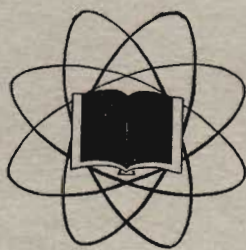


JOURNAL

of the

AMERICAN SCIENTIFIC AFFILIATION



The fear of the Lord is the beginning of wisdom. Psalm 111:10

Volume 5

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The Journal Of The American Scientific Affiliation

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EDITORIALS

The Journal of the American Scientific Affiliation is intended to be a medium of discussion on topics pertinent to our Organization's aims. Therefore, we wish to encourage comment and discussion both on papers that have already appeared and on new subjects.

To that end we are opening up in the next issue a section for letters and shorter communications. So we invite you to send such letters and items to the Editor.

Space available will be limited so the Editor will reserve the prerogative to publish only those letters and portions thereof he deems pertinent and contributive. Names of the writers will be affixed unless directed otherwise by the author.

The items picked up by the Editor in this issue concerning outside publications by ASA members have all been chance findings. No doubt a great deal of such activity has been overlooked.

We urge you to overcome modesty, in this instance at least, and send in such items about yourself. They will be rewritten in the third person for inclusion under News Items. We are always interested in what you are doing, such as publishing or presenting papers, receiving awards, and so on.

News Notes

A paper entitled "A Replica Technique in the Study of Chemical Precipitation Processes" by **Robert B. Fischer** and **Joseph E. Ellinger** of Indiana University was given at the annual meeting of the Electron Microscope Society of America in Cleveland, November, 1952.

Announcement was made recently of a book entitled "Vector Analysis" by **Earl C. Rex**, Assistant Professor at George Pepperdine College. (Wm. C. Brown Co., Dubuque, Iowa, 1952. 88 pp. Paperbound \$3.25.)

Volume IV (1952) of "Advances in Electronics" contains a chapter entitled "Fluctuation Phenomena" written by **Albert van der Ziel** of the Department of Electrical Engineering of the University of Minnesota. It is concerned largely with an advanced treatment of the problems of noise in electronic equipment.

The August 4, 1952 issue of **CHEMICAL AND ENGINEERING NEWS** contains a feature article concerning our fellow A. S. A. member, **Werner Von Bergen**. The following quotation is taken from this article: "For outstanding achievement in the field of textile chemistry, **Werner von Bergen**, director of the research and control laboratories of the **Forstmann Woolen Co.**, will receive this November the **Olney Medal** of the American Association of Textile Chemists and Colorists. To Mr. Von Bergen will go recognition not only for his countless contributions to wool technology but also for his vigorous, life-long championing of the cause of chemistry in the world's woolen industry." We congratulate Mr. Von Bergen upon the receiving of this recognition.

New Members

Harold E. Baker, Jr., 27 Highland Avenue, Northfield, Vermont, is Instructor in Physics at Norwich University. He received his B.S. degree from the King's College, soon to receive M.S. in Physics from University of Delaware.

George Lee Bates is currently doing graduate work in Geology and Physics at Columbia University, while on leave as Instructor of Physics at Wheaton College. He received the A.B. degree from Princeton, M.S. from the California Institute of Technology. His address is 99 Lincoln Ave., Bergenfield, N. J.

Robert Wayne Cooke, 86 Solomon Avenue, Inwood Long Island, New York, is a missionary of The Sudan Interior Mission. He attended the Providence Bible Institute, received the B.S. degree from Cornell University in 1952.

Howard R. Cramer is a student and graduate assistant at Northwestern University. He is majoring in Geology, received his M.S. from University of Illinois. Present address: 918 Noyes Street, Evanston, Illinois.

Henry Theodore Dirks, 210 Cheriton Ave., Winnipeg, Manitoba, Canada, is Assistant Plant Pathologist in the Dominion Laboratory of Plant Pathology, University of Manitoba. He received the B.S. degree from this institution in 1951.

Joan Dunkel, 3965 First, N. E., Seattle, Washington, is a student at the University of Washington. She received the B.A. degree from the Washington (D.C.) Missionary College, the M.A. from Walla Walla College.

A. C. Eitzen, Hillsboro, Kansas, received his M.D. degree from Rush Medical College, is a Fellow of the American College of Surgeons.

Stewart E. Ensign is at present teaching Biology at Bob Jones University. He received his B.A. from this institution and also is taking post-graduate work at the University of Wyoming.

Gerald E. Fisher is a medical missionary to French East Africa. He received his B.A. from Butler University, his M.D. from Indiana University. His home address is 1120 Chester Ave., Cleveland, Ohio.

June Gadske, 2805 Cherry Street, Berkeley, California, is a missionary to high school youth under the Young Life Campaign. She received the B. A. degree from Miami University, the M.A. from Northwestern University.

Richard Carl Gilbert is a University Fellow in Mathematics at the University of California, Los Angeles. Received his B.A. degree from Harvard College in 1951. His present address is 10410 Lanark St., Sun Valley, California.

Robert P. Glover, 93 W. Levering Mill Road, Bala-Cynadd, Penna., is engaged in private medical practice. A Wheaton College graduate, he received his M.D. from the University of Pennsylvania School of Medicine, and M.Sc. (Med.) from the University of Minnesota.

Vernon Leslie Grose, 7206 South 118th Place, Seattle, Washington, is a Project Design Engineer with the Boeing Aircraft Company. He received the B.S. degree from Whitworth College, Spokane, in 1950.

Elam K. Hertzler, Linville, Va., is a graduate assistant and student at the University of Delaware. His

(Continued on page 11)

Stratigraphy and Paleontology

CORDELIA ERDMAN

Instructor in Geology, Wheaton College
Wheaton, Illinois

The early days of geologic investigation belong to the latter half of the 18th century. At that time nobody was paying much attention to fossils, and rocks were classified on the basis of their gross characteristics. The great controversy of the day was between the Neptunists, who believed that a receding, once world-wide ocean was responsible for forming all rocks, and the Plutonists, who maintained that many rocks had cooled from a molten state. Hutton, champion for the Plutonist school, also contended that in the case of those rocks which were composed of sediments, older beds were covered by successively younger beds. This seemingly very obvious principle is basic to all subsequent stratigraphic reasoning. It is known as the Law of Superposition.

It was not long before a second law of stratigraphy became apparent. A young English surveyor's assistant (William Smith) in 1796 began collecting fossils from the rock layers he traversed in England and Wales. As he studied these, he discovered that each layer contained its own distinctive fossils. One day when he was calling upon a cleric of the Church of England, he picked out unlabeled fossils from the man's collection and told him the locality from which they had come. The amazed churchman was quick to see that Smith had stumbled on something important, and he encouraged him to study further. As a result, there was published in 1815 the first geologic map of England; and, with even more far-reaching effects, the principle of Faunal Dissimilarity was set forth, the principle that each rock unit in a given series contains a fauna distinguishable from all others in the series.

George Cuvier, the great anatomist and paleontologist, carried on Smith's idea. He, too, recognized that each major rock unit carried a distinctive fossil assemblage. Since he believed in the fixity of species, a dogma which says that every species is a separate and direct creation, he could only explain sudden appearance of new forms in successive layers on the basis of local catastrophes followed by immigration of life from distant places. Alcide d'Orbigny continued to uphold this catastrophism as the explanation for faunal dissimilarity, but he postulated re-creations in place of immigration. Deperet, according to R. S. Lull (1947, p. 6), quotes his statement of 1848:

... twenty-seven times in succession, distinct creations have come to re-people the whole earth with its plants and animals after each of the geological disturbances which destroyed everything in living nature. Such is the fact, certain but incomprehensible, which we confine ourselves to stating, without endeavoring to solve the superhuman mystery which envelops it.

Meanwhile, without worrying about any "superhuman mystery," Charles Lyell was busily investigating the rocks around Paris. He adopted and adapted Smith's rock units, arranged in order of superposition, and in 1833 he presented to the geologic world a stratigraphic column which was really the first

geological timetable. As his groups or systems of rocks became identified over more extensive areas of the continent, it became increasingly evident that the principle of faunal dissimilarity was indeed a law of nature. The Catastrophist philosophy thus had reason to become more firmly entrenched. It was supported by the accumulating evidence that rock systems were separated by erosion surfaces or at least by lithologic discontinuities which indicated a fairly rapid change in the environment. Since these were synchronous with gaps in the fossil record, that is, the types of life fossilized above and below the discontinuity did not grade into one another, the belief developed that they represented "recognizable and universal dates on the geologic calendar" (Krumbein and Sloss, 1951, p. 15).

