

THE GEOLOGICAL SOCIETY OF AMERICA

GEOMORPHOLOGY NEWSLETTER 7

June 1963

Thank you all again for sending in information about your research in geomorphology and for the notices about conferences and for other suggestions. The Associate Editors who helped gather the news for this Newsletter again did an excellent job and are to be complimented; they are: Nelson R. Gadd, eastern Canada; William C. Bradley, Rocky Mountain area; Richard W. Lemke, Great Plains states; Arthur T. Fernald, central Atlantic States; Ernest H. Muller, New York and New England; William A. White, southeastern States. We have compiled almost as much news over a time span of this one past year as we compiled for Newsletter 6 after a hiatus of more than two years. This year we wrote also to those residing in foreign countries and had a few replies. A total of 373 geomorphologists or those claiming affiliation with the Group should have been reached by our Associate Editors or by our direct letter. We hope that all of you will take advantage of all this sharing of information in this Newsletter and will write to each other regarding mutual problems.

Sidney E. White, Editor

We wish to call attention to the Arid Lands Research Newsletter, a fine 5-10 page Newsletter which carries all sorts of announcements, research notes, and summaries of work being done in the arid and semiarid regions. It is published by the Committee on Desert and Arid Zones Research (of the American Association for the Advancement of Science); the mailing address is, % Geochronology Laboratories, Univ. Arizona, Tucson. Your name will be added to their mailing list without charge if you write, but voluntary cash contributions are the only funds that keep this Arid Lands Research Newsletter alive and operating.

NOTES FROM THE DESK OF THE SECRETARY

New officers of the Group elected by the recent mail ballot are:

- Chairman: Luna B. Leopold, U. S. Geological Survey
- First Vice-Chairman: A. L. Washburn, Yale University
- Second Vice-Chairman: David M. Hopkins, U. S. Geological Survey
- Secretary: Laurence H. Nobles, Northwestern University

The three new panel members, elected to serve two year terms from June 1963 to June 1965 are:

- William C. Bradley, University of Colorado
- Dwight R. Crandell, U. S. Geological Survey
- Donald F. Eschman, University of Michigan

Holdover panel members are:

- Ernest H. Muller, Syracuse University
- Paul R. Shaffer, University of Illinois
- Clyde A. Wahrhaftig, University of California

Link Washburn has agreed to serve as conferees for the Group on the Program Committee for the Annual Meeting in New York.

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On the recommendation of the Selection Committee the Council has chosen Arthur H. Lachenbruch as recipient of the Kirk Bryan Award for 1963. The Award is based specifically on Art's G.S.A. Special Paper No. 70 entitled Mechanics of Thermal Contraction Cracks and Ice-Wedge Polygons in Permafrost. Formal presentation of the Award will be made at the Geomorphology Group luncheon at the New York meeting.

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Current Status of the "Publication Situation" in Geomorphology

In November, 1961, E. H. Muller proposed from the floor of the Annual Meeting of the Geomorphology Group that the Chairman appoint a committee to investigate the situation in publication as it affects geomorphology. Chairman J. T. Hack appointed Muller to a committee consisting of himself, D. D. Smith and S. E. White with R. P. Goldthwait as Chairman. This committee circularized most of the affiliates of the Group and produced the report that was sent out with the revised edition of Geomorphology Newsletter No. 6. You will remember that this report seemed to indicate sufficient interest to warrant further investigation as to the financial feasibility of establishing a new journal of geomorphology. As a result of this report Chairman J. G. Fyles appointed a new committee consisting of R. P. Goldthwait, A. D. Howard, E. H. Muller and D. D. Smith with P. R. Shaffer as Chairman.

This committee is now investigating various publishing alternatives and would be delighted to have any information and ideas that might be furnished by the membership of the Group.

There appear to be three alternative methods of publication:

(1) Through a commercial house. At least one publisher has expressed interest, and is investigating the matter, but nothing has progressed beyond the talking stage as yet. The committee is in the process of sounding out other commercial publishers. Such a venture might take either of two forms--complete editorial and financial control of the Journal by the publisher, with no participation by the Group, or a joint effort in which the Group would take upon itself the task of providing some editorial help and/or supervision.

(2) Through a university press. A few have been approached; we are desirous of contacting more. This would undoubtedly involve considerable efforts on the part of the group in the editorial field.

(3) Printing by a printing house with the Group assuming the role of publisher. This is probably the least desirable of the three alternatives as it would involve a financial commitment of the part of the Group. The Council has given the Group the go-ahead, but with the restriction that we do not involve the Society financially or do anything to jeopardize the tax-exempt status of the Society. Thus an independent publishing venture would probably involve serious legal ramifications.

The problems that we appear to face are (1) limited subscription and (2) high cost. Based on Coldthwait's survey, an analysis of the Group membership made by Nobles, and information on the subscription to the old "Journal of Geomorphology" it seems unrealistic to count on more than 750 subscribers at the start, with later growth to perhaps a thousand. It appears that the subscription price for a quarterly journal with such a small subscription might have to be as high as \$ 15 per year.

If we are to proceed with such a journal it is evident at this stage that we need (1) a publisher, (2) an editor or group of editors to work in conjunction with this publisher, and probably (3) an angel. We have made some tentative investigations with respect to item (3) but with no great success as yet.

The committee earnestly solicits any information and/or opinions that members of the Group may have with respect to the foregoing items. Communications should be sent to the secretary, Laurence H. Nobles, Department of Geology, Northwestern University, Evanston, Illinois, who will duplicate them and circulate them to the committee members. We are in hopes that we may be able to have a formal proposal to submit to the Group by the time of the New York meeting.

Charles W. Carlston, USGS (Washington), has completed research conducted on a part-time basis over the past 5 years on the quantitative relationship between geomorphology and hydrology, resulting in a USGS Prof. Paper, Drainage Density and Streamflow, soon to be published. His current research is on meanders and meandering valleys, work which should shed some light on the relative validity of the cyclic versus noncyclic theories of landform evolution and on the general problem of underfit streams.

William W. Emmett, Hydraulic Engr., USGS (Washington), spent the summer of 1962 making surveys and cross sections of some small channels in the western States, the surveys to be repeated at intervals to measure changes with time. This is an initial attempt to implement the idea of a network of bench marks or hydrologic study areas as described by Luna B. Leopold in the following papers:

A National Network of Hydrologic Bench Marks, USGS Circular 460-B, 1962

The Vigil Network, Bull. Internat'l Assn. Sci. Hydrology, 7th yr., No. 2, 1962

The Man on the Hill, USGS Circular 460-A, 1962

It is hoped that the detailed locations and a file of basic data from such observation areas will be filed in 3 central repositories — Washington, D.C., Geneva, Switzerland, & Ghent, Belgium, so that years hence the location of bench marks will not be lost. The loss of such data on original surveyed locations has caused geomorphologists dearly in the last 3 years because we are unable to repeat surveys made by earlier workers. The plans for the central repositories in connection with the observation areas are described in the abovementioned publications. Send for your copies, c/o USGS, Washington. Botanical reconnaissance and additional areas will be established in summer of 1963 by several persons who are studying under Richard J. Chorley, Cambridge, England; William S. Benninghoff, Univ. Michigan; and Alan Jopling, Harvard Univ. It is hoped that these new workers will include Michael J. Kirkby, Cambridge; Thomas R. Detwyler, Michigan; and H. Olav Slaymaker, Harvard.

Walter B. Langbein, USGS (Washington), is working on a theoretical derivation of the hydraulic geometry of river channels based on the addition of 2 stochastic tendencies operating in river channels — a tendency for minimum total work, and uniform distribution of work. These tendencies were explained in a preliminary way in USGS Prof. Paper 500A, The Concept of Entropy in Landscape Evolution. Langbein, Robert M. Myrick, and Luna B. Leopold, USGS (Washington), have finished 2 papers on hydraulic and channel characteristics of small tidal estuaries for which the hydraulic geometry was measured. Leopold, Emmett, and Myrick are continuing their studies of erosion and sedimentation in an ephemeral wash near Santa Fe, New Mexico. Among the techniques being used is the following of painted rocks placed on the bed of the stream and later picked up after individual flows. This group is also continuing the study during periods of high discharge in the meltwater season, scour and fill changes, and high water profiles in a reach of Popo Agie River, near Lander, Wyo.

