to that amount to the board of university regents. The largest single item is $169,508 for the construction and equipment of an agronomy wing to the horticultural building. The next largest is $100,000 for the construction of an addition to the present student infirmary. Other items include $27,500 for the purchase and installation of safety devices throughout a number of university buildings; $22,000 for moving equipment from its present location to the new mechanical engineering building in process of erection at Camp Randall; $25,000 for an electric distribution system; $15,000 for a water line to the pump house; $16,000 for the purchase of real estate, and $35,000 for the construction and equipment of a new building for animal research.

ACCORDING to the terms of a recent appropriation by Congress, the United States Department of Agriculture will establish a new field laboratory on the Pacific coast to study problems of bee-keeping in that region. The site of the new laboratory has not been selected, but a location in which most of the problems to be studied will apply is being sought. In addition to the bee-culture laboratory near Washington, D. C., the department now operates field laboratories at Laramie, Wyo., and Baton Rouge, La. The bill provides $15,000 for bee-culture investigations on the Pacific coast with the new field laboratory as headquarters.

APPROXIMATELY 14,144 acres of land were added to the Rocky Mountain National Park, Colorado, by proclamation of President Hoover dated June 25, upon recommendation of the Secretaries of the Interior and Agriculture. Authority for the addition of the land was contained in the act of Congress approved on June 21. The new addition adds to the park the headwaters of the Colorado in the vicinity of the Never Summer Mountains, picturesquely so-called by the Indians because of the everlasting snows that spatter their summits. This is a magnificently scenic area. In this region the Continental Divide makes a U-shaped loop, forming a broad valley through which the Colorado River winds. About one third of this basin was included in the national park, the remaining portion being in the adjoining national forest. Under the presidential proclamation it is all included within the park. In addition to its scenic value, the new area is of geologic interest and constitutes a natural unit of the park. Through it will be constructed a portion of the new Trail Ridge road, which, when completed, will be the highest continuous road in North America. At one point it will reach an altitude of 12,120 feet, and 9 miles of its total length of 28 miles will be located above timberline.

THE French Minister of Public Instruction has, according to the *Journal* of the American Medical Association, appointed a commission to draw up a bill to provide that, out of the profits of commercial establishments exploiting a scientific discovery, a certain proportion shall go to the benefit of the scientists who made the discovery. Such a law has been demanded for many years, and the Commission Internationale de Coopération Intellectuelle has already discussed the subject at length. It has conceded, in principle, that it is just to recognize the existence of certain rights of ownership in scientific inventions and discoveries, just as the rights of ownership in artistic productions are recognized. A French law, which dates back three years, accords to the author of a painting and to his descendants for a period of fifty years after his death a *droit de suite,* that is to say, a percentage of the price paid for the picture every time it is resold. It has been considered unjust that a work of art for which the artist who creates it usually receives a low price should enrich several merchants by successive sales and speculations whereas the artist and his family remain in misery. It is now regarded as no more than just to apply the same principle to the author of a scientific discovery which, even though it can not be patented, will, by exploitation, enrich a number of industrialists and merchants. Laboratory workers receive modest salaries in the faculties or the scientific institutes, but their research becomes for others a source of wealth in which they have no part. A small percentage will therefore be figured on the profits of industrialists exploiting a discovery that is not entitled to a regular patent, and the sums thus collected will be placed in a special fund destined to furnish indemnification to the scientists who are the authors of exploited discoveries. This fund will be a *caisse commune,* which can be used likewise to indemnify other scientists, authors of discoveries in pure science and not capable of exploitation. The fund may be used also for the creation of research laboratories and experimental hospitals. A special commission composed of scientific men acting under the ministry of public instruction and administer the fund and will see to its judicious distribution.

DISCUSSION

CONIFER INFLORESCENCE

STROBILAR structure and origin form a much more enigmatic subject than can be readily pictured. At once an utter difficulty of definition and the tangle of inequal terms is encountered. The relation between the cone and flower is tied up with the inflorescence. Inadvertently the student thinks that a flower has no semblance to the unit of structure in a cone

and that the cones of pines must be far simpler and older than any flowers, both ideas being the exact reverse of the truth. Giantism, reduction and elimination, even more than progressive changes, obscure the primitive structures, while the view that the higher seed plants arose somewhere near their first observed occurrence in geologic time has so dominated botanical thought that views of descent have been much too restricted to reach fuller clarity.

