Freud on their published papers and books. Unfortunately, such mutual backslapping does not make a science. As Karl Popper has pointed out in *The Logic of Scientific Discovery*, another publication of Basic Books, the essence of scientific inquiry is the free criticism of existing theories and the replacement of them by better theories in the light of the criticism. This spirit of scientific criticism is absent from the correspondence of Freud and Abraham.

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History of Genetics

It takes an unusual person to write a really good history of any branch of science. Professor A. H. Sturtevant, the author of **A History of Genetics** (Harper and Row, New York, 1965. 165 pp., $5.50), is indeed such a person. He has been an active and creative geneticist for more than half a century, and has known personally most of those who have worked significantly in modern genetics in the period from the rediscovery and confirmation of Gregor Mendel's work in 1900 to the end of the 50-year time span covered by his book.

The extent of his firsthand knowledge is illustrated by the highly informative "intellectual pedigrees" he has constructed, a fascinating way of showing who trained (or otherwise influenced) whom in this relatively new branch of biology. Among the more than a hundred included geneticists—and cytologists who contributed directly to genetics—I believe Sturtevant knew all but perhaps two or three. In addition, he at one time or another worked in the same department or institution with nearly half of them.

The fact that Gregor Mendel's name does not appear in any one of these intellectual pedigrees dramatically illustrates the well-known fact that Mendel was indeed a solitary scholar. As a geneticist, he had neither intellectual ancestors nor intellectual descendants in the sense of continuing personal communication. Had he had either, his amazing work would no doubt have been appreciated decades earlier.

In his characteristically direct, clear, and succinct way, Sturtevant successively summarizes genetic knowledge before Mendel, Mendel's own contribution, the "rediscovery" of Mendel's work a third of a century after its publication, and the rapid additions to knowledge and understanding made during the subsequent half century of genetics.

The chapter on the rediscovery is of special interest because of the author's painstaking collection of known facts and his careful appraisal of their significance. Take, for example, the three papers that de Vries published in 1900. It seems clear that the first to appear in print, in which de Vries did not refer to Mendel, was actually submitted for publication later than the paper in which he *did* refer to Mendel. Why was Mendel mentioned in one paper but not in the other? We do know that in 1954 T. D. Stomps reported correspondence indicating that de Vries received a reprint of Mendel's paper from Beijerinck in 1900, just as he was about to publish his own first papers. We also know that both Tschermak and Correns were deeply concerned that de Vries did not refer to Mendel in the paper that he read before the Paris Academy of Sciences. Stomps gives a possible explanation; namely, that the academy paper was merely a summary of the more complete paper published in Germany. Even so, apparent inconsistencies remain and one wonders why Mendel's work was not cited.

Whatever the facts may be—and, no doubt, unanswered questions will always remain—Sturtevant documents well the unusual circumstances surrounding the virtually simultaneous and independent recognition of the significance of Mendel's work by de Vries, Correns, and Tschermak. Of the three, Sturtevant points out, it is probable that only Correns independently rediscovered Mendel's principles.

Old-timers in genetics and newcomers alike will thank Professor Sturtevant for conserving in book form his unique knowledge of the history of one of the most significant developments in 20th-century biology. In addition, newcomers will find that the book is a beautifully concise summary of the substance of classical genetics. In this respect, it is made even more valuable by a carefully selected three-page chronology of significant genetic discoveries and interpretations.

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Forest Soils Conference

Forest-Soil Relationships in North America (Oregon State University Press, Corvallis, 1965. 532 pp., $8), edited by Chester T. Youngberg, covers a wide range of subject matter in a rapidly expanding field that is of great importance for the future of forestry in North America. It contains the papers presented at the Second North American Forest Soils Conference, which was held at Corvallis, Oregon, in August 1963.

The volume is evidence of the gradual coming of age of forest-soil research on this continent. Essentially, only in the far north and west do we still depend largely on virgin, unmanaged forests for our wood products. Here as elsewhere, forest-soils investigations serve as a major foundation stone, increasingly essential for the building of a sound silviculture. Many of the 35 papers presented represent fundamental investigations made by professional soil scientists; others were contributed by foresters who have turned their interest and talents toward the application of their knowledge of forest soils in forest management. Most of the important general research that is under way is covered, but forest-soil survey methods and soil-site productivity evaluations are especially well represented.

