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There were so many replies to personal requests for news and to the annual request via Larry Nobles that we were overwhelmed for nearly three months. A special attempt was made this year to contact almost everyone on the West Coast; the kind services of our Associate Editors were not used. The voices of research cry out from the wilds of Canada to the shores of California, from Switzerland to the Antarctic, and from the depths of the ocean basins to the tops of mountain ranges. Our thanks go to you all - all 96 of you for writing and for your news contributions and reprints. Nearly complete addresses for everyone have been recorded, since correspondence among you about the many research efforts is an expected consequence upon receipt of this Newsletter. You may note, incidentally, the several instances of duplication of research among you.

Many colleagues expressed surprise at our Boulder address (although this was noted in our last Newsletter), which is but for one academic year. We shall return to the fold at Ohio State University after the summer of 1966. Appreciation now is given for use of printing facilities, stationary, and postage to the Department of Geological Sciences of the University of Colorado, our host for this year.

Sidney E. White, Editor

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KIRK BRYAN AWARD FOR 1966

Charles S. Denny, 1965, Alluvial fans in the Death Valley Region: U. S. Geological Survey Prof. Paper 466, 62 p.

This paper is a precise description of the complex morphology and surface features of a group of alluvial fans typical of the arid American Southwest. The description leads to a critical discussion of processes of fan formation. The paper is based on a large body of detailed and careful field observations. It should serve for many years as a standard reference of alluvial fans, desert basins, and their sediments. It shows that an alluvial fan is a complex morphological feature whose form is determined by the interaction of a variety of processes.

The paper contains a discussion of minor erosional landforms on fans produced by the process of creep generated by expansion and contraction of clay. This discussion has wide applicability to similar landforms in other regions.

N E W S I T E M S

Troy L. Péwé (Arizona State Univ., Tempe) helped lead a successful INQUA central Alaska Field Conference, 18-29 August 1965, along with Oscar J. Ferrians, Jr., Donald R. Nichols, and Thor N. V. Karlstrom. The conference was attended by 68 scientists from 18 different countries. As a result of the symposium held in conjunction with the conference, a volume on Polar Processes and Features (mainly periglacial) of 25 papers is being compiled. In addition, among several publications that appeared in 1965, Péwé, with others, authored or helped author papers on the Physical Environment of Alaska; Origin and environmental significance of large-scale patterned ground in the Donnelly Dome area, Alaska; Geology of the Mt. Hayes D-3 Quadrangle, Alaska; Extent of Glaciations in Alaska; Subglacial topography of Gulkana Glacier, and an extensive study of Fossil Ice Wedges. Péwé received new C^{14} dates on carcasses of extinct animals in permafrost from Fairbanks; all indicate that permafrost has been present there for more than 30,000 years; some thawed 5,000 to 8,000 years ago.

Stephen C. Porter (Univ. of Washington) is completing work on the glacial history of the Yakima River drainage in the east-central Cascade Range of Washington under an NSF grant. This valley appears to have one of the most complete records of Pleistocene glaciation yet found. On the basis of soils and various weathering parameters, it has been possible to delineate 3 and possibly 4 major episodes of glaciation, the younger two of which are Wisconsin. The youngest of the two Wisconsin drifts may be subdivided on the basis of moraines, outwash, and weathering parameters into 5 substages, whereas the older may be subdivided into at least two. A good record of Neoglaciation occurs along the Cascade crest. Comparable, but not quite as complete records exist in the nearby drainages of Wenatchee River and Ingalls Creek, now being worked on by William A. Long and Kenneth D. Hopkins, respectively. Special attention has been paid to volcanic ash layers of known age; quantitative X-ray fluorescence studies of titanium dioxide content of different ash layers have been used to provide a rapid supplementary technique for identification. Recently completed quadrangle studies in the Puget Lowland east of Seattle by Theodore A. Curran, Charles Anderson, and Theodore F. Rosengreen emphasize the recessional history of the Puget Lobe during the Vashon Stade of the Fraser glaciation. Fifteen stages of ice recession are delineated within four quadrangles. Other recently completed studies of glacial geology include the lower Quinault drainage of the southwestern Olympic Peninsula by James L. Moore and two valleys on the east flank of the Olympic Mountains at the margin of the Puget Lowland by Jim G. Friskin.

Thomas D. Hamilton (Univ. of Washington) is completing work on the glacial history and geomorphology of the Alatna Valley in the south-central Brooks Range of Alaska. Drifts of 3 major glaciations are delineated, the youngest of which has several stades. C^{14} dates should provide basis for interregional correlation. Stephen C. Porter and Hamilton in summer of 1965 studied the glaciation of the Kurupa Lakes region in north-central Brooks Range hoping to be able to provide correlation between the Alatna Valley and the Anaktuvuk and Chandler drainage basins.

John R. Reid (Univ. of North Dakota) Sam Harrison, are in the process of determing past flood frequency of a section of the Turtle River through analysis of tree scars left by rafted ice and logs during the spring floods.

Sam Harrison, working with Lee Clayton, plans to start a flume study on the relation between ground-water seepage forces and stream competence, morphology, and sediment characteristics; a flume with controlled pore-water seepage will be constructed. Tom Hamilton will be starting a complementary study of the relation between groundwater seepage and the characteristics of one or two small streams in western North Dakota.

John Reid took three undergraduate students with him to the area of the Martin River and Sioux glaciers in summer, 1965. Investigations involved the establishment of ice-movement and ablation stations across two glaciers for remeasurement this summer, but additional studies were more geomorphological. Among these was study of the morphology of the 1964 earthquake-triggered avalanche on Sioux Glacier. The changes in this cover as a result of glacier flow and impeded ablation of the underlying glacier ice will be studied in more detail in 1966. Other studies involved impounded glacial lake and melt-water stream fluctuations. Measurements were made with a Price current meter and a lake level gage. Additional studies on ground water variations in the proglacial outwash plain will be made by Kirth Erickson.

Frank Schulte is a Fulbright Fellow in New Zealand carrying out studies of the Cass River drainage basin under the supervision of Max Gage. His investigations include a correlation of velocity and the physical character of the stream bed and its components.

Others working on geomorphological problems include James Merritt and LaVern Rude, each mapping the glacial geology of half of Griggs County, N. Dak., Peter Kukk, mapping the "Pembina Delta" in the glacial Lake Agassiz basin, and Ted Callender, investigating the post-glacial history of Devils Lake through analysis of the physical environment of the lake as well as the bottom stratigraphy.

Samuel J. Tuthill (Muskingum Coll.) with William O. Field and Lee Clayton, in summer, 1965 in the Sherman-Sheridan Glacier area, Alaska, located the glacier terminus precisely, worked on the glacial geology, and determined the geographic distribution of the pro-glacial biota. This work was NSF-supported and in cooperation with an Ohio State Univ. Inst. Polar Studies team under direction of Colin Bull and Cedo Marangunic. The general purpose of the two research teams was to establish reference data so that the reaction of the Sherman Glacier to the 33 x 10^6 cubic yard rock avalanche, triggered by the March 1964 earthquake, can be studied precisely. It is expected that the addition of rock mass plus the mass of the conserved ice insulated by the rock debris on the lower glacier will initiate terminal advance. This expectation was supported by the appearance of a low push moraine during winter 1964-65. After the lower glacier advances sufficiently to equilibrium, this debriscovered portion of ice may stagnate. During the coming years a study of the forestation and animal population changes in time may be made with rare precision.

