pears to be about twice the percentage in common between the St. Maurice (Lower Claiborne) and Claiborne, as between the latter and the Jackson. Moreover, the marked individualistic character of the true Claiborne molluscan fauna apparently precludes its amalgamation with either the St. Maurice or Jackson beds, especially the latter.

Forty-odd years ago we observed *Mitra millingtoni* and *Aturia* in the impure limestones just above the "sand" at the Lower Claiborne bluff suggesting that here might be the position of the Moodys Branch marl though now generally classified as basal "Ocala." We hope to refer to this subject again in the near future. At any rate, let us not drastically modify our Eocene stratigraphic nomenclature until more evidence is presented requiring such modifications.

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THE MUSEUM AND SOCIAL ENLIGHTENMENT

Your readers surely approve of Dr. Goldstein's argument, published in Science (August 30, 1940), that museums should be potential forces for social enlightenment. Some of his proposals, however, are already realities.

When I was there last the Deutsches Museum, the masterpiece that the late Dr. Oskar von Miller created in Munich, had thirty-three motion-picture machines which explained factory processes. A very large proportion of the exhibits were of the dynamic variety for which Dr. Goldstein pleads; that is, the visitor could push buttons and pull levers, make the wheels go round and see for himself how sectioned locomotives, engines and other machinery worked. Von Miller's principles have been followed both here and abroad in technical museums. It may interest Dr. Goldstein to know that von Miller conceived the idea of the planetarium and installed the first one in his museum.

Yet it must be conceded that no museum in the world interprets its exhibits both technically and socially. Surely it is not enough to install a model of an elevator and watch it go up and down as a button is pushed. The elevator created the skyscraper and hence Rockefeller Center. When a single huge office building discharges 50,000 on the sidewalk at five o'clock a problem in transportation is created which the engineer must solve. That, too, is part of the elevator's social story. And so with the cotton gin, which revived a dying slavery in this country and was the occasion of our high tariff policy, and with the steam-engine of Watt, which gave us the slum.

Especially vulnerable to attack is the natural history museum—usually a storehouse of exhibits. It should begin with the solar system and show by motion pictures of the animated cartoon type how a great star wanders in our part of the heavens and by sheer gravitational attraction pulls out of the solitary sun long streams of gas which curl into spirals and eventually congeal into planets.

We are now prepared for geology and geophysics. So we pass into an adjacent hall and see how this cooking, heaving earth became what it is to-day—see with the aid of operative models that we may work ourselves how mountains, continents and seas were formed, learn something of the seismic forces that are still molding the earth, behold miniature volcanoes spouting imitation lava and ashes and burying Herculaneum and Pompei.

In the next division the curtain goes up on the drama of life. The first bit of protoplasm is born in a puddle on this congealed earth. Microscopes on every hand reveal primitive living forms. Or Dr. Roemmert's microvivarium, which made such a success at the Chicago and New York World's Fairs, could be used here with even greater dramatic effect.

We move on and learn what becomes of this protoplasm. The first backbone appears. Reptiles, birds, mammals follow. At last come the anthropoid apes. *Homo sapiens* is in sight. His origin is obscure. But he is seen emerging in such experimental forms as *Pithecanthropus erectus,* the Peking Man, the specimens found in Sussex, England, Rhodesia, South Africa. This evolution of life is shown by the diorams now so highly developed, stuffed animals, skeletons, single bones, but above all by motion pictures.

Having created man we pass into the anthropological division and see what he has made of himself—see the Cro-Magnons experimenting with art, the Swiss lake-dwellers building their houses on piles and learning to weave. Roman bathtubs, mummies, totem poles, click into their logical places. But the end is social man—man, a free agent, dominating his environment. From the birth of the solar system to man—what a story!

It may be argued that all we have done is to rearrange familiar exhibits and compel the visitor to follow a definite route, to present more diorams, more dynamic models, more motion pictures. True. But we are also more evidently progressing from star to man. Slimy puddles and extinct dinosaurs appear more obviously as preparations for the emergence of man. The totem poles and the mummies are clearly ripples in the current of biological and social evolution.

