ing the modeling that was such an attractive feature of the preceding stage. At Altamira the color employed is red and the drawing is deplorable. As a rule these examples are not well preserved. Those from Marsoulas, in either black or red, are not much better. The best work of this phase is to be seen at Font-de-Gaume and is executed in black or brown. It is often combined with engraving of a high order, done before the color was applied.

In the *fourth phase* the engravings lose their importance. The lines are broken and difficult to follow. The small figures of the mammoth at Font-de-Gaume and of the bison at Marsoulas show this tendency to emphasize detail at the expense of the ensemble.

Paleolithic painting reached its zenith in the fourth phase. The outlines are drawn in black, as are the eyes, horns, mane and hoofs. The modeling is done with various shades produced by the mixing of yellow, red and black. Engraving always accompanies the fresco, serving to emphasize the details. These polychrome figures are seen at their best on the ceiling of the left chamber near the entrance; also at Marsoulas and Font-de-Gaume.

Shortly before his death, M. P. Jamin, a well-known Parisian artist, exhibited in the Paris Salon of 1903 a large oil painting inspired by the discovery of these polychrome frescoes. This canvas also formed part of the French art exhibit at the Louisiana Purchase Exposition, St. Louis, in 1904. It represents the cave-dweller artist in the little side chamber of Font-de-Gaume at work on one of the thirteen figures of the bison while members of his family look on and applaud. In a panel above his head is the unfinished group of reindeer. It has long been the custom for artists to copy the old masters. M. Jamin has rendered a valuable service to both art and archeology by introducing the modern French school of painters to the earliest school of art developed on what is now French soil. The ages of Phidias and of the Italian Renaissance, viewed in the light of their antecedents, are wonderful manifestations; but not more wonderful than that of the Vézère troglodyte, a contemporary of the mammoth and rhinoceros, the bison and the reindeer.

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AMERICAN SOCIETY OF BIOLOGICAL CHEMISTS

FOR several years the biological chemists of this country have been considering the advisability of organizing a national biochemical society. The growth of the Society of Physiological Chemists (New York City), which was founded in 1899, the development of the biochemical section of the American Chemical Society, which was organized in 1905, the increasing number of chemical papers on the programs of the American Physiological Society, and the great success of the recently established *Journal of Biological Chemistry,* were among the influences that stimulated thoughts of a national organization of biochemical workers.

At the suggestion of Professor John J. Abel, a meeting for the purpose of effecting the establishment of such a society was held in New York City, at the headquarters of the American Association for the Advancement of Science (Hotel Belmont), on the afternoon of December 26, 1906. About seventy-five American biological chemists had been invited by Professor Abel to attend the meeting, but many were unable to go to New York at the time stated. There were few, however, who did not heartily favor the project. Of those who had been invited to attend the meeting the following were present:

John J. Abel, Carl L. Alsberg, Samuel Amberg, Silas P. Beebe, Russell H. Chittenden, Otto Folin, Nellis B. Foster, C. Stuart Gager, William J. Gies, Robert A. Hatcher, Reid Hunt, Holmes C. Jackson, Walter Jones, Waldemar Koch, Phoebus A. Levene, Arthur S. Loevenhart, John A. Mandel, John Marshall, Gustave M. Meyer, Thomas B. Osborne, Raymond H. Pond, Alfred N. Richards, Herbert M. Richards, William Salant, Philip A. Shaffer, Herbert E. Smith, Frank P. Underhill, George B. Wallace, Charles G. L. Wolf.

The meeting was formally addressed by Professor Abel, who, in urging the desirability and timeliness of immediate organization of biological chemists, made the following remarks:

"I take the liberty of rehearsing briefly the reasons for which this meeting has been called. * * * We have become convinced that there is need in this country for an organization which shall further the interests and foster the growth of biological chemistry. Biological chemists at present are affiliated with widely differing societies and come little in contact with the great body of men who are interested in biochemical work. Whether we as chemists have as our field of work the physiological chemistry of our medical schools or deal with the chemical problems of botany, zoology, pathology, pharmacology or medicine, we all have one common meeting-ground, and that is chemistry as applied to animal or vegetable structures, living or dead. As distinguished from the work of pure chemists, organic or inorganic, our efforts are directed towards throwing light on the life processes and functions of living structures, with the help of chemical and physico-chemical methods.