Richard H. Ragle (Norwich, Vermont) has been working with the AINA-AGS Icefield Ranges Research Program since 1961 mostly as Field and Scientific Leader, but also as glaciologist. This program has been growing and now has scientists in geography, geology, geophysics, meteorology, and plant and mammal ecology. Field project supervisors have included M. Mellor (CRREL, Hanover, N. H.); Colin B. Bull (Ohio State Univ. Inst. of Polar Studies); and Melvin G. Marcus (formerly Univ. Michigan). In the summer of 1965 David F. Murray (Univ. Colorado Inst. Arctic-Alpine Research) worked on the plant and animal ecology of an isolated nunatak, Kaskawulsh Knoll; Karen Ewing (Univ. Michigan) on stream development on the North and Central arms of Kaskawulsh Glacier; Noye M. Johnson (Dartmouth Coll.) and Ragle on a survey of a slide onto the Allen Glacier in the Chugach Mountains; J. Peter Johnson (Carleton Univ., Ottawa) on geomorphic development of Gladstone Creek east of Kluane Lake; Robert K. Fahnestock (Univ. Texas, Austin) on stream channel morphology and patterns in coarse outwash alluvium of the Slims River; and Sam Collins (Rochester Inst. Techn., N. Y.) and Richard Machowski (Northern Michigan Univ., Marquette) on the geomorphology of a small area of sequentially arranged features on the north margin of the Kaskawulsh River lobe of the Kaskawulsh Glacier.

Archie M. Stalker (Geol. Survey of Canada, Ottawa) spent time in 1965 on the Quaternary stratigraphy along the banks of the South Saskatchewan River in Alberta and Saskatchewan. C. S. Churcher of the Royal Ontario Museum and University of Toronto went along to study the vertebrate fossils there; they uncovered a remarkable collection of vertebrates in sands beneath till, sands estimated to have an age of 25,000 years, deposited probably just prior to the Classical Wisconsin. Postglacial deposits containing mostly horse and bison remains also were examined. They intend to continue this study early in the summer of 1966. Further progress was made in 1965 in delineating the Foothills Erratic Train, now mapped in detail from about 3 miles north of the United States border near Milk River to about 40 miles north of Calgary - a linear distance of 230 miles; the boulders originated near Jasper, Alberta.

John E. Armstrong (Geol. Survey of Canada) spent several weeks in 1965 investigating proglacial and post glacial marine deposits (up to 700 feet above sealevel) in the fjord valley extending from Kitimat to Terrace in the Coast Mountains of British Columbia, 400 miles northwest of Vancouver. Robert F. Legget and associates in cooperation with Armstrong are investigating the sensitive clays (glaciomarine and marine) of the Fraser Lowland.

William H. Mathews (Univ. British Columbia, Vancouver) just completed a study of a second catastrophic drainage (jokullhaup) of Summit Lake, B.C., under Salmon Glacier in November 1965. With H. Nasmith and G. E. Rouse, he is collaborating on a study of the post-glacial Bridge River ash in south central B.C.

J. Ross Mackay (Univ. British Columbia) will be working at Garry Island, Mackenzie Delta, in April 1966. His objectives are: to resurvey vertical tubes installed in August 1965 in areas of tundra polygons and solifluction slopes, hoping that any differential 3-dimensional movement due to the six-month temperature difference may be measured; to measure the penetration of frozen ground, ab initio, in an artificially drained 400-foot-diameter lakebed. In early June, a 1000-mile boat trip will be made down the Mackenzie River particularly to study the 3-dimensional mixing of Liard River with Mackenzie River water. On two previous trips, temperature and turbidity differences were detected for 250 miles downstream. The rest of the summer will be spent on a full scale experiment trying to grow a pingo.

Aleksis Dreimanis, University of Western Ontario (London, Ontario), continued investigations in the Port Talbot Interstadial type area along N. shore of Lake Erie, and new test-drillings were done, with assistance of the Geological Survey of Canada. Two layers of buried volcanic ash were found in the Banff National Park, Alberta, and their stratigraphy is being studied jointly with John Westgate. J. Westgate spent one year as postdoctoral N. R. C. research fellow at the University of Western Ontario, and investigated a stratigraphically interesting section of 9 tills at Zorra, Ontario. A. A. Berti is J. L. Craft - cirque-like depressions in Adirondacks, New York; C. B. Gunn is re-investigating the diamond occurrences of Great Lake Maumee from the Lake Whittlesey deltaic gravels at Komoka, Ontario. U. J. Vagners continued studies of till lithology and mapped the Fort St. Marie area, Ontario. In 1966-67 A Dreimanis will be on sabbatical leave, and Franz Mayr from Innsbruck, Austria, will replace him.

Stephen S. Visher (Bloomington, Indiana) wrote in Professional Geographer, May 1965, about 15 Americans who contributed notably to physiography during the period 1900-1920.

John E. Warme (Univ. Calif. Los Angeles) continues his studies of lagoonal and deltaic sedimentation and organic life in Mugu Lagoon, Ventura Co., California. In his geomorphic analysis of the development of the area, he has determined that the eastern part of the lagoon rests on a wave-cut platform at the base of the Santa Monica Mountains, the western part extends onto the Osnard Plain underlain at least by 1000 feet of deltaic Pleistocene and Recent sediments and a greater thickness of older Cenozoic strata, and that Mugu Submarine Canyon extends to within one-quarter of a mile of the beach. Mugu Lagoon is the most recently formed in a series developed behind barrier beaches in this area. Old beach ridges are exposed inland from the modern beach, with extensive sedimentary filling and salt march development between the older ridges. Marsh expansion is very rapid, restricting circulation and promoting deposition.

Charles G. Higgins (Univ. of California at Davis) has been in Europe since September 1965, working especially in Greece, where near Pilos he is studying closely-spaced, well-exposed tubular solution wells (often measuring a meter in diameter and 4 meters depth) in Pleistocene calcarenite along the coast. He also is working on several groundwater problems, such as the origin of salt water in springs and wells far from the ocean, the velocity of underground salt water flow, and the distance inland of salt water contamination. In order to establish fully the reconstruction of the geologic history of the Cave of Nestor near Pilos, he is attempting, with the help of Paul Faure, to date the flowstone layers by radiometric means. At the time of writing to this Editor, however, in February, Higgin's return address was "somewhere" in Switzerland (sigh!).

Edwin D. McKee (USGS., Denver) is continuing his investigations of primary sedimentary structures in modern deposits and in an experimental laboratory in Denver. A report on dunes at White Sands, New Mexico, is soon to appear, and another on climbing ripple laminations is in press. Studies of recent flood deposits on the floodplains of Bijon Creek, Colorado, and experiments on the development of convolute bedding in the laboratory are underway.

Robert M. Norris (Univ. Calif. at Santa Barbara) is studying the relationship between dune sand color and age, being convinced that unconsolidated sands grow steadily redder in warm and hot environments with the passage of time. So far, no clear means for establishing a useful quantitative relationship has emerged, although much yet remains to be done regarding the influence of mineral composition, temperature, and rainfall (climate). A second study is in progress dealing with the origin of the headlands along the Santa Barbara coast. Some headlands are deltaic forms, others are prograded beaches formed in the shelter of offshore rocky reefs, others more resistant rocks, and other still of uncertain origin; ten to 12 headlands are being studied.

Peter P. David (Univ. of Montreal) undertook in 1964 a long term study of sand dune areas in Canada in part by means of aerial photographs and in part on basis of field work in selected localities. His ultimate goal is the preparation of a map of dune distribution in Canada, and the classification and interpretation of the dune areas. He originally had expected to determine former wind directions in an analysis of the overall late-Glacial pattern, but has since recognized that only local wind directions may be determined, since Canada was deglaciated in a series of stages and the dunes are of different ages.

