sending chemists to Europe to study or by bringing chemists to this country to the University of Virginia, there to place with them four or five chemists to be trained by them under Dr. Small's direction. The latter plan was adopted, and with the cooperation of the United States Department of Labor the National Research Council brought to the University of Virginia Dr. Mosett and Dr. Burger from the laboratory of Professor Spaeth in Vienna. Dr. Small, Dr. Mosett, Dr. Burger and four chemists have been working at the University of Virginia for the past eighteen months on the synthesis and degradation of phenanthrene derivatives producing compounds of increasing complexity which resemble this nucleus of the morphine molecule in physiological function and in degradation compounds of the morphine molecule itself.

In order, however, to know what effect these compounds would produce, whether of value or of no value as substitutes for addiction-producing drugs, it was necessary also to have a unit which could test these chemical products in a systematic way for their biological action. Through the sympathetic cooperation of President Ruthven and the trustees of the University of Michigan, such a unit was arranged for in the department of pharmacology under the supervision of Professor Edmunds and Dr. Eddy. As soon as the chemical products are manufactured at the University of Virginia they are sent, with a report of their chemical composition and properties, to the University of Michigan where they are studied biologically and then reported upon. Both sets of reports are studied by the committee and the value of the substances determined. Some thirty new compounds have already been made at the University of Virginia and sent to the University of Michigan.

For such a plan of work there were various phases requiring the help of the United States government. This help and cooperation was freely granted by the United States Public Health Service under the direction of Surgeon-General Cumming and by the Narcotics Bureau under Commissioner Anslinger. Also two manufacturing houses rendered help by contributing rare chemicals for this study. These firms are Merck and Co. and Sharp and Dohme.

Preparatory to the setting up of the two units mentioned, the committee found it necessary to provide an analysis of the chemical literature of the morphine derivatives for the use of American students, especially for the use of the students in the laboratory for alkaloid chemistry at the University of Virginia. Dr. Small has prepared this for publication and the United States Public Health Service has agreed to publish it as a bulletin. A similar analysis of the literature of the biological action of morphine derivatives is being prepared for the use of the laboratory at the University of Michigan by Dr. R. A. Hatcher, professor of pharmacology at Cornell University Medical School.

Such analyses are necessary in order that the group of workers in each university may proceed with their problems without the necessity of individually spending their time studying the literature.

The second avenue of approach adopted by the committee that might prove of some assistance in the problem of drug addiction was to present accurate information concerning the necessary uses for which addiction-producing drugs should be employed. The committee felt that if it could present these necessary uses to the medical profession, with suggestions for the substitution of non-addiction drugs in cases where the latter would serve equally well, the use of addiction-producing drugs might be considerably reduced. Articles to present this information are being prepared by the American Medical Association in conjunction with the National Research Council by Dr. Fishbein and a group of skilled writers to be published in the *Journal of the American Medical Association.*

Graduate students interested in alkaloid chemistry or the physiological action of alkaloids will find opportunity for such study at the University of Virginia and the University of Michigan.

WM. CHARLES WHITE,
Chairman, Committee on Drug Addiction

AMERICAN SCHOOL OF PREHISTORIC RESEARCH

THE tenth annual session of the American School of Prehistoric Research opened in Paris on July 1, and closed in Prague on September 3. Twelve students—ten men and two women—all but two of them graduate students, were enrolled: Lloyd Cabot Briggs, Harvard University; Miss Jeanne Ernst, Mount Holyoke College; John P. Gillin, University of Wisconsin; Robert F. Greenlee, Northwestern University; Theodore D. McCown, University of California; Robert H. Merrill, University of Michigan; John Z. Miller, Lehigh University; Panchanan Mitra, Yale and the University of Calcutta; Cornelius B. Osgood, University of Chicago; Froehlich G. Rainey, University of Illinois; Miss Lucile Serrem, Columbia University; Sol Tax, University of Wisconsin. J. Townsend Russell, Jr., a former student of the school, assisted the director, who also had the assistance of two other former students after the group reached Czechoslovakia, *viz.*, V. J. Fewkes, of the

University of Pennsylvania, and Robert W. Ehrich, of Harvard University.