However, it is evident that only a beginning has been made. Many contributions are well illustrated with appropriate photographs and charts and are provided with usually apt graphs and tables. It is difficult to select particular papers for mention, but those that deal with nutrient cycling, nitrogen accretion in ecosystems, and the clonal concept in site relations are among the more stimulating.

The usefulness of combining the study of soils and vegetation is evident throughout. Geographically, the papers reflect the location of the conference. Fifteen represent work done in the Pacific States, five are reports from the South, and four are from Canada. Unfortunately, Mexico is not represented. Although the majority of the authors are associated with governmental institutions or universities, one industrial forestry organization is very well represented. It is hoped that more private companies will report at the next conference.

The editor has assembled a most useful volume. The book is well and

attractively bound in green cloth and is printed on good quality paper. Forest research workers, students, and teachers will find the collection valuable, but it should also serve effectively as a means of educating the growing number of forest managers who are seriously concerned with improving the productivity and usefulness of the lands under their care.

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Science Books for Young People

Developing authentic science materials for children to read, material that will sharpen their observations of the natural world, currently interests many nationwide elementary school science curriculum committees. Studies by these committees have shown that children are tremendously interested in their natural environment. Any parent or teacher knows the endless number of questions they ask with very little encouragement.

Unfortunately, children often receive answers that are invalid, superficial, and lacking in explanations. Adults seldom suggest to children that by observations and simple experiments they could learn at least part of the answer themselves. It is becoming increasingly apparent that young people can learn and understand more than adults realize. How much they can understand depends on the organization and presentation of the material; this, in turn, requires a knowledge of how children learn.

Edwin B. Kurtz, Jr., and Chris Allen, the authors of **Adventures in Living Plants** (University of Arizona Press, Tucson, 1965. 128 pp., $4.95), are a scientist (Kurtz) and an elementary school teacher (Allen) who have combined their efforts to produce an elementary botany book for children, ages 11 to 13 years. The manuscript and the sections on "things to do and think about" were read and tested by children, revised, and then tested again. (Most authors of children's books could profitably use this technique.) The efforts of Kurtz and Allen have resulted in an authentic, exciting, and readable children's book about plants. Illustrations are plentiful and appealing without being gaudy. The drawings convey their intent somewhat better than the photographs, but both are used to advantage.

The authors have organized their material into a series of plant "adventures" built around the structure and life activities of plants: the plant body; cells; photosynthesis; respiration; nutrition; circulation; growth; reproduction; heredity; the plant kingdom; and ecology. New words and how to pronounce them are considered in the final section. Each "adventure" is accompanied by a series of simple experiments and investigative activities designed to stimulate children to further observations and explorations into a topic. The authors have presented the subject of botany through a naturalistic and descriptive approach; however, they have been able to maintain a coherent explanation of the living plant, its structures, physiology, and ecology.

The book is suitable for a home library and should be in elementary school and children's libraries. It could be used as a textbook in the upper levels of the elementary school but will probably become a reference book.

There should be more books on science which represent "good" science and at the same time appeal to young people. The present volume is an effort in the right direction.

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ECONOMICS AND THE SOCIAL SCIENCES

Colombian Prehistory Comes of Age

Donald W. Lathrap

Only since World War II has a systematic picture of Colombian prehistory begun to emerge. Previously there had been reports of archeological work at particular sites or in restricted areas and some discussion of stylistic variation among the various regions of Colombia, but a sense of time depth and a feeling for the place of Colombia in a coherent scheme of New World cultural evolution was lacking. The phenomenally rapid change in this situation during the last 20 years has occurred almost entirely as the result of the efforts of Gerardo Reichel-Dolmatoff and his wife Alicia Dussan de Reichel. Their work has been reported in a splendid series of technical monographs and articles, mainly in Spanish. Now their many basic contributions are consolidated and summarized in a lucidly written and beautifully produced book: **Colombia** (Praeger, New York, 1965. 231 pp. $7.50) by Gerardo Reichel-Dolmatoff. The volume is Number 44 in the Ancient Peoples and Places Series, edited by Glyn Daniel.

It is worth stressing the degree to which the modern synthesis of Colombian prehistory presented in this book is the result of the Reichel-Dolmatoff's own research, since the author is engagingly modest in his presentation and extremely generous about crediting and discussing at length the contributions made by others.

This is a "popular" book. The technical jargon of the trade is either eschewed or carefully explained. There is a sense of form, style, and closure that is rare in the publications of most other New World archeologists, even when they are assaying popular writing. It can be read with pleasure and profit by any intelligent layman, but the large quantity of important facts

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