Richard O. Stone (Univ. of Southern California, Los Angeles) indicates that the geomorphic studies of faculty and graduate students are concerned with desert, coastal, and submarine processes and landforms:

John J. Fisher (Univ. of Rhode Island, Kingston) is conducting a study of the glacial stratigraphy of Block Island by means of electrical resistivity techniques; he is assisted by graduate student Raymond Whitehead. Correlation between sea cliff outcrops and drill holes will be used to establish a resistivity network across the island. This, the first phase of a long-term study of the glacial geomorphology of the Island, is supported by a two-year grant from the Office of Water Resources Research. Block Island is an isolated remote remnant of the Wisconsin terminal moraine; its study should prove significant in correlating glacial deposits of Long Island with those of southern New England.

Harold W. Borns, Jr. (Univ. of Maine) is continuing his 1965 field studies on a large end-moraine complex in eastern coastal Maine. It extends over 150 miles from St. John, N.B. to the Penobscot River, and consists of a 30 mile wide belt to lobate cross-cutting moraines, marine deltas, and kame fields, all about 14,000 years old, the margin of which at times was controlled by the sea.

Dwight R. Crandell (U.S.G.S., Denver) along with Donal R. Mullineaux continue their studies of the variety and frequency of postglacial eruptions and mudflows on Mount Rainier. They hope to produce an educated guess concerning the nature of future volcanic hazards in and adjacent to the National Park. Their study of the surficial deposits has proven valuable since the deposits represent a rather wide range of events at the volcano that have not occurred within the relatively brief interval of historic time.

Peter W. Birkeland (Soils & Plant Nutrition, Univ. California, Berkeley) has nearly completed his correlation between Sierra Nevada glaciations and the deposits of Lake Lahontan; the main basis for this is the tracing of river terraces along the Truckee River, and soil morphology. His work on the origin of soils along the transect involves analyses of mineral grains, soil thin sections, and clay mineralogy. Birkeland also, with Carl M. Wentworth, Jr. and Meyer Rubin (both of USGS), is making a quantitative study of the formation of a cumulative chernozem soil profile on a Recent alluvial fan on the California coast, as well as determining the usefulness of soils as an aid in marine terrace correlation.

Keith M. Hussey (Iowa State Univ., Ames) is attempting to interpret drainage changes within the Colorado Piedmont as revealed by the pediment remnants along the east side of the Piedmont and southward from the South Platte-Arkansas divide to the Arkansas Valley.

Glenn R. Scott (U.S.G.S., Denver) writes that the Southern Rocky Mountains Branch of the Survey is preparing a revised edition of the Morrison quandrangle, Colorado. The previous map (I-428) by J. H. Smith showed only sedimentary rocks and now is out of print. The new map will show sedimentary and crystalline rocks and the overlying surficial deposits. The surficial map is to be an extensive modification and addition to the work originally prepared by Richard M. Pearl.

Henry E. Kane (Ball State Univ., Muncie, Indiana) has published with University Microfilms the "Quaternary Geology and Geomorphic History of the Southeastern Portion of the Canon City Embayment, Colorado." Kane, along with Keith Huffman (U.S.D.A., Muncie) are mapping the glacial geology of Delaware County, Indiana.

Randall E. Brown (Battelle-Northwest, Washington), and others, are studying deflation features, loess, and sand dunes of late Pleistocene to recent in the Hanford Project area.

John W. Blagbrough (Albuquerque, New Mexico) and William J. Breed (Museum of Northern Arizona, Flagstaff) completed their study of the Protalus Ramparts on Navajo Mountain, southern Utah: Protalus ramparts form platforms extending from the base of the upper slopes of Navajo Mountain onto topographic benches below and have elevations of approx. 8,500 feet. The platforms are composed of either one, two or three protalus ramparts and have an average length of 300 feet and a width of 200 feet. The protalus ramparts are formed by large angular boulders derived from the Dakota Sandstone of Cretaceous age, and are separated by ditches which are either free of or partially filled with talus debris. The ridges are between 5 and 80 feet high, 10 and 120 feet wide, and were deposited within 500 feet of the talus covered slopes of the mountain. The degree of weathering and the topography of the platforms indicate that they formed in the Wisconsin, and two ages are distinguished using physiographic criteria. The older protalus ramparts correlate with the Bull Lake glaciation and the younger are assigned to Pinedale glaciation of the Rocky Mountain region. The individual ridges in the platforms probably developed during distinct periglacial stages. The elevations of the regional and orographic Wisconsin snow lines in the southwestern United States suggest that the protalus ramparts formed below the orographic snow line along seasonal snow banks which were above timber line. The altitude of the platforms indicate that the life zones in the regions were depressed a minimum of 3,000 feet during the Wisconsin. Blagbrough and Steven E. Farkas also started a study of rock glaciers in the San Mateo Mountains of west-central New Mexico, work which will continue this spring and summer (1966). The rock glaciers are at an altitude of about 9,000 feet in the 10,000 foot mountain range that was too low to have been glaciated during the Wisconsin.

Noel Potter, Jr. (Univ. of Minnesota) has selected the Galena Creek rock glacier in the northern Absaroka Mountains, Park Co., Wyoming, for detailed study. Attention will be paid to the structure of debris and ice, movement rates, processes by which debris and ice are fed to and incorporated into the mass, the insulative properties of the debris mantling the ice, and avalanche deposits on and adjacent to the rock glacier. A portable hammer seismograph was successful in determining thickness of debris on the ice. The debris mantle is a relatively constant one meter over about 2/3 of the rock glacier surface and overlies relatively clean glacier ice. Thickness of debris mantle increases to 2 to 3 meters over the downvalley 1/3 of the rock glacier. Maximum surface velocity where the rock glacier flows out of the cirque is .84 m/yr (a two-year record). Maximum surface velocity near the downsteam end is about 1/6 the above rate. A series of lobes near the middle are overriding one another, as shown by measurements between printed boulders on adjacent lobes. Structural studies will be facilitated by orientation studies of tabular boulders on the surface. Fabric studies on ice collected in summer of 1965 showed typical temperature glacier fabric for c-axes, with four maxima distributed in rhomblike pattern about the normal to the foliation of the ice. A five-month summer field season is planned for this year (1966).

C. Vance Haynes (Univ. Arizona, Geochronology Labs.) is continuing study of late Pleistocene alluvium through stratigraphic mapping and C^{14} dating, in reference to archeological sites (locality not mentioned) to obtain data on rates of alluviation, erosion, and soil formation, and to correlate these with estimates of associated faunal and cultural changes.

Carl Oppenheimer, marine microbiologist, is the new Director of the Florida State University's Oceanographic Institute, replacing Al Collier who is returning to full-time teaching.

The Ohio State Univ. group working on the east side of the Colorado Front Range, in part with the Institute of Arctic and Alpine Research (Univ. of Colorado), will continue in summer 1966 its several glacial, periglacial, and botanical projects: Richard B. Bonnett on a 2-year study of the total Wisconsin glacial sequence of the upper Boulder Creek drainage basin; R. Gary Wallace on a 3-year mapping and motion study of periglacial and glacial deposits in 5 valley heads and cirques above the uppermost limit of late Pinedale stage moraines; Ronald L. Laughlin on a 2-year phytogeographic and ecologic study of plant communities on the same deposits of Wallace's area; and Sidney E. White on the motion of 3 rock glaciers (including the Arapaho rock glacier) initiated in 1961, and of many protalus lobes, of rockfall, alluvial, and avalanche-produced talus, and frost rubber sheets, initiated in 1964 and 1965. James H. Richards (Englewood, Colorado) will make size analyses and fabric studies of all the talus under observation. A seven to 10-year continuous motion study is planned in an attempt to determine the rate of accumulation and movement to estimate the amount collected in the valleys since late Pinedale. Several massive rockfalls and spectacular mudflows occurred on the talus during summer 1965 as a result of repeated locally intensive cloudbursts.

