The Geomorphologist

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NEWS ITEMS

(Recorded here in the order received)

Under the supervision of Robert Diete and Adrian F. Richards (Univ. of Illinois, Urbana), graduate students in the marine geology program, Louis Butler, Peter Ealey & Paul Boyer had the use of the Coast and geodetic Survey's OCEANOGRAPHER from October until December 1966 to study the evolution of the continental margin of South America from the Amazon River to Buenos Aires using geophysical methods and satellite positioning. A group of seven Univ. of Illinois civil engineers and geologists developed telemetering vane shear, nuclear density, and pure pressure probes to measure these properties in place on the sea floor. The probes, and a new 4-barreled camera-cover was tested in the Wilkinson Basin of the Gulf of Maine summer of 1967 from the Coast and Geodetic ship DAVIDSON in a cooperative program with George Keller, Institute for Oceanography of ESSA.
Keller and Richards planned to board the OCEANOGRAPHER in Wellington, New Zealand, and collect a series of cores across the South Pacific, and to radiograph and perform critical geotechnical tests on the cores collected aboard the ship before reaching Valparaiso, Chile.
In Urbana, new laboratories were completed and well-equipped for graduate training and research in sedimentology, marine geology, and marine geotechniques. An elaborate X-ray installation features a fine-focus 150 KV tube, electronic fluoroscopy, and remote specimen handling. Nathan Ayer, Gordon Frazer, and Michael Moore are investigating structures in cores, and the application of photogrammetry techniques to stereo-radiography of sedimentary materials. (Rec'd June 1967)

Arthur L. Bloom needs help with this one! Proposal title (received on a post card from one of his admirers): - "Is there a geologist there who can tell me how the northward thrust of Michigan's mit strained the Niagara Escarpment enough to pucker it across northern New York, causing the Finger Lakes?" It's too big a job for Art Bloom to handle alone; a symposium needs to be organized. Anyone for geopuckerization? (Recd Sept '67)

Roger L. Spitznas of Augustana College (Rock Island, Illinois) continued research summer of 1967 on marine terraces along the California coast west of Stanford University. This study will close the gap between the areas of earlier studies by David D. Smith and William C. Bradley. Another project also supervised by Arthur D. Howard was completed by Carrol Ann Hodges on the Geomorphic Evolution of the Clear Lake Basin in California. Howard is studying the coastal terraces himself along the Santa Lucia coast south of Monterey, California. (Recd Nov 1967)

As of September 1967, Nicholas K. Coch's address is Geology Department, Queens College of C.U.N.Y., Flushing, New York.

The 10-year program of study of Corwin C. Reeves, Jr. (Texas Technological College, Lubbock, TX) on the pluvial lake basins of West Texas continues and is extended into northwestern Chihuahua, México. Data indicates that fluctuations of both the Texas and Mexican lakes were synonymous with those in the Great Basin (Lahontan and Bonneville). Chronology of the Mexican Lake Palomas (recently discovered), being mapped by personally flying over the area, is shedding much information on the Pleistocene history of southeastern New Mexico, and particularly on the age of the Rio Grande Valley. The West Texas lake program is in high gear. Several cores up to 86 feet long were taken from different pluvial basins; clay mineralogy is complete and pollen studies are underway at University of Texas and University of Oklahoma (other core samples are available to anyone interested). Minerals discovered are glauconite, primary dolomite, and sepiolite. Stratigraphy of the Ogallala aquifer and relation of pluvial lake basins to the top of the Cretaceous is now being studied with help of subsurface data supplied by U.S. Bureau of Reclamation and local water districts. (Recd Feb '68)

Garald G. Parker was transferred from research into administration from Denver to Albany, N.Y. as District Hydrologist with U.S.G.S.; he will continue writing with Everett A. Jenne a U.S.G.S. Prof. Paper on the piping-collapse structure phenomenon.

Rex M. Peterson, now at the Center for Research in Engineering Sciences (Univ. of Kansas, Lawrence) is studying the geomorphology of part of the Wasatch Range from radar imagery.

John A. Wolfe (909 Houston Natural Gas Building, Houston), geologist and mining engineer, reported on a 20 x 30 km limestone block which glided northward about 5 km on south-central Samar Island, Philippines, damming a large river which drained about half the island and moving the drainage divide to within one km of the west coast.

Peter Birkeland (Geological Sciences, Univ. of Colorado, Boulder) continued his study of the marine terrace sequence along the Malibu, California coast, summer of 1967, including the overlying nonmarine alluvium, and the stratigraphic relations of and genesis of relict and buried soils; this work will continue in summer of 1968. Birkeland soon will begin a new study of Quaternary stratigraphy in western Colorado, and of soil morphology and stratigraphy in the Alpine region west of Boulder.

After four years in administration in Washington, D.C., Donald R. Nichols transferred to Menlo Park (U.S.G.S.) California summer of 1967 to work on the San Francisco Bay sediments project. The Survey is using a multi-disciplined approach to define the geology of the Bay, the engineering characteristics of sediments in and marginal to it, and the ground response during earthquakes. Nichols will map the surface distribution of Bay muds, and work out their recent history by radiocarbon dating and geomorphology. David McCulloch is involved in the subbottom acoustical profiling program, and George Schlocker on the mineralogy of the Bay sediments.

Stanley N. Davis, now at Univ. of Missouri (Columbia) to teach hydrogeology and Pleistocene geology, in spring of 1968 under sponsorship of Internatl Hydrol. Decade will give a series of lectures to the "Curso de Hidrología Subterranea" in Barcelona, Spain, and during summer of 1968 will deliver a more extensive lecture series to the "Curso de Postgrado en Ingeniería Hidrológica" in Barcelona, Venezuela, also sponsored by I.H.D. and the Ministerio Obras Publicas de Venezuela. Robert J. Pauken, Jr., a graduate student under Davis' supervision, has started a paleontological study of fossil gastropods in Missouri loess to attempt correlation with the better known Pleistocene fauna in Kansas and Illinois, and to learn the ecological factors influencing the loess fauna.

Parker E. Calkin (S.U.N.Y., Buffalo) will continue study of northwestern New York Pleistocene geology as well as in western Maine with Hal W. Borns, Jr. in summer of 1968.

Stan A. Schumm, now at Colorado State Univ. (Fort Collins) to teach fluvial geomorphology and hydrology, will start a number of new projects in Colorado: regional study of the effect of geomorphic and geologic variables on the hydrology of small drainage basins, model drainage basin study utilizing the civil engineers' "rainfall-runoff facility", geomorphic evolution of small drainage systems obtaining runoff and sediment yield data for each stage of development, and lunar erosion mechanisms in a high altitude chamber to explain the sinuous channels seen on Lunar Orbiter IV and V photographs. He will be involved in fluvial geomorphology in C.S.U.'s Summer Institute in this subject this summer. His Australian research on the effect of changing climate and hydrologic regimen on the paleochannels of the Murrumbidgee River of southeastern New South Wales will appear as a U.S.G.S. Professional Paper.

