Clark University; Dr. Alfred O. Gross, ornithologist of Bowdoin College; V. C. Wynne-Edwards, zoologist of McGill University; Harold Peters, biologist of the U. S. Biological Survey, and Dr. Kenneth Sewell, anthropologist of the Massachusetts Memorial Hospital.

A LARGE collection of the mammals, birds, reptiles and plants of Panama has been brought to the U. S. National Museum by Dr. Gerrit S. Miller, Jr., curator of mammals at the Smithsonian Institution. By accompanying detachments of U. S. Army engineers engaged in cutting new roads through the jungle, Dr. Miller was able to secure a considerable variety of epiphytes, or air plants, which grow in the tops of trees often more than 100 feet above the ground. He also obtained a large number of bats by visits to the Chilibrillo bat caves just north of the Canal Zone proper. Among the mammals secured were eight porpoises from the Pacific Coast of Panama. The types of these sea mammals along the coast of Southern California are fairly well known, and collections have been made off the western coast of South America. Little has been known of those dwelling in what might prove to be a transition zone. Dr. Miller made a special effort to secure a collection of the "night monkeys" of the Panama jungle to supplement the collection in the National Museum. The expedition also made a trip to the Pearl Islands, about fifty miles west of Panama City. The collection brought back to Washington includes about 450 mammals, 150 birds, 150 reptiles and amphibians and 400 specimen sheets of plants.

C. S. HOWARD, of the U. S. Geological Survey, and members of the Bureau of Reclamation recently sent to Washington samples collected at several points in Lake Mead for study of conditions of temperature, composition of the water and quantity of suspended matter at different depths of the lake. Previous observations showed the presence of suspended matter near the bottom of the lake in the vicinity of Boulder Dam and these later observations show that a comparatively large quantity of suspended matter was present in the lower ten per cent. of the depth of the lake at one point 20 miles above the dam and at another point 50 miles above the dam.

AN audit of returns from oil and gas properties under Federal lease and prospecting permit, completed in the Washington office of the Conservation Branch, U. S. Geological Survey, discloses production of 3,500,549 barrels of petroleum, 7,222,066,000 cubic feet of natural gas and 9,642,220 gallons of natural gasoline, having an aggregate royalty value of $545,202.14, from public lands and naval reserves during the month of March, 1937. Compared with the corresponding figures for March, 1936, these returns show increase of 13 per cent. in petroleum produced, of 4 per cent. in natural gas produced and 3 per cent. in natural gasoline produced and of 9 per cent. in royalty and rental accruals.

DISCUSSION

MAHOMET AND THE MOUNTAIN

TO-DAY the great public has an even more naive idea of the evolution and course of life on the globe than that satirized in the "Princess of Babylon" by Voltaire nearly two hundred years ago.

> "Sire," answered the Phoenix, "I am not old enough to have an opinion about antiquity. I have not lived more than about 27,000 years, but my father, who was five times as old, had it from his ancestors that the generations of all animals started on the banks of the Ganges. For my part I am not conceited enough to hold this opinion. I can not believe that the foxes of Albion, the marmots of the Alps, and the wolves of Gaul come from my country; and I do not believe either that the firs and oaks of your country are descendant from the palms and cocos palms of the Indies."

In attempting to broaden the ideas of people over and above schools, we are certainly much dependent on our series of national parks and monuments. In developing them, therefore, we should omit all that is merely grandiose, even if it come from the heads of dignified research institutions. We should confine ourselves entirely to the plain and the concrete—that which rests in its own dignity, that which will speak now and to the future in terms of dollars.

Fulfilling such requirements, not one of our national monuments is more outstanding than Fossil Cycad National Monument, as briefly told in SCIENCE last March 19. It has been for some years the lively expectation that a plain, exceedingly simple and dignified museum might be put on the main mesa front and that the area would be submarginally added to up to at least one square mile. In fact, this has been the plan and virtually the only plan discussed for some time. Of course, at present the chief thing against it, as Senator Joseph T. Robinson said, is "the concerted drive among members of Congress for economy in the National Government."

Nevertheless, I have just received from Harry Slattery, personal assistant to the Secretary of the Interior, the following statement in somewhat different tone, of date July 23:

> The Department appreciates your untiring efforts in behalf of Fossil Cycad National Monument but it can not agree with you regarding the development which you propose. A $95,000 expenditure on this monument now is not consistent with the best interests of the program of

national park development. An appraisal of the considerations upon which this decision rests will clarify our position.