John Montagne (Montana State Univ., Bozeman), with help from the Water Research Act, and under the auspices of his University, has set up an automated data gathering facility on the entire east flank of the Bridger Range, 18 miles northeast of Bozeman. They are attaching various instrument arrays onto this system, and invite any researcher with an interest in snow and snow avalanches, meteorological observations, or related subject to visit and utilize these facilities. Presently, with Dr. C. C. Bradley, they are working with snow temperatures and snow stratigraphy as factors in snow strength; also, they are experimenting (successfully at present) with wind baffles on an exposed ridge designed to prevent the formation of dangerous overhanging snow cornices. They have just concluded a school on snow avalanches for over 100 students from the Northern Rocky Mountains, and continue to analyze the reasons for and the prediction of avalanches. So far, Montagne is not impressed with the importance of their local avalanches as primary movers of rock material, although the relentless incipient amounts that are brought down each year may have a cumulative effect much like Rapp's avalanche types in Lappland. This has been a very dangerous year (writing in February 1966) for avalanches because of the thin snow pack (promoting snow metamorphism of unstable type) and the prolonged winds early in the winter.

Carroll Ann Hodges (Colorado State Coll., Greeley) has finished a complicated geomorphic history of Clear Lake, California, under the guidance of Arthur D. Howard. Clear Lake, the largest freshwater lake entirely within the State, was first noticed by W. M. Davis who suggested that its outlet alternately shifted from one side of the basin to the other. She will join the Utah Construction & Mining Co. in San Francisco later this year.

Roger Spitznas (Augustana Coll., Rock Island, Ill.) is continuing a study of the California coastal area between those previously studied by David D. Smith and William C. Bradley. Portable seismograph studies should provide information on the configuration of the rock platform of the "100-foot" terrace. The primary goals are terrace correlation between the two previously studied areas, and an attempt toward better evaluation of the respective roles of eustatism and tectonism in determining terrace levels.

Arthur D. Howard (Stanford Univ., Calif.) is working on an up-to-date summation of the role of drainage in geologic interpretation, and on an improved procedure for portrayal of remnants of elevated erosion surfaces.

Rudolf Martin (now of 720 7th St., Calgary, Alberta) has continued his interest in Paleogeomorphology, and in its use in exploration for oil and gas. A paper published on this deals with a number of geomorphic features recognizable on buried erosion surfaces which illuminate certain problems of modern geomorphology including the peneplain controversy and the nature of summit levels.

George P. Rigsby (San Diego, California) has been discovering how complicated ice crystal structure truly is in the temperate Blue Glacier in the Olympic Mountains of Washington. The study began as a statistical inquiry of the shape of ice crystals to determine if thin sections in two dimensions would provide all the information that may be observed in the three-dimensional specimen. He has learned that the shapes of some of the crystals, when followed very carefully in the third dimension, are so complicated that sometimes the same crystal is cut more than 15 to 20 times in one 21 cm by 32 cm thin section. He was able to follow the same crystals through several successive thin sections. Hence, a two-dimensional study of temperate glacier ice does not reveal the true nature of the ice crystals, since single crystals branch in such complicated ways and wind around between other crystals. The average grain size size appears to be only a few cm, but when carefully followed in the third dimension, many crystals may exceed one third of a meter. In addition, the "c" axis of the crystal may vary as much as ten degrees from one side of the section to the other, which might lead one to believe, when studying a two-dimensional section, that the different parts of the same crystal are not related.

The current research of Robert E. Wallace (USGS, Menlo Park) relates to use of geomorphology along the San Andreas fault zone as a key to offsets, rates of movement, and thus also to earthquake prediction. Studies are concentrated in the Carrizo Plain area west of Bakersfield, where offset stream channels are so beautifully displayed. The program is primarily a part of the study of the Western Earthquake Belt. An Earth Orbiter program being conducted within the USGS in cooperation with NASA is being integrated with the earthquake program. Under the Earth Orbiter program, a series of tests and evaluations of remote-sensing techniques are being conducted. Already available are infrared and radar images, as well as black & white, color, and nine-frame multiband photographs of much of the Carrizo Plain area. Such new techniques may assist in the geomorphic analysis of the region (e.g., identifying obscure ancient offset segments of drainage channels, or offset of non-obvious soil units).

Harold E. Malde (USGS, Denver) is spending his final season of field work in the Puebla Valley, Mexico, studying Early Man sites in the Valsequillo area, financed by NSF through Harvard University, and in collaboration with Clayton E. Ray, vertebrate paleontologist from the Smithsonian Institution, Cynthia Irwin-Williams, archeologist from the Paleo-Indian Institute at Eastern New Mexico University, and Juan Armenta Comacho of University of Puebla who discovered the Early Man sites. The sites occur in the lower part of an alluvial section at least 35 meters thick, in association with an extinct vertebrate fauna. Although no radiocarbon dates are yet available, the artifacts are archeologically primitive and must be counted among the earliest signs of man in the New World. By use of volvanic ash beds, Malde is attempting to correlate the sites with glacial deposits on the adjacent high volcanoes. The petrography of the ash beds is being studied by Virginia C. Steen of Washington State University, who recently completed a study of Mount Mazama and Glacier Peak ash in the Pacific Northwest.

Morris M. Leighton (307 East Florida Ave., Urbana, Illinois) has been made honorary fellow of the New York Academy of Sciences for his contributions to Quaternary Geology.

In the summer of 1965, Luna B. Leopold and William W. Emmett, with other colleagues in the U. S. Geological Survey, ran a boat expedition down the San Juan River and through the Grand Canyon of the Colorado. They took depth measurements of the river throughout the whole length and believe that because of the closure of the bypass at Glen Canyon Dam there never again will be as favorable an opportunity for getting depth data close to natural conditions. Leopold and Emmett recently published a paper in the Bulletin of the International Association of Scientific Hydrology, suggesting how Vigil Network original data should be prepared, and, hopefully, filed so that geomorphologists in the future might be able to resurvey from the same benchmarks. It is hoped that all geomorphologists who are making recurrent measurements through time, that is, re-surveys, will read this paper and participate in an international permanent file of benchmark locations so that re-surveys are possible in the distant future. It is suggested that geomorphologists making such time observations look up Leopold's and Emmett's paper in the 10th Annual Volume, No. 3, 1965, entitled, "Vigil Network Sites: A Sample of Data for Permanent Filing." In the same publication Emmett presents the results of his time observations at certain hillslopes and channel sites.

Garnett P. Williams is continuing his flume studies on sediment transportation, using methods nearly identical to those of Grove Karl Gilbert.

John E. Parkes (USGS, Washington) is conducting a hydraulic experiment in the laboratory on artificial meandering channels, investigating the effect of curvature on the position in the meander of energy loss.

Garald G. Parker (USGS, Water Resources Div., Denver) is doing research on Basic Processes of Erosion and Resultant Landforms at field stations at Warbonnet Ranch, near Harrison, Nebraska; at Thomas Condon - John Day Fossil State Park, near Kimberly, Oregon; Capitol Reef Natl Mon., Utah; Bryce Canyon Natl Park, Utah; Petrified Forest Natl Park, Arizona, Death Valley Natl Mon., Calif.; Virgin Peak bajada, Nevada; Cathedral Gorge State Park, Nevada; and House Range bajada, Utah. These are all long-range observation stations and a part of the Vigil Network. The basic processes of erosion that are most intensively under study are piping and collapse structure phenomena, involving field observation and laboratory study of the rocks involved. In the laboratory phase of the research, Everett A. Jenne is an associate, and Valmore C. LaMarche will help determine, by tree-ring dating methods, rates of cliff recession and land-surface denudation at Bryce Canyon and also at Table Cliffs Plateau, Utah.