Dwight R. Crandell and Donal R. Mullineaux (U.S.G.S., Denver) recently completed field work on the surficial deposits of Mount Rainier Natl Park. Already finished is "Surficial geology of Mount Rainier" to be published as a short bulletin; it includes a map of surficial deposits and a brief text written in nontechnical style for park visitors. Crandell and Mullineaux next will start an evaluation of volcanic hazards at Lassen Peak and Mount Shasta. The evaluation will be based upon the Holocene history of the volcanoes similar to that described in the recently published U.S.G.S. Bulletin 1238 "Volcanic hazards at Mount Rainier, Washington."

Waldo S. Glock, now at Inst. Arctic-Alpine Research, Univ. Colorado reports that his recent work has been exclusively with tree growth and climate. Northern Arizona, like northern New Mexico, gives a sensitive measure, it appears, of changes in the distribution of rainfall as it affects pertinent soil moisture just before and during the growing season. With changes in effective soil moisture the pattern of growth layers shifts in elevation. These shifts are readily detected. Our plans call for submitting some 450,000 ring measures to computer analysis in order to trace pattern shifts (and hence effective moisture) during the last two centuries.

John W. Blagbrough (Museum of Northern Arizona, Flagstaff) commenced a study of rock glaciers and protalus lobes in the Capitan Mountains of south central New Mexico. Over 100 of these periglacial features were mapped; field evidence indicates that the rock glaciers developed from protalus lobes. A study of protalus lobes on Carrizo Mountain in south central New Mexico also is underway. About 15 of these deposits were observed at altitudes between 7500 and 8700 feet.

Victor C. Miller, now at Indiana State Univ., Terre Haute, had published by UNESCO (Paris), in its Aerial Surveys and Integrated Studies; Proceedings of the Toulouse 1964 Conference, a paper "Aerial Photographs and Land Forms (Photogeomorphology)", pp. 41-69.

Aleksis Dreimanis (Univ. Western Ontario, London), on sabbatical in 1966-67 during summer of 1967 travelled through England, Scandinavia, and central Europe trying to find out how and why controversial opinions have developed on the geologic history of the last ice age in Europe. Half of the time was spent on field trips to most significant regions, guided by local geologists, geographers, and botanists. During the remaining time he visited 30 research institutes and laboratories to learn methods and participate in seminar discussions. While in Poland in early Sept., Dreimanis attended a symposium of an INQUA Committee, presenting two papers on his and his students' studies of glacial deposits and proposing that genetically significant parameters be selected when investigating tills. Dreimanis and 5 graduate students are continuing analyses of tills, including indicators of ore deposits and till stratigraphy. Inventory of the mastodons of Ontario, and reviewing of mastodon occurrences in eastern North America has lead to a proposal of a new climatic-environmental hypothesis on extinctions of mastodons (Canadian Jour. Earth Sci., v. 4, p. 663-675).

Paul F. Karrow (Univ. Waterloo, Dept. Earth Sciences, Ontario) will complete mapping of the Stratford-Conestogo area, Ontario, for Geol. Surv. Canada, with field work supplemented by a deep-drilling program, seismic survey, and palynological studies of late-glacial sediments (Thane Anderson is doing the palynology). A. McLellan (Dept. Geography and Planning) will study the morphology of outwash deposits in the Waterloo area. H. T. Hui and R. G. Mannada Rani (Biology Dept.) are studying interglacial fossil molluscs and diatoms of the Toronto area. B. A. Sreenivasa is studying a late-glacial pollen profile from a bog in the Waterloo moraine.
W. M. Tovell and J. H. McAndrews (Royal Ontario Museum) are studying pollen profiles and lake bottom cores in connection with the low-water Lake Stanley of the Huron Basin. W. R. Cowan (Ontario Dept. Mines) will begin mapping the Pleistocene geology of the Brantford area, Ontario, in summer of 1968.

W. Armstrong Price (Corpus Christi, Texas) won second prize at the San Antonio Convention of the S.E.P.M. Symposium on the Gulf of Mexico and Caribbean region for his paper "Development of basin-in-basin honeycomb of Florida Bay and the northeastern Cuban lagoon." In addition, he has written "Little known patterned estuarine features of South Florida and Cuba: basin-honeycomb and pocket harbor", "Plains microrelief in non-glaciated regions as environmental indices," and "Pimpled plains and hogwallow gilgai: grasslands soil microrelief." His consulting work now includes study of restoration possibilities of the former stabilization condition of the large tidal flat of the central Laguna Madre, Texas.

Lee S. Clayton (Univ. North Dakota, Grand Forks) will spend summer of 1968 on glacial geology and Lake Agassiz history in northeastern North Dakota, work on Pleistocene history of lower Copper River Valley, Alaska (with Sam Tuthill, Muskingum Coll.) and study Pleistocene stratigraphy and geomorphology of nonglaciated southwestern North Dakota. John Bluemle is working on the glacial geology of McLean County; Kirth Erickson will begin aerial photographic and field study of tectonic lineations in western North Dakota; Tom Hamilton is studying the relationship of stream channel configuration to groundwater flow in Little Missouri Valley; Sam Harrison is finishing a laboratory study of the effects of groundwater seepage on fluvial processes; and Ron McCarthy will begin a study of Lake Agassiz beaches. (See Elson below)

John A. Elson (Geological Sci., McGill Univ., Montreal) continues his Glacial Lake Agassiz studies, mainly in Canada. New roads are making altitude determinations of beaches feasible in new areas and exposing new sections in the 5 or 6 sedimentation basins. Much depends on the interpretation of these sediments (mainly varved clays). He will examine the probable northwestern outlet this year also. Elson reports: "On the home front, the thermistors, moisture cells, and soil movement indicators that my family complain about cluttering up the back yard have functioned for more than a year and will soon have yielded enough data to show the geomorphic effects of a Montreal winter. The insulating effect of snow and the checking effect of the January thaw are very impressive. This back yard research is a pilot study of techniques used by graduate students Hugh Gwyn, who is studying the role of freeze-thaw processes on slopes of differing exposure and drainage, and by Roger Thomas whose project is to estimate the rate of denudation of Mont St. Hilaire, a mountain nearby to McGill."

Mapping by U. S. Geol. Survey of the glacial geology of Yellowstone Natl Park now is about one half completed. A Pinedale ice cap covered most of the central and southern part of the Park. Stagnation of the ice cap is demonstrated by abundant ice contact fluvial and lacustrine deposits in the Yellowstone Lake Basin and the upper Lamar Valley. Glacial striations on the crest of the Washburn Range indicate an extensive Pre-Pinedale glaciation. In the summer of 1968, Gerald M. Richmond will work in the southwestern part of the Park, Harry A. Waldrop will work in the Madison Junction area, and Kenneth L. Pierce will work in the Mammoth Hot Springs area.