Robert S. Sigafos, USGS, has just completed a manuscript on the affect of floods on vegetation along the river and on the flood plain of Potomac River near Washington, D.C., by the use of tree rings and morphologic characteristics resulting from flood damage. He is able to date many of the flood occurrences which affected vegetation.

Stanley A. Schumm, and R. W. Lichty, USGS General Hydrology (Denver), have evaluated data collected at 50 gaging stations on the Great Plains in an effort to determine the effects of sediment character on fluvial morphology; their results soon will be published, as: Sinuosity of Alluvial Rivers on the Great Plains, G.S.A.Bull.; and Tentative Classification of Alluvial River Channels, USGS Circular. G. C. Lusby, USGS, General Hydrology (Denver), and Schumm have measured erosion on Mancos Shale hillslopes in western Colorado; the results show important seasonal changes in rates of erosion and in the erosion processes themselves.

F. L. Doyle, USGS, Ground Water Br. (Yuma), is studying geomorphology and surficial geology of the lower Colorado River from Yuma downstream towards the delta.

Jack R. Van Lopik and Donald D. Carr, Texas Instruments (Dallas), are presently engaged in studies to develop quantitative and objective systems for describing, classifying, and mapping surface geometry. This work is being conducted for Air Force Cambridge Research Laboratories. A recent report, "Terrain Quantification, Phase I: Surface Geometry Measurements," Texas Instruments Inc., Science Service Division, AFCRL Final Rept. 63-208, Project 7628, 85 pp., 31 Dec. 1962, summarizes previous and current investigations into quantitative terrain description.

Edith M. McKee, Winnetka, Illinois, is writing a book on paleogeomorphology as it relates to commercially important mineral deposits, with multi-layer paleogeomorphologic maps that have been used successfully for mineral exploration and evaluation. She writes that her work in geomorphology is a great help in interpreting subsurface structures!

Herbert M. Summers, Univ. Southern California graduate student, is utilizing time lapse photography to determine the nature of formation of subaqueous and subaerial current ripple in a study contrasting dune ripples, stream current ripples, and marine current ripples.

Walter R. Buss, Weber Coll. (Ogden, Utah), has just completed a model study, implemented by slow motion photography, of rapid mass movements in granular materials. According to A. D. Howard, under whom these studies were made, the results will have interesting implications in the field of mass movement. We hope the results soon will be published.

Carroll Hodges, Stanford Univ. graduate student, under supervision of A. D. Howard, is studying high-level erosion surfaces within the Sierra Nevada.

Chester B. Beaty, Geogr. Dept., Montana State Univ. (Missoula), is currently working on two projects, (1) slope development around the Missoula Valley, involving processes, climatic amelioration, and concomitant changes in processes, and (2) glaciation of the northern end of the Mission Range.

Peter E. Wolfe, Rutgers Univ. (New Brunswick, N.J.), completed his field work on Late Cenozoic uplifting and exhumation of the buried "Rocky Mountains" of central-western Montana.

Robert MacNish, Univ. Michigan graduate student, under supervision of D. J. Eschman, will continue field work on the geomorphologic history of Wet Mountain Valley, Colorado, and thus fill the gap between Arkansas Valley - Royal Gorge and the Huerfano Park region.

John Montagne, Montana State Coll. (Bozeman), reported excitedly about a study of avalanches in the Bridger Range this past winter (1962-63); this started partly as a service to winter sports enthusiasts and partly out of pure academic interest. Weather stations were set up and financed by U.S. Forest Service and with the help of M.S.C.'s Electronics Research Lab. With these instruments they were able to predict and control avalanches of major proportions and made progress in the fields of snow temperatures and vapors and their relations to avalanche occurrence. A secondary result of their studies will lead to an analysis of the effects of avalanching on modern topography, especially when the snow melts in the spring. Avalanches this past winter were the greatest in the history of the Bridger Range; some were tremendous, involving up to half a mile of runout on nearly flat slopes and over 40 feet accumulation of snow in the runout. John writes that they were quite successful in predicting the major avalanches, and that they are on the trail of finding new data that have a strong bearing on avalanches and their prediction, since Charles Bradley (W. C. Bradley's brother) has invented a new instrument for him called a resistograph that replaces the ram penetrometer as an instrument for determining the relative strength of various snow layers within the snow pack.

The Geography Dept. at Univ. Canterbury, New Zealand, is embarking on a combined climatic and geomorphic study of a small valley in the Southern Alps. Large scale maps of the angle and aspect of slopes and surface cover will be made. Climatic study under J. N. Rayner will include continuous recording of climatic parameters and calculation of heat and moisture balances under various macro-conditions. Investigations of runoff rates and of erosion processes on various slopes under various vegetative cover will be under the direction of R. S. Waters and Jane M. Soons.

The Geology Dept. of Univ. New Mexico have numerous faculty and graduate students working on geomorphologic problems and dissertations; these are:

Roger Y. Anderson and Douglas Kirkland, Reconstruction of Blancan Geomorphic Surface near Channing, Texas

Peter Coney, Geology and Geomorphology of the Cordillera Huayhuash, Peru

John W. Blagbrough, Geomorphology and Glacial Geology of the northern Chuska Mountains, New Mexico and Arizona

Steven Farkas, Geomorphology and Quaternary Stratigraphy of the Lake Peak area, southern Sangre de Cristo Mountains, New Mexico

Dwight Deal, Geomorphic History and Origin of the Gila Conglomerate, southwestern New Mexico

Gene Bailey, Directionality of Pyroclastic Distribution in relation to Geomorphic Surfaces in northern New Mexico

Lawrence Wagner, Origin of Recent Tractional Features and their relation to Channel Morphology of the Rio Puerco, Socorro County, New Mexico

James Sturdevant, Geology of the Olalla Area, British Columbia — an Analysis of relations of Ore Deposits, Structures, and Geomorphology

Ernest Lendenmann, Geomorphology and Ground Water, East Flank of the Manzanita Mountains, New Mexico

Charles Dodge, Coastal Morphology of Woodbine Shore Features, Tarrant County, Texas

Sherman A. Wengerd, Raised Marine Features of the Guaymas — San Carlos area, Sonora, México; also, Coastal Morphology and Recent Sediments between Estero Soldado and Venado Tomolo Lagoon, Sonora, México; also, Geomorphology and Glacial History of the Ridgway area, San Juan Mountains, Colorado (with K. F. Mather).

D. J. Colquhoun, Univ. South Carolina (Columbia), emphasizes that "... the dating of the Miocene sea cliff and recognizing of the Miocene marine deposits on the east and not on the west near Orangeburg, South Carolina was the work of Kenneth Pooser, ..." then a Ph.D. candidate at Univ. of Kansas. Credit to the work of Kenneth Pooser was not given in the 1962 Geomorphology Newsletter #6.

Donald Garrett, Univ. Southern California graduate student, is working on the Saratoga Springs dunes at the south end of Death Valley, California; his studies include nature of sediment movement across dunes, sediment type and size distribution within dunes, heavy mineral concentrations, nature of ripple marks, and variation in dune shape and configuration with time. By means of a carefully surveyed grid system, he has been able to collect monthly samples from one dune for about an 18-month period.

Robert M. Norris, Univ. California, Santa Barbara, is finishing a study of the barchan dunes of Imperial Valley, California; the dunes on the west side of this basin seem, like the Algodones dunes on the southeast side, to be related genetically to the old Lake Cahuilla (sic) beaches. Another project involves the relation between dune color and age; unconsolidated dune sands generally seem to darken with exposure to weathering. Norris would appreciate receiving sands from other dunes elsewhere.