As part of the U. S. Geological Survey's contribution to the International Hydrological Decade, a Vigil Network of small drainage basins and other selected sites is being established to monitor hydrologic and geomorphic processes during long periods. At the present time, there are 58 sites throughout the United States where data are being gathered on hillslopes, stream channels, soils, and climatology. Richard F. Hadley (USGS, Denver) has been acting as the coordinator for this effort and maintains a file of the kinds of data being collected at each site. Field work at the individual sites is being done by several geologists and hydrologists in the Water Resources Division. Types of observations may include all kinds of data on stream channel cross sections, channel or gully profiles, channel scour, and characteristics of streamflow; hillslope erosion, and rate of mass movement; vegetation; precipitation; reservoir sedimentation; tree-ring analysis; and soil chemistry and soils descriptions. Our attention is called to the location of the 58 sites in an article by Hadley, on Selecting Sites for Observation of Geomorphic and Hydrologic Processes through Time, in Internatl Assoc. of Scientific Hydrology, No. 66, Symposium of Budapest, p. 217-233.

Alan V. Jopling (Harvard Univ.) is investigating the hydraulic environment of desposition of some of the fluvio-glacial outwash deposits around Boston, Massachusetts, an attempt to reconstruct the hydraulic parameters of paleo-flow regimes using the principles of sediment transport mechanics. He published a 15-page article on Hydraulic Factors Controlling the Shape of Laminae in Laboratory Deltas in the Jour. of Sed. Pet., Dec. 1965.

William C. Bradley (Univ. Colorado) is spending this academic year at Univ. Texas with Hoover Mackin learning about what happens to stream gravel when stored and weathered a while and then returned to the stream. The stream is the Colorado River of Texas; the rocks are Precambrian crystallines from the Llano Uplift; the data include pebble shape and downvalley decrease in grain size. Laboratory research involved construction and successful operation of an abrasion mill using the same rocks.

Sherwood D. Tuttle (Univ. of Iowa, Iowa City) completed the text of a manuscript for a Coastal Atlas of the Americas: Massachusetts and Rhode Island, work in conjunction with Woods Hole Oceanographic Institution. His work on comparison of valley shapes and sizes with stream sizes and discharge continues. Early results suggest correlation between maximum valley width at the top and maximum flood on the river.

After completing work on the delta of the Burdekin River, Queensland, Australia, as mentioned in the last Newsletter, James M. Coleman, Sherwood M. Gagliano, and W. Gill Smith (Coastal Studies Inst., Louisiana State Univ.) spent 4 months on the Malay Peninsula. Their first work was in the Klang delta region of Selangor. This delta is typical of the type that develops along high tidal, muddy, low energy coasts of tropical Southeast Asia. Of interest in this area are the large freshwater swamps that occur landward of the mangrove saline marshes. The geometry and nature of organic sediment accumulation were investigated in some detail. Reconnaissance of both east and west coasts of the Malay Peninsula revealed sharp contrasts between the two areas. The west coast is predominantly a muddy, mangrove-fringed, low energy coastline whereas the east coast is a sandy, high energy coast with long straight beaches and lagoons. This difference appears to be the result of effective wave energy reaching the coastline. It is expected that these studies of the Burdekin and Klang deltas will lend themselves to comparison with previous and present investigations in the Mississippi, and also with other delta studies by the Coastal Studies Institute and by other groups throughout the world. These comparisons are leading toward a better understanding of relationships between delta form, morphology, sediments, and the processes acting on a delta during its development. The Institute is continuing its beach-process studies, experimentally in the Hjulström Laboratory in Uppsala under the direction of Åke Sundborg, John Norrman and Nils Meland, and analytically in Baton Rouge under direction of Choule Sonu.

David Kirtley (Florida State Univ., Tallahassee) is working on the Sabellariid worm reefs which protect the intertidal and subtidal zones of the east coast of Florida from about Cape Kennedy to Miami Beach. Dan Shier studied the vermetid gastropod reefs of the Ten Thousand Islands area near Cape Romano. The work reported in last Newsletter on shallow-water surge or surge flow is continuing at Florida State Univ. under supervision of William F. Tanner with successful model runs now achieved in Karo syrup which slows motion so study is possible without high-speed cinematography. Each surge has the essential characteristics of a low-angle thrust fault, except that it quickly obliterates itself. Surge flow, usually restricted to water only a few millimeters deep, may be important in initiating grain transport. Dean Barnum completed a statistical analysis, employing the method of moments, of a 100-square-mile area in the Nebraska sand hill country (Long Lake quadrangle). Twelve classes were used; skewness was -0.72, and kurtosis, 3.07. These values are much closer to the Gaussian than one commonly finds for regions cut by running water; however, the probability plot showed that the distribution does not match the Gaussian except in a very general way. Areas cut by running water tend to have kurtosis less than 3.0, or skewness negatively greater than -1.0 or both.

The Coastal Plains studies of Don. J. Colquhoun (Univ. of South Carolina, Columbia) have progressed so successfully that he now has recognized and proven the existence of seven terrace formations. The succession of continental and marine landforms present on the Atlantic Coastal Terraces is well illustrated in the subsurface by sediment size, mineralogy, clay mineralogy, and flora and fauna studied in the light of stratigraphy. The succession may be obscured surficially since the terminal geomorphic surface records only the last erosive, transportational, or depositional process operative in the area, not the preceeding stages necessary to produce that surface. Among other things that are now apparent, based upon the work, are: the reason for the shape of the land surfaces of most of our lower Coastal Plain; the reason for the development of much of the major soil series on the lower Coastal Plain; the recent history of the lower Coastal Plain; and also the reason for the location of many of the Carolina Bays. Over a large area, stratigraphy, lithofacies, biofacies, environmental facies, geomorphology, and pedology are shown to be closely allied. William K. Pooser has done excellent work in rock stratigraphic interpretation and biostratigraphy in the central South Carolina Coastal Plain. He has shown, with paleontologic proof, the existence of the Late Miocene Duplin Marl southeast of the Orangeburg (Citronelle) Escarpment, and has suggested that the Orangeburg Escarpment could have been cut during Late Miocene time. The overlying surficial sediments are alluvial in nature and not marine. Although not stated, this would indicate that the Citronelle, as mapped by Doering (1960), must be older than Late Miocene.

W. Armstrong Price (Corpus Christi, Texas) states that his dune study on Padre Island, Texas, shows the bare seif longitudinal dunes shift about 30 feet north in summer and back again in winter without gain. From 1930 to 1960 the seif field of northern Padre Island moved half a mile into Laguna Madre. New information on the Carolina Bays and other oriented lakes from the Arctic and the Southern High Plains, supplemented by aerial photographic studies, now permit a comprehensive classification of oriented lakes and their origins and development, viewing the "bays" as deflationary counterparts of the High Plains oriented, oval, unfilled playa basins which, in the case of the bays, were filled during along period of humid forest growth. Deflation and the interior remnant longitudinal dune fields require a period of semi-arid grassland before the long humid period.

Henry W. Menard (Scripps Inst. Oceanography, La Jolla, Calif.) and his associates, Stuart Smith and Tom Chase, are engaged in the prepartion of physiographic diagrams of the eastern and central Pacific Ocean basin. They also are completing the description of the numerous fracture zones of the Pacific, hoping to establish the details of the faulted topography. A third project is the topographic analysis of abyssal hills from detailed surveys and random sounding lines. They hope to determine whether or not the hills have any particular lineation in certain regions. Confronted with hundreds of millions of soundings, they have been driven to digitizing and computer analysis of echograms. In addition, using data processing techniques, they recently have redone the hypsography of ocean basins, and have the depth distribution in different physiographic provinces in the world ocean. The high frequency of transitional depths of 2-4 km, which has been attributed to sedimentation at continental margins, is actually associated with the mid-ocean rise and ridge system.