"Now, it will be granted, I think, that scattered and divided forces cannot develop that coordination of effort that is desirable when many workers have one great interest in common. In such a case, organization is beneficial. It encourages research, it furnishes the mechanism for competent criticism and helpful discussion; and lastly, the very fact that we have felt impelled to organize will make it evident to faculties of science and medicine and to scientific and medical societies that a great and growing department of research demands its fitting place in the general scheme of higher education.

"I come now to the question of an academic career in biological chemistry. You have probably all, at one time or another, been asked to recommend some young man for a teaching position in physiological chemistry. The authorities in question want a man who has had a first class training in organic, inorganic and physical chemistry and biology, has had some experience in teaching physiological chemistry, has an agreeable personality, is a fascinating lecturer, and a promising if not already fruitful investigator. For such a rare combination of natural endowment and acquired culture, there is offered a salary ranging from $800 to $1,500, the title of assistant or instructor, with guarded hints as to promotion at some uncertain date and still more non-committal statements as to a possible rise in salary.

"Biochemical research is quite the thing to-day. Every species of laboratory, clinical, bacteriological, hygienic, pathological, pharmacological, wants a chemist. All these laboratories no doubt afford fine opportunity to the young chemist for training in the broad field of biological chemistry. But what of his future? Is it as promising as it should be?

"This state of affairs is largely our own fault. We attend only the meetings of societies of other specialists for fear we shall lose something that lies on the border line between their territory and ours. These other specialists have their house in

order, organization has done its invaluable service for them, and the result is that every worker knows his fellows, each knows where to turn for advice and sympathy; each member, no matter how remotely placed or how depressing his immediate environment, has the courage and enthusiasm in his work which comes from being connected with those who have the profound conviction that their branch is one of prime importance and dignity.

"I believe in special societies for specialists and I have no fear of the so-called narrowing influence of specialization. I feel rather that any possible danger in that direction is more than offset by the stimulus to go deeply into our subject which comes from association with those of like interests. Chemistry, the fundamental science that must always guide our work, offers unlimited opportunity for broadening the mind.

"It is my firm conviction that a national society of biological chemists should be organized at once. There are in this country, as near as I can ascertain, about one hundred active workers in this field, using the term in its widest sense. A very small minority of those with whom I have corresponded are undecided as to the wisdom of forming such a society, but are willing to accept the action of the majority. Some of these, again, have raised the question as to the advisability of asking the Physiological Society to give us a separate chemical section.

"Many of us have given careful thought to this proposition, but have decided that it will be best to have an independent organization. I have already outlined some of the advantages that would follow on organization, and I can only repeat that I believe these advantages would be greater if in name and fact the organization is independent. I believe that we can have a society on broader lines than is possible to a mere section. We wish to draw into our society the biological chemists of all departments of biology including those organic and physical chemists who take a lively interest in our subject, but who would perhaps not care to join a physiological society. In fact, since a large number of our proposed membership are primarily chemists rather than physiologists, we should be marching under a wrong banner, no matter how great the freedom granted by the parent society.

"This desire for, or prejudice, if you will, in favor of, entire independence in name and action, would equally forbid our organization as a section under the American Chemical Society. While recognizing that the various branches of science are mutually dependent and constantly receiving help from each other we still contend that special devotion in each individual branch alone insures success. In other words, we should stand for *independence* with *interdependence.*"

At the conclusion of Professor Abel's remarks, which were warmly applauded, general discussion ensued. Hearty approval of his proposal was evidenced, and it was agreed to organize at once the society that Professor Abel suggested. The undersigned thereupon proposed a few written articles of agreement on which a permanent organization could be based. These articles of agreement were adopted and will govern the society until the formal ratification of constitution.