Richard Van Horn, USGS (Denver), has started a 3-year study of the geology of the north part of Salt Lake Valley, Utah, including Lake Bonneville sediments that blanket large areas of the valley up to about 5150 feet, near the altitude of Bonneville shoreline.

Garald G. Parker, USGS, General Hydrology (Denver), with Lynn M. Shown and Karl W. Ratzlaf have studied for the past year erosion processes and resultant landforms in the drylands (arid & semiarid regions) of western United States. A principal research station was set up in the White River badlands, just north of Pine Ridge Escarpment, near Harrison, Nebraska. In addition, in cooperation with National Park Service and Oregon State Bureau of Parks, several research areas were established at selected sites for studies of general erosion and sedimentation, of slope-form analyses, of rates of cliff retreat, effects of exposure on different rock types, and similar or related geomorphic effects. Areas of intensive study for summer of 1963 will be in Bryce Canyon National Park and in Capitol Reef National Monument.

Richard O. Stone, Univ. Southern California (Los Angeles), and James Dugundji, Mathematics Dept., Univ. So. Calif., are engaged in a research project for the Waterways Expt. Sta. at Vicksburg, Miss., on definition, mapping, classification, and quantitative expression of microrelief features (greater than 3 inches and less than 10 feet). Maps of 25 micro-features of the semiarid environment were made; profiles from the maps are being analyzed by applying a Fourier Transform and using high speed computer methods.

Doak C. Cox, Tsunami Research Program, Hawaii Inst. Geophysics (Univ. Hawaii), started early in 1962 a 2- to 3-year research program on the oceanography, geology, and geomorphology of Hawaiian shorelines, instigated by a desire for better utilization of shoreline areas, and involving studies of source areas; rates of transport, of comminution, of loss of sand; and causes of historic shifts in shorelines. Ralph M. Moberly is in charge of initiating the program, Francis P. Shepard will help for certain periods of time, and the services of graduate students will be utilized to the utmost.

Roger L. Spitznas, Augustana Coll. (Sioux Falls, So. Dak.), graduate student of Stanford Univ. under supervision of A. D. Howard, is investigating the coastal geomorphology of a large segment of the Santa Cruz Peninsula south of San Francisco.

William C. Bradley, Univ. Colorado (Boulder), who worked summer of 1962 on marine terraces around Santa Cruz, Calif., with a sledge hammer seismograph, writes that the technique was successful most of the time in determining depth to bedrock where the latter was well-consolidated mudstone or siltstone and thickness of cover less than 30-40 feet, but would not work where bedrock was soft sandstone or badly weathered crystalline rocks. Surveys showed relief of as much as 15 feet on so-called "smooth" rock platforms within the terraces.

Donald Coates, Univ. Colorado graduate student (under W. C. Bradley), in summer of 1962, studied the short "wet weather" stream valleys that dissect the lowest marine terraces along the central California coast; in their lower parts, these streams are incised 5 to 15 feet in valley fill. He determined that the fill and incision both can be produced under present day conditions, and do not necessarily indicate either a sealevel change or a change in position of shoreline.

Francis P. Shepard, Scripps Inst. Oceanography (La Jolla, Calif.), reported early in 1962 that he had supervised extensive studies of the types of submarine canyons around the lower end of Baja California. Divers under supervision of Robert F. Dill discovered narrow granite gorges with overhanging walls at the heads of several canyons, and evidence of at least one vertical wall in depths of 600 fathoms. Turbidity currents apparently carry coarse sediment to at least 1200 fathoms along the axes of the canyons.

James C. Ingle, Jr., Univ. Southern California graduate student, is completing a research grant for ONR on tracing beach sand movement by means of fluorescent dyed sands. He has compiled data on nature and rate of sand transport, zones of erosion and deposition, size of sediments involved, and has perfected a technique which yields to quantitative determination. This method of analysis is currently being extended to movement of sediment down into submarine canyons and to eolian transport on desert dunes.

Ray Gremillion and W. F. Tanner, Florida State Univ. (Tallahassee), and Paul Huddleston, one of their students, have been studying long ridge-and-depression pairs which look like they might be abandoned Pleistocene barrier islands and lagoons. These features occur on several different terraces at altitudes up to about 200 feet.

Norman Hyne, Florida State Univ. graduate student, has been comparing beach features observed on a low-energy beach near Tallahassee (annual breaker height about 6 cm) with those on a high-energy California beach. He reports that the low-energy beach sands have much less "internal structure," and that grain orientation (long axis parallel with maximum beach slope in both areas) is statistically more sharply defined on the low-energy beach. Internal structures have been studied by means of X-ray radiography.

Jon Schnable, Florida State Univ. graduate student, is studying the barrier islands which rim the delta of Apalachicola River in order to work out a detailed history of the area. Dan Shier, Fla. State Univ. grad. student, has discovered what appears to be a wave-cut notch in Tertiary limestone at the "minus one-meter" level along the lagoon coast east of Carrabelle, Fla. Bruce Grant, Fla. State Univ. grad. student, has recently completed a summary study of barrier island characteristics along selected parts of coasts of Mozambique, Brazil, Holland, and United States. In making a preliminary world-wide appraisal, he noted that barriers rarely develop along coasts within about 20° of the equator.

Francis Ruellan, École Pratique des Hautes Études, Lab. Geomorph. (Ille et Vilaine, France) writes that their principal research is oriented toward littoral and pre-littoral studies around Bretagne and in particular toward preparation of a geomorphic and sedimentologic map at 1:10,000 du golfe Normand-Breton. Others working in the Laboratory are undertaking research in the interior of France, in the Sahara, and in Brazil.

Roger H. Charlier, Chicago Teachers Coll.-North (5500 N. St. Louis Ave., Chicago 25), recently published an article on coastal morphology (France and Belgium Atlantic shores) in *Zeit.für Geom.*, and now is trying desperately to find financial support to publish a bibliography (1950-1961) of coastal, sedimentological, and geomorphological publications in French.

G. William Holmes, USGS (Washington), with Joseph H. Hartshorn, USGS (Boston), expect to complete their reconnaissance mapping of the glacial geology of the Berkshire Hills, Mass., by end of summer of 1964. In the meantime, Holmes, with Bjørn G. Andersen, Univ. Oslo, will conduct intensive studies during summer of 1963 in southeastern Norway tracing the Ra (middle Swedish Salpausselkä) moraine to the Swedish Border.

Charles S. Denny, USGS (Washington), plans to continue his work in Champlain Valley. He hopes to complete mapping the Plattsburg and Dannemora quadrangles, and, with A. Williams Postel, USGS, to continue a study of drift lithology in the northeastern Adirondacks.

Chauncey D. Holmes, Univ. Missouri (Columbia), is still working on the glacial history of central New York State with new emphasis, now on palynology and radiocarbon dating.

Ken Pierce, Yale Univ. graduate student, is finishing a study of the surficial geology and geomorphology of the McConnellsburg Valley area, Pennsylvania.

William J. Wayne, Indiana Geol. Survey (Bloomington), has a paper in press on Pleistocene Formations of Indiana, in which he has established rock-stratigraphic units for these Pleistocene sediments he has been working on for so long.

Allan F. Schneider, Indiana Geol. Surv., and Hank Gray, have completed a report on the geology of Upper East Fork (of White River, Indiana) Drainage basin, undertaken at request of Indiana Flood Control & Water Resources Commission. Field work for the 1° x 2° Chicago quadrangle, a cooperative program with Illinois Geol. Surv., will begin in summer of 1963 with Schneider in charge of mapping; both bedrock and glacial geology will be mapped.

W. Hilton Johnson, Univ. Illinois (Urbana), completed a study of the Illinoian and Kansan glacial deposits in central Illinois.

Wakefield Dort, Jr., Univ. Kansas (Lawrence), is studying significant new exposures of Nebraskan and Kansan tills and glaciofluvial deposits along the east side of the Missouri River Valley in northeasternmost Kansas. Of 17 quarries (sic) in an 11 mile stretch, 5 are rapidly being expanded, and all exposures show intricate stratigraphy.