Victor Sim, Geography Department, University of Western Ontario (London, Ontario) is studying channel development of small streams and frost heaving. Robert W. Packer continued statistical investigations of slope angles. Theses completed: D. J. Davis on present drainage pattern in a glacial spillway along Seaforth moraine, Ontario; B. B. Smithson - glacial geomorphology of the upper Isortoq River, Baffin Island; B. E. Zimmer - on bluff erosion near Port Bruce, Ontario.

Robert M. Quigley, Soil Mechanics Division, University of Western Ontario (London, Ontario) and three of his students, H. Hawson, J. McBain, C. deWit, are studying clay minerals in tills, marine and lacustrine clays, and their engineering properties.

Paul F. Karrow (Univ. Waterloo, Ontario) led the last day and a half of INQUA Field Conference G in the Niagara Falls - Toronto area. During the last day, the group found a mammoth tooth near the Woodbridge railway cut, and C. S. Churcher (Univ. Toronto) plans to publish a report on it. In addition, Karrow began in summer 1965, a three-year project mapping the Conestogo and Stratford areas of southwest Ontario for the Geological Survey of Canada. This area is interlobate between Huron, Georgian Bay, and Ontario ice lobes; a very complex area in which deposits of each lobe are a multiple till sequence going back to Pre-Tazewell tills. Maps of the Scarborough area at one inch equals half a mile have been released by Ontario Dept of Mines, with the accompanying report to be published early in 1966. A final report on the Guelph area also is in press, and preparation of a report on the Thornhill area is now underway.

John A. Elson (McGill Univ., Montreal) continues his work in the St. Lawrence Lowlands, acquiring stratigraphic data concerning sealevel fluctuations due to the Valders advance in the Montreal area, and also paleontologic data in connection with temperatures and salinity deduced from study of four fossil marine pelecypod species. He is cautious about his results, due to the environmental uncertainties of these species. His newest research involves mapping and dating beach ridges of Glacial Lake Agassiz, in part by aerial photographic studies (formerly not possible) and in part by field (bush) work. He has worked his way northward through the whole lake basin, including the Minnesota River Outlet, as far north as Latitude 55°. Numerous unexpected stratigraphic lacustrine sections have proven invaluable, even to the extent of resolving a problem concerning the absence of lacustrine fill in the Pembina Valley. In 1965 he discovered one lacustrine section there, which now eliminates that particular problem. It now appears that Lake Agassiz I may have drained eastward after it had subsided to the Norcross level instead of to the lower Campbell level, and that a dry interval followed, and then Lake Agassiz II rose to the Norcross level again and drained southward. It subsided rather rapidly to the Campbell level as the southern outlet was eroded. The study of Lake Agassiz has been facilitated very much by the work of Stephen Zoltai and Victor Prest in Western Ontario where the outlets and margins had been practically unknown before.

Nelson R. Gadd (Geol. Survey of Canada) kindly sent us the Survey's May to October 1965 Report of Activities, Paper 66-1 (1966) which includes 142 short papers by their "Pleistocene people" during the 1965 field season. Gadd himself in his own work expects "sweeping correlations of pre-Champlain Sea-Late Wisconsin phenomena" soon to be possible in the story of the deglaciation of southern Quebec.

The Water Resources Research Center at Univ. Hawaii is directed by Doak C. Cox. Associated with him at the Center are Agatin T. Abbott and Leonard A. Palmer.

For several summers now, Robert P. Sharp (Calif. Inst. of Technology) has been studying the Pleistocene glacial sequence in certain critical areas along yhe east side of the Sierra Nevada, first in the Bridgeport Basin (filling out the picture of glaciation there), then in the Mono Basin (with Joseph H. Birman developing the concept of the Tenaya and Mono Basin glaciations as additions to Blackwelder's classical phases - Tioga, Tahoe, Sherwin, and McGee), next in the Convict Creek area, and now in the Sherwin Grade area where a serious problem exists because of the K - Ar dates obtained from the Bishop tuff. Does the Bishop tuff overlie the type Sherwin till, or does the Sherwin till rest upon the Bishop tuff and the till below the tuff then is a still older till? Sharp's tentative conclusion is that the type Sherwin till of Blackwelder is older than the Bishop tuff. This may be established by careful, detailed field work, and, if the K - Ar dates are correct, will show that the Sherwin till is very very old. His other major work in the Kelso Dunes area of eastern Mohave Desert now is in press, and current work, with the blessing of Robert M. Norris, is a study of the very large semiperiodic intradune flats within the southern part of the Algodones Dunes in the Imperial Valley.

The group working in geomorphology out of the Univ. of Michigan is large and busy. Norm Lasca this year is a NATO Postdoctoral Fellow, studying the Ra moraine south of Trondheim, Norway, under the direction of Bjørn G. Andersen.

W. Philip Wagner has completed his field work concerned with correlation of the Northern Rocky Mountain and Midcontinent glacial sequences of southwestern Alberta. Incidentally, he will be teaching geomorphology, glacial geology, and groundwater geology at Univ. of Vermont, in Burlington next year.

Richard Pike finished a complicated study of lunar craters aimed at determining the existence of any modification of the craters with time by means of such parameters as slope, rim diameter to floor diameter ratios, and others, with the astrogeologists (USGS) in Flagstaff, Arizona.

Robert MacNish has finished working on the ancient and modern history of the Arkansas River in his study on the Cenozoic History of Wet Mountain Valley, Colorado. His current employment is with the USGS in Albany, New York, with field work centered in the Susquehanna River basin.

Myles Parsons will begin field work for the Geol. Survey of Canada in summer 1966 near Cochrane, Ontario, where several eskerine ridges are "drowned" in thick lacustrine clays.

Donald F. Eschman will be working in summer 1966 in the Thumb area of Michigan, an area just recently covered by U.S.G.S. topographic maps for the first time. Reconnaissance reveals many as yet unsolved problems on the glacial and postglacial history, left relatively untouched since Taylor's work of around 1910. The relationships of the Erie Basin and Saginaw Basin proglacial lakes as well as the morainal story between these two basins also needs to be studied.

Parker E. Calkin (State Univ. New York at Buffalo) is writing a paper on Antarctic pebble ripples (with H. T. U. Smith) and another on Antarctic sand dunes (with Robert H. Rutford), in addition to preparing and publishing road logs for a N. Y. State Geological Assoc. Field Trip on the Late Pleistocene History of Northwestern New York. In Summer 1965, he mapped the Middlebury and part of the Lincoln Mt. 15-min. quadrangles for Geol. Survey of Vermont. He plans to start a two-year research program on the late-Pleistocene glacial recession problems of northwestern New York where the major lake strandlines and end moraines converge in the classic Buffalo- Niagara Falls area. Recent C^{14} dating of events in the Erie and Ontario basins conflicts with many published chronologies of glacial history in the whole Great Lakes area, specifically, where 6 glacial lakes as well as the glacial recession from the Valley Heads advance in western New York appears to be sandwiched into less than 1,000 years time.

James H. Zumberge (Grand Valley State Coll., Allendale, Michigan) continued the last (?) of the Ross Ice Shelf Studies (RISS II), under the sponsorship of his College and supported by NSF. The field party consisted of Egon Dorrer of Munich (leader), Oskar Reinwarth of Munich (glaciology), Klemens Nottarp of Frankfurt (electronic specialist), Wilfried Seufert of Braunschweig, Norbert O'Hara of Michigan, and David Stelling of Seattle (field assistants). The party left McMurdo Station in November, 1965, and traveled the "Dawson Trail" to a point northwest of Roosevelt Island on the Ross Ice Shelf where they then headed south along a route previously traveled by the RISS I party in 1962-63. The purpose of the traverse was to determine the geographical coordinates of marked points on the Shelf ice whose coordinates were previously determined in 1962-63 by RISS I. Accurate determination of horizontal distances between points was made by tellurometer. Snow accumulation also was measured. The change in geographic coordinates between 1962-63 and 1965-66 will permit the determination of absolute movement of the Shelf ice between Ross Island and Roosevelt Island. Changes in the horizontal distances will allow strain determination of the same sector. Horizontal strain, net accumulation, and absolute movement are necessary for establishing the glaciological regime of the ice shelf.