The National Park Service is administering ninety-five national parks and monuments. The records for the past year show that the number of visitors in many of these areas varied from 100,000 to more than 900,000 people. It is hardly likely that any such numbers would visit Fossil Cycad and yet the funds available to the established parks are insufficient to construct and maintain the accommodative, educational, and recreational facilities which will satisfactorily care for their existing needs.

In some of the areas there are lacking such essentials as sufficient water supplies, acceptable roads, fireproof structures for perishable collections now in the custody of the Service, and adequate personnel, both for protection of the areas and for guidance of the visitors. The first duty of the Service must be the care of the areas already developed.

Developments of additional areas can not be undertaken unless their justification is unimpeachable and their future maintenance is assured. The Fossil Cycad National Monument does not satisfy either of these requirements. It is realized that the area is of outstanding paleobotanical interest and as such it has been given the protection of the National Park Service so that it will not be exhausted as so many of the fossil quarries have been. But it is also realized that the subject of fossil cycads does not have a broad appeal and, therefore, extensive development of this monument would benefit only a limited group of people. This is particularly true since the area does not possess other outstanding attractions. The scenery is neither impressive nor is it unusual; the geological interest, other than its paleobotanic relations, is not phenomenal; the area is too small for wildlife preservation; the terrain does not lend itself well to recreational development, and there is little historic interest.

We are not depreciating the scientific value of this monument but are bringing to your attention the fact that it does not meet those standards which are essential to the justification of the type of development which you propose. Even if funds are available for the construction of the museum building, the exhibits, the lodge, and the entrance roads, maintenance of these facilities and custodianship of the area would require a considerable additional appropriation and would deprive other more frequented areas of much-needed funds.

We believe that this monument should be protected against depredation, and preserved for scientific research, but that an elaborate development by the Government is not justifiable. We also believe that the story of the cycad can be effectively told by a display which, for the present at least, can be housed in the administration building at Wind Cave National Monument, twenty-two miles distant, where custodianship is already provided. Such a display would not be unrelated to the area in which it is shown because both the formation of the cave and the preservation of the cycads are chapters in the story of the Black Hills geologic province, of which both of these areas are a part.

Last year more than 16,000 people visited Wind Cave. It is hardly expected that this number would visit and be favorably impressed by the specialized development proposed at the Fossil Cycad National Monument. However, the assembly room in the administration building of Wind Cave where visitors congregate to await their turn to enter the cave is an excellent place for the unhurried study of a representative exhibit.

Again may we indicate appreciation of your helpful interest in the development of Fossil Cycad National Monument and emphasize the fact that the National Park Service is continuing to study the situation in hope of devising a fitting plan of presenting the scientific features of this area to the public.

I must admit that I find little sympathy with any of these views. The Cycad Monument (of which I am virtually the donor) is in a singularly attractive and accessible portion of the Black Hills rim. It is in the midst of its own geology, at that point of peculiar interest because of the problem of the Jurasso-Cretaceous boundary. Then there is the problem of petrifaction as never so well exemplified before; and nextly the cycadeoids themselves illustrate the most profound problems of seed plant descent and origin of modern forest canopies. The chemistry of petrifaction is most wondrously illustrated. All this evidence which the wayfaring man so needs to see (absent from other distractions) has no more to do with speleology than the snowcap of Kilimanjaro. It must have been an oversight on the part of nature to put so much scientific clarity and loveliness only twenty-two miles from a cavern set in a gulch and now surrounded by a sort of caravansary. That is not what the student of evolution exactly wishes to see first, nor does he want his fine hour of study in the field so distracted. Will the "public" be as dumb to-morrow as it is to-day?

Much more, the *in situ* collections at the monument are a unit which for the sake of science must be kept absolutely intact. As we say, they have nothing to do with the motley crowd of sightseers.

Caverns are banal anyhow. We read above of those 900,000 Americans who perhaps saw the Carlsbad Cavern of New Mexico and that beautiful stalagmite labeled "Forty million years old"; when, of course, some of us think the cavern was under water within ten or twelve million years back. Yet if any one suggests that the gentlemen ought to revise the estimate, the guides get boundlessly impertinent. And then there is the cavern chamber "three quarters of a mile long and seven hundred feet high!"

Perhaps the members of Congress may come more and more seriously to ask where both the worthwhile and economy begin.