Now all of this was done before the publication of Darwin's "Origin of the Species" (1859), and although Lamarck had advanced evolutionary ideas previously, these had had little influence on the early stratigraphers. This means that the geologic timetable was based on objective fact alone and was not formulated to support evolutionary concepts, nor was it even an outgrowth of evolutionary concepts.

However, the modern period of paleontology and stratigraphy did begin with Charles Darwin, because, as Neaverson states (1928, p. 4):

In the light of evolutionary theories, the gradual increase in complexity of organization as shown by fossils passing from earlier to later rocks assumed new significance and the mutual interdependence of paleontology and stratigraphy was more emphasized.

In other words, the scientists threw over catastrophism altogether and accepted evolution as an alternative for a phenomenon which was already well established. According to the new theory, successive fossil faunas represented not re-creations but groups which would merge into one another in a time direction except for the interruptions in the sedimentary record.

Determining equivalent age.—The Christian world has long raised its eyebrows at geology. Many times one hears doubt expressed concerning the validity of the geologic timetable or concerning the validity of using fossil content to determine equivalent age of rock units. Much of this doubt grows out of a confused belief that all ideas of organic development are inherently contrary to special creation; and out of the erroneous assertion that "geologists date the fossils by the rocks and then turn around and date the rocks by the fossils." Both of these concepts have been vigorously propagated in much pseudo-scientific "Christian" literature.

We have seen that the geologic timetable is based upon the two principles of stratigraphy: 1. in a normal sequence of rock layers, the oldest must be on the bottom and the youngest at the top; 2. rock units contain their own distinctive fossil assemblages. The problem is to know how to equate or compare the

ages of layers occurring in geographically separated sequences; in other words, how to fit rock strata into an over-all chronology.

Many times the stratigrapher is able to compare data from two areas which are not widely separated; or he can actually trace layers from place to place; thus he can establish their time equivalence on non-paleontologic grounds. In other cases such tracing is impossible. Then the stratigrapher depends upon similar fossil assemblages alone to make his correlation.

In comparing the rocks of two separated districts the geologist has to rely entirely on the fossils present in those rocks. Supposing the fossil assemblages to be identical, the rocks are held to be contemporaneous (or synchronous), even if they occur in such widely separated countries as England and America. (Neaverson, 1928, p. 7.)

The reasoning is this: similar fossil assemblages could only occur at approximately the same time in geologic history: therefore, rocks containing such similar assemblages must be approximately equivalent in age. The next question is, is this **valid** reasoning?

First of all, note that a consistent relative order of appearance of varying organisms is demonstrated in every area where the Law of Superposition can be applied. Dunbar writes:

Where the structure of the rocks is simple, the succession of faunas that occupied the region from age to age can be determined by studying the fossils of successive formations. When this succession has been confirmed by wide experience in many regions of undisturbed strata, we may be confident that different forms of life succeeded one another in this order in time on the Earth . . . The relative time of existence of a vast number of kinds of animals and plants has now been established, and their place in the geologic column has been confirmed by the cooperation of geologists the world over. This is not a theory derived *a priori*, but a discovery painfully and tediously worked out by the systematic study of the faunas of rock formations *first carefully located in the geologic column*. (Dunbar, 1949, p. 8.) (Last italics mine.)

And again: "The appearance of trilobites and dinosaurs and three-toed horses is not fortuitous and irregular" (Dunbar, 1949, p. 8). However, the fact that we can establish relative ages for the various kinds of organisms in one location, plus the fact that these same relative ages hold good in other regions, too, does not necessarily guarantee equivalent age of like kinds. Paleontologic correlation rests upon this issue, "Does any characteristic occur only once in time, or may it be repeated at successive intervals?" If a characteristic type of assemblage does occur only once, then assemblages of this type must be time equivalents. There seem to be several possible explanations for the appearance of similar fossil faunas and floras in divergent regions.

1) One may revert to catastrophism and regard the organic assemblage of each layer as a special creation of God. If there was an extensive series of world-wide catastrophes (a view not substantiated by geology), then the creation of organisms which ensued was probably (but not necessarily) a creation of like forms with world-wide distribution. This would make them of exactly the same age. If one postulates only local catastrophes, then he must say that God always

re-created organisms in the same sequence (first trilobites . . . later ammonites . . . then reptiles, etc.). This would invalidate the age of equivalence of layers containing like forms.

2) One may believe that all species existed from the beginning and that recurring fossil groups merely indicate the recurrence of certain environmental conditions. In this case, fossil sequences must be due to progressive changes in environment which caused immigration of life from other areas. This, too, would invalidate age equivalence.¹

3) The evolutionist says that "Different kinds of animals and plants have succeeded one another in time because life has continuously evolved; and inasmuch as organic evolution is world wide in its operation, only rocks formed during the same age could bear identical faunas" (Dunbar, 1949, p. 8).

4) One may believe that different kinds of animals and plants have succeeded one another in time because God created the great categories of organisms at successive points in time, giving to each the ability to be changed and developed within God-ordained limits. Then like assemblages represent a cross-section of time, and the degree of equivalence depends upon the rapidity of dispersal of the changing forms.

There is little in the way of geologic evidence to give credence to the grosser forms of Catastrophism. "There is no longer much general support among stratigraphers for the principle of correlation based on synchronous diastrophism" (Krumbein and Sloss, 1951, p. 308). If local catastrophes are involved (and there are many of these recorded in the rocks) there would be no need for re-creation, for the population would be reinstated by immigration. But if fossil sequences are always and only a record of successive immigration of forms which all existed from the beginning, there remains to be explained the amazing coincidence that they have always immigrated in exactly the same chronological order (considering life as a whole) or that they have immigrated in such a fashion as to build spurious sequences (considering directional change manifested within a genus or family). Also one might ask where was the source area from which all these animals came. Therefore we are left with alternatives 3) and 4): thorough-going evolution or modification within successively created categories. In either of these cases, closely similar faunas represent generally equivalent segments of time.

Index Fossils.—The Law of Faunal Dissimilarity deals with faunal assemblages. It is by means of such groupings of species that the "finer resolution of time-rock distinctions may be accomplished," for, as Krumbein and Sloss continue (1951, p. 306),

1. It might be well to mention here one ingenious suggestion of the catastrophists—namely, that during some great world-wide flood which rose to progressive heights, the first forms to die would be those living at low elevations, then those living at successively higher elevations would be engulfed. It is asserted that complexity of life increases with elevation. Thus simple forms of ocean life would be buried first, later land reptiles, and ultimately mammals. This theory fails to take into account at least two factors: 1) the new categories of life which appear in successively younger strata are often interlayered with older categories of life. For example, in the walls of Grand Canyon there are several hundred feet of rock containing marine fossils exclusively. Above this there are more than 1,000 feet of rock containing the footprints of land animals. These layers are overlain by 500 feet of layers bearing fossils of corals, brachiopods, crinoids and other marine animals. 2) many fossil sequences are known which manifest cumulative variations in a time direction. Examples of this are corals which tend to increase their number of septae in successively younger layers; or oysters which are more and more coiled in successively younger layers. It is hard to conceive of a flood manifesting such selective action.

Of course the most sweeping criticism is that the idea of increase in complexity of life with increase of elevation is only superficially tenable.

If the approximate biozone (historical span) of a number of component species in an assemblage are known, although each biozone may be relatively long, it is probable that only in a short time-rock interval can all the species be expected in the same assemblage.

For grosser distinctions recourse is had to index fossils, those forms which have a very wide geographic distribution but to have everywhere a narrow time range. Krumbein and Sloss point out (1951, p. 305):

Time-rock correlation by index fossils would be much more confidently applied if there were many truly cosmopolitan species . . . (but) the experienced stratigraphic paleontologist can usually place the strata involved in their proper system with some assurance. At least, the fauna can be placed as either high in one system or low in the succeeding one. Since the biozones of most species persist through several ages and commonly through more than a single epoch, application of individual species to correlation of specific stages or series is rarely effective.

Dunbar, writing for the beginning student in geology, also emphasizes the possibility of determining relative age by use of index fossils:

During the last one hundred years, paleontologists in many parts of the world have cooperated in gathering such a mass of information that it is now as easy for a trained specialist to identify the relative . . . age of a fossiliferous rock formation as it is to determine the relative place of a sheet in a manuscript by its pagination. (Dunbar, 1949, p. 52).