Within the past few years, however, much real progress has been made in the study of the ancient history of the conifers. Both Araucaria and the pines are traced back to the Carboniferous. Older cones are more complex and leafy; single scales fewer, and groups of seed scales suggesting shoots more in evidence. No less, unity in the entire Conifer-Araucaria phylum as it appears in the flora of to-day is very certain. In the fossil genus Pararaucaria accompanying the Araucaria cone series from the Cerro Cuadrado, Patagonia, bract and scale are both prominent, while the seeds are curtained by the tissues of the scale. Outer appearance was not markedly different from Picea or Larix, except in the much larger bract, although, as if nature intended to prove the point further from the fossil side, the scale, as normally one-seeded as in Araucaria, is rarely seen to be both one and two seeded in one and the same cone.

The shoot or inflorescence theory of the cone advanced at various times best seems to fit the increasing evidence. It is recalled that abnormal cones of Picea with leafy axes in the bract axils seemed to indicate the seed scale to be the remnant of a shoot. The apposed view was that the staminate and ovulate cones are strictly homologous, with the bract itself a sporophyll and the scale really an outgrowth from it bearing the seeds. But this latter view seems to fail, or at least can only suggest plants very much simpler than any conifers and living far back in time, plants embryologically simple as in early Cordaites or in pro-Conifers. Much depends on the interpretation of the Gnetaleans. Did they all once have complete flowers? At least the flowering gymnosperms were a reality and can only be thought of as numerous and varied in Permo-Carboniferous and later times. Leaving embryogeny somewhat aside or as a thing in itself progressive, conifers might be as much the descendants of angiosperms as the reverse. That is, conifers are now specialized utterly in flower and foliage, though ancient in wood structure. Conversely, the angiosperms are still plastic in their flowers, but absolutely advanced in embryogeny, leaf and wood. Casuarina is an angiosperm which wanted to be a conifer, but started too late.

It is expected shortly to illustrate some of these points at length and adequately in an account of the Field Museum collections from the Cerro Cuadrado. In searching for collateral illustration use has been made of a hasty method of cone sectioning and illustration which may have escaped note by many teachers of botany. The great pine cones when thoroughly dry may with care be close wrapped in several ways to prevent breaking of the scales, and then set in the heavy oak jaws of an old-fashioned carpenter's vise and sawn through on the lines needed for all the desirable sections. A narrow, fine-toothed orchardist's pruning saw is about the best for the purpose. After sawing out the various sections it is, however, quite necessary to have at hand polishing laps of the lesser sizes run at rather low rates of speed to avoid breaking the projecting scales. Then instead of the felts used in ordinary petrified wood polishing, sand paper of several grades of fineness may be used to bring the surfaces of the sections down to the needed smoothness cleared of saw cuts. The sections need no staining and no treatment. The natural colors leave all features of the woody cylinder and bundle patterns in bold outline. The color values lend themselves to photography. By first loosing and setting aside the seeds these may then be replaced in the finished transverse section. The great cones of Coulter's pine, the Sabine pine and the knobcone and sugar pine so sectioned afford remarkable material for classroom use in botany. No one who has seen such sections will ever again be in doubt about the organization of the cone, the features of the woody cylinder, the origin of the bract and scale supply and their features as they traverse the cortical parenchyma to divide up for the later course in bract and scale. Even the smaller cones can be similarly seen. The impression gained will be one of a remarkable unity in the general features of seed cones throughout the conifers, just as emphasized by Eames, studying Agathis several years ago, and by Worsdell.

Of course the student ought to hold in mind a variation of type which runs all the way from such an open lax cone as that of *Podocarpus andinus* to the giant close-set woody types, or yet includes cones, inflorescences, reduced to but a single seed as in the yew, where the modified seed scale is quite surrounded by bracts. He ought to recall that the angiosperms are a unit in which the flower was present in very ancient days, and that the ament of the poplar and the willow results from inequal reduction of those primitive flowers to forms analogous to coniferous fertile shoots. He ought to see that the cycadeous strobilus is the remote prototype of the magnolia seed cone; that there must be hidden in the older rocks

an amphisporangiate strobilus, either simple or complex. That strobilus is in a measure visualized in Cycadeoidea. Maybe it is seen in Tumboa. In any case it was a forerunner of flower and cone.

