morial Lecture at the Imperial College of Science and Technology, London, on May 4. The subject of the lecture will be "Huxley as a Literary Man."

THE Psi chapter of Sigma Pi Sigma, honorary physics fraternity, was installed at Purdue University on April 12. Dr. Marsh W. White, of the Pennsylvania State College, executive secretary, and Dr. M. N. States, of the Central Scientific Company, national president of the fraternity, were the installing officers. After the twenty-seven charter members of the chapter were initiated the new chapter conferred honorary membership upon Dr. Cornelius Lanczos, professor of mathematical physics at the University of Frankfort, Germany. Dr. Lanczos is visiting professor at Purdue University. After the installation dinner an open meeting of the chapter was addressed by Dr. Lanczos, who spoke on "Maxwell, and his Influence on Modern Magnetic Theory." The installation of the Purdue chapter brings the roll of chapters of Sigma Pi Sigma to twenty-three.

DR. CARL E. SEASHORE, dean of the Graduate College, State University of Iowa, gave the initiation address at the annual initiation of the Iowa Chapter of Sigma Xi on April 27, speaking on "The Scholar as a Person." The initiation included 102 new members. Professor E. I. Fulmer, of Iowa State College, also participated in the initiation, speaking on "The Aims and Emblems of Sigma Xi."

THE Iowa Academy of Science will hold its forty-sixth annual meeting at Iowa State Teachers College, Cedar Falls, on April 29 and 30. Dr. James H. Lees, of the Iowa Geological Survey, will give the presidential address on "Our Underground Geology." The academy lecture will be presented by Dr. L. L. Thurstone, of the department of psychology of the University of Chicago, on "The Measurement of Social Attitudes." Section meetings for the presentation of papers in special fields of science have been provided. The Junior Academy of Science of Iowa holds its first annual convention with the parent organization this year.

THE American Association of Museums meets at Cambridge this year on May 12, 13 and 14. Eight sections of the association are arranging twenty-two special programs covering almost every branch of museum interest. There will be a conspicuous absence of formal business in order to give time in three days for these conferences, besides three general sessions, discussions, entertainment and a banquet at the Fogg Art Museum. Several distinguished guest-speakers, including President Lowell, of Harvard, will be present. Headquarters will be the Commander Hotel. Reservations should be made at once. The special rate is $2.50 a day per person. Applications for double rooms with bath are urged to conserve accommodations. Reduced railroad fares have been granted on the certificate plan.

DISCUSSION

THE FIELD NATURALIST IN THE FINAL INTERPRETATIONS OF LIFE

NOTHING seems more obvious to me than the fact that the livingness, the behaviors of life are externalities which must eternally be interpreted in their own terms and magnitudes. Advance inward a fraction beneath the surface, and all the familiar externalities of life vanish. One encounters, then, infinite levels of action and interaction from the surface to the electronic depths. As we recede from the surface view of life, we meet ever-expanding planes of complexity until an organism in terms of its electrons or free energies or anything else from the ultra-physical point of view must mean nothing but a vast realm and play of restless force approaching immateriality, call it what we will. Chemistry represents but one small level of analysis, physiology another, morphology another, electro-magnetic behaviors another, *ad infinitum,* until the molecules, atoms and spinning electrons themselves are reached, and the personal warmth and touch of life is no more.

It is legitimate to ask: Why stop at any level, the most superficial, in this weird organic complex with the external behaviors of life at one end and vast electronic depths at the other? Cellular studies seem simple enough, but what of their aggregates? The bricks of the house, too, are simple units, but a study of the individuality of bricks will not help us to comprehend the art, the style of the architecture of the completed structure. One brick tells nothing, nor two nor ten nor a hundred. Nothing is seen nor felt until those commonplace bricks are built into their final orderly arrangements, and the externality of a particular form is created. Life in a sense is as fugacious as art; life is the art of organic expression, and a John Burroughs or an Alexander Wilson or a Ruskin alone will interpret the finalities of it all for us.