Richard W. Lemke, USGS (Denver), is completing field work near Great Falls, Montana, where determination of the southern limits of continental glaciation, differentiation of the drift sheets, and examination of different levels of glacial lake Great Falls and associated outlet channels constituted part of the study. Previously, with Colton and Lindvall, the USGS (Map I-327) Glacial Map of Montana East of the Rocky Mountains, was published.

The North Dakota Geological Survey, headed by Wilson M. Laird, continues to carry on glacial geology mapping in many counties - 5 new ones since our last report. Lee S. Clayton was author of their Bull. 37 on Glacial Geology of Logan and McIntosh Counties, North Dakota, in which ideas on origin of dead ice deposits in the Coteau area are offered. Laird and Samuel J. Tuthill started work on terraces of the Little Missouri River, paying particular attention to the sedimentological history and the fauna.

Richard F. Madole, Ohio State Univ. graduate student and Fellow of Inst. Polar Studies, under supervision of S. E. White, completed his mapping of the Pleistocene stratigraphy of the whole of St. Vrain Drainage Basin on the east side of Colorado Front Range. He has identified pre-Bull Lake till on the interstream divides above 11,200 feet as well as that previously reported in Tahosa Valley, 2 stades of Bull Lake till, 3 stades of Pinedale till, and 2 stades of still younger till in the cirques; these will be correlated with the outwash from the same drainage basin out on the Piedmont between the high pediment remnants.

E. L. Hendricks, USGS, and Robert S. Sigafos are continuing their study of recent changes in a glacier on Mount Rainier, Washington, using botanical evidence stemming from the effect of ice on the forests.

Reconnaissance of the glacial Late Pleistocene in New Zealand continues, mainly on the east side of the Southern Alps; those currently or recently engaged include William E. Powers, Fulbright Visitor, Northwestern Univ., U.S.A., studying the Hurunui River Valley, North Canterbury; Jane M. Soons, Geogr. Dept., Univ. Canterbury, studying part of the Rakaia Valley, Canterbury; Lee S. Clayton, Fulbright Scholar, Univ. North Dakota, working on the Waiarau, Hope, and upper Clarence Rivers, North Canterbury; and D. R. Gregg, NZGS, and Maxwell Gage, Univ. Canterbury, working jointly in the Rangitata and South Ashburton River Valleys, South Canterbury. Useful contributions to regional Pleistocene geology also have come from the 1:250,000 geological mapping project of NZGS, but most of the remaining areas for future work are extremely difficult of access.

John R. Williams, now with USGS, Water Resources Div. (Anchorage), has been studying glacial and glaciolacustrine deposits of the southwestern Copper River Basin and nearby upper Matanuska Valley. Some of this work is published, as in Arctic in 1961 (Late Wisconsin and Recent History of the Matanuska Glacier, Alaska, with Oscar J. Ferrians, Jr.), and as contributions to USGS Misc. Geol. Inv. Map I-357, with others, on the Surficial Deposits Map of Alaska. He is now engaged in research on occurrence of ground water in permafrost regions.

O. J. Ferrians, Jr., USGS (Washington), is compiling a map, scale 1:2,500,000, showing the distribution and general character of permafrost in Alaska. He also is continuing the preparation of final reports on surficial geology of northeast part of Copper River Basin.

Lynn Yehle, USGS (Washington), completed the third season of a 3-year project mapping the surficial geology of Lower Chitina Valley, south-central Alaska.

Henry R. Schmoll, USGS (Washington), also completed the third season of a 3-year project involving areal mapping and glaciation of the Slana-Tok area, south-central Alaska.

John R. Reid, Univ. North Dakota (Grand Forks), reported on his studies of the near-stagnant portions of the Martin River Glacier, east of Cordova, Alaska, with Lee S. Clayton; he accompanied W. M. Laird, principal investigator, who worked on the limnology of the lakes with S. J. Tuthill. Reid's dramatic account of the draining of the "sinkhole" lakes is described in Amer. Geogr. Soc. Glaciological Notes, No. 13, Jan. 1963, p. 11-12. The project will continue in 1963 with special emphasis on lacustrine deposits associated with the front of the main ice lobe and on thickness and nature of the dead-ice moraines.

Weston Blake, Jr., Geol. Survey Canada (Ottawa), completed his work, under supervision of R. P. Goldthwait, on Geomorphology and Glacial Geology of Nordaustlandet, Spitsbergen, and in summer of 1962 undertook reconnaissance geology of the Bathurst Inlet region. In 1963, he will continue reconnaissance work on Bathurst Island.

George Denton, Yale Univ. graduate student, started work in summer of 1962 on glacial geology of the southeast end of Kluane Lake, Yukon Territory; this work is part of the Icefield Ranges Research Project, organized by Walter A. Wood.

R. J. Fulton, Geol. Surv. Canada, finished his work at Northwestern Univ. on Deglaciation of Kamloops Region, British Columbia, and he will now extend this work in summer of 1963 with reconnaissance at the north end of Okanagan Valley. His main interest will be studies of lake silts, recent volcanic ash, and pre-last-glacial stratigraphy.

O. L. Hughes, Geol. Surv. Canada, has a preliminary report in press on Surficial Geology of Dawson, Larson Creek, Nash Creek Areas, Yukon Territory; in summer of 1963 he will compile data from helicopter reconnaissance of northern Yukon and the Mackenzie Delta regions.

E. B. Owen, Geol. Surv. Canada, Engineering Geologist, in the course of work on damsites on Rat, Porcupine, and Peel Rivers, Northwest Territories and Yukon Territory, found an interesting distribution of "jasper-hematite pebbles" from ore deposits in the Snake River area that are interpreted by O. L. Hughes as evidence of northward-moving ice in that region. Tusk ivory was found also in gravel in McDougall Pass in Mackenzie River Drainage Basin.

J. S. Scott, Geol. Surv. Canada, Engr. Geologist, will begin investigation of slope stability in the Upper Cretaceous of western Canada, in cooperation with Univ. of Alberta.

J. Ross Mackay and John K. Stager, Geogr. Dept., Univ. British Columbia (Vancouver), will spend summer of 1963 studying the pingos and ground ice of the Mackenzie Delta area, a continuation of field work carried on for many years.

William H. Mathews, Univ. British Columbia, completed a report on dating by K/A of 13 Cenozoic volcanic rocks in the southern half of British Columbia. These already have helped in tying the geomorphic history of the region to the geologic time scale. He is also undertaking work on the hydrology of glaciers, including the normal release of meltwater, abnormal floods from failure of ice-dams, and the record of water pressure on the underside of a glacier 500 feet below ice surface. This last study should provide new data on consolidation of sediment beneath glaciers and the possibilities of hydrostatic uplift as contributing to the slip of a glacier over its bed.

George W. White, Univ. Illinois, has 3 graduate students working on problems in glacial geology in Saskatchewan: William A. Meneley is completing a dissertation in the Melfort area, Sidney Whitaker is beginning one in southern Saskatchewan, and Gerald Burns will act as field assistant preparatory to his own studies.

L. J. Chapman, Ontario Research Foundation, is continuing his study of the Lake Algonquin plain east of Georgian Bay. Particular attention is being paid to possible outlets to the Ottawa Valley used during the draining of the lake. Also under way is a revision of his book, co-authored with D. F. Putnam, *The Physiography of Southern Ontario*.

Paul F. Karrow, Ontario Dept. Mines, plans to complete Pleistocene mapping of the Guelph area of southwestern Ontario. Also during 1963, a cooperative mapping project under the chairmanship of Karrow will be carried out northwest of Toronto by a committee of representatives from the fields of hydrology, civil engineering, pedology, and Pleistocene geology. A comprehensive report is planned incorporating maps of geology, soils, ground-water, and engineering data.