Oh, God, why live, to breathe a prescribed and rationed
air!—All free
Opinion, all interchange of vigorous thought, suffocated
By the poisonous motor-exhaust of motor minds!

Passion regimented; curiosity regimented; endeavor regimented;
Culture, and grace, and all the things I cared for
Equally divided among the mob, and sauced to their taste!

YALE UNIVERSITY G. R. WIELAND

PROPOSED CHEMICAL MECHANISMS FOR THE PRODUCTION OF SKIN ERYTHEMA AND PIGMENTATION BY RADIANT ENERGY

IN 1927 Lewis[1] made the suggestion that the skin erythema produced by various physical agents, including radiant energy, was due to the liberation or formation of some histamine-like compound which he called the H-substance. About this same time Harris[2] found that alcoholic extracts of skin contained a substance with the pharmacological properties of histamine. As this substance appeared in the tissue spaces, it apparently disappeared from the tissue cells. The following year Ellinger[3] began his attack on the problem by irradiating histidine with the rays from a quartz-mercury lamp. This procedure resulted in the production of an active substance which Ellinger considered to be histamine. It was reported in these papers that the active substance was formed by the physiologically active rays (290 to 320 millimicrons) as rapidly as by the shorter rays, provided the total energy were maintained constant. The very interesting experiments of Szendrö[4] have since shown that the active compound produced in Ellinger's experiments was not histamine but imidazoleacetaldehyde. The physiological importance of Ellinger's discovery has been questioned by Bourdillon, Gaddum and Jenkins.[5] These workers reported that the production of the active compound by the physiologically active ultra-violet wave-lengths was too slow to account for the production of erythema. It is apparent that more work must be done before the controversy regarding the production of imidazoleacetaldehyde from histidine by means of the near ultra-violet can be settled.

Raper and his co-workers[6] have shown that the enzyme tyrosinase will catalyze the conversion of tyrosine to dopa (3, 4-dihydroxyphenylalanine); dopa is then oxidized, in the presence of the same enzyme, to a red indole derivative which spontaneously changes to melanin. There is as yet, however, no direct proof that this mechanism operates in mammals, since tyrosinase has been isolated only from plants and the lower forms of animal life. Bloch[7] has demonstrated the presence of an enzyme, dopa oxidase, in the melanoblasts of the skin. This enzyme catalyzes the conversion of dopa to melanin, but it has no action on tyrosine. In experiments, which will be published in complete form shortly, the author has found that tyrosine is converted to dopa by ultra-violet light. This reaction will occur even if the tyrosine solution is separated from the light source by means of a thin glass filter, although it is slower under these conditions. As might be expected, dopa can be produced by this method only in the presence of oxygen. Changes in the ultra-violet absorption spectra of irradiated proteins have led to the suggestion that dopa may be formed from tyrosine even when the latter is combined in the protein molecule,[8] but this hypothesis has not yet been tested directly. This work suggests that skin pigmentation produced by radiant energy is the direct result of the conversion of tyrosine to dopa, the latter being converted to melanin by dopa oxidase.

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A MICROBIOLOGICAL TEST FOR CARCINOGENIC HYDROCARBONS

WITHIN recent years the researches of various groups have definitely shown that certain synthetic hydrocarbons are capable of inducing cancerous growths in mice. In the attempt to extend these findings, new syntheses have been made in order to obtain a better understanding of the chemistry of carcinomas.

Since the carcinogenic hydrocarbons bring about such marked changes in tissue cells, it was hypothesized that they might also cause marked physiological changes in unicellular organisms. Using a bacterium, *Escherichia communior,* and a simple synthetic culture medium, direct total counts of the numbers of organisms per unit time indicate that certain carcinogenic hydrocarbons accelerate the rate of reproduction of the test organism. Typical growth curves with 1,2,5,6 dibenzanthracene and with methylcholanthrene show approximately 50 per cent. more organisms in the eighth to ninth hour of growth than control cultures.

With phenanthrene, a non-carcinogenic hydrocarbon, repeated tests showed curves identical with the controls. If these results may be taken as presumptive evidence of a correlation between carcinogenicity and stimulation of bacterial growth, it seems possible that if an extension of this study to other hydrocarbons shows such a correlation to be general, a short microbiological test for carcinogenic hydrocarbons may replace the tedious methods available at present.

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[6] H. S. Raper, *Physiol. Rev.,* 8: 253, 1928.
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