The concept of index fossils is used extensively. However, the paleontologists would be the first to admit that in some cases hasty application may have led to invalid conclusions. Constant rechecking and revision eventually point up such inconsistencies.

Perhaps now we are in a position to examine the charge that geologists are guilty of circular reasoning. Their actual procedure is: 1) to observe the chronological sequence of rock units in a given area, and 2) from this to determine the chronological sequence of the contained fossils. (This is "dating the fossils by the rocks"). Then the fossils of another area may be compared to this standard sequence and assigned a relative geologic age by applying the concept of time equivalence for index fossils or like assemblages. This is not circular reasoning. It is a piecing together of information with reference to a standard.

Present status of paleontologic correlation.—How much reliance does the stratigrapher place on this fossil evidence in his effort to determine the age equivalence (or non-equivalence) of rock units? There are actually many means of correlation other than the paleontologic one. Krumbein and Sloss explain that (1951, p. 288)

Normally, two or more methods are employed in the solution of any individual correlation problem and no generalization can be made as to which methods are most useful in any individual case. Some of the methods that may be used are: 1) tracing layers laterally; 2) lithologic identity; 3) relative position in sequence; 4) structural relationships. These methods are useful only in relatively local situations.

However, Lull describes the process of correlation thus (1931, p. 19):

Having settled the sequence of strata in a given region, fossils are sought for, especially such genera and species as are sufficiently distinctive to be considered "horizon markers." Once determined, these serve to identify the age and, therefore, correlate the rocks containing them wherever they may be found.

Neaverson says (1928, p. 7):

It was once suggested that faunal migration is such a slow process that by the time a fauna reached the opposite quarter of the globe its original centre of dispersal would be occupied by a very different faunal development . . . Later it was realized that the time needed for migration is negligible compared with the period taken by the deposition of a rock series, so that essentially similar faunas are nowadays held to be contemporaneous . . .

Stratigraphic paleontologists recognize the limitations of their practice. James Gilully, past President of the Geological Society of America, in 1949 made an honest admission which sums up the situation. He said:

If several species that arose in different centers come to live in a particular area . . . their order of superposition may be different in different parts of the area . . . When we take into account the entire fauna we never find such reversals, but the fauna as a whole does not, of course, change so quickly as the individual species. Even in theory it will never be possible to be certain of the precise equivalence of beds in widely separated regions. Paleontology . . . can never offer us a chronology capable of indefinite refinement.

It would be safe to say that Gilully's comments reflect a growing concern within the ranks of geologists themselves. The current use of paleontology in stratigraphy has been undergoing some rather telling analysis and criticism in the past few years. Witness this excerpt from a paper entitled "Geological Correlation and Paleogeology" by Robin S. Allan (Allan, 1948):

Because of the sterility of its concepts, historical geology, which includes paleontology and stratigraphy, has become static and unproductive. Current methods of delimiting intervals of time, which are the fundamental units of historical geology, and of establishing chronology are of dubious validity. Worse than that, the criteria of correlation—the attempt to equate in time, or synchronize, the geological history of one area with that of another—are logically vulnerable. The findings of historical geology are suspect because the principles upon which they are based are either inadequate, in which case they should be reformulated, or false, in which case they should be discarded. Most of us refuse to discard or to reformulate, and the result is the present deplorable state of our discipline.

This undoubtedly represents an extreme position; but Allan's plea for more use of principles of sedimentation and of paleogeology in interpreting and correlating rocks is a plea which finds an echo in many other geological writings. Raymond C. Moore, writing in the same year as Dr. Allan, stated firmly that assemblages of fossils could be used as indicators of geologic time only if subsequent and antecedent as-

semblages were known from the same area. He writes further (Moore, 1948):

Possibly excepting correlations based on occurrence of shortlived free-floating or swimming organisms of the sea, such as graptolites and some cephalopods, or rapidly migrating land animals and plants, most intercontinental correlations of fossil species or assemblages cannot be accepted as indicating precise contemporaneity.

However, these objections pertain to refinements within the timetable. As noted earlier in this paper, geologists have reason to be satisfied concerning the over-all sequence in which organic forms have made their appearance. But when it comes to deciding what life forms were characteristic of the smaller time units, there is far less satisfaction. The smaller the time unit, the more difficult the problem. Nevertheless, modern research in sedimentation and paleoecology will doubtless point the way toward more reliable and effective use of paleontologic methods of stratigraphic correlation.

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Discussion

Mr. S. C. Sinclair: Many of you folk may be wondering why the A.S.A. is divided on the extent of mutational changes. One group believes that a sequence such as the modern horse from Eohippus is possible while the other group denies that any such change could occur. The answer to this difference lies in the perspective of the two groups. One group is looking at it Paleontologically, the other group Genetically.

Fossil sequences such as the horse fit beautifully into an evolutionary trend if such a thing can be shown to exist, but circumstantial evidence of this sort can not prove the theory in the absence of more direct evidence, such as has not been found in Genetics. Really the sort of Evolution one believes in, whether organic, theistic or threshold is decided by where one leaves God for chance. Variety from heterozygosity is **not** Evolution.

A certain taxonomist I know, though he knew the disfavor of Lamarckism yet was so impressed with the ingenious manner in which animals are adapted to the environmental niche they fill, could not help but feel that some mechanism for specifically adapting them to their environment must exist. I agree with him that adaptations do not look like haphazard mutations but show the hand of almighty God; and I believe the Bible bears me out that basic species patterns are the design of God. Job 39:13-17, 5-6 and 40:15,19.

I am convinced that we shall not make any real head-

way in our testimony for Christ until we make an open break with the theory of Evolution.

Descent from a common ancestor can not be the only criteria of gene identity, for, fortunately for our diabetics, the genes in sheep, pigs, and horses responsible for insulin production, form its protein structure so identically that purified hormone preparations from any of these sources can be injected without fear of reaction.

I believe I have in my mind about what I would consider a hybrid difference between two individuals and a species difference. Dr. Lammerts feels he can classify plants on this basis, and that, confusion as to what is or is not a species difference is merely lack of experience. Hybrid differences usually involve the presence or absence of single genes, whereas species differences typically involve a different gene pattern as well as one or more different genes. Though most of the genes are shared in common, their integration in a successful individual in a given environment constitutes their uniqueness. For example the aquatic spider differs in several essential ways from a similar terrestrial spider. The water repellent hairs that hold the bubble of air over its abdomen must be of the right rigidity, of just the right number per square inch, growing on just the right part of the body, and of the right shape with a hook on the tip of just the right size and angle. The more complicated things such as instinct and physiological fitness must also be right.

If changes such as bunodont teeth and hind feet bearing three hooved toes to hypsodont teeth and monodactyls are possible, then changes such as a low receding forehead to a high sharp one, heavy protruding jaw to a flat vertical one, fang-like interlocking canines to even dentition, and stooped posture to an erect one are theoretically possible, fossil sequence or no fossil sequence. If changes such as these can be definitely proved then we must look further than genetics for a mechanism. Why not let us admit that God is responsible for these changes, if such can be proved, and if it's God, it's not Evolution. The lack of a fossil sequence is a pretty flimsy defense for the faith of God's precious ones. And why quote Simpson as an authority when Evolution is his alternative to faith in the God of Creation?

I don't believe we fully appreciate the effect this theory has had, not alone on biology students but on philosophy and theology and practically every area of human thought. The apostle Paul said that if meat cause my brother to stumble then I will eat no meat. So may we say that if My Evolution cause my brother to stumble then I will have nothing to do with this philosophy of chance.

