bell on multi-nippled sheep (SCIENCE, n. s. 9: 637).

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SCIENTIFIC BOOKS

Plants and Man, A Series of Essays relating to the Botany of Ordinary Life. By F. O. BOWER, Sc.D., LL.D., F.R.S., Emeritus Professor of Botany, University of Glasgow. Macmillan and Co., Ltd., London, 1925. pp. xxi, 365.

IN spite of William Beebe, the exception who proves the rule, it is well known that there is a dearth in this country of writers of the so-called "popular science." It is perhaps not so widely realized what a handicap this entails. However, the recent "evolution trial" was denounced much more harshly in the British and Continental press than in our own. This may have been due to the European public being informed in science largely through the medium of a popularized literature. The writer has recently come across a book by F. O. Bower, published last year in London, which is believed should prove of wide appeal among "laymen" in this country. Only occasionally is one reminded of its British origin, as in "tyre," "Kitchen Garden" and "Dessert Fruits."

The purpose of the book "is to explain, for the general reader, in very general terms, how plants fabricate for their own life commodities that man

finds so useful in his. The intention is to give a bird's-eye view of these far-reaching processes." It consists of a series of essays showing how botany relates to everyday life. The fact that these were originally newspaper articles indicates that they are of general interest. The author presents his subject in an interesting and original manner. It is an instructive and authentic book written in non-technical language.

An American quotation begins the book. How plants alone can harness the radiant energy of the sun and store it up in forms useful to man and how plants manufacture starch is told in vivid style. The author makes this astonishing statement: "The chlorophyll-containing cell . . . is the prime source of the food of all things . . . the most decisive organic agent at work upon the earth's surface." A fundamental difference between plants and animals lies in the fact that the former have theoretically an unlimited body, while that of the animal is fixed at a relatively early date. The size of plants is mechanically limited, because, says Bower, "while the weight increases as the cube of the dimensions the strength increases only as the square."

The fixed position of the plant body brings difficulties, in the protection against animal attack, in effecting pollination and in the dissemination of the seed. The author says, "The wonder of it all is that plants thus stationary have succeeded as well as they have done." The competition between grassland and woodland is described and the reason for it is given. While we do not commonly have moors in this country, we all are familiar with them through song and story. Here we find the why and wherefore of it in simple language. The adaptation of plants to mountainous regions is discussed and we feel quite at home as the author speaks of the White Mountains of New Hampshire and Tunnel Mountain near Banff. He says, "There is in fact a close affinity of the mountain flora of North America with that of Scandinavia and of the Scottish hills and ultimately with that of all Arctic lands."

Man is dependent upon plants even for his play. He takes for granted the greens of the golf links, the lawn for tennis and croquet with never a thought of how it was prepared and how it is maintained in good condition. The author points out that there are three factors in the construction of seaside links, *viz.*, (1) the rocky skeleton, (2) the plants which act as dune builders or holders of the soil, and (3) the skin of mixed vegetation.

Bower exposes the secrets of how new kinds of flowers, fruits and vegetables are produced when he discusses hybridization, grafting and artificial selection. The history of common fruits and vegetables becomes a romance. Another interesting story is how man changes the natural rôle of fruits when he uses them for food.

We have all heard the old tale of wheat sprouting after it has been lying in some Egyptian tomb for centuries, but what is the actual truth of the longevity of seeds? Bower gives the case of the seeds of Sacred Lotus which germinated after they had been kept dry for one hundred sixty years. Much has been written about cereals, but it would be hard to find in the same space elsewhere as much interesting and useful information.

Plants in their mechanical construction involve engineering principles used by man, although, of course, there is no connection between them. Wood is discussed as to its nature and use. The author proves its durability, when animal and fungal life is excluded, by citing the case of some oak piles that supported the Roman bridge at Maintz. After their removal these piles, sound as the day they were driven by the Romans, were purchased by a piano manufacturer. Bower shows that plant fibers, such as cotton and flax, have been known to man from the dawn of civilization. He likewise demonstrates their use and complete regulation to the needs of the plant.

The spread of plants is discussed, showing how man is the controlling factor, although other influences are not belittled. We are told of plant robbers which prey on other plants. "The result of parasitism may be stated quite generally for any living type, including even man himself: once the individual reaches maturity, physiological dependence and degradation tend to go hand in hand."