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THE SPECTRA OF GASES LIGHTED WITH STRONG ELECTRICAL DISCHARGES

THE spectrum of a gas is known to vary with the pressure and the type of electrical excitation. Experiments were undertaken to find out what the spectrum of the gas is like when very strong discharges are used. A small discharge tube containing the gas at pressures up to several cms of mercury was arranged to be excited either in the usual way by the discharge of a transformer, or by a small 0.002 microfarad condenser, or by the violent discharges of a 1 microfarad condenser charged to 15,000 volts. The discharge of a 1 microfarad condenser at this voltage is quite an energetic affair; it produces a blinding flash of light and a pulse of sound like a gunshot. With hydrogen in the tube the Balmer lines widened with increasing strength of the discharge, the higher members of the series disappeared and the continuous spectrum became more intense, until with the 1 microfarad condenser discharges there were no Balmer lines left at all, only the continuous spectrum and some absorption lines due to aluminum from the electrodes, etc. Helium, oxygen and nitrogen exhibited similar changes, *i.e.*, with increasing intensity of the discharge in helium the lines gave way to a continuous spectrum, and in oxygen and nitrogen the molecular bands gave way to spark lines and these in turn to a continuous spectrum. The continuous spectra from all the gases were closely alike. The intensity distribution across the continuous spectrum was rather even and probably not that of a black body.

The result of the experiments was in some respects a surprise, although to be sure as the experiments progressed one could see in what direction they were headed. That certain lines would widen or disappear in the intense discharges was to be expected, but to find all the lines wiped out and their places taken by a smooth continuous spectrum was hardly anticipated. It seems that the external characteristics of the atoms were pretty well effaced. One may imagine that the conditions approached those in the interior of a star.

E. O. HULBURT

NAVAL RESEARCH LABORATORY

SCIENTIFIC MINUTE MEN IN ANTHROPOLOGY AND ARCHEOLOGY

IN cooperation with the Division of Anthropology and Psychology of the National Research Council, Science Service has arranged a plan by which competent and accurate reports of rumored discoveries relating to anthropology and archeology may be obtained for prompt publication in the press. The committee, appointed by the Division of Anthropology and Psychology, National Research Council, is as follows: Dr. Roland B. Dixon, Harvard University, Cambridge, Massachusetts; Dr. A. L. Kroeber, University of California, Berkeley, California; Dr. Leslie Spier, University of Washington, Seattle, Washington, and Mr. Neil M. Judd, chairman of the committee, U. S. National Museum, Washington, D. C. Dr. Fay-Cooper Cole, chairman of the division, has been helpful in formulating the plan.

The plan, briefly, is this. Selected anthropologists, geologists and paleontologists situated in geographically strategic localities are commissioned special correspondents of Science Service and authorized to visit and investigate any reported discoveries in their vicinity which may appear important or likely to receive wide publicity. Science Service guarantees to defray expenses up to $50.00; more than this, by prior agreement. Specific authorization is not required but the collaborator uses judgment in determining what needs investigation and, to avoid duplication of effort, first ascertains that others near by are not also starting out on the same report.

Before starting on any specific investigation, each investigator states what is known of the reported discovery, his personal plans, telegraphic address, etc., in a concise telegram sent press rate collect to Science Service, Washington, D. C. He does not wait for an answer but proceeds immediately with the investigation. Upon arrival at the site, the results of preliminary investigation are telegraphed to Science Service. Details and photographs are sent as soon as possible by mail.

Investigations are restricted to reported discoveries that seem likely to be of real importance or that seem likely to create considerable publicity. Science Service, supplying science news to a fifth of the newspaper reading public in America, is desirous through this plan to distribute accurate and prompt news of all important archeological and anthropological investigations before exaggerated and misleading statements are circulated.

The investigator arranges with his institution to coordinate his efforts under this cooperative plan with his activities on behalf of his institution. The scientific results of any investigation may be published as the scientist sees fit, but news reports and public statements, in consideration of the participation of Science Service, are distributed exclusively through Science Service.

Sixty-six archeologists and anthropologists located