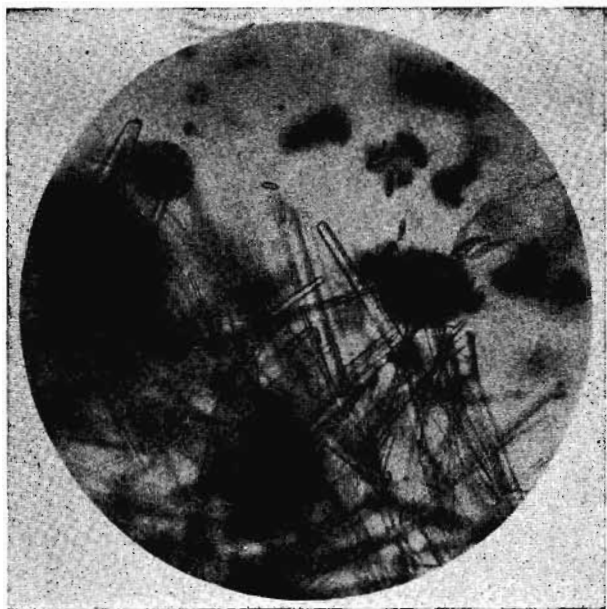
An area needing further study is the distribution of organisms in time (geologically) and space (geographically). Could it be possible that a pattern of plant and animal life was established in one or several areas and subsequently spread in all directions considering ecological barriers? If so a lag in distribution might cause apparent sequences in the earth's strata. Another factor, mentioned by Dr. Kulp, A.S.A. Journal, 1-3, 23 (1949), is that necessary for soil preparation for forest growth. Certain characteristic changes in plant life would occur beginning with bramble bushes, possibly, on up to the evergreens that require shelter for proper rooting. With these floral changes would go the animal changes characteristic of them. These changes might also look like geologic sequences.



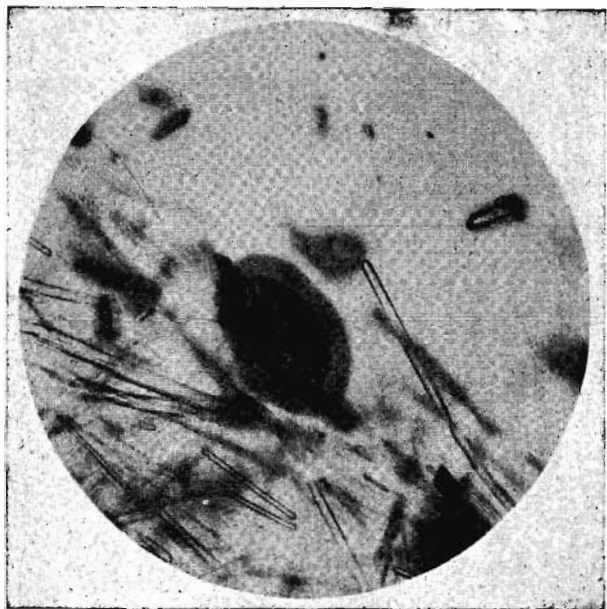
Typical scene on A.S.A. Black Hills geological field trip, August 26-28. Left to right: Dr. Culley, Mr. Pletcher, Prof. Oorthuys, Dr. Hartzler, Dr. Tinkle, Prof. Stoner



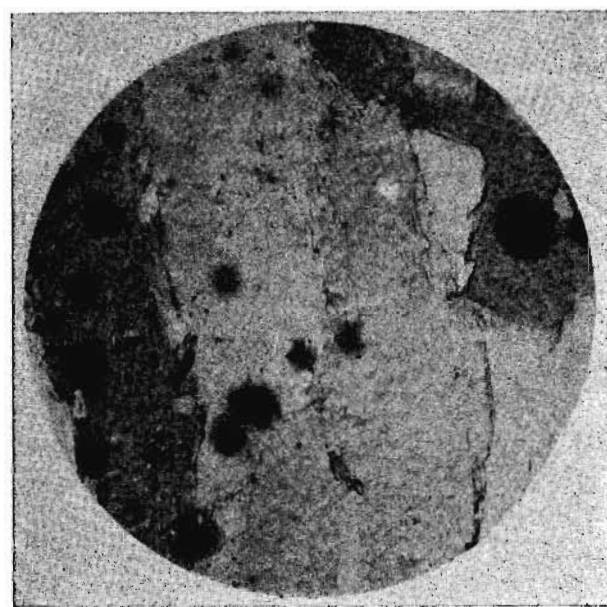
Dr. Paul M. Wright, left, discusses a fossil horse jaw with Dr. Mixer. This fine fossil specimen was discovered by Roger Wright, 8 years of age, who seems to be following his father's interest.



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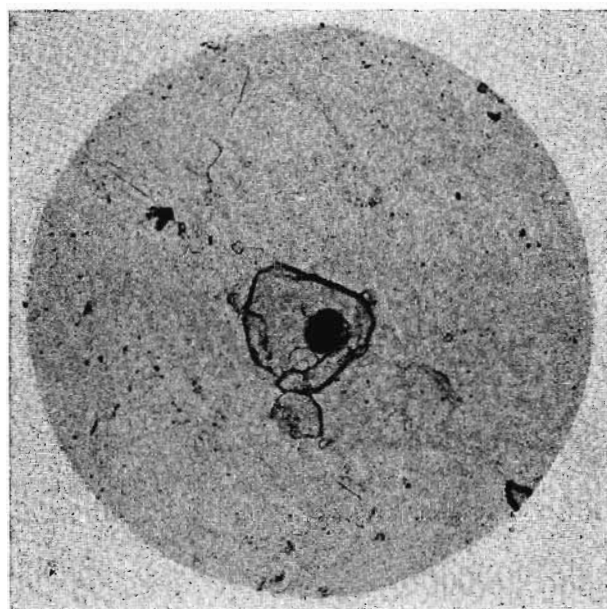
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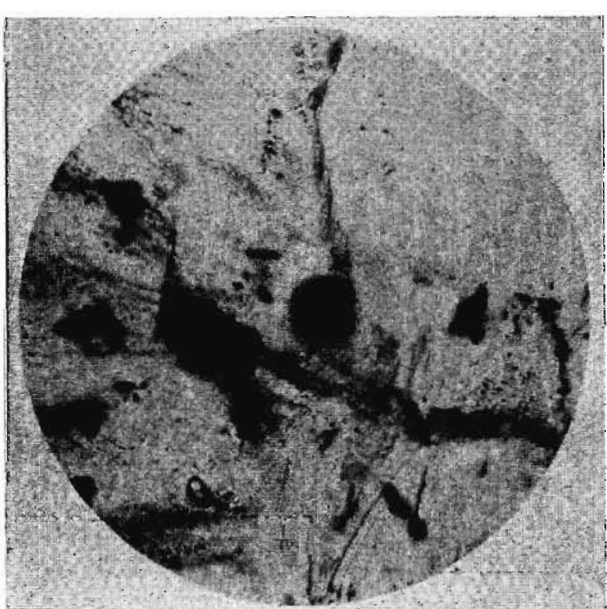
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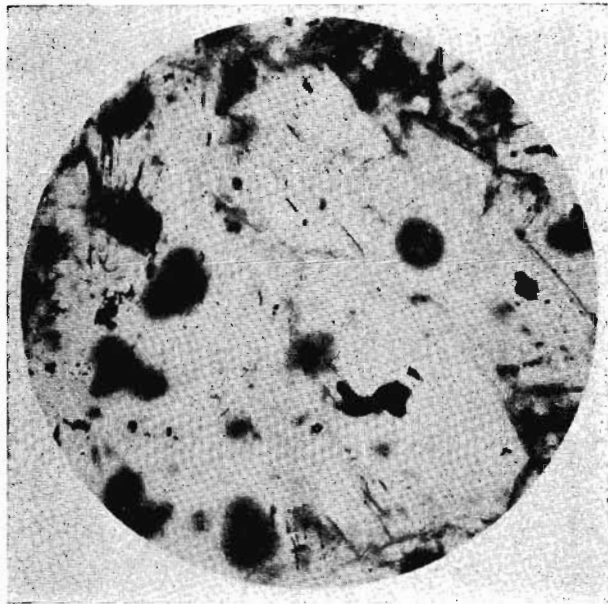
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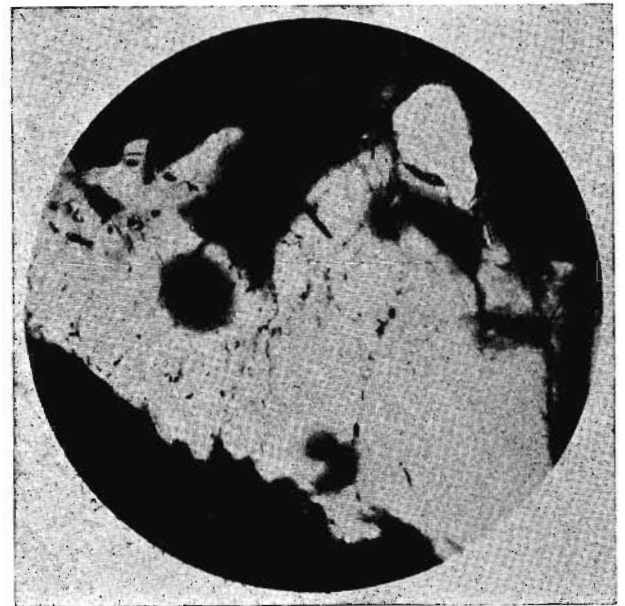
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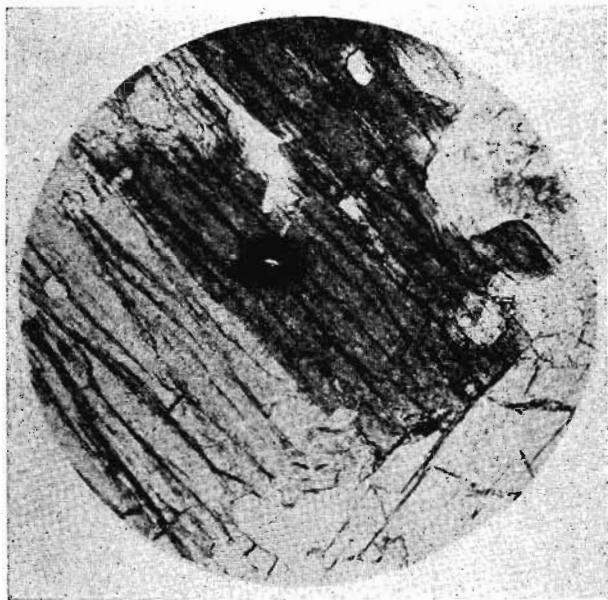
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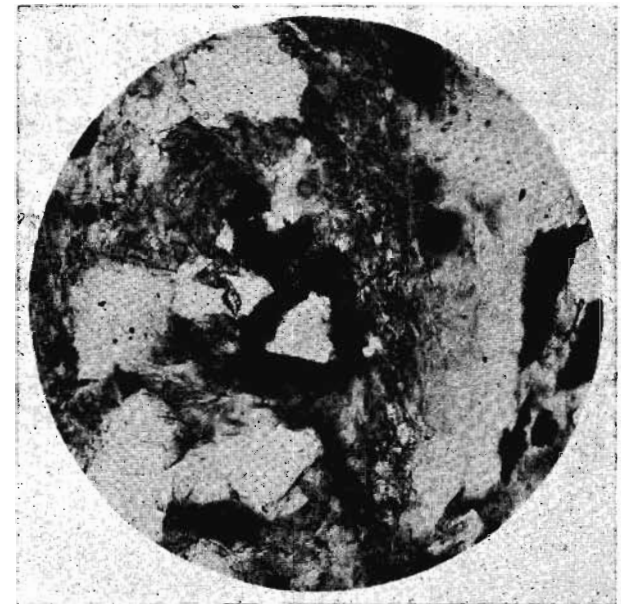
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9