Richard O. Stone (Univ. Southern Calif., Los Angeles) and Herb Summers, through O.N.R., continue their time lapse photographic study of subaerial and subaqueous ripples. Stone with Robert E. Stevenson (Bur. Comm. Fisheries, Galveston, Tx) wrote a paper together on the applications of space photography to meteorology, oceanography, sedimentation and coastal features. Under Stone's supervision, Harold Palmer is studying the mechanics of marine scour off the southern California coast, and Allen Y. Tamura is investigating the selenite-capped buttes, made famous by Eliot Blackwelder, in the Mojave Desert at the southern end of Danby Dry Lake, San Bernardino County.

The research project by Troy L. Péwé (Arizona State Univ., Tempe) and Randall Updike, supported by U.S.Army Research Office at Durham (No. Carol.), on the glacial geology of the San Francisco Peaks in 1967 demonstrated the existence of at least two pre-Wisconsin glaciations, two early Wisconsin advances, two late Wisconsin advances, and two post-Wisconsin cold periods. Most detailed work was on pre-Wisconsin deposits and tentative results differ in detail from the earlier work of Sharp. Enormous boulders, "erratics", lie at the base of the mountain and it is not yet decided whether these are mudflow-carried or glacier-carried. If glaciers carried them, the glaciation indeed was very early and very extensive. Field work was begun on origin and distribution of altiplanation terraces by Péwé and Richard D. Reger near Hughes in central Alaska where several stages of terrace formations were identified. Péwé will continue his work on the geomorphology of placer gold deposits near Fairbanks, Alaska. In the summer of 1968, under Péwé's supervision, Robert Merrill (and Péwé) will begin mapping glacial deposits to interpret the glacial history of the White Mountains in southeastern Arizona.

Jerry A. Lineback and Alan M. Jacobs (Illinois Geol. Survey, Urbana) are restudying the Illinoian "ridged drift" of Kaskaskia Basin in southern Illinois in light of recent work on ice stagnation features. They expected to find end moraines and till plains, but instead found ridges of ice contact stratified drift, kames, trenches of silt, and two tills thought to represent lodgment and ablation deposits of an Illinoian glacier. They would like to compare notes with anyone currently interested in ice stagnation features. This work is being prepared for presentation at northcentral GSA meeting.

A meeting on the geologic aspects of coastal engineering was held at the U.S. Army Coastal Engineering Research Center, Washington, D.C., 14 February 1968. A discussion of research in progress included - Development and field testing Xenon 133 as a radioactive sand tracer, and geophysical exploration for shallow sand deposits off the Atlantic coast, supervised by D. B. Duane; a Six-year Survey of eight Atlantic coast beaches, and a laboratory study of beach cusps, suppervised by Cyril J. Galvin, Jr.; and Long Term changes and changes due to specific storms on three New England beaches, supervised by M. O. Hayes.

Peter Vernon and Owen L. Hughes (Inst. Sedimentary & Petrol. Geol., Calgary, Alberta and Geol. Surv. Canada) made observations on both rock glaciers and debris-covered ice glaciers in the Southern Ogilvie Ranges and Wernecke Mountains, Yukon Territory prior to 1962; see results published in Geol. Surv. Canada Bull. 136 (1966). Canada Tungsten Rock Glacier, near Canada Tungsten Mine, Flat River, Distr. of Mackenzie, was surveyed and marked at the snout and with several lines across the middle in 1963 by Hugh Gabrielse (Geol. Surv. Canada). Remeasurement in 1965 by Anders Rapp and Hughes showed an advance of 8.5 feet at the snout.
James Gray (McGill Univ., Montreal) supervised by Brian Bird and supported by Geol.Surv. Canada, currently is studying mass movement in the Ogilvie Mountains, including talus that descends to and merges with rock glaciers.

Oscar J. Ferrians, Jr., now Menlo Park, Alaskan Geol. Branch, U.S.G.S. (he was formerly in Washington, D.C.) is working on gold placer deposits in south central Alaska.

J. Peter Johnson, Jr. (Geography Dept., Carleton Univ., Ottawa), in order to learn more of mass movement in the Yukon Territory, has concentrated efforts on four rock glaciers, 3 in Slim's River Valley and one on the western edge of the Yukon Plateau. One of the 3, overlooking the terminus of the Kaskawulsh glacier from the northeast, may have started as a debris avalanche; the other two of the 3 are fed by rock fall and talus. The rock glacier on the edge of Yukon Plateau is in a cirque at the head of a valley and is the only one clearly related to glacial origin. Triangulation nets are established around each and positions of surface movement markers now may be determined by resection. Surface fabrics, increment borings from trees, plane table maps, and lichenometric studies are being made where appropriate. One rock glacier may be drilled into summer of 1968.

Some of the work William F. Tanner (Florida State Univ., Tallahassee) has been doing lately may be summarized as follows:
The change in height of a wave, with a unit change of bottom width, is proportional to the original height, and, as additional units of width are taken, the heigh' decreases:
$\frac{dh}{dw} = -kh$ where h is breaker height, w is width of bottom, and k is a coefficient.
Integration gives $h = h_o e^{-kw}$ An application has been made along the concave coast between Virginia and Florida, where a single wave system is assumed. Using published data for average breaker heights, and taking a critical depth of 20 m from maps, one can get $k = 0.042$, then $h_o = 200$ cm, and finally $w = 125$ km. That is, the open-ocean "breaker" height would be about 200 cm, and a bottom 125 km wide would reduce "breakers" of this height to zero. The second equation permits prediction of breaker height on any exposed part of this coastal strip.
The same type of calculation, for the Panhandle coast of Florida, yields $k = 0.075$, $h_o = 50$ cm, and $w = 52$ km. This strip includes a stretch of "zero energy" coast (southeast of Tallahassee), as one might suspect from the figures. For northeastern states, convergence effects (due to coastal irregularities and bottom variability) are great, and the assumption of a single wave system cannot be defended. Therefore, the original equation is much too restrictive, and needs major modification if it is to be applied to anything other than simple concave beaches. However, for the simple (or stable equilibrium) case, the equation given above appears to offer a means of predicting several aspects of breaker "energy". Furthermore, the coefficient k in the exponent appears to be the sum of two numbers, $k = a + b$, where a is an index of wave refraction, and b is a residual not far from 0.013.
Most measurements of sand transfer along a beach, made to date, have yielded accumulation rates (R_a) or depletion rates (R_d), having the dimensions MT^{-1}, and hence are not very satisfactory. An estimate of work (having dimensions ML^2T^{-2}) is preferred.
The northern part of St. Joseph Spit, Gulf County, Florida, provides a possible area for getting such a rate. The estimated mass of the northern end of the spit is 5×10^{14} g; the estimated distance of transport is 5×10^5 cm; the estimated time duration is 4×10^3 years. The work measure obtained from these figures is 7.82×10^{18}, with an average velocity for the entire mass of 1.25 m/yr. A similar calculation for Sandy Hook, New Jersey, yielded 19.5×10^{18}. A third calculation, for the large peninsula south of Choctawhatchee Bay (Florida panhandle) gave 13.8×10^{18}. These results indicate that the method is consistent, inasmuch as they hold a predictable relationship to breaker activity in the three areas.
These results permit energy - vs - drift charts to be used, as follows, to obtain a first approximation to work figures: enter the chart with wave energy, read the indicated drift per year, and use an assumed distance of 1.25 m/yr.
An estimate of total work energy along the St. Joseph Spit beach suggests that only about one part of 10^6 has been used for net sand transport; it is assumed that the remainder was lost in turbulence and in back-and-forth movement of sediment.