Nancy S. Stehle writes that all of the field work of the Polar Division of the Naval Civil Engineering Laboratory, Port Hueneme, California, during the past year has been conducted in the Antarctic near McMurdo Station. R. A. Paige has been studying the movement and physical features of the Ross Ice Shelf and its relationship to the neighboring sea ice. Paige also is working on the physical properties of pressure ridge and undeformed sea ice. Mrs. Stehle has been accumulating measurements of drift on natural, depressed, and elevated surfaces on the Ross Ice Shelf, and last year initiated laboratory studies with a wind tunnel in a cold chamber at Port Hueneme to analyze drifting of snow under controlled conditions.

Wakefield Dort, Jr., on the University of Kansas Antarctic Research Expedition, flew throughout Southern Victorial Land examining cirques (their distribution, form, and present ice content) in an attempt to determine processes of origin. This study also involved him in the late-glacial chronology of the area. He later studied the alpine glaciated regions of Tasmania, Australia, and New Zealand.

Robert F. Black (Univ. Wisconsin, Madison) had most of the summer of 1965 automatically used up in preparation for and in leading INQUA Field Conference C. He did manage field time in northeast Wisconsin and the upper peninsula of Michigan on the Valders problem on an NSF grant. He is convinced now that the Valders boundary will have to be modified considerably from that of Thwaites and others. In November and December 1965, he made a quick trip to the Antarctic to reinstall thermal recorders at one of the field stations, after the instruments had been serviced at the factory because of damage caused by people. Charts were changed on other thermal recording instruments, and ice wedges and sand wedges allowed to grow unmolested until later return for long term growth measurements.

Robert L. Nichols (Tufts Univ., Medford, Mass.) completed his third arctic summer field season in Inglefield Land, Northwest Greenland, studying elevated dissected deltas, raised beaches, the glacial history and all geomorphic processes.

George H. Crowl (Ohio Wesleyan Univ., Delaware) worked during summer of 1965 with botanist J. Gordon Ogden III around Lake Tasersiaq in southwest Greenland on glacial geology and the relationship of vegetation to past glacial history. In summer of 1966, Crowl and Ernest H. Muller (Syracuse Univ.,) will help with the Ohio State Univ.-India Educational Program.

Donald R. Coates (State Univ. New York at Binghamton) reports that his recent research is a continuation of studies on till thicknesses of the glaciated Appalachian Plateau, based on analyses of 2,000 water well records, which indicated that many of the hills in central New York were not merely bedrock sculptured by glacial erosion with a thin till veneer, but were actually produced by glacial deposition having unequal till thickness (average of 12 feet on north slopes and 92 feet on south slopes), as "till shadow hills" -- a variation of crag and tail topography on a massive scale. His major effort over the past five years, "Base flow characteristics of streams in the glaciated Appalachian Plateau" soon will be published, along with "Deglaciation of the Great Bend region of Pennsylvania and New York." His "Geology of Broome County, N. Y." will be included in the new Soil Survey of that county by U. S. Dept. Agriculture. The "Geology of south-central New York," a guidebook with articles and field trip logs prepared for the 35th Annual Meeting of the N. Y. State Geological Association (May, 1963) was edited by Coates. It includes papers by Howard A. Meyerhoff, New York's role in the Mesozoic and Tertiary evolution of the northern Appalachians (10 pp.); Coates' General Geology of south-central New York (36 pp.); Donald L. Woodrow and Robert C. Nugent, Facies and the Rhinestreet formation in south-central New York (28 pp.); James E. Sorauf and Herman E. Roberson, Upper Devonian stratigraphy and sedimentology in the Binghamton area (10 pp.); and Coates' Geomorphology of the Binghamton area (17 pp.).

Bjørn G. Andersen(Univ. i Oslo, Norway) and G. William Holmes (U.S.G.S., Beltsville, Maryland) in May and June searched in the Narvik district of northern Norway for evidence of the Fennoscandian moraine. Moraines and moraine-deltas do abound there; some may be dated by marine fauna, so within the year they should have an idea of the late-glacial chronology and know whether the Fennoscandian moraine is on the land or beneath the sea. Holmes mapped for a fourth field season in western Massachusetts late in 1965, especially in the Berkshire Hills and Taconic Mountains, where he confirmed the existence of several large glacial lakes, first proposed by Frank B. Taylor early in this century. Several other lakes were mapped, and several proposed by Taylor were discounted. He also studied the Richmond boulder train, of interest because of the large size of its boulders, the narrowness and straightness of its pattern, and because it was one of the first ever described in the United States, sparking a controversy that lasted 30 years. It was first described by an amateur geologist, Stephen Reed, who understood its glacial origin before some of the more eminent professional geologists did. Holmes expects to return to Norway in spring 1966, and continue mapping in New England in summer and fall 1966. The U.S.G.S. branch of regional geology in New England is continuing a program of surficial mapping planned to cover Massachusetts, Rhode Island, and Connecticut. The following personnel are mapping quadrangles in Massachusetts: Joseph Harshorn, William Holmes, Roger Colton, Bob Oldale, Carl Koteff, and Robert Schnabel. Although mapping in Rhode Island momentarily has been abandoned with the withdrawl of the Cooperative Program there, Phil Schafer and Tom Feininger have finished several quadrangles. In Connecticut, the following are mapping surficial geology: Fred Pessl, Phil Schafer, Edward Simpson, Harold Malde, Charles Warren, and Mike Pease.

Paul W. Howell (Portland, Oregon) helped lead in 1965 the Geol. Soc. of the Oregon Country (sic) annual field trip, as a result now is undertaking a study of the "Geomorphology of the Suplee area, Oregon," and finds very little of the geomorphology of central Oregon ever has been studied.

John B. Lucke, formerly of the Univ. of Connecticut, joined the Division of Sciences and Mathematics at Grand Valley College (Allendale, Michigan) in 1964. Through his initiative a program of instruction in geology has been developed at the new college.

Peter Fleischer - a sediment study of Pleistocene Lake Tecopa, the nature of the shore features, and the extent and history of the lake;

Norman M. Hyne - a preliminary study of the evidence of the Climactic Optimum along the southern California coast;

Donald Garrett - monthly variations in dune shape, heavy mineral concentrations, ripple marks, wind direction and grain size variations of the Saratoga Springs Dunes at the extreme southern margin of the Death Valley region;

Donald F. Nemeth - the geomorphic and sedimentary characteristics of talus in the Mojave Desert and the San Gabriel Mountains;

Harold D. Palmer - detailed study of microrelief features on the sea floor; small-scale forms of the shallow portions of the continental shelf are to be examined using SCUBA equipment;

James W. Vernon - completed a study on sediment transport in the Inner Shelf area of the California coast; fluorescent dyed sands were spread on the sea floor, and data obtained on dispersion rates, ripplemark formation, and small-scale relief features. Stone received a grant to study desert pavement, and the nature and occurrence of flash floods in the California and Nevada deserts.

Jacques B. Wertz (Denver, Colorado) recently has had a number of publications on erosion and deposition in the arid and semiarid southwest appear in European periodicals; these have had favorable reception by Europeans. One on the two geomorphological accidents, arroyo cutting and arroyo capture, appeared in Revue de Geomorph. dynamique, pp. 145-157, Oct.-Nov.-Dec. 1965. Another on "The Flood Cycle of Ephemeral Mountain Streams in the Southwestern United States" will be published in Annals Assoc. Amer. Geographers.