10

MICROGRAPHS OF PLEOCHROIC HALOS

These micrographs taken by Dr. Roy M. Allen, should follow the article, "The Evaluation of Radioactive Evidence on the Age of the Earth", which appeared in the December, 1952, Journal

Original magnification 150x, reduced to 100x in reproduction

1. Pleochroic halos around zircon grains in cordierite. Showing extremely sharp outer borders and variation in the width of the borders, also slight halos around minute zircon grains. No halos occur around sillimanite crystals.

2. An unusually large zircon crystal in the same matrix as No. 1, showing opaque mineral inclusions within it, possibly the radioactive source of the halo. Notice the faint halo around one end of a small zircon where an opaque inclusion occurs.

3. Halos around zircon grains in biotite (a biotite schist from Sherman, Conn.). This illustrates the extreme difference in absorption which can occur in the same matrix and surrounding the same nuclear mineral. Also the variation in the sharpness of the border.

4. Halos around zircon in biotite, illustrating sharpness of border, variations in intensity and a faint negative halo around one minute zircon grain.

5. A section of a tourmaline crystal in greisen (Cumberland, Enz.) cut normal to the C axis, hence not in a direction of maximum absorption. The extremely minute nucleus, clearly seen in the original micrograph is not evident in the reproduction.

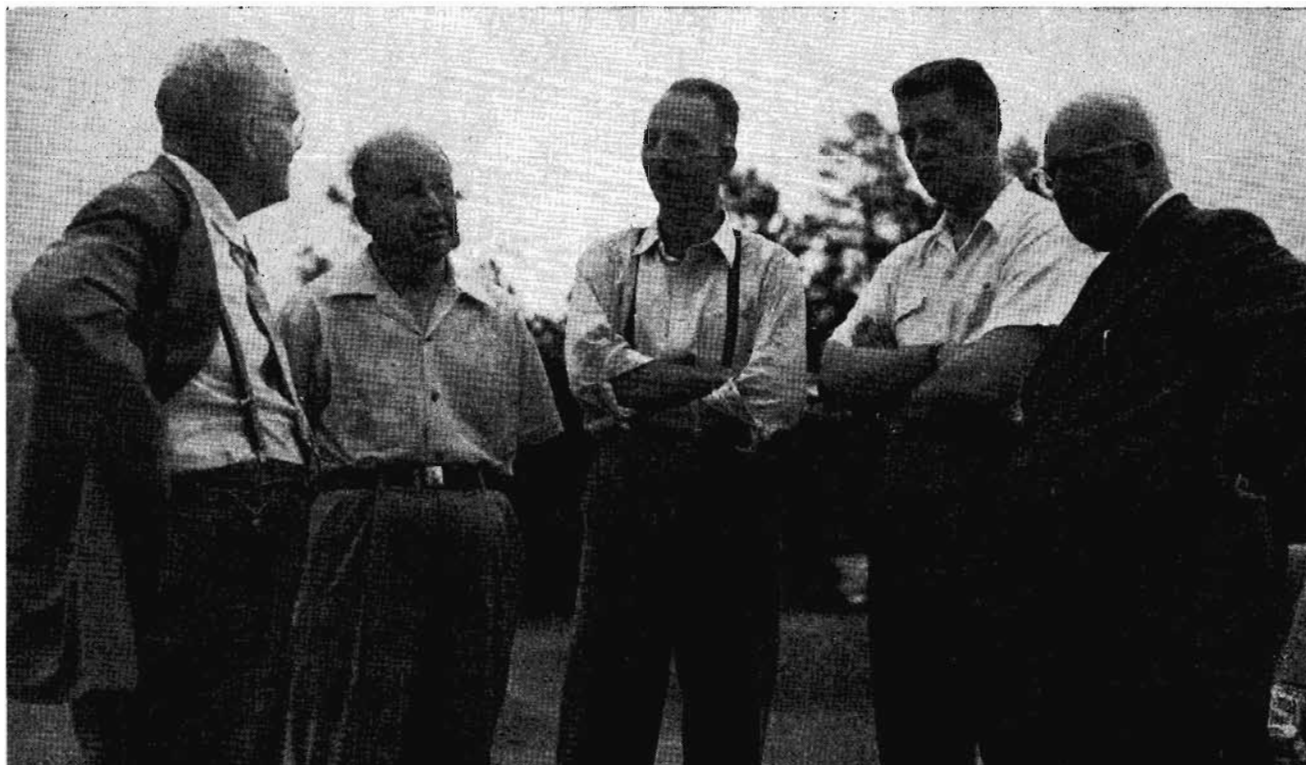
6. An unusual halo in biotite (from greisen, Zinnwald, Germany). It surrounds a transparent nucleus, possibly cordierite, which itself contains an opaque mineral grain, probably cassiterite. Notice the halo is concentric with the transparent mineral rather than the opaque one.

7. Halos around opaque cassiterite grains and a zircon grain in biotite (greisen, Germany). That the cassiterite itself does not produce halos is evident from the grains around which no halos occur.

8. Halos around zircon located within cassiterite occurring in luxulianite. Notice the difference in the intensity of the halos.

9. Here the halo occurs around a zircon nucleus located within hornblende, a rather uncommon condition.

10. Halos in biotite schist. Here we have also a halo surrounding an angular crystal of andalusite as well as around zircon grains. As there are no evidences of inclusions within the andalusite, yet the halo is very intense, it would appear that the radioactive element responsible for the halo must be located within the lattice structure of the andalusite itself.