Life, somehow, is externally a translation upward of forces and behaviors from one level to another. The final theme of the organic complex is living expression, but there is a new, a subordinate theme for every subordinate level. The bird in the totality of its morphology and physiology builds a particular nest and sings a specific song, and it behaves thus in virtue of an infinite number of component levels of

internal interactions. Song is not to be sought in one organ or in two, constituting any one of its dissected and exposed physiological or morphological levels, nor in the complexities of any chemical level involving hydrogen-ion relations, blood plasmas or corpuscular affinities. Let us finally decide to study life in the properties of proteins, sugars, starches. We find no hint of the manifestations of life here. We will study the molecule, the atom, the electronic whirls and modes even more intensively. All well and good, but we can not expect to find any of the externalities of life in these remote depths of a bird's chemistry. There appears to be nothing to indicate the properties of atomic iron in the electronic energies of iron. Surely the properties of the iron atom do not allow one to predict the properties of any organic molecule into which iron enters as a constituent. At every point new property-levels are built up, one within or upon the other until the resultant of all is the subtle mood of living-expression, which we would all understand if we could.

To my own mind there is no hope of tracing life which is a summation-property, to any internal subordinate level beneath the bones and integuments, so to speak. I would as soon declare that the facies of life existed at one level as another, and hold that the free energy of the electrons should contain its embryo as truly as the morphologically immature embryonic configuration.

With these features in mind, I find great justification for the broader view-points of the genuine field-naturalist. Yet some look askance at him in these days of intensive specialization. The true naturalist is content to see the final resultant of all these interior interacting levels of structure and function, and in truth the final relevancies of life must be sought alone in its external features of form and expression. While the old-time naturalist has become scarce in our midst, it is simply because the newer psychology of organisms has thought to find the key to life in the internal relations of its mechanism. Henry David Thoreau, beholding the sunset with soul attuned to the beauty of it all, is as true a scientist as Leeuwenhoek bringing to light the sperm cells of life. One works on a more external plane than the other—that is all. The man studying chromosomes is content with the details of chromosomes, but if he seeks finality in their relations, he becomes for the moment a naturalist engaged with the external properties of life.

For that reason, a Thoreau studying the relation of his moods to the whip-poor-will's calling, term him poet-naturalist if you will, is a genuine out-and-out naturalist, nevertheless. The electronist, the chemist, the biophysicist, the physiologist, the morphologist, on and on are but subepidermal naturalists in their restricted fields. The true naturalist, the man who must always stand upon their isolated summations, ever transcending all the complexities of their intracellular finds, must be the old-time field-naturalist. Let him now touch his own subtle moods with the poetry and the philosophy of it all; let him stand as a complete entity before the wonders of the gods and he becomes, still more, the calm poet-naturalist in our midst, with sublimities of thought and feeling projected infinitely beyond the levels of his colleagues lost within the organizing integuments which somehow made all this possible as the final vision of life. At last, perchance, moments of mystical experience may lift the soul above mundane relations, and he will, like Wordsworth, feel close to some immanence in the universe.

> When the light of sense
> Goes out, but with a flash that has revealed
> The invisible world.

It is then that we have seen and felt infinitely beyond the confines of our own finite personalities, with a rare vision and mood that glimpses even the gods themselves. It is then that the scientist feels the reality and greatness of an infinite externality of being, it would seem, and the innate religious consciousness of man has asserted itself as the final logical outlook of life.

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SPONTANEOUS COMBUSTION IN THE MARSHES OF SOUTHERN LOUISIANA

THE following is abstracted from my notes on observations of marsh fires of apparent spontaneous origin. My complete notes on the subject appeared in *Ecology,* Vol. XII, No. 2, April, 1931.

On August 4, 1924, shortly before noon, while hiking in a dried marsh two miles east of Mandeville, Louisiana, with a party of boy scouts, we observed the start of a fire which apparently ignited spontaneously. The muck-like soil of the marsh, as rich as 90 per cent. in combustible matter near the surface, varies from a few inches to several feet in depth. We were in the midst of an unprecedented drouth, and the water level, which normally would stand a few inches above the grass roots, was several feet below the surface, all but a few deep lagoons and the bottom of alligator holes being without water. The temperature was over 100° F. in the shade, and in the sun the heat was so intense that it was impossible for the boys to walk barefooted in the sand. A strong southwest wind, estimated at 20 to 25 miles per hour was blowing across the lake.