ANNOUNCEMENTS

The University of Arizona, Department of Geochronology, will host the 1968 Rocky Mountain Field Conference of the Friends of the Pleistocene, 21-22 September 1968.

Vance Haynes, Paul S. Martin, Everett Lindsay, and Peter J. Mehringer, Jr. will conduct a two-day field trip through the San Pedro Valley of Arizona to examine fossil pollen and vertebrate localities, early man sites, landforms, and stratigraphic sections pertinent to the late Quaternary history of the Valley. The possibility that a large lake, which occupied the Valley in Wisconsin time, will be explored. If you plan on going, let Vance Haynes, Dept. Geochronology, Univ. Arizona, Tucson, Arizona 85721, know.

In June 1969, an International Conference on Arid Land in a Changing World, is sponsored by the Committee on Arid Lands, Amer. Assoc. for the Advancement of Science, and is to be held at the University of Arizona, 3 - 13 June 1969. Six days of conference sessions are interrupted by 3 days of one-day field trips and a Sunday off. Seven field excursions will be held pre-conference, and eight post-conference, ranging from Denver and Los Angeles to Salt Lake City to Mazatlán, México. Now is the time to make your preliminary registration; write for form and additional information to: International Arid Lands Conference, c/o Department of Geochronology, University of Arizona, Tucson 85721

VARIOUS ITEMS OF INTEREST

William Van Royen, Director of the Division of Environmental Sciences of U. S. Army's Research Office - Durham (A.R.O.D.) (Box CM, Duke Station, Durham, North Carolina 27706) is engaged now in research management and thought we might be interested in knowing of the scope of Army-supported basic research in geomorphology and closely related fields. Write for his booklet on Basic Research Grants & Contracts to learn how you may word your proposals and administer your research projects through his Division. Environmental Sciences (Terrestrial) in cludes geology (structural geology, historical geology, and hydrology); geomorphology; geography (world landscapes, natural and man-modified environmental characteristics and stresses; ...); glaciology; soils, soil mechanics, frozen soils, snow and ice; ...).

Geobotany Symposium: A meeting of botanists (and other interested persons) concerned with the relationship of geology to botany, either in terms of plant distribution or the Pleistocene pollen record in Ohio and neighboring States, was held on the Bowling Green State University campus on Saturday, 24 February 1968. The main purpose of the meeting was for specialists in similar fields who did not know each other to get acquainted. Thus, the emphasis was on informality and individual discussion, although several papers were presented. Most of those attending the meeting (a total of 50 in all) were botanists, although a few geologists, zoologists, and naturalists came. Geologists participating were: George H. Crowl, Ohio Wesleyan Univ.; Ed Herdendorf, Ohio Geol. Survey; C. F. M. Lewis, Geol. Surv. Canada; and Jane L. Forsyth, B.S.G.U., and "Instigator" of the affair. The meeting was sufficiently successful so that another is being planned for 1969 at the Royal Ontario Museum, Toronto, with "Jock" McAndrews in charge!

Francis Ruellan (Directeur, Centre d'Études des Problemes de la Mer, Univ. de Rennes, France) intéresse surtout à la géomorphologie littorale et prélittorale, mais aussi à la désagrégation et à la décomposition des roches et à la photogéologie. Masson et Cie présente un volume par F. Ruellan "Photogrammétrie et Interprétation de Photographies Stéréoscopiques Terrestres et Aériennes" avec 124 pages, 48 figs., et 8 planches stéréoscopiques indépendantes accompagnées de leur commentaire (prix 70F); Masson et Cie (Ed.), 120 boulevard Saint-Germain, Paris-6, France.

A recent publication by the National Research Council of Canada sheds interesting light on the trend of graduate students in geomorphology in Canada: about 27 are geologists and more than 70 are in geography. This results partly from the tradition of French geographers and from the invasion of Canada since the war by British geographers who have always considered the Quaternary and modern processes as their territory; and from the economic or hard-rock orientation of most Canadian Geology departments which tend to view other geological subjects with disdain. As a result, many geological problems here are in the hands of non-geologist specialists, such as civil engineers (soil mechanics), foresters, anthropologists, and geographers. There is a coming trend, however, in the application of geomorphic studies in the search for economic minerals which may revitalize the field and make it "respectable" again. (Submitted by John A. Elson)

P U B L I C A T I O N S

PROCEEDINGS
o f
INTERNATIONAL ASSOCIATION FOR QUATERNARY RESEARCH
VII Congress, 1965, Boulder, Colorado

(For sale by the University of Minnesota Bookstore,
Minneapolis, Minnesota 55455
or by the individual publishers)

International Studies on the Quaternary. 28 papers. H.E.Wright and D.G.Frey, editors. Geol. Soc. America Special Paper 85, 565 pp., 1965. $20.00

Pedological Record of the Quaternary. 10 papers. F.D.Hole, editor. Soil Science, v. 99, p. 1-72, 1965. $1.50

Quaternary Studies. 32 papers. H.E.Wright and F.C.Howell, editors. Quaternaria, v. 8, 314 pp., 1966. $10.00

The Bering Land Bridge. 23 papers. D.M.Hopkins, editor. Stanford University Press, 495 pp., 1967. $18.50

Pleistocene Extinctions: the Search for a Cause. 19 papers. P.S.Martin and H.E.Wright, editors. Yale University Press, 453 pp., 1967. $12.50

Quaternary Paleoecology. 24 papers. E.J.Cushing and H.E.Wright, editors. Yale University Press, 433 pp., 1967. $15.00

Means of Correlation of Quaternary Sequences. 32 papers. R.B.Morrison and H.E.Wright, editors. University of Utah Press, 624 pp., 1967. $7.50

Quaternary Soils. 18 papers. R.B.Morrison and H.E.Wright, editors. University of Nevada, Desert Research Institute, 340 pp., 1967. $4.00

Arctic and Alpine Environments. 22 papers. H.E.Wright and W.H.Osburn, editors. Indiana University Press, 1967. $12.50

Quaternary History of the Ocean Basins. 21 papers. Mary Sears, editor. Pergamon Press, Progress in Oceanography, v. 4, 344 pp., 1967. $16.00

Archaeology of the Southwest. 5 papers. Cynthia Irwin-Williams, editor. Eastern New Mexico University, 1968.