Left to right: Dr. Maxwell, Prof. Stoner, Mr. Sinclair, Dr. Stam, Dr. Howitt



1952 ASA Convention Picture, Black Hills, South Dakota

1. Russell L. Mixer
2. Irving A. Cowperthwaite
3. Howard Franks
4. R. D. McAllister
5. ——— Franks
6. Karen Franks
7. Mrs. Howard Franks
8. Mrs. R. D. McAllister

10. Joyce Sutherland
11. J. Lawrence Kulp
14. Peter W. Stoner
15. Herbert Barrett
16. Earl C. Rex
17. Eugene Wright
18. Mrs. Earl C. Rex
19. John Sutherland

20. Mrs. Paul B. Stam
21. John C. Sinclair
22. William T. Tinkle
23. Paul B. Stam
24. Mrs. Brian P. Sutherland
25. Paul Bender
26. Brian P. Sutherland
27. Mrs. Paul G. Culley

28. Joseph Maxwell
29. Paul G. Culley
30. Roger Wright
31. H. Harold Hartzler
32. Paul M. Wright
33. Margie Culley
34. William D. Fletcher
35. Hendrik J. Oorthuys

These considerations might harmonize facts of distribution which are now evidences of Evolution.

Dr. Wm. Tinkle: I wish to say that this paper by Miss Erdman is a fair statement of the position of the standard geologist. However, the standard geologist is an evolutionist. I appreciate this paper very much for there is a great deal of truth in it; however, in some respects I must be very critical.

Regarding index fossils, in order for a certain species of fossil to be a good index, somebody must tell us when that species started (created or evolved) and also when it became extinct, at least in relation to other species and preferably in relation to time. Suppose that we take a special species of trilobite as an index for a certain formation. Then a new formation of rocks is searched out and we find that species of trilobite there. What is the conclusion? The new formation is the same age as the old since they have the same fossils. Are there not also two other possibilities? Perhaps this species of trilobite could have lived earlier or later than previously indicated. There is still another choice. This species of trilobite may have lived in a wider region than we had formerly thought. Again, is the geologist omniscient? What about early geologists? Smith was not educated. Lyle was educated but in law. Sedgwick was trained in Latin and Greek.

Dr. J. L. Kulp: I don't believe we would expect the early geologists to have had training since it was not possible to obtain such training. But no present geologist accepts the index fossils because anyone else says so. The rocks are still there. You can still find the same sets of fossils and since the early work of the men you have mentioned, thousands of trained men have gone across the face of the earth wherever the stratigraphic section outcrops appear and have found sequences wherever the outcrop is not deformed. And I should add that only about one per cent is deformed and there is always considerable evidence of it.

Taking the total fossil picture the broad outline of life is clear and undebatable and this is exactly the sequence which is described in Scripture. This makes it distinct from any other early cosmology.

NEW MEMBERS

(Continued from Page 2)

major field is in Mathematics. Received the A.B. degree from Eastern Mennonite College.

Raymond E. Hoisington, Stillman Valley, Illinois, is Instructor in Chemistry in the Rockford, Illinois schools. He has an A.B. from Wheaton College and has done graduate work at Wisconsin University.

William A. Howe, 129 N. Walnut Street, Lewistown, Pa., is an Instructor in the Lewistown Joint School District. He received the B.S. degree from Juniata College, the M.A. from New York University, and is taking graduate work at Penn State College.

John S. Hyde, pediatrician, 1102 Harlem Ave., River Forest, Illinois. He received the M.D. degree from University of Illinois in 1944.

Elhart James Kennedy is a graduate assistant in the Department of Vegetable Crops, Cornell University. He holds a B.S. in Agriculture from Colorado A. and M. His address is 123 Veterans Place, Ithaca, New York.

Wilbur C. Kramer, 10622 Avenue E, Chicago, Ill., is an Efficiency Superintendent with the Chicago Dist.

Elect. Gen. Corp. He received the B.S. degree from the Illinois Institute of Technology.

Horace A. Larsen, 6627 S. Harvard Avenue, Chicago, Ill. is Pastor of the Englewood Presbyterian Church in Chicago. He received the M.A. and Th.D. degrees from Burton College, and an honorary D.D. from Pike's Peak Bible Seminary.

Stanley E. Lindquist, 1343 S. Prospect, Park Ridge, Illinois, is Dean of Men and Associate Professor of Psychology at Trinity Seminary and Bible College in Chicago. He also is Research Associate in Psychology at the University of Chicago. He holds the Ph.D. degree from the University of Chicago.

Henry H. Loewen, 152 N. Dillrose, Wichita, Kansas, is a physician and surgeon. Received his M.D. degree from Kansas University in 1936.

Norman L. Loux, 305 Blackstone Blvd., Providence, Rhode Island, is a psychiatrist at Butler Hospital. A graduate of Goshen College, he received his M.D. from Hahnemann Medical College, took graduate training in psychiatry at Butler Hospital and the Yale University School of Medicine.

John McGowan, 680 Dickens St., Trail, British Columbia, Canada, is employed by the Consolidated Mining and Smelting Company of Canada, Ltd., as Superintendent of the ammonia plant. He holds the B.A.Sc. degree from the University of British Columbia.

William R. Nesbitt, 965 North 14th Street, Laramie, Wyoming, is Director of the Student Health Service at the University of Wyoming. He received the B.S. degree from Duke University, and the M.D. from Duke University School of Medicine in 1942.

Robert B. Oldham, Jr., is Pastor of the First Baptist Church, Monterey, Tennessee. A.B. degree, Western State College, Th.B. from Southern Baptist Seminary, Louisville, Kentucky.

William D. Osborne, Jr., is a missionary to Brazil under the Conservative Baptist Foreign Missionary Society. His home address is R. 2, Wareham Street, Middleboro, Massachusetts. He holds an A.B. in Theology from Gordon College of Theology and Missions, Th.B. from Eastern Nazarene College.

Joseph E. Pryor, Harding College, Searcy, Arkansas. He received the B.A. and B.S. degrees from Harding College, the M.A. and Ph.D. from Louisiana State University. At present he is Professor of Chemistry and Physics and Head of the Department.

Clayton F. Rasmussen, 603 Washington Street, Alhambra, California, is a Design Engineer with Beckman Instruments, Inc. Received his B.S. in Electrical Engineering from the University of Wisconsin in 1952.

Floyd F. Rawlings, Jr., 2325 3rd Street, LaVerne, California, is Professor of Chemistry at LaVerne College. He received the B.A. degree from University of Redlands, M. S. from Oregon State College, and Ph.D. from the University of Washington.

Walter E. Schlabach, Deder Hospital and Clinics, Box 102, Dire Dawa, Ethiopia. Medical missionary under the Eastern Mennonite Board of Missions and Charities.

Douglas H. Taylor, Mosvold Mission Hospital, Ingwavuma, Natal, Union of South Africa. He is Medical Director of the Mosvold Mission Hospital, under the Evangelical Alliance Mission. Received the B.S. degree from Wheaton College, M.D. from the Medical School of the University of Oregon.

More Than Five Senses

PHILIP MARQUART, M. D.

Professor of Psychiatry

Wheaton College, Wheaton, Illinois

Do you know that you have another set of eyes and ears? That you can sense other things than those in the world around you? The Bible tells us so. In fact, one must be careful in reading the Bible to distinguish between these two sets of senses. For instance, are you looking unto Jesus, as a Christian should? That does not mean looking with bodily eyes, but with the eyes of the heart.

The sense organs of the body are those with which we **perceive** the things that are in the world (I Jn. 2:15, 16). The lust of the flesh must have an object out there in the environment. The lust of the eyes is covetousness and also must have an object out there in the world.

Perceiving then in this way with the eyes of the body, we gather information from the book of nature, which is God's common revelation of Himself. If such information is gathered by an exact method, we call it scientific. All information gathered by the bodily senses is called **empirical** and such information can be said to be empirically demonstrable. In fact, we use such empirical gathering of knowledge when we read the Bible, which is God's special revelation.

However, we should not get the idea that the eyes of the heart (Eph. 1:18, Williams) are any less real nor that they give light on things less significant. The inner set of senses constitutes a genuine reality even though they are not composed of molecules. Think of the "heart" here as the center of your personality—the real you inside, i.e., your soul. This constitutes an example of earthly things being used to explain heavenly things (Jn. 3:12) because that is the way human minds can understand them. These eyes lie dormant and unused until God opens the heart in regeneration, and sets it aglow. The eyes of the heart, therefore, are those that are involved in gaining insights that are above and beyond the empirical and the mundane.