The most ambitious museum ever planned but never erected was that of Le Corbusier and Paul Otlet. In their vast pyramid there is not a staircase—only ramps and elevators. You begin your journey at the apex. There you see the first man with nothing but his hands and his brains. You spiral your way down and behold him acquiring new abilities, learning how to fashion tools, how to cultivate the soil, how to weave. Further

on he gathers into stable communities. Nations spring up. Always winding downward, the path leads to new proof of man's ability to evolve socially and to change his environment. The spiral widens as it slants down and down, so that there is an ever-expanding space for the ships, the machines, the art, the houses that man created in his progress through the ages. At the bottom of the pyramid you find yourself on the sidewalk in the twentieth century, in the midst of a modern city, with its electric lights, its buses, its subways, its airplanes.

That museum was almost built in Geneva. I am told that political bickerings prevented its realization. Had it been built it would not only have satisfied Dr. Goldstein's cogent requirements but played its part in revealing what the nations of to-day owe to one another and to the past.

WALDEMAR KAEMPFFERT

THE NEW YORK TIMES

SPHALERITE AND GALENA IN SEDIMENTARY ROCKS IN OHIO

RECENTLY, while making a study of the sedimentary formations of Mississippian age, in a quarry located in the city of Wooster, Ohio, the presence of sphalerite and galena was discovered in a horizon within the Cuyahoga formation. These minerals occur as crystals in the shale or as fillings or replacements of fossil forms such as crinoid stems or brachiopods. They are also present in fossiliferous concretions associated with iron pyrite and calcite. The sphalerite is much more abundant than the galena and appears to occur where fossils are numerous. The concretions are calcareous because of the abundance of the crinoid and brachiopod shells.

Near Marshallville, Ohio, in the railroad cut near that place, the Pottsville formation of lower Pennsylvanian age is exposed. In the shale beds occur numerous concretions, some of which, when broken, show sphalerite associated with iron pyrite, calcite and barite. These concretions are likewise fossiliferous.

There are other places in Ohio where sphalerite and galena occur in sedimentary rocks. These occurrences may have some value to students interested in the theories of the origin of sphalerite and galena ores, such as those of the upper Mississippi valley.

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A NEW SOURCE FOR AGATE ARTIFACTS IN CENTRAL NEW MEXICO

IT is commonly assumed that agate artifacts found in central New Mexico are derived exclusively from the river gravels of the area in which agate pebbles are fairly abundant. Continued geologic study of the region indicates that some of them were derived from rock in place. Cerro Colorado, a small but prominent hill approximately 14 miles west of Albuquerque in the valley of the Rio Puerco, is the remnant of a volcano of Tertiary time. It was clearly such a source of agate. Its rough, rhyolitic slopes are cut by narrow, irregular veins of gray to white chalcedony or agate. This material is not entirely homogeneous in texture, and the largest available masses are only 3 or 4 inches in diameter, yet it is suitable for making artifacts. That this material has been so used, presumably by the Indians, is shown by the presence in the locality of spalls and worked pieces. The veins of chalcedony are too narrow and irregular for systematic quarrying. However, they weather less readily than the bedrock and project above its surface as tiny ridges. Fragments of the chalcedonic veins eventually weather out and drift down the slope, where they are available for use. It also seems probable that the projecting veins were broken off by the agate users of the past.

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SCIENTIFIC BOOKS

HORTICULTURAL PLANTS

Propagation of Horticultural Plants. By GUY W. ADRIANCE and FRED R. BRISON. ix + 314 pp. 182 figs. New York: McGraw-Hill Book Company. 1939. $2.50.

A KNOWLEDGE of the fundamentals of propagation of plants is recognized as something essential to good horticultural practice, and in recent years this subject has been involved in many research projects. The results of such investigations have contributed to both science and practice.

This book has been prepared primarily as a text for horticultural courses in college. There are seventeen chapters arranged as follows: Introduction; Seeds; Flowers and Fruits; Germination of Seeds; Forcing Equipment; Asexual Propagation; Bulbs and Related Structures; Layerage; Cuttage; Graftage; Grafting Waxes, Materials, and Tools; Methods of Grafting; Methods of Budding; Propagation of Certain Plants; The Relation of Propagation Practices to Diseases; Transplanting; Growing and Handling of Nursery Stock.

A glance at the chapter titles shows that the authors chose to handle various phases of the subject at random rather than to organize it under the main divisions, sexual and asexual propagation.

Each chapter is followed by a set of questions and a few "suggested references." At the end of Chapter III the following questions are asked: 1. What is an inflorescence? 3. What is the distinction between a