Mycorhiza, one of the most interesting of all plant phenomena, is a relation between certain fungi and the roots of higher plants. In some cases, as, for example, certain orchids, the plant has become so dependent upon the fungus that its seeds will not grow unless the fungus be present. The author makes quite clear what is meant by fungus and fungal parasitism and shows why a study of the fungi is necessary for successful agriculture. Bacteria, as well as fungi, are briefly discussed and their relation to such important things as soil fertility, diseases of plants and animals, vinegar, "retting" of hemp, indigo, butter, cheese and tobacco are mentioned. Their part in scavenging and sanitation is well described.

Bower shows man's dependence upon vegetation for his food, his shelter, his clothing, his curative drugs, his arts and his luxuries. In the case of vegetable dyes, pigments and essential oils, man has in some instances been able to produce them synthetically, but artificial rubber yet remains to be produced on a commercial basis. The book closes with an exposition of man's influence upon vegetation, the

author showing both destructive and constructive phases.

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THE STANFORD RESEARCH INDEX CARD

IN 1816 George Crabb introduced his now famous book, "English Synonymes," with the words: "In the prosecution of my undertaking, I have profited by everything which has been written in any language upon the subject; and although I always pursued my own train of thought, yet whenever I met with anything deserving of notice I adopted it, and referred it to the author in a note." Every research worker, no matter what the subject of his investigation, would like to be able to use these words in introducing his paper or book to the public.

To-day, with somewhat more than twenty thousand scientific periodicals *at our disposal*,[1] the finding of what has been written on any certain subject and the digging out of what is deserving of notice are projects whose completion, as a usual thing, can be only approximated. It is indeed the rare instance where an author feels this sublime assurance that he has "caught everything." I have no solution to offer for this predicament of the researcher of the present as he tries to arrive at a proper ratio between laboratory and library work. Chasing literature is of course almost certain to "pan out" in the long run or average run, and it is only justice to those who have labored that we should take some pains to know what they did, but this point of view seems to provide one with what amounts to a full-time job. We are dazed at the thought of the automobile traffic of the future and likewise at its scientific literature problem. In scientific papers of the next century how will it be possible to give each individual his due right of way and protection from extinction! Even now we need any comfort and aid in this work that can be discovered.

A familiar line that is apt on the matter of reference research is the phrase: "When found make a note of it." This suggestive advice should be supplemented by the emphatic commentary: "And make enough of a note." The time and energy spent in relocating articles, which have been seen but were not "noted," or which were noted inexactly or too briefly, is a begrudged and particularly irritating expenditure. This item of loss can not be wholly avoided, but possibly it can be largely reduced.

[1] World List of Scientific Periodicals, 1900–1921, Oxford University Press, 1925. This list actually gives 24,128. These are supposed to be the living ones. But dead periodicals have to be looked after and then too the birth-rate in this realm shows no sign of decline.

We use blank forms with economy in almost numberless situations in the business world. We use them likewise in gathering our scientific data and in the classification and working up of such data. Is it not possible to do the same in the matter of gathering scientific references and abstracts? Research, no matter what the laboratory or the subject, involves a certain scheme that is more or less evident in all scientific articles, especially those that report experimental work. This likewise constitutes the basis for most good scientific abstracts. This formula is as follows: name of worker, statement of problem, description of material (phenomena or subjects) worked upon, discussion of method or apparatus used, the results and conclusions and the place of publication. Obviously such a schematic arrangement is not difficult to provide for in a simply printed form, and this may serve as a convenient frame on which to place, in an orderly manner, all sorts of scientific content. The 4 x 6 inch card reproduced herewith has been developed from this standpoint and is offered as an aid in the organization of working abstracts of scientific literature.[2]

The upper part of the card is divided vertically so that it may be conveniently filed under author or topic. In addition to the author's name there is space to indicate if desired: the year when the work was actually done which sometimes is importantly different from the publication year; pertinent information about the author, such as his training, special competency, position, other articles or what not, and his address. "Lecturer" is used as alternate to author in the belief that one's index on a certain topic should contain a card for an important or special lecture, interview or conference, that he may have listened to on the subject.

The date when the reference was noted and the name of the abstractor may be entered in the upper right-hand corner. The file number or notebook number and page of location for fuller abstract or related material are provided for. There is space to note who cited the work if one is unable to consult or see it himself, to record in what library it is available and the call number. This latter is often a time saver.

The title line gives enough "area" for most authors to announce what they are writing about. If the card stands for a book the next line will be used in naming the publisher, city, date and perhaps price. If it is an article this line will carry the name of periodical with the date, volume and page. It seems worth while to devote one line to a general characterization expressing the abstractor's analysis from the standpoint of type of article, and his appraisal of its merit or

[2] These cards may be had from the Stanford University Bookstore.