On motion by Professor Abel, Professor Chittenden was elected president of the society. In accepting the presidency, Professor Chittenden expressed appreciation of the reasons which led to the establishment of the society, and declared his hearty interest in its future growth and success.

The following council and officers were elected: John J. Abel (*vice-president*), R. H. Chittenden (*president*), Otto Folin,

William J. Gies (*secretary*), Walter Jones, Waldemar Koch, John Marshall, Lafayette B. Mendel (*treasurer*) and Thomas B. Osborne.

No plans have been made for a meeting before next December, although the council was authorized to use its discretion in this and all other matters affecting the welfare of the society. WILLIAM J. GIES,
Secretary

SCIENTIFIC BOOKS

The Bird: Its Form and Function. By C. WILLIAM BEEBE, Curator of Birds, New York Zoological Park. New York, Henry Holt & Co. 1906. 8vo. Pp. 496, with over 370 illustrations.

This book is 'intended as an untechnical study of the bird in the abstract' and tells of the structure and characteristics of birds, dwelling especially upon the adaptations of the various organs to their uses, and their bearing on the relationships and past history of birds. It thus covers ground that has been but little worked, for while there are books a many on the anatomy of birds, these, with the exception of Headley's 'Structure and Life of Birds,' are purely descriptive and fail to show the relations of a bird's structure to its surroundings and mode of life. Here we are told why a beak, a foot, a wing, is of a given shape, what rôle it plays in a bird's daily life, or, if its present use is not obvious, what hint it gives of a bird's past history when the part now useless was all-important.

The first chapter, devoted to the ancestors of birds, of necessity recapitulates what is already known—what we do *not* know will fill volumes still to be written. We would, in passing, dissent from the statement that Archæopteryx 'frequently walked or ran on all fours,' and if Mr. Beebe will make a figure of the animal in such a position he will doubtless appreciate the difficulties in the way. Next is a long chapter on 'Feathers,' including their origin, structure, development, arrangement and moult, and this is followed by a discussion of 'The Framework of a Bird,' the skull being given a chapter by itself. Much information as to color and color changes will be found under the caption 'The Body of a Bird,' where some good illustrations are given of the effects of food, light and moisture, one of the most striking being the very dark form of the white-throated sparrow, produced by exposure to moisture-laden air through two moults. So, part by part, the bird is considered in detail, the final chapter treating of 'The Bird in the Egg.' Under 'The Eggs of Birds' we learn of the eggs themselves and of the information that may be gathered from them when studied in connection with the habits of the bird that laid them. For "That which adds the greatest interest to anything is the '*why*' of it, and a vast collection of eggs, beautiful though they are, yet if ignorantly looked at is worse than useless. Why one bird lays twenty eggs and another but two; why one bird's eggs are white, another's of varied colors, we will never learn from blown museum specimens." It has been denied that oology is a science, but whether it is or is not depends on the individual and it is to be hoped that this chapter may afford fruitful suggestions for future work on the part of our younger ornithologists. The chapters on Wings and Beaks and Bills are among the best because Mr. Beebe, who is a keen observer, has here combined the results of his experience in the field, and of the opportunities offered by having many species of birds continually under his observation in the New York Zoological Park. In regard to beaks we are told that "The finding and securing of food being the most important problem birds have to solve for themselves, it is for these purposes, and especially the last mentioned, that we find bills most adapted. This is so universally the case that we may often judge accurately of the kind of food of a certain bird from a glance at its beak."

It is impossible that a book of this nature, where much information is crowded into a small space, should be entirely free from errors, and here and there slips occur. Thus we are told that *Amphioxus* has biconcave vertebræ, after having been correctly informed that the backbone is represented by a mere thread of gristle; that the moa was found in