The itinerary included parts of France, Spain, Switzerland, southern Germany and Czechoslovakia. Digging was done in three sites, representing various culture levels: thirteen days in the Abri des Merveilles (Dordogne), with three horizons—two Mousterian and one Aurignacian; three days in the cavern of El Pendo (Prov. Santander), Spain, with four horizons—Mousterian, Solutrean, Magdalenian and Azilian; and seven days at Homolka, near Prague, with late Neolithic and early metal cultures.

This gave the students a wide range of experience not only in the art of digging, but also practice in the determination of specimens from various epochs as well as from various phases of a given epoch. It was our good fortune at El Pendo to help in the discovery of two works of art dating from the Magdalenian Epoch—a stag engraved on bone and a horse, likewise engraved on bone.

The actual digging was supplemented by visits to fifty prehistoric sites representing practically every phase of prehistory and by the study of museum and private collections. Coincident with the diggings and the visits to sites and museums, forty-two conferences were given—eleven by the director and thirty-one by foreign specialists and by certain of the students. For these conferences we are indebted to the Abbé Breuil, Harper Kelley, Z. Le Rouzic, G. Chauvet, Étienne Patte, Count Begouen, Louis Begouen and D. Peyrony, in France; Carballo in Spain; D. Viollier and Emil Bächler in Switzerland; F. Birkner and K. Hörmann in Germany; and J. Schranil and J. Skutil in Czechoslovakia. The students who gave conferences were Greenlee, McCown, Merrill and Tax; a former student—Fewkes—also gave conferences.

Toward the end of the term, thanks to the assistance of Russell, Fewkes and Ehrich, it was possible for Mrs. MacCurdy and myself to remain behind in France in order to make a prehistoric pilgrimage through France and Spain with General Charles G. Dawes, our ambassador to Great Britain, who met us in Périgueux on August 23 and remained with us until the end of the month. At the same time there also joined our party Mr. Addison L. Green, chairman of our board of trustees, and his son, Marshall Green. We visited the principal prehistoric sites of the Vézère Valley; then went to northern Spain to see the cavern of Altamira and the prehistoric museum in Santander. In Madrid, we visited the Archeological Museum and the Museum of Natural History; and in Seville, the Archivo de Indias. From Seville, we made a two-day excursion to the museum at Niebla, the dolmen de Soto, and the prehistoric copper mines at Rio Tinto.

During the spring months our school dug jointly with the British School of Archaeology, Jerusalem, at the cave of the valley near Athlit, and south of Haifa, Palestine. This was our second season at this site. Miss Dorothy Garrod, representing the British school, was again in charge; our two representatives were Dr. Martha Hackett, of Mount Holyoke College, and Theodore D. McCown, of the University of California. This second season's excavations yielded some 20,000 specimens dating from the Mousterian, Aurignacian, Mesolithic and later epochs. Joint excavations will be resumed here during the spring of 1931.

In March, 1930, there was published *Bulletin* No. 6 of the School (43 pages), containing the director's report and Miss Dorothy Garrod's paper entitled: "The Paleolithic of Southern Kurdistan," which describes the joint explorations and excavations of our school and the Percy Sladen Fund (British) during the autumn of 1928.

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SCIENTIFIC APPARATUS AND LABORATORY METHODS

TWO IMPROVEMENTS IN THE TECHNIQUE OF KYMOGRAPH RECORDING

1. THE use of the pressure air gun for applying carbon particles in suspension in the place of smoking to blacken the recording surface.

2. The use of transparent cellophane in place of glazed paper as a recording surface.

(1) In many respects the time-honored procedure of preparing kymograph paper for use by "smoking" is a very unsatisfactory one. The unevenness of the resulting surface, particularly when natural gas is used in the smoking burner, the inconvenience in operation and smudginess of the smoking arrangements, and the inadaptability to other surfaces than glazed paper are perhaps the most serious difficulties. It has been found possible to obviate these and other difficulties by applying a suspension of fine carbon particles in a suitably volatile vehicle, sprayed on to the recording surface with an air gun. The following procedures have been found advisable in the preparation and application of the carbon suspension.

a The vehicle should be sufficiently volatile to just wet the surface slightly. If put on too dry the impact of the jet tends to remove some of the already