Ed. Mirenych, Geol. Surv. Canada, did geologic work in areas west of Kingston, Ontario, supplemented by seismic studies to locate preglacial channels and determine drift thicknesses in Oak Ridges moraine and by borings in small lakes adjacent to Lake Ontario for pollen study. The 1963 field season will take him to the west Ungava Peninsula for reconnaissance geology by helicopter.

Hulbert A. Lee, Geol. Surv. Canada, will begin investigation of criteria for tracing gold and associated minerals in basal till and glacial dispersion of ore fragments in the Kirkland Lake District, Ontario.

Owen L. White, Univ. Waterloo (Ontario), will commence mapping the Pleistocene geology of the Bolton Sheet, northwest of Toronto for Ontario Dept. Mines.

John A. Elson, McGill Univ. (Montreal), is chairman of a Soils Subcommittee whose duty it is to recover data of scientific value from the excavations of the Montreal subway. Two other committees deal with bedrock and engineering geology. As the subway is being constructed by a tunnelling technique the opportunity for observing contacts in Pleistocene deposits may be more limited than hoped for. Much of the 1962 field season was spent preparing for two field trips which McGill sponsored last October. The St. Narcisse moraine system (probably Valdres) was traced about 90 miles west from the Three Rivers area.

Aleksis Dreimanis, Univ. Western Ontario (London), has published a description of a simple quantitative method for determination of dolomite and calcite. He is continuing studies of pre-classical Wisconsin in Southern Ontario; new interesting material was obtained by drilling 60-130 feet below the Lake Erie level at the Port Talbot Interstadial type locality, and also new plant-bearing interstadial deposits were located in the Toronto area. During summer of 1963 Pleistocene deposits will be mapped in the London-St. Thomas area for Ontario Dept. Mines. Under his supervision M. Rutulis completed a study on differentiations of tills in Southern Alberta, applying pebble counts, carbonate analyses, X-ray diffraction analyses and till fabric measurements. U. Vagners started a study on till-bedrock relationship in Southern Ontario, and G. MacKenzie on correlations of Pleistocene cores and exposures in Lake Erie Basin. M. J. Risk will study shallow water ripple marks in the Great Lakes.

Norman P. Lasca, Univ. Michigan graduate student, under supervision of D. F. Eschman, will continue his work in Skeldal, East Greenland, on modern moraines, ponded features of at least 3 distinct ages, raised marine beaches, and on pingos.

James H. Zumberge, Grand Valley State Coll., Allendale, Michigan, brings us up to date on the Ross Ice Shelf Expedition of 1962-63 of Univ. of Michigan: Walther Hofmann, geodesist from Munich, Germany, was party leader; other members were Klemens Nottarp, electrical engineer, Frankfurt; William Campbell, glaciologist and meteorologist, Univ. Washington; John Heap, glaciologist, Scott Polar Institute; Arthur Rundle, glaciologist, Univ. Michigan and Egon Dorrer, geodesist, Munich. The group completed a tellurometer traverse from McMurdo Sound to Camp Michigan along the "Old Dawson Trail." A north-south leg of the traverse extended to about 81° South along a trail originally established by Bert Crary. The party also remeasured accumulation stakes set out in 1960 by Swithinbank, and remeasured 100-meter strain rosette stakes at 20 locations along the Camp Michigan - McMurdo route.

For the past year, Charles Swithinbank has been director of Univ. of Michigan's Glacial Geology and Polar Research Laboratory; he returns to Scott Polar Inst. in Cambridge, England for the summer of 1963. Work of the Laboratory on the ice of the Great Lakes will be continued by John Heap, formerly of Scott Polar Inst.

Arthur D. Howard, Stanford Univ., returned in September 1962 from a 2-year stay in Salvador, Brazil (erroneously reported as San Salvador in Newsltr #6), and is now completing a photogeological study of a large test area in the Amazon Basin for the Brazilian Petroleum Corporation. He is finishing the last of a textbook on practical photogeology, and plans to continue his long range study of the evolution of the landscape of San Francisco Bay region.

William H. Mathews, Univ. British Columbia, has received a Senior Research Fellowship from N.R.C., Canada, to undertake Pleistocene studies in New Zealand for a year starting July 1963.

Robert K. Fahnestock, USGS (Fort Collins, Colorado), will join the Geology Dept. of Univ. of Texas in September 1963. He is currently working on the fluvial morphology of streams of the Olympic Peninsula of Washington and on reaches of the Rio Grande near El Paso, Texas.

Richard F. Flint, Yale Univ., returned recently from a 2-month sojourn in Argentina where he studied glacial geology and pseudo-glacial geology on the east side of the Andes; he is also concerned, in cooperation with John Sanders, Nick Coch, and Bob Oaks, in an investigation of Pleistocene sediments and Coastal Plain features in Virginia under the auspices of ONR.

Paul R. Shaffer assumed his new duties as Associate Provost of Univ. of Illinois in February 1963. He continues part-time teaching in the Geology Dept. and his graduate students are continuing a research program in glacial geology in Illinois and Missouri.

Paul MacClintock, Princeton Univ., is working with Perry Stewart on the Vermont Geol. Survey in mapping the glacial geology of that State.

Heikki Ignatius, Geol. Survey of Finland and Univ. of Oulu, is Visiting Associate Professor at Univ. of Illinois for the year 1962-1963, where he is teaching geomorphology and offering a seminar in glacial geology.

Richard W. Lemke, USGS (Denver), wrote in 1962 that he returned from a year's assignment in Chile (1961-1962) where he was engaged in geologic studies pertaining to reconstruction in the southern part of that country following the earthquakes of 1960. A direct relation between damage and that of landforms and kinds of materials was demonstrated in most places.

Donald R. Coates, Harpur Coll., will teach this summer at Univ. Illinois field camp in the Bighorn Mountains, Wyoming. Next academic year (1963-64) he will be on sabbatical leave with the NSF in Washington, in the Scientific Education and Personnel Division. His long-range research interests include development of parameters for integrating geologic and hydrologic data, and analysis of the drainage history of eastern North America.

G. Gordon Connally, S.U.N.Y. College at New Paltz, is completing an investigation of drift dispersion and moraine limits in south central New York between Seneca Lake and the Genesee River. A related analysis of distribution of heavy minerals in till of this region was completed last year by Norman E. Wingard, Michigan State Univ. graduate student.

L. J. Crain, USGS, Ground Water Br. (Albany), is preparing reports on a 2-year groundwater study in the Jamestown area of southwest New York where sub-surface data suggest that major shaping of certain through troughs occurred in pre-Wisconsin time and the Wisconsin ice failed even to remove completely the pre-Wisconsin fill.

William R. Farrand, Columbia Univ., has been studying deep water cores from the bottom of Lake Superior, investigating the sub-bottom topography, and considering the possible origins of deeply submerged valleys on the floor 500 to 1200 feet below present lake level. For the summer of 1963, he joins an archeological field program in south central Turkey, directed by Ralph Solecki, Anthropology Dept., Columbia Univ. In October 1963, he begins 2 years residence at Univ. of Strasbourg, where he plans to study glacial morphology and stratigraphy in the Vosges and the Rhine Valley.

Bruce C. Heezen, Lamont Geol. Observatory, Columbia Univ., in late 1962 investigated the Hikurangi, Kermadec, and Tonga Trenches and studied archipelagic aprons of the Pacific between Samoa and Tahiti. With Marie Tharp, he is completing a Physiographic Diagram of the Indian Ocean, scale 1:10,000,000, and text to accompany the previously published Physiographic Diagram of the South Atlantic.

Robert L. Nichols, Tufts Univ. (Medford), plans to return to Inglefield Land, northwest Greenland, summer of 1963 under NSF and U.S. Army auspices for study of raised beaches, glacial geology, and pre-glacial geomorphology.

Frederick Johnson, Phillips Academy (Andover, Mass.), has just returned from work with the Tehuacan Archeological-Botanical Project in southern México which currently involves the collaboration of some 15 specialists. Human occupation prior to 9000 B.C. seems to be indicated and a well-documented chronology of climatic change is being developed.