The Bible context usually reveals which eyes are meant. The mind works upon the data gathered by our bodily senses and, in characteristically human fashion, there is produced that fund of information which we call **common sense**. Only human beings can do this. Animals may find the use of their bodily senses necessary, and even life-saving on occasion, but no beast ever builds up its own common sense. Not even a horse is ever able to construct "horse sense".

Let us consider a diagram to show these things. The knowledge which we gain through our senses is limited. This is the empirical area at the center. All that lies outside this circle may thus be labeled "supra-empirical", and its extent is limitless. But God promises to reveal to His people some of these things. This, then, is the **revealed** area (Deut. 29:29). The limitless area outside the revealed is known by no man.

When the Lord was here bodily upon earth, the eyes of the body could look upon Him, in a manner no longer possible in this age. For instance, Luke said that they "were eyewitnesses of the Word" (Luke

1:2). They could actually see Jesus with their physical eyes. Even so, many saw Him and yet were not saved, because knowledge of God must come not through our physical senses, but from what God reveals.

Likewise the Apostle John said: "That which was from the beginning, which we have heard, which we have seen with our eyes, which we have looked upon, and our hands have handled, of the Word of Life" (I Jn. 1:1). He is here describing the physical perception of Christ by the sensations of the body.

Some, like doubting Thomas, place too much stress upon these empirical perceptions. He had to see and feel the nailprints in the hands of the risen Saviour before he would believe. But he was told: "Blessed are they that have not seen and yet have believed" (John 20:29).

We are told that hope that is seen with the physical eyes, is not real hope (Rom. 8:24). The Blessed Hope must rest on the seeing function of these inner eyes.

No man hath seen God the Father at any time (John 1:18). The nearest approach to gazing upon God is to look at Jesus. "He that hath seen Me hath seen the Father" (John 14:9).

Things that are seen with the eyes of the body are temporary. Eternal things are invisible to these eyes (II Cor. 4:18). The things that are seen with physical eyes come from those which are unseen (Heb. 11:3).

The Lord told the disciples of John the Baptist to return to the prison and tell John the things which they had **seen** and **heard** (Luke 7:22). "How that the blind see, the lame walk, the deaf hear, the dead are raised." These were actual physical events which they could report to John. In fact, the messengers themselves may have sensed these things only as physical miracles. The Lord knew that John would catch the deeper meaning in his heart. He would see in Christ's message the figures and symbols of Salvation and he would recognize the fulfillment of Messianic prophecy from Isaiah 61:1, 2.

Peter declared at Pentecost: "He hath shed forth this which ye now **see** and **hear**" (Acts 2:33). These things could be empirically sensed with the physical sense organs, but they were the direct working of the Holy Spirit in human hearts. Only the child of God, whose inner eyes had been enlightened could catch these deeper meanings. There were many in that crowd, however, who went home unsaved because the natural man receiveth not the things of the Spirit of God, in spite of all evidence (I Cor. 2:14).

Jesus was talking to his followers when He said "Blessed are the eyes which see the things that ye see." It was their physical sense organs that saw these miracles that He was working, but these disciples were seeing more. Through their inner eyes, they were being enlightened spiritually as well.

In Luke 17:20, Jesus said, "The Kingdom of God cometh not with observation". In other words, it does not come as an empirically demonstrable event. Observation is the method we use when we learn

through the physical senses. When the Son of Man is to be again observable on earth, He will come like lightning (Luke 17:24).

Now as we turn to consideration of the eyes of the heart, let us note that it is not at all difficult to determine from the context which set of sense organs are intended. Jesus mourned because the city of Jerusalem was unable to receive the benefits of her peace, for **they were hid from her eyes** (Luke 19:42). Jerusalem did not receive Him and therefore the eyes of her heart remained blind. II Cor. 4:4 says that it is the god of this world that blinds the minds of them that believe not.

The Emmaus disciples had their eyes "holden" by Christ for a special purpose, but when He "broke bread", their eyes were opened (Luke 24:16, 31). Note that this could refer to both or either sets of eyes. Later the same day, He appeared to the disciples and opened their understanding. They were given new perception through the eyes of their hearts (Luke 24:45). Note that this was not merely new instruction and new learning through physical eyes, but it was actually a new kind of perception. The purpose was that they might understand the Scriptures. A man unsaved may read the Word and get meaning, narrative and history, but only the enlightened may see the things that we see in it. Again and again, Jesus said: "He that hath **ears to hear**, let him hear." "Let these things sink down into your ears." Here again are the ears of the heart.

Romans 10:14, 15 tells something about how salvation comes. A preacher, who is a sent man, and who walks with grace (beautiful feet), comes bearing good tidings. The unsaved listen with the **ears of the body**, but they do not really hear the Gospel unless it sinks down into the **ears of the heart**. As a result, they believe and call upon the Lord and are saved.

But how does one believe? What is faith? Faith is not mere hunch, a leap in the dark, without basis. Faith is **evidence**. Faith is absolute evidence and proof of things not seen with the physical eyes (Heb. 11:1). Our faith is featured by **seeing** Him Who is invisible to physical eyes (Heb. 11:27). Faith is the use and functioning of the eyes of the heart. The basis of salvation is that we must believe that He exists (Heb. 11:6) without seeing Him with the eyes of the body. It is not just guessing and hoping. It has the most certain proof that there is when those inner eyes are open. Faith, then is a **look** to Jesus so that He Who is the Light of the World can enlighten our lives. Then we can say "Amen" which means "I believe". Saving faith is that initial faith which is featured by "a life for a look at the Crucified One". "Whom having not seen, ye love" (I Pet. 1:8). In other words, we love One whom we have not seen with physical eyes. "But we see Jesus . . . crowned with glory" (Heb. 2:9). Psalm 34:5 furnishes us with a picture of the initial salvation of a person through faith. "They looked unto Him and were lightened, and their faces were not ashamed."

We should not think that these inner eyes and other sensations are any less real than what we experience in the body. Indeed, these inner eyes see things that are more real and more lasting (II Cor. 4:18). They show us a portion of reality which has real being, even though hid from our natural eyes.

Jesus said that He knew and testified of what He had seen and heard (John 3:11). These heavenly things are vastly more genuine than we, or any other earthly thing (John 3:12). We should also emphasize that these inner sensations give us new data of the nature of

perception, and that they are not concepts or thinking. Neither should we confuse them with the little dialogues which frequently go on within our consciousness. The Pharisee in Luke 7:39, spake within himself, saying certain critical things about the Lord. This was merely the course of thought in a man unsaved and unregenerate, but Jesus could read these thoughts through the function of His inner senses. Neither in His case, dare we say that this was Extra-Sensory Perception. Rather, it was His omniscience.

There may be some question as to whether Satan is able to make men see things with the eyes of the heart. If he is, they are lying signs, and not true reality. A man under the influence of alcohol may see pink elephants and green snakes, but they are not really there. The alcoholic, however, believes that he sees these things with the eyes of his body, and this is probably true. However, even the unsaved will be using those inner eyes in the next life, because that is all that he will have left to use while he is absent from his body. Remember the rich man in Luke 16:23. "He lifted up his eyes in hell." There can be no doubt which eyes are here involved.

The child of God ought constantly to be exercising his inner eyes. They should be kept "looking unto Jesus" (Heb. 12:2; Ps. 141:8; II Chron. 20:12).

Other sensations of these inner eyes are sometimes mentioned. "O taste and see that the Lord is good" (Ps. 34:8). This passage is narrowed to the use of the age of grace in I Pet. 2:3; "O **taste** and see that the Lord is gracious." Likewise, Jesus **tasted** death for every man (Heb. 2:9). Also the sweet-smelling savour of the old-time sacrifices becomes in New Testament terms an inner spiritual sensation.

Not only does man possess this inner set of senses for perceiving spiritual things. These constitute a candle unlighted until he be regenerated. Then they begin to shed light upon an entirely new realm of reality, the divine revelation of these things God wants man to know. Adam had this lighted candle, but the light went out when he fell, and since then man has perceived only natural things, and that by empirical methods only.

Angels and demons have this light, since they do not carry bodies around with them. In Luke 4:34, the demon knew who Jesus was far better than men did, and he also knew his own ultimate fate. Satan couldn't hide from Jesus, even in His human life, for both had their spiritual senses in working order. Thus we see the setting of the temptation in the wilderness. The entire encounter was conducted above the level of the natural. Jesus has all His inner sensation, for He is Light. Even in human form, He retained His omniscience (which means the same thing). Nothing is hid from Him.