Causes of Climatic Change. 19 papers. J.M.Mitchell, editor. American Meteorological Society Monograph, 1968.

Continued, on page 9

Proceedings of INQUA, list concluded:-

The Periglacial Environment. 26 papers. T.L.Péwé, editor.
Arctic Institute of North America, 1968.

Loess and Related Eolian Deposits of the World. 33 papers. C.B.Schultz and J.C.Frye, editors. University of Nebraska Press, 355 pp., 1968.

Quaternary Glaciation of the Alps. 16 papers. G.M.Richmond, editor.
University of Colorado Press, 1968.

Quaternary Geology and Climate. 25 papers. H.E.Wright, editor.
National Academy of Sciences-National Research Council, 1968.

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Now a beautiful English edition of Børge Fristrup's The Greenland Ice Cap has just (1968) appeared (the Danish edition was published in 1963) by way of the University of Washington Press (Seattle 98105). It is printed in Denmark, but with a 1966 dateline, with 312 (9.5 x 11 inch) pages, 3 color plates of a Danish expedition in 1878, 51 small color photographs each separately tipped-in taken by the author, some 50 black and white photographs, many being oblique aerial views, and a few as double-page spreads from numerous sources, 9 maps of Greenland particularly of expedition routes, 20 sketches and figures, and an Index, Bibliography, and Chronology of Events, all for $20.00. Each of the 20 chapters has a different drawing of a snow or ice crystal as a vignette.
In the Acknowledgements, Fristrup hopes a single book still will be written by the many scientists who have done so much research in Greenland; in the meantime, this book is intended to demonstrate the tremendous effort so far accomplished in this large part of Denmark. In this he certainly is successful, for he has assembled a wealth of material concerning all the early explorations and expeditions, all the recent scientific work of the French, British, and Americans, and a summary of the nature of the Greenland Ice Cap.
After an introduction on the description and distribution of the ice sheet (ca. 15 pp.), a rather complete and somewhat lively review (183 pp.) follows of the highlights of every exploratory trip and expedition from the first discovery of Greenland in A.D. 982 by Erik (the Red) Thorvaldsen through the sporting expeditions of 1966. A listing here of all the leaders would be unnecessary, yet a selected few of the more famous may give an idea of the remarkable coverage by Fristrup in this book: Frobisher, Egede, Jensen, Rink, Nordenskiöld, Nansen, von Drygalski, Peary, J. P. Koch, Mikkelsen, Rasmussen, Freuchen, Lauge Koch, Wegener, Watkins, Hobbs, Knuth, Victor (Exp. Polaires Francaises), Simpson (British North Greenland Exp.), and the many many American scientific investigators from 1950 on, including accounts of the American stations on the cap and the tunnels excavated into the cap. The last 83 pages are a very respectable learned paper on the climate, temperature, thickness, movement, age, and regimen of the Greenland ice sheet.
Such a book is a delight to have around the house for it may be picked up and read at random, choosing the subject for which you happen to be in the mood.

C. C. Langway, Jr.'s long awaited report on his Stratigraphic Analysis of a Deep Ice Core from Greenland merits much more than your ordinary consideration. It is 130-page U. S. Army Cold Regions Research & Engineering Lab Research Rept 77, dated May 1967. Langway properly emphasizes the potential of such studies in stating that the value of investigating deep ice cores is almost limitless. The core was recovered from June through August 1957 by rotary core-drilling at Site 2 on the ice cap in the dry snow zone about 350 km east of Thule at 2000 m. Core recovery provided nearly continuous undisturbed ice from 19 m to 110 m, about 75 to 85 % recovery from 110 m to 305 m, and

Langway's Stratigraphic analysis of a deep ice core, cont.-

two 5-m lengths from 360 m and 411 m. For control purposes and other measurements, a 25 m-deep hand-augered hole produced the complete record from the surface downward. Detailed macrostratigraphic studies (melt features, light transmissivity, and bulk density) of the core proved most valuable, but showed that classical stratigraphic criteria for determining annual layering was good only down to about 95 m. Below that it was necessary in addition to employ indirect physical and chemical measurements. Combined vertical variation in bulk density, macroscopic structures, oxygen isotope ratios, ionic constituents, and extraterrestrial dust (black spherules) permited estimates of annual accumulation layers, especially at depths greater than 100 m. The oxygen isotope ratio variations, however, provided the best means of determining annual layering at these greater depths. The deep ice core contained 1023 years of annual accumulation data. Past history, as determined by all the techniques, showed the Greenland ice sheet appeared to receive more accumulation during historically warmer periods and less during colder periods, had a temperature similar to today's in A.D. 934, underwent a gradual lowering of accumulation from A.D. 934 to a minimum in A.D. 1773 (a time of historically documented advance of Greenland ice and maximum extent of European and Alaskan glaciers in the late 18th century), and suffered a warming trend after 1773 with general increase in both accumulation and temperature during the 19th and 20th centuries, a time of general northern hemisphere glacier retreat. This report also contains many worthwhile hidden discussions of controversies in glaciation and glaciology upon which new information now has been directed by Langway's interpretations of the volume of new data.

Antarctic Soils and Soil Forming Processes, edited by J. C. F. Tedrow, Antarctic Res. Series, v. 8, Amer. Geophys. Union of the Natl Acad. Sci.-Natl Res. Council, Publ. No. 1416, 177 pp., 1966. $10.00. consists of six papers covering Antarctic geomorphology, climate, patterned ground, vegetation, soil microbiology, and soils. The volume is illustrated with many photographs and diagrams, and many tables of data. The papers are entitled: "Geomorphology of Antarctica" by R. L. Nichols; "The Antarctic climate" by W. S. Weyant; "Preliminary measurements of growth of nonsorted polygons, Victoria Land, Antarctica" by T. E. Berg and R. F. Black; "Terrestrial vegetation of Antarctica" by E. D. Rudolph; "Ecology of soil microorganisms of Antarctica" by W. L. Boyd, J. T. Staley, and J. W. Boyd; and "Antarctic soils" by J. C. F. Tedrow and F.C. Ugolini.
(Review condensed, from Jerry Brown, in Arctic, 20(3), 1967)

Eolian Geomorphology, Wind Direction, and Climate Change in North America, was prepared by H. T. U. Smith for Geophysics Res. Directorate, Air Force Cambridge Res. Labs, from Tri-metrogon World War II aerial photographs, is a 48-page mimeographed (8.5 x 11 inch) report, dated 1963, with 20 photographs of the dune types in central and western Sahara; for a copy write to: U. S. Dept. Commerce, Office of Technical Services, Washington,D.C. 20025. Although stream action once was dominant in this part of the Sahara (presumably during the Pleistocene), wind appears to be the main geologic process today. The contribution here seems to be in the descriptions of the many (new to this writer) dune forms and in their value in determining present or former wind directions. "Active dunes may be classed as simple, compound, and complex. Simple dunes include attached lee ridges of sand, barchans, transverse ridges, and 'longitudinal' forms. ... Compound dunes comprise barchan, transverse, and longitudinal types, and are transitional into simple types ..., and complex .... Complex dunes are most widespread, and show extreme diversity in character. They may be grouped as longitudinal, peaked, domal, ridged, and undifferentiated. They are believed to have been formed by divergent winds, and to have had a complicated development history." The peaked and domal dunes appear extraordinary and their origin must be complex; the aerial photographs reveal them and all the others magnificently.