Under Alan V. Jopling, Harvard Univ., three graduate students are engaged in study of mass movement and erosion processes: Martin Cassidy is investigating rock creep on Mount Washington, N.H.; Larry Dingman is studying movement of cobbles and boulders in New Hampshire mountain streams; Val LaMarche, now with Hydrology Section, USGS, is attempting quantitative estimates of erosion rates based on Bristlecone dendrochronology in White Mountains, Calif.

Robert G. La Fleur, Rensselaer Polytech. Inst., is attempting to relate the phases of Lake Vermont to the lower levels of Lake Albany in the Schuylerville area, N.Y. An excellent source of information on grading and sole markings in uncompacted sediments is being studied in bottomset beds of an ice-margin delta at Rensselaer.

Walter S. Newman, Queens Coll., N.Y.C., reports progress in a variety of coastal sedimentologic and geomorphic studies. With David Krinsley and Miles Silberman, both of Queens, and Taro Takahashi of Univ. of Rochester, he is developing electron microscopic criteria to distinguish among glacial, eolian, and littoral sands. With Krinsley, he is applying these criteria to a suite of sand samples collected from the modern foreshore to the Suffolk terrace south of Norfolk, Virginia, to support geomorphic studies by Nick Coch and Bob Oaks. With Alfred C. Redfield, Woods Hole Oceanog. Inst., and Rhodes Fairbridge, he is undertaking a study of salt marsh stratigraphy and coastal morphology of the New York Bight.

H. T. U. Smith, writing from Palo Alto, Calif., where he is winding up a year of sabbatical leave, reports that the Geol. Dept. Univ. Mass. recently moved into the first two sections of a new building with a third and final section still to be added. Available facilities include a large stream table, an experimental cold room, and photogeological laboratory. Photogeologic studies of ice-free areas in Antarctica, and field studies on playas, desert erosion and sedimentation are underway by Smith, Ward S. Motts, and several graduate students as well as coastal erosion and sedimentation on Cape Cod by Gregory Webb and his students.

David P. Stewart, Miami Univ. (Oxford, Ohio), reports on the glacial mapping program of the Vermont Geol. Survey. A report on Glacial Geology of Vermont was published in 1962 as Bull. 19, and publication of a surficial geology map of the state will occur in the near future.

Rhodes W. Fairbridge, Columbia Univ., returned in autumn of 1962 from travels that included research in Egypt-Sudan-Libya, lecturing at the Sorbonne, and collecting radiocarbon samples for dating of the "celebrated and much-disputed mid-Holocene high sea level." He has resumed work on a Bibliography and Index of Organic Reefs.

Ernest H. Muller, Syracuse Univ., mapped surficial geology of the Belmont and Wellsville quadrangles in 1962. In summer of 1963 he will again be aided by undergraduate research participants under an NSF grant. The ultimate goal of this continuing work is compilation of a Pleistocene geology map of the western part of New York, scale 1:250,000. He also plans field work in the Bristol Bay region of southwest Alaska to relate previously developed glacial chronology to archeological work of Don Dumond, Univ. Oregon.

James S. Street, Syracuse Univ., who last summer (1962) completed a study of lateral variation in tills in the Rush Creek area of central New York, plans to begin mapping the glacial geology of the Tug Hill Plateau in summer of 1963 under sponsorship of N. Y. State Museum.

William O. Field, Amer. Geogr. Soc., is assembling a report on behavior of glaciers of southern central Alaska, and continues his responsibility for World Data Center A for Glaciology.

Listed below are the research programs in geomorphology, glacial geology, and closely allied fields that have been proposed to or are currently being sponsored by the Office of Naval Research. Such a list, submitted by Louis O. Quam, is pertinent here for it shows where our research interests lie today.

Principal Investigator & Institution

Research Topic

R. J. Russell, Louisiana State Univ. (Coastal Studies Institute)	Coastal environmental processes, and morphology of coastal features, incl. worldwide studies of beaches, reefs, coral platforms, deltaic and alluvial coasts.
J. H. Vann, Louisiana State Univ.	Geomorphology of lowland Guiana coasts.
A. N. Strahler, Columbia Univ.	Analysis of beach forms and processes, Sandy Hook
H. G. Goodell, Florida State Univ. &	Sedimentation, bottom topography, and water
D. S. Gorsline, Univ. Southern California	characteristics in Florida bays.
C. S. Alexander, Univ. Illinois	Geomorphology and soils of northern Tanganyika coast.
J. E. Sanders and R. F. Flint, Yale Univ.	Coastal plain and continental shelf stratigraphy and geomorphology, southern Virginia.
A. L. Bloom, Cornell Univ.	Marsh morphology and sea-level changes in coastal Connecticut.
F. Ahnert, Univ. Maryland	Occurrence of estuarine meanders.
C. G. Higgins, Univ. California (Davis)	Distribution and origin of beach rock in Greece.
R. L. Miller, Univ. Chicago	Kinematics of sediment particles within breakers.
H. G. Richards, Phila. Acad. Natur. Sci.	Marine Pleistocene of eastern North America.
H. E. Wright, Jr., Univ. Minnesota	Lake sediment chronology and climatic change in the Near East.
C. J. Roy and K. M. Hussey, Iowa State Univ.	Alluvial morphology and origin of silt (so-called loess) deposits, Missouri River Valley.
D. S. Simonett, Univ. Kansas	Role of landslides in slope development in the high rainfall tropics (New Guinea).
T. K. Chamberlin, Scripps Inst. Oceanog.	Submarine Canyons of east-central Honshu, Japan.
H. J. Walker, Louisiana State Univ.	Morphology of Arctic Coasts and Deltas.
R. P. Goldthwait, Ohio State Univ.	Glaciology and Geomorphology of Sukkertoppen area, Greenland.
S. Apollonio, Yale Univ.	Glaciology of Devon Island.
K. M. Hussey and R. W. Fass, Iowa State Univ.	The Gubik (Pleistocene) near Barrow, Alaska.
J. C. F. Tedrow, Rutgers Univ.	Soil-forming processes in Arctic Alaska.
A. H. Lachenbruch, U. S. Geol. Survey	Permafrost investigations in Alaska.
C. Benson, Univ. Alaska	Snow studies on the Arctic Slope, Alaska.
R. A. Bryson, Univ. Wisconsin	Heat exchange, lake ice and bog studies, Canadian Subarctic.
G. P. Woolard and N. Ostenso, Univ. Wisconsin	ARLIS II Drift Station studies on Arctic Basin Geology and Geophysics.
K. Hunkins, Lamont Geol. Observatory	Ice Island T-3, Arctic Basin Studies.

A N N O U N C E M E N T S

MEETING OF ASSOCIATION OF AMERICAN GEOGRAPHERS

At the Denver annual meeting of the Association of American Geographers, on 2-4 Sept. 1963, there will be an invited panel on the geomorphology of the Rocky Mountains with W. E. Powers as panel chairman. At this early date we know only of the speakers and their subjects:

- G. M. Richmond: High level erosion surfaces in the Rockies - their origin and age
- H. E. Malde: Changing environment of ancient man in the Rocky Mountain region - late Pleistocene to Recent
- W. S. Osburn: Mass wasting at high altitudes in the Rockies
- J. Montagne: Glacial history and stratigraphy in the Jackson Hole-Yellowstone region
- R. V. Ruhe: Basin fluvioglacial deposits and terraces

LATIN AMERICAN CONFERENCE ON STUDY OF ARID REGIONS

The Latin American Conference Relative to the Study of Arid Regions will be held in Buenos Aires, 16-21 Sept. 1963 under the auspices of UNESCO. The work of the conference will be developed by means of reports from individual nations, plenary sessions, study sessions (symposia and round table discussions), conferences, and scientific and technical communications. For information and General Circular #2, write to: Ing. Agr. Antonio J. Prego, Exec. Secy, Working Committee, Instituto de Suelos y Agrotecnia, Cerviño 3101, Buenos Aires, Argentina.