We as regenerate men, can know only in part and when we see Him face to face, we shall not even then have the infinity of omniscience. We will merely know all there is to be known about our inner heart condition, for the Light will be upon us.

If there are such phenomena as E. S. P., as men claim, perhaps we should relate them to these spiritual senses which have no bodily sense organs. They are merely bits of His omniscience which He reveals to us as we look unto the Light. But if unrelated to His written Word, we should take warning. Satanic forces can also reveal great, but limited, knowledge in the case of mediums, soothsayers and fortune tellers.

Thus we see the importance of these perceptions in the heart. They involve the spirit of the regenerated

man, as the candle of the Lord (Prov. 20:27). They involve all of **revelation**, including revelation to the ancient prophets, **illumination** to us through the Spirit-enlightened Word of God. And they involve all the problems of **inspiration**.

The heart, then, has inner functions which are similar to our physical senses. The activities of these inner senses bring us new information which is analogous to perception, not to conception or reasoning. It opens up a whole new world of reality, of heaven, paradise, supernatural things, open only to the believer. These additional sensations begin to function when we are born again. If a man die unsaved, they begin to function in hell, where men are necessarily removed from their bodies.

Let us indicate this warning note. The believer should see and hear these things only in relation to the inspired Word of God. Any spiritual information obtained in any other way should be viewed with suspicion. It may be Satanically derived or it may be a personal wish arising within the heart.

Book Reviews

RELIGIOUS BELIEFS OF AMERICAN SCIENTISTS

Edward LeRoy Long, Jr. B.C.E., B.D., Ph.D.

The Westminster Press, 1952

The author is an ordained minister in the Presbyterian Church, U.S.A. with training at Rensselaer Polytechnic Institute, Union Theological Seminary and Columbia University. His previous books are, "The Christian Response to the Atomic Crisis" and "Science and Christian Faith."

The book attempts to summarize the varied viewpoints of scientists who have written at all on religion. All views from the fundamentalist's to the atheist's are included. A chapter is given to the American Scientific Affiliation under the title "Biblical Statement and Scientific Fact." After quoting our constitution to show our objectives, Dr. Long mentioned our academic requirements and statement of faith. He lists the executive council as a sample of the membership. The papers at the Los Angeles convention led him to believe we are divided into progressive scientists who discuss Gamow and Carbon 14 and others such as those interested in deriving from "stretched observation that the Greek word for heaven and the English uranium have a similar root." **Modern Science and Christian Faith** is commended particularly for its chapter on "A Christian View of Anthropology" while the section dealing with "The Bible and Chemical Knowledge" "seem superficial, if not meaningless." He concludes we are headed for deeper rifts and wonders what we will do when we are convinced that "a literal reading of the Bible cannot possibly be harmonized with the content of modern science."

E. Ralph Hooper, formerly an anatomist at University of Toronto, F. L. Marsh of Union College, and L. T. More, onetime professor at University of Cincinnati, are credited with opposing evolution from Biblicistic presuppositions or as a method of interpreting reality. Dr. Howard Kelly, for many years professor of surgery at Johns Hopkins, and Charles M. A. Stine, director of research for E. I. DuPont de Nemours & Co.

from 1907 to 1945, are labeled compartmentalists because their religion is kept in one sphere and their science in another. Author Long is more sympathetic with those who are aware of inaccuracies in the Bible but holds to its core of religious truth, exemplified by W. L. Poteat, retired from Wake Forest College; F. J. Pack from University of Utah; C. E. de Lajous, University of Pennsylvania Graduate School of Medicine; and H. H. Lane, professor of zoology at University of Kansas. They "admit two spheres of authority, which nevertheless must be interrelated to each other." He adds a Roman Catholic, Hugh S. Taylor, dean of the graduate school and professor of chemistry at Princeton University, to this group.

By contrast with the men already mentioned, who approach science through religion, there are the distinguished scientists who are led to some level of religious belief because of their philosophies of natural science. Einstein is treated in the chapter on "God as Cosmic Structure." Dr. Arthur H. Compton believes in God as First Cause, and men like Du Nouy, who wrote the best seller **Human Destiny**, see God working through the process of evolution. Some men, such as Carl W. Miller of Brown University, emphasize man's role in religion, and others have a non-theistic outlook or are absorbed in their enthusiasm for science and invention.

Dr. Long concludes, "Scientists hold no religious view uniquely their own." "On what shaky ground are those pulpit preachers who suppose that to quote a scientist proves religious truth." "Likewise wrong are those who hold that a 'scientific spirit' implies denial of all devotion to religious creeds." But a literal interpretation of Scripture is likely to lead to tinkering with science, so one should have a proper attitude toward both the scientific method and Biblical theology which lets the truth of both be applied to "our total knowledge of man's natural and ultimate environment. "It is within this framework, that Christians will face a scientific age, fully acknowledging the truth in science and ultimately loyal to God in Christ."

I think this is a very helpful book in giving us an insight into many varieties of religious ideas taken directly from the writings of the men of science. It shows the benefits and defects of each view. Anyone who speaks or writes on science and religion should read this volume. I may not agree with the Author's estimate of my own particular attitude but I have a better appreciation of how my harmony between science and scripture impresses one who has a liberal theology.

R. L. Mixer

A BRIEF NOTE ON THE TRANSLATION OF THE WORD "DAY" IN GENESIS I

By John R. Howitt

Since the objective of the A. S. A. is primarily to reconcile the facts of science with the Holy Scriptures it is imperative that in the first place we should know exactly what the Bible says. This should be, as far as possible, a matter of translation rather than interpretation. If we believe, as we profess to do, that the Bible is the Word of God, then we must seek to discover the correct translation of the Word itself.

At the last two conventions of the A. S. A. there was a good deal of informal discussion about the first chapter of Genesis and some Fellows and Members

referred to various alleged Hebrew scholars as their authority for a number of different translations and interpretations of the first two verses of Genesis. Some of these translations and interpretations were quite original and amazing.

As a result of these discussions the writer decided to discover, if possible, the truth or otherwise of some of the translations and interpretations which were discussed. A letter was therefore written to the Professor of Oriental Languages at nine different universities representing the highest authorities in England, the U. S. A. and Canada. These universities were Oxford, Cambridge, London, Harvard, Yale, Columbia, Toronto, McGill and Manitoba. It may reasonably be assumed that none of those who answered the questionnaire was a fundamentalist and therefore there could be no bias towards the conservative position in any of the replies received.

The question asked was, "Do you consider the Hebrew word "Yom" (day) as used in Genesis I accompanied by a numeral should be properly translated

- (a) a day, as commonly understood
- (b) an age
- (c) either an age or a day without preference

No reply was received from Oxford or Cambridge Universities but the remaining seven who replied gave the answer in each instance as "a day as commonly understood." One of those who replied, Prof. Robert H. Pfeiffer of Harvard University, added the word "of 24 hours" to his answer.

Since the last convention of the A. S. A. in South Dakota the new Revised Standard Version of the Bible has been published. This translation has been widely publicized and since the board of revision was composed entirely of modernists it may reasonably be assumed that there was no bias on the part of the

editors towards the fundamentalist position. This translation is supposed to reflect all the accumulated wealth of scholarship since the King James Version was first published. In this translation the meaning of the word "day" in the first chapter of Genesis would also appear to be that of a 24 hour period, eg., Gen. 1:8, where we read, "And there was evening and there was morning, a second day". If there had been any possibility of translating the word "Yom" as an age it is most probable that the editor would have so translated the word or at least have added the alternative rendering as a foot note.

From the foregoing observations it is clear that the use of the word "day" in the first chapter of Genesis means a period of 24 hours and nothing else. This is in accord with the teaching of conservative scholarship since the days of the primitive Church. Any attempt to change the meaning of the word "day" into geological ages is simply a distortion of the Scriptures and from the context it is obvious that the statement regarding the time in each instance refers to the day's work recorded in the preceding lines.

It would appear, therefore, that in all our thinking we must recognize that the days of Genesis were periods of 24 hours each. We cannot escape this conclusion in view of the clear meaning of the text in the Hebrew. In Gen. 2:4 the word "Yom" appears in the Hebrew text without any qualifying numeral and the word may therefore be considered in this case as having a wider application, which is obviously implied in the context.

To reconcile the geological record with the days of Genesis should be one of supreme interest and priority to the Fellows and Members of the A. S. A., but in seeking to find a solution to this problem we dare not diverge from the revealed truth of the Word of God.