The compendium on arid region research by Lawrence K. Lustig is truly an Inventory of Research on Geomorphology and Surface Hydrology of Desert Environments. It is Chapter IV of University of Arizona Press' "Deserts of the World: An Appraisal of Research into Their Physical and Biological Environments," as yet unpublished and price unannounced. The complete edition is to cover physical features, flora and fauna, weather and climate, coastal zones, and desert regional types. We received a 1967 preprint of Chapter IV (189 pp., 8.5 x 11 inches, soft cover) from the author, but it might be obtained from Office of Arid Lands Research, Univ. of Arizona, Tucson 85719; these preprint chapters apparently are scarce and do not constitute official publication.

Lustig undertook a monumental task in providing this inventory of arid regions geomorphology so far achieved and the literature that covers it. Section II, Backgrounds of Modern Geomorphic Concepts (8 pp.) is an excellent status report of trends in modern geomorphology as he recapitulates the older schools of thought, thought in 19th Century North America, recent thought, conceptual frameworks, and quantitative studies. This section could stand by itself as a separate publication. Section III, Availability of Information (69 pp.) discusses what is known and written in every country in the world (except USSR and China) touched by a desert climate, from South Africa, the Sahara, the Somali-Chalbi, the Arabian Desert, southern Asia (Iran, Afghanistan, West Pakistan, India), the Australian Deserts, South America (Patagonia, Peru, Chile), to the untypical North American Deserts (U.S. and México). Lustig gives researchers scant opportunity for self-praise in Section IV, Evaluation and Recommendations (21 pp.), as he embarrassingly argues with justification that we still know little about the origins of desert landforms: plains, basins, pans and playas, inselbergs, pinnacles and tors, alluvial fans and pediments, or even what a desert is (definition), and what is the true nature of desert sands and dunes, of desert weathering and soils, or of desert stream channels. His recommendations for research in future are realistic and reasonable. Section IV, Pertinent Publications, lists on its 87 pages, arranged by the specific geographic areas previously discussed, with some annotations, approximately 2200 references to the literature cited in the three preceding sections.

William B. Bull kindly wrote, summarized in part here: The thoroughness of this work will make it valuable for many years. It will greatly aid those who try to reduce the provincial nature of their own studies on the North American Continent, by furnishing extensive sources of information to serve as a basis for comparison. This unique undertaking was started by contacting individuals and agencies in many parts of the world, and was supplemented by an extensive trip made by the author. Many of the principal authorities and depositories of arid-lands information, and most of the major deserts of the world, outside of the USSR and China, were visited to appraise the geomorphic work done. The result is a summary of man's efforts to understand the geomorphology of arid regions.

Arid Zone Newsletter, 1966, issued by Arid Zone Research Liaison Officer, R. O. Slatyer, Comm. Sci. Industrial Res. Organization, Caberra, Australia, again provides a cross-section of all manner of research in progress, with reports first from universities, state, and commonwealth organizations, on animal physiology, zoology, botany, hydrology, geology, geography, and geophysics. Of special interest to us is C.S.I.R.O.'s work on aeolian topography, stream geometry and behaviour, soil water, and Quaternary climates. The Division of Soils soon will be printing all of their maps (four already in print) of the Atlas of Australian Soils. This section on reports is 68 pages. Next is one review of 8 pages on work on: Water Redistribution for Increasing Pasture and Forage Production. Last are 17 pages of News Items and Announcements.

Life, Land and Water, edited by W.J. Mayer-Oakes, Univ. of Manitoba Press, Box 35, Winnepeg 19, Manitoba — first book of this Press, on Glacial Lake Agassiz & the region around it; geological, ecological, meteorological, and archeological; a Proceedings of the 1966 Conference on Environmental Studies of the Glacial Lake Agassiz; hard cover, $6 and paperback, $4. (Recommended by John A. Elson)

A symposium on the Cenozoic Geology of the Colorado Plateau in Arizona was held in August 1964 at the Museum of Northern Arizona in Flagstaff to develop an hypothesis on the Evolution of the Colorado River in Arizona. As a result, with this as its title, there is now available Museum of Northern Arizona Bulletin No. 44, edited by Edwin D. McKee, Richard F. Wilson, William J. Breed, and Carol S. Breed, paperbound, 8.5 x 11 inches, x + 67 pp., 24 figs., 1 tbl., 1967, for $2.50.

An attractive sepia picture of a part of Grand Canyon on the cover sets the mood. The figures are necessary, helpful locality and paleodrainage maps, plus a cross-section and 3 physiographic diagrams of the evolution of the river from Strahler's 1948 paper. Table 1, 10 x 23 inches, tipped into the back cover to be folded out while reading, is a correlation chart summarizing the sequence of events of 14 areas across the Colorado Plateau in Cenozoic time. Not only for further understanding here, but also for all geologists interested in this part of the Plateau, this table should prove to be of extreme value. One hundred and forty-nine references are cited (p.63-67), 39 per cent being of 1960 vintage or more recent. The Abstract by Wilson gives away their final conclusions, and the Preface by McKee explains the need for this synthesis of work begun by the Museum and others in the early 1940's and culminating now with this symposium. The symposium was organized into 12 panels with 20 participants (plus one in absentia), many serving simultaneously on several panels. After skipping ahead to peruse their conclusions, it seemed strange to this reviewer that several other geologists still living who have published considerable research in this area were not among the participants; perhaps they were invited but were unable to attend that particular August.