CONFERENCE ON PERMAFROST

The Building Research Advisory Board of the National Academy of Sciences — National Research Council announces an International Conference on Permafrost, at Purdue University, Lafayette, Indiana, 11-15 Nov. 1963. Papers will not be presented orally, but will be prepared well in advance for study by panel members who will then discuss them in specific subject matter sessions. The several sessions will explore: Surficial Morphology; Massive Ground Ice, Gelifluction, and Patterned Ground; Phase Equilibria and Transitions; Thermal Aspects; Physico-Mechanical Properties of Frozen Ground; Exploration and Site Selection; Sanitary and Hydraulic Engineering; Earthwork and Foundation Engineering; and Research Needs. Program and registration form are now available, from: Robert P. Darlington, Asst. Director for Program Planning, Building Research Advisory Board, 2101 Constitution Ave., N.W., Washington 25, D.C.

GEOMORPHOLOGY AT INTERNATIONAL GEOGRAPHICAL CONGRESS, LONDON, 1964

The 1964 London meeting of the International Geographical Congress has a strong appeal to geomorphologists. A brief list of some of the activities, sent in to us by Keith M. Clayton, will illustrate this. While the Congress as a whole lasts from early July to mid-August, the main meetings will be in London from 20-27 July 1964. At these meetings the Congress will be divided into 9 sections, of which Geomorphology is one, and Hydrology, Oceanography, and Glaciology, are another. In these 2 sections, papers for reading will be on the following topics:

- Fluvial transport, meanders and stream flow; Use of statistical methods and field experiments; Periglacial phenomena; Glacial erosion; Coastal geomorphology; Changes in sealevel, particularly in relation to glacial fluctuations; Polar regions; Ocean floor - submarine geomorphology and sedimentology.

During the London meetings, the following Commissions of I.G.U. also will hold sessions for reading of papers: Karst Phenomena; Evolution of Slopes; Periglacial Morphology; Erosion Surfaces around the Atlantic; Coastal Geomorphology; Applied Geomorphology.

Outside London, the following Symposia will be held (each designed to attract 20-50 participants):

- A. Pleistocene geomorphology. Two symposia, the first at Exeter, 10-15 July, to discuss periglacial topics; the second at Cambridge, 15-19 July, to discuss aspects of continental glaciation.
- B. Erosion surfaces. At Bristol and Swansea, 12-20 July.
- C. Karstic phenomena. At Settle (Yorks.) and Buxton (Derbys.), two British karst areas from 28 July - 4 August.
- D. Coastal phenomena. At Norwich and Exeter, 29 July - 6 August. Especially on movement of beach material and sand dune morphology.

Full details are in the 80-page Second Circular, obtained free upon request from: 20th International Geographical Congress, c/o Royal Geographical Society, Kensington Gore, London, S.W. England. Those who wish to submit papers should note that abstracts must arrive in London by 1 Nov. 1963. All geomorphologists are cordially invited to attend these meetings.

INQUA CONGRESS, COLORADO, 1965

The VII Congress of the International Association for Quaternary Research will be held in Boulder and Denver, Colorado, 30 August - 5 Sept. 1965. INQUA is an international inter-science association, whose purpose is to bring together, on a world-wide basis, the viewpoints of the several disciplines concerned with the physical, chemical, and biological factors that control present day natural environment, and with the history of changes in environment and its controls during the Quaternary.

The program is being organized by John F. Lance, program chairman, into 3 groups of subject matter:

1. Present environment and processes - ranging from arctic to tropic, wet to dry and including the oceans and the atmosphere.
2. Local or regional data from a wide range of scientific disciplines on the environment and history of the Quaternary.
3. World-wide interpretations of chronology, correlation, and changes in environmental controls during the Quaternary.

There will be no complete proceedings of the Congress. A series of the more outstanding papers will be considered for publication as a special volume by the A.A.A.S. and also G.S.A. has just approved a 400-page Special Volume for INQUA, if we can get the papers in by 30 June 1964. Other papers may be published in ordinary journals, many of whom have offered to devote an issue during the summer of 1965 to papers of interest to INQUA. Additional cooperation of this nature by any journal not yet contacted would be welcomed. If you are in a position to arrange such an offer, please do so. It is urged that as many as possible take advantage of this opportunity for pre-Congress publication, and submit papers by 30 June 1964. Such papers may be brought up to date in oral presentation, and are much more sure of publication if submitted by the early deadline. Papers for possible post-Congress publication will be considered until the closing of the Congress. Co-editors in Chief are H. E. Wright and D. G. Frey for INQUA.

A number of Symposia of inter-science interest are being planned, both during the week of the Congress and in the course of pre- and post-Congress field conferences. Every attempt will be made to have the papers of each Symposium published as a group. If any University Press or other press is interested in such publication after review of Symposia plans in the First Circular, contact should be made with the Secretary General.

Field conferences are being planned in the following areas and under the local organizers indicated. H. T. U. Smith and C. Bertrand Schultz are general co-ordinators.

New England, Joseph Hartshorn

New York State, Ernest H. Muller

Central Atlantic Coastal Plain, Horace Richards

Florida - Bahamas, Gene Rusnak

Mississippi Delta and Central Gulf Coast, J. P. Morgan and H. E. Fisk

Great Lakes - Ohio River Valley, Richard P. Goldthwait

Upper Mississippi Valley, John C. Frye

Central Great Plains, Robert Stephenson and T. M. Stout
 Northern and Middle Rocky Mountains, John Montagne, Armand Eardley, G. M. Richmond
 Southwestern Arid Lands, Leo Heindl and Erik K. Reed
 Northern Great Basin and California, Clyde Wahrhaftig and Roger B. Morrison
 Central Alaska, Troy Péwé

Each of the above organizers is developing a local committee for the preparation and operation of the field conference. Trip routes, housing reservations, and guidebook material will be planned during summer of 1963. Those interested in assisting should contact the local organizer.

The National Committee for the Congress is interested in seeing to it that all having an interest in the Congress are invited, and the Secretary General will welcome additional names and addresses for the mailing list. The overseas list is especially in need of development. A first circular describing the Congress is being mailed, and copies are being sent to all listed members of the Geomorphology Group.

The National Committee desires to assist overseas individuals to attend the Congress. Charter flights from points in Europe are being scheduled both before and after the Congress, and group flights of 25 or more can be arranged between any International Airports. The fares for such flights are materially less than regular flights.

Opportunities in the form of teaching fellowships, exchange positions and visiting lecture series at one or more institutions are being sought, both to assist overseas participants to defray part of their expenses, and to make overseas experience and knowledge available to institutions in this country. Those interested in providing such opportunities should contact E. S. Deevey, chairman overseas assistance program, or the Secretary General. If you have a particular individual in mind arrangements may be made directly with that individual. If you wish suggestions as to individuals please indicate what discipline or disciplines you are interested in. Partial travel grants will be made available to deserving individuals, and nominations or applications for such grants are being received by the Secretary General.

The National Committee is particularly anxious to extend invitations to all sciences interested in environment and its history. In this regard we suggest that field conferences include material of interest to soil scientists, limnologists, archeologists, ecologists, climatologists, oceanographers and others, in addition to geologists and geographers. Please acquaint your friends among these allied sciences with the Congress and encourage their participation. Include them in field conference planning and discussion.

Also, in planning, please remember that there will be visitors from many nations, and that some will not speak English. Those who can converse in French, German, Russian, or Spanish the official languages of the Congress, are specifically invited to offer their services.

Gerald M. Richmond
 Secretary General, VII INQUA Congress
 Building 25, Denver Federal Center
 Denver, Colorado

COASTAL RESEARCH NOTES

An interdisciplinary newsletter, Coastal Research Notes, which has been appearing 3 or 4 times each year, is interested in printing personal items and brief progress reports (up to 400 words) on any aspect of coastal research. Material should be sent to William F. Tanner, Geol. Dept., Florida State Univ., Tallahassee, Florida. Subscriptions can be obtained from David D. Smith, Research Triangle Institute, Box 490, Durham, North Carolina. The price within U.S.A. is \$1 per year. Coastal Research Notes will begin carrying, later in 1963, the research bibliography on coastal work compiled by the Coastal Engineer panel of the Engineering Division of the G.S.A.