Chapter I compiled by W. J. Breed, is an outline (28 pp.) of the recently acquired geologic data, carefully and uniformly treated (e.g., Significance, Sequence of Events, Evidence for), of 17 areas west to east from the California-Nevada-Arizona lines to the Eastern Navajo Reservation area by 11 geologists. The 12 locality maps are indispensable since the mass of data is very difficult to follow from one area to the next. As an extreme example of the wealth of sequence offered, W. Kenneth Hamblin, for Shivwits Plateau area: Hurricane Fault Zone, lists and gives evidence for 18 events.
Chapter II compiled by C. S. Breed, summarizes (16pp.) laboriously step by step the events listed for the previous 17 areas from the close of Cretaceous to late Cenozoic, covering structural development and faulting, sedimentation, volcanism, and erosion. Although intended to serve as background for the climax of the discussion, this chapter reports so much information that it requires the reader's undivided attention to age, area involved, and geology for comprehension. For anyone unfamiliar with this part of Colorado Plateau, it amounts to a near-impossible task to follow upon first reading.
Chapter III summarized by Wilson develops (16 pp.) the evolution of the Colorado River system in 5 drainage stages — End of Cretaceous, Laramide, Mid-Cenozoic, Late Miocene (?) and Early Pliocene, and Modern. Drainage in northern Arizona at the end of Cretaceous probably was on an east and northeast gently sloping alluvial plain. Post-Cretaceous erosion removed 1000's of feet of Mesozoic sediments. In early Cenozoic, large uplifted areas and bordering monoclines produced north and northeast drainage toward lakes in central Utah and a widespread erosion surface. A whole host of events occurred in mid Cenozoic including sedimentation, local uplifts and erosion, and volcanism. Two separate drainage systems eventually appeared — Hualapai, draining west or southwest from Hualapai Plateau, and the ancestral upper Colorado, draining south and southeast from Utah into northeast Arizona. The Kaibab upwarp acted as drainage divide between the two. Late Miocene (?) and early Pliocene events include more sedimentation, some into interior basins, additional volcanism, and continued operation of the Hualapai and upper Colorado drainage systems. Final headward cutting of west-flowing Hualapai tributaries east around the south end of the Kaibab upwarp started in mid or late Pliocene, and lead to capture of upper Colorado River westward around the upwarp, forming the modern drainage arrangement sometime between 10.6 and 2.6 million years ago.

Evolution of the Colorado River in Arizona, cont.-

Details of the drainage changes are not worked out, and a few items of considerable importance are confusing. Some of the inferred drainage patterns on the maps (Figs. 20 and 21) are highly improbable, with several instances of 3- and one 4-stream junction (at right angles!) shown. On Fig. 20, the pre-Colorado River is flowing north, northeast, then north, and finally northwest into Utah, following (possibly with tongue-in-cheek) a proposed ancestral drainage system of Richard A. Young, with the burden of explanation for complete reversal of direction to come later. The ancestral upper Colorado River flowed southeast out of Arizona along the future site of Little Colorado River, and yet Fig. 22 shows a post-early Pliocene Little Colorado River unexplicably flowing northwest into a southwest-flowing upper Colorado River. For the progressive stages of headward piracy around the south end of the Kaibab upwarp, heavy reliance is made upon Strahler's famous 3 diagrams. Unfortunately, no attempt seems to be made to relate exact position of river and future canyon to structure (jointing or fault zones) as headward cutting transpired to produce final piracy of upper Colorado River.

No doubt this compilation and organization of recent data and summary of geologic events for this part of the Colorado Plateau has long been awaited and certainly constitutes a fine contribution to our understanding of the evolution of the whole Colorado River system, but it seems to this reviewer as if he has been through it all before, recollecting somewhere from the dim past the writings of the many others who have gone before — Powell, Davis, Blackwelder, Longwell, Strahler, and Hunt.

As was promised, No. 1 of Geografiska Annaler, Ser. A, v. 49A, 1967 is a single paper (127 pp.) devoted to deltaic morphology and processes, with 15 sketches, charts, and tables, 27 photographs, 58 graphs of plotted data, and 6 maps, and 2 Plates in the back pocket. The author, Valter Axelsson, has made the aim of his work a survey first of recent advances in studies of deltas, and then to exemplify and illustrate certain deltaic features by a rather complete description of a rapidly growing delta, The Laitaure Delta, in northern Sweden. This work was supervised by Philip Hjulström; help was obtained from Åke Sundborg and many many others.

The first part is a review (31 pp.) of the conditions necessary for formation of deltas, the flow patterns at the mouths of deltaic channels, morphology of delta fronts and delta plains, the splitting and closing of distributaries, and the sedimentary structures of deltaic deposits. The second part (15 pp.) is on the results of experimental studies on diversion of sediment at branching channels made in the Geomorphological Laboratory in Uppsala. The third part is a hydrological, morphological, and sedimentological account (64 pp.) of Laitaure Delta, one of the largest and most rapidly growing lake deltas in Sweden being built by sediments carried by Rapaälven into Lake Laitaure, fed mostly by meltwater from about 40 glaciers in Sarek National Park. The annual variation in water discharge is very great, as is also the sediment discharge being less than 0.01 ton/day and greater than 20,000 tons/day on other days. As a result, for some years, more than half the total annual discharge of sediment occurs during a 5 day period, which is also half the total annual delta growth. Lake Laitaure already is half filled by the delta and Axelsson estimates that if the present rate of sedimentation continues, the lake will be filled within 1000 years!

The special volume of Geografiska Annaler, on Landscape and Processes, Essays in Geomorphology, dedicated to Philip Hjulström, issued as Ser. A, v. 49A, Nos. 2-4, 1967, of 270 pages, contained not only the 20 papers listed on p.12 of The Geomorphologist, No.11, May 1967, but also 4 extra papers that appeared as a bonus, by:

Dylik, J., Solifluxion, congelifluxion and related slope processes

Koark, H. J., Über einen subglazialen Evorsionsring

concl.- p. 14

Rudberg, S., The cliff coast of Gotland and the rate of cliff retreat
Sundborg, Å., Some aspects on fluvial sediments and fluvial morphology. I. General views and graphic methods.

For this special volume, this makes a total of 10 papers on fluvial morphology, hydrology and subglacial streams; 4 on mass movement and periglacial conditions; 4 on marine erosion and coastal morphology; 2 on slope erosion and aridity, and one each on weathering, glaciology, deglaciation, and rock deformation.

The third issue of Current Research in Geomorphology, June 1966, records geomorphic research in progress during the academic year 1965-1966 of 351 different persons in University Departments and others outside of Universities in Great Britain as well as in several other countries. This is 47 more than was in this Register for 1964-65. The fourth issue of Current Research in Geomorphology, July 1967, registers 358 persons engaged in research in 1966-67. Again, as in previous years, this number of people reflects the continual interest in geomorphology in Britain as well as the strength of the British Geomorphological Research Group. For any one of these issues (1963, 1965, 1966, 1967) send $1 to Bruce Proudfoot, University of Durham (Science Laboratories), Department of Geography, South Road, Durham City, England

Pleistocene Mollusca of Ohio, Bull. 62, Part 2 (of 4 parts), 243 pp., 1967, at $2.50, by Aurele La Rocque (Ohio State Univ., Columbus), State of Ohio Division of Geol. Survey, continues the pagination of this Bulletin from (Bull. 62, Part 1, 1966, 111 pp.) p. 113 through p. 356, for Chapter 4, Naiades, including 32 genera and 106 species, and Chapter 5, Sphaeriidae, of 61 species. It appears great emphasis has been placed on locality, diagnosis, ecology, and bibliographic perfection. Maps of North America showing distribution of certain key species, with each a small inset map of Ohio distributions, appear on almost every page; these, plus many sketches of individuals total 208 Figures. Eight Plates on glossy paper of photographs and sketches of scores of individuals are at back.

Since Charles B. Hunt's Physiography of the United States (W.H.Freeman & Co.,1967,$7.50) has been reviewed at least in 3 other places, by R.O.Stone, Jour.Geol.Educ.,v.15, p.120, 1967; by D.R.Crandell, Amer.Jour.Sci.,v.266, p.125-127, 1968; and by E.B.Espenshade,Jr., in Geotimes,v.13, p.36,38, 1968, we certainly do not need to review it here. Yet we do wish to state that it is excellently written and is a joy to read because it is full of "Huntisms", good humor in least suspected places, and the little lectures against the depredations of man everywhere.

Cuchlaine A. M. King's Techniques in Geomorphology (St. Martin's Press,N.Y.,1966,$8.00) has been reviewed in only one place, more or less favorably, by J.A.Brophy, Jour.Geol. Educ.,v.15, p.122, 1967. L. K. Lustig in his annotated bibliography (see p. 11, this issue) writes: This book treats techniques that have been employed in quantitative geomorphic investigations, but does so in such a manner that the reader who wishes to employ similar techniques must resort to the original literature. That is, the book describes techniques that have been used by others, and cites results, but does not fully explain the procedures in any detail.

Samuel I. Outcalt and Donald D. MacPhail's A survey of Neoglaciation in the Front Range of Colorado, Univ. Colorado Studies, Series in Earth Sci.,No. 4, Univ. Colo. Press, Boulder, 124 pp., 1965, $4.50, with 17 photos (most are oblique aerial), 17 black and white maps, 12 blue-shaded glacier maps, 9 Figs., and 44 tbls., includes ablation, accumulation, recent glacier activity, glacier variation and climate, and photogrammetric study of mass balance for 1963-64 of 8 drift glaciers on the Continental Divide.

Sidney E. White, Editor

The Geomorphologist

To Affiliates of the Geomorphology Division:

OFFICERS AND PANEL MEMBERS

For the benefit of all affiliates of the Division, we list here the new Officers of Division and Members of the Panel.

Officers:	William D. Thornbury	Chairman
	Arthur D. Howard	First Vice Chairman
	David M. Hopkins	Second Vice Chairman
	Sidney E. White	Secretary

Panel Members:	Term of Office:
Joseph H. Hartshorn	July 1967 through December 1968
Troy L. Péwé	July 1967 through December 1968
M. Gordon Wolman	July 1967 through December 1968
Dwight R. Crandell	January 1968 through December 1970
Stephen C. Porter	January 1968 through December 1970
A. Lincoln Washburn	January 1968 through December 1970

The revised By-Laws of the Division stipulate two-year terms for Panel Members. During the transition period Joe Hartshorn, Troy Péwé, and Reds Wolman serve only one and one-half years. The three new members that you chose by ballot last November will serve the new full two-year term. We shall again have to nominate three Panel Members later this year for two-year terms.

PUBLICATIONS

In 1967, the then Chairman of the Geomorphology Division appointed a Publications Committee consisting of Donald F. Eschman, Chairman; Arthur L. Bloom, and Ernest H. Muller, to investigate the feasibility of the Division sponsoring a series of paperback books on different phases of geomorphology, for use as primary or supplementary textbooks in colleges and universities or as up-to-date reviews of special subjects in geomorphology for all geologists and other scientists. During 1967 up to the time of the annual business meeting of the Division at New Orleans, the committee encountered general enthusiasm for the idea from the many geomorphologists they consulted, as well as from prospective commercial publishers. At the annual business meeting, definite interest was shown again for the Committee to investigate further the feasibility of such a publication series, and, in fact, a motion was carried easily by those present in favor of such continuation. This Committee, then, is still in existence and continuing its work.

Continued, next page -

Two questions, which, if answered by you, may help your Publications Committee in their work:

1. What are your current favorite publications that you use for review reading or that you read to bring yourself up-to-date in your special area in geomorphology ?

2. What areas in geomorphology do you believe need a review paper written to bring us up-to-date with the latest information and research in that area?

Please give these two questions some thought, and then please send your answers to the Chairman of your Publications Committee:

Dr. Donald F. Eschman
Department of Geology
University of Michigan
Ann Arbor, Michigan 48104

OR, you may instead, if it seems easier, enclose your answers to these two questions with the news of your research progress or plans to Sidney E. White, Editor of The Geomorphologist, our Division's Newsletter. Your answers to these two questions will be forwarded to Don Eschman, of course.

In addition, on the older problem of a journal publication, at the annual business meeting of the Division in New Orleans, the possibility of an international journal on the Quaternary, to be edited by A. Lincoln Washburn at University of Washington and to be published perhaps by Elsevier, was announced. This news was received with great enthusiasm by those present and it was moved immediately and passed that the Division endorse Linc Washburn's efforts to establish a Quaternary journal and offer whatever assistance it could. This indeed is great news, for it may eventually become the solution to our decade-old problem of our need for a Journal of Geomorphology.

SYMPOSIUM

A symposium on the Quaternary of Quebec, organized by the section of Geomorphology and Quaternary of the A.C.F.A.S., and the Department of Natural Resources of Quebec, will be held in Chicoutimi, on the 5th, 6th, and 7th of September 1968. A field trip within the Lake Saint-Jean / Saguenay area will be under the direction of Dr. Pierre Lasalle.

Those who expect to present a paper at this meeting must inscribe it in one of the following sections: (1) Glacial Quaternary, (2) Marine and Lacustrine Quaternary, (3) Periglacial, (4) Paleontology and Palynology, (5) Pedology - Ecology - Climatology, (6) Archaeology. Titles and abstracts must be sent to the Secretary before May 31, 1968.

To avoid confusion and to facilitate the planning of the meeting, it will be useful to know, as soon as possible, the intent of the scientists to present a paper and/or to attend the meeting. Please send all correspondence to: Jean-Claude Dionne, C. P. 35, Sillery, Québec, Canada. The Organizing Committee consists of J. C. Dionne, Benoit Robitaille, Pierre Lasalle, et Robert Bergeron.

NEW YORK GLACIOGRAM

Since our last note of March 1967, the New York Glaciogram has appeared twice (Vol. 2, No. 1, May 1967 and Vol. 2, No. 2, Nov 1967). The May issue with yellow cover and sketch of old friend Smilodon yawning from a rock top holds 21 news items from 20 contributors, whereas the November issue with light blue cover and sketch of glacier and mountains contains 29 items from 30 people. The editor believes a plateau has been reached, but this writer believes growth and greater interest is indicated.

February 1967

Sidney E. White, Secretary

THE GEOMORPHOLOGIST

The Annual Newsletter of the Geomorphology Division

If you will contribute news you may have about current or recently completed research, or research plans you may have, we will produce another Newsletter. Please send any news, or information you believe your fellow geomorphologists should know about, exciting new publications we might not have seen yet, and your answers to the two questions asked by your Publications Committee (please identify these answers for the Publications Committee).

Use the space below, and send to Sid White: - at least by March 1st

Dr. Sidney E. White
Geology - Ohio State University
125 South Oval Drive
Columbus, OHIO 43210