RECENT PUBLICATIONS AND REVIEWS

In view of the current trend in geomorphology toward precise measurement of all geomorphic processes, the report by K. R. Everett on Slope Movement, Neotoma Valley, Southern Ohio is a praiseworthy first step in that direction for slopes now in the classical humid temperate climate. It is Report No. 6 of Ohio State Univ. Inst. Polar Studies (also O.S.U. Research Foundation Proj. 1374) of 59 pp., 4 maps, 8 photos, 3 tbls., 2 figs., and 19 graphs, supported by two NSF grants, and with the help of Geology and Botany, and the Microbiological Res. Sta. at Neotoma. The following is from Everett's abstract.

Special instrumentation was designed to measure and record distance, rate, and time of soil movement, as well as the co-existing physical conditions in Neotoma Valley. Linear motion potentiometers with a sensitivity of 0.02mm were held in flexible stanchions attached to pipes anchored in bedrock at 4 sites. Small aluminum plates were buried in the slope and connected to the shaft of the potentiometer by an aluminum rod. Soil movement against the plate caused displacements of potentiometer shaft and a resistance change. Coleman soil moisture units containing thermistors were placed at the same depth near the aluminum plates. Resistances from both Coleman units and potentiometers were measured by a modified Wheatstone Bridge.

The general form of Neotoma Valley is bedrock controlled. It has been modified during the Pleistocene by deposition of slack-water silt and clay which forms terraces on the lower slopes. Sheet-wash and rill-wash are effective in removing surface material downslope. Blow-down is a major agent in denudation of the northeast-facing slope. Data from clay cylinders buried 37 months and from the transducer sites indicate downslope movements of the mantle proceeds discontinuously in space and time. Individual movements can amount to 0.5 mm and are closely related to change in soil moisture (that is, wetting and drying), but freezing probably plays no role. Maximum movement rates indicate that, under present conditions, downslope movement is in the order of 8.2 meters per 1000 years.

Once in a while a publication appears that can serve geomorphologists as a valuable source of information without originally having had that intention. Such is Soils of the North Central Region of the United States, published in June 1960, but previously not sufficiently advertised in our circles. The region includes Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Nebraska, North Dakota, Ohio, South Dakota, and Wisconsin. Soil scientists of the state universities and agricultural experiment stations in each of the 12 states have collaborated in assembling information available on genesis, characteristics, classification and distribution of the soils of the region. This North Central Regional Publ. No. 76 (also Bull. 544) consists of 192 pages of narrative, tables, and figures, a comprehensive key to practically all of the established or tentative soil series (well over 2000), and a map (1:2,500,000). The map shows the distribution of 189 soil associations and has 17 color separations according to Great Soil Groups. The soil series in the key are arranged according to texture, lithology, origin of parent material, thickness and profile and degree of development, and Great Soil Group classification. Not only geomorphologists, but geographers and ecologists should find this publication of extreme help. In fact, it is suggested that it could form the main source of several lectures on soils to their beginning geomorphology classes. It is available at least through Agricultural Expt. Sta., Univ. Wisconsin, Madison, and Ohio Agricultural Expt. Sta., Wooster, Ohio, for \$2.00.

Jane L. Forsyth has produced the glacial geology of another Ohio county in less than a year since the appearance of her Geology of Knox County (Ohio Geol. Surv. Bull. 59, 1961; see Geomorph. Newsltr #6). This time it is Geology of Fairfield County (Ohio Geol. Surv. Bull. 60, 1962, \$3.00), jointly with Edward W. Wolfe and George D. Dove. She is responsible for parts of Chaps. 2, 5, 6, 9, the glacial map (1:62,500), and all of Chap. 7 (34 pp.), although she insists most of Chap. 7 is drawn largely from unpublished work by James F. Conley now with the North Carolina Geol. Survey.

Simple Measurements of Morphological Changes in River Channels and Hill Slopes, by John P. Miller and Luna B. Leopold, are described in stencil form not ordinarily obtainable, prepared for UNESCO Symposium on Changes of Climate with Special Reference to the Arid Zones, Rome, Oct. 1961. It contains careful explanations for monumented stream cross sections so that the stream can be resurveyed at the same place years later, measuring rates of bank recession with iron pins, emplacement of vertical chains in channelbottom gravel as indicators of bed scour, "crest-stage" gaging pipes, studying movement of rocks along channel bottoms and in headwater ephemeral rills, and techniques for measuring rates of erosion along hillslopes. One of the principal values of such a paper is the casual manner of exposure of the inaccuracy of a number of old fashioned notions we have entertained about streams.

Two fine publications of the new Special Study series of Utah Geological and Mineralogical Survey, not yet publicized, written and submitted to us by Armand J. Eardley, are Glauber's Salt Bed West of Promontory Point Great Salt Lake, No. 1, Dec. 1962, \$.50, of 6 written pages, plus a geologic and a stratigraphic section, and Gypsum Dunes and Evaporite History of the Great Salt Lake Desert, No. 2, Dec. 1962, \$.75, of 14 written pages, plus 2 charts, 1 map, 3 geologic sections, and 12 photomicrographs of gypsum crystals, totaling 27 pages. Both publications are beautifully illustrated, with added attractions such as an outside cover photograph in pale blue, and a black & white title page photograph. Inside the back cover are lists of other publications, too, all obtainable from Utah Geol. & Min. Surv., 103 Civil Engr. Bldg., Univ. of Utah, Salt Lake City. In addition, the northwest quarter of the new State of Utah Geologic Map has just appeared, edited and compiled by William Lee Stokes, showing the Quaternary deposits in several categories aimed more at use than at age and origin. The map is the best yet of any large segment of the Basin and Range Province, and also is obtainable at address given above (price unknown at this time).

Confirmation again of the extreme value of photogeology in applied geomorphology for engineering practices and petroleum exploration comes to us in the form of 4 privately reprinted articles from J D Mollard and Associates, Ltd. (Regina, Saskatchewan). It is satisfying to know that the time-tested photogeological techniques continue to provide information for the industry. The articles, authored by Mollard, emphasize the identification and interpretation of structures, and one in particular (Photogeophysics its Application in Petroleum Exploration over the Glaciated Plains of Western Canada), the fracture systems - fault patterns and joint systems - in sedimentary and crystalline rocks through as much as 300 feet of Pleistocene drift or lake sediments as revealed on the surface by stream drainage patterns (a practice introduced into the petroleum industry by Norman C. Smith, photogeologist, 15 years ago, a practice, which, amazingly enough, unfortunately for all concerned was received with considerable indifference at that time).

In 1961 Pleistocene Geology of the Randall Region, central Minnesota, by Allan F. Schneider of 151 pages was published by Univ. Minnesota Press, as Bull. 40. Anyone who wishes to own a thorough summary of Minnesota Pleistocene history as well as a detailed story of a central part of the State would do well to acquire a copy.

The 117-page field guide for the New York State Geological Association meetings at Binghamton, 3-4 May 1963 includes a survey of New York's Role in the Mesozoic and Tertiary evolution of the northern Appalachians, reviewing primitive drainage conditions and structural controls of the region, by Howard A. Meyerhoff, Univ. of Pennsylvania. In Geomorphology of the Binghamton Area, Donald R. Coates discusses quantitative geomorphometry, reviews evolution of the drainage pattern, reserves judgment on the peneplain concept, and, following Moss and Ritter (1962), relegates Binghamton and Olean drifts to facies of a single sheet.

A translation of Pierre Birot's book Le cycle d'erosion sous les differents climats will be published during summer of 1963, paperbound, 135 pages, probable cost \$1.50; request from Keith M. Clayton, London School of Economics, Aldwych, London, W.C.2, England.