Geomorphic studies at Univ. of Massachusetts are proceding along several fronts. Ward Motts is directing a series of projects on the geomorphology, sedimentology, and hydrology of desert basins and playas in the Mojave Desert and elsewhere in the Southwest. Miles Hayes is conducting studies of coastal morphology and sedimentology along the New England coast, with particular emphasis on estuarine conditions and on year-around beach profiles. H. T. U. Smith continues with studies of alpine and desert gemorphology, the latter involving areas in North Africa via aerial photographs, in southwestern United States, and in Antarctica. Particular attention is devoted to eolian phenomena in Antarctica and to a unique area of flood erosion.

Ken Fahnestock (USGS and Univ. Texas, Austin) calls our attention to the Sept 1965 issue of Office of Water Resources Research Catalog, vol. 1, Part 2, of 149 pp. in which are summaries of 501 research projects on the Nature of Water, Water Cycle, Water Supply Augmentation and Conservation, Water Quality Management and Control, Water Quality Management and Protection, Water Resources Planning, Resource Data, and Engineering Works. Fahnestock's own research on streams in Wyoming, Washington, and Yukon Territory continues.

George W. White, after 18 years as Head of the Department of Geology at the University of Illinois, is now Research Professor. He is continuing his studies, supported by a NSF grant, begun in 1964 of stratigraphy of the pre-late Wisconsinan and earlier tills. Below the "early Wisconsinan" (Altonian) tills is a series of tills with a very strong weathering profile (Sangamon ?). Beneath this complex in a few places is as much as 20 feet of extremely weathered drift. Stanley E. Totten (Hanover Coll., Indiana) is also associated with this project; David Gross and Stephen Moran are graduate research assistants.

Wilson M. Laird, State Geologist of North Dakota and E. A. Noble, newly appointed Assistant State Geologist, are directing geologic mapped, Grand Forks and Traill Counties are almost wholly within the Lake Agassiz plain while Burke and Mountrail Counties are in areas where large scale stagnation has left large areas of dead-ice moraine. Reports in preparation include Divide County by Dan Hansen and Ted Freers and Williams County by Freers, Hansen and Jack Kume. Also in preparation is a report on multiple tills in northeastern North Dakota and one on ice-thrust features in the same area by John P. Bluemle. Lee Clayton spent July, 1965, in south-central Alaska making a study of recent fluctuations of the Sherman and Sheridan Glaciers with the Muskingum College Group. Freers is completing a study of the structure and glacimorphology of the Vaughan Lewis Glacier, near Juneau, Alaska. Recently published reports include geology of Eddy and Foster Counties by Bluemle and geology of Burleigh County by Kume and Hansen, both NDGS publications. Several other reports have been published elsewhere: a report on mollusks from a terrace of the Cannonball River, N. Dak. by Samuel J. Tuthill (Muskingum Coll., New Concord, Ohio), Laird and Charles I. Frye (also of Muskingum Coll.); a summarization and integration of previous publications on Lake Agassiz by Tuthill, Laird and Ronald J. Kresl; and a comparison of a Pleistocene molluscan fauna from N. Dak. with a Recent molluscan fauna from Minnesota by Tuthill, Clayton and Laird.

Don J. Easterbrook (Western Washington State Coll., Bellingham) this spring (1966) will finish a two-year NSF project dealing primarily with late Pleistocene glaciomarine deposits in northwest Washington. These sediments now are traced over 3,000 square miles in Washington, including the Northern and Central Puget Lowland and the San Juan Islands. Thirteen C^{14} dates from wood and shells in the deposits range from 10,370 to 13,010 years. Evidence for two pre-Vashon glaciations in the Central Puget Lowland will be published as a joint effort with Rocky Crandell and Estella Leopold. A publication on the Pleistocene stratigraphy of Island County will appear shortly with the Washington Division of Water Resources. Easterbrook will continue study of the glacial deposits of Whidbey, Camano, and the San Juan Islands, and will work on the Alpine glaciation of the Cascades near Mt. Baker, about which almost nothing is known at present.

Virginia C. Steen (Washington State Univ., Anthropology Lab. Pullman) completed a 3-year N.S.F.-supported study of effects of weathering environments on volcanic glass of the Mt. Mazama and Glacier Peak pumice eruptions. Her data greatly strengthen correlation of these deposits by use of refractive index measurements, by showing limited change of n despite extremes of local temperature and precipitation.

Professor George H. Dury, Department of Geography, University of Sydney, Australia, hopes in 1967 to take a sabbatical of two terms to do geomorphic research in the United States. Can anyone help in making arrangements with him for some collaborative research effort while he is in this country?

W. Frank Scott (Washington State Univ.) is examining the sedimentary characteristics of the peculiar varve-like rhythmic bedding in the Touchet Beds of south central Washington.

Gerald M. Richmond (USGS, Denver) deserves the highest praise for the tremendous job he did as Secretary General of the VII INQUA Congress. Some of us may not realize that the work of the Congress went on for many months after the meetings in Boulder and the post-Congress Field Conferences were finished. As far as we can determine, the task of "wrapping up" this INQUA Congress, as of mid-March 1966, is just about completed. One of the last finishing touches was the completion of the VII INQUA Membership (and address) List, which, incidentally, is still available to anyone for $1.50. Hopefully, a large new area of endeavor now has opened in the Executive Committee of the International Union of Quaternary Research toward an eventual tie with the International Council of Scientific Unions. Gerry writes that his research time at last is being spent on writing the glacial history of the east slope of Glacier Natl Park and of the Plains to the east. In summer 1966, he will be in charge of Pleistocene studies in Yellowstone Natl Park with the NASA-USGS Yellowstone Project; with him will be Kenneth L. Pierce, who mapped glacial deposits in the northwest part of the Park last summer, and who will concentrate efforts in the southeast quarter of the Park next summer.

Stanley N. Davis (Stanford Univ., Calif.) soon will have a book on Hydrogeology published. Under his direction, Malcolm Clark is studying the late Cenozoic history (volcanic, tectonic, and glacial) east of Sonora Pass in the Sierra Nevada (northeast of Yosemite Natl Park). The Ph.D. work of Raymond Pestrong on the Development of Drainage Patterns on Tidal Marshes, including tests of engineering properties of the sediments together with some measurements of the hydraulic geometry of channels, was published (in 1965?) as Stanford Univ. Publ. in Geological Sciences, v. 10, no. 2 (paperback,$3).

William R. Farrand (Univ. of Michigan), now returned from Strasbourg, France, is head of the Glacial Geology and Polar Research Laboratory at Univ. of Michigan. His research activities are divided between (1) the study (with James H. Zumberge) of Pleistocene sediments and sublacustrine morphology in depths greater than 500 feet in Lake Superior, and (2) the study of prehistoric rock shelter sediments in France and in Syria.

Jane L. Forsyth, formerly Pleistocene Geologist with the Ohio Geological Survey, is now on the staff of Bowling Green State Univ. (Ohio). This position allows time (especially in summers) for continued research on the Pleistocene of Ohio and on the ecological aspects of geology. She still remains Editor of the Ohio Journal of Science, with the editorial offices of the Journal moved from Columbus to the Geology Department at Bowling Green State Univ., Bowling Green, Ohio.

George F. Adams (City Coll., N. Y.) spent the past academic year in Grenoble, France, studying Alpine geomorphology, with the assistance of the Institut Dolomieu and the Institut de Geographie Alpine. A forthcoming paper will consider the impact of the French view of alpine geomorphology on what might be considered the traditional views in the United States.

Roger B. Colton (U.S.G.S., Denver) was transferred to the Denver Federal Center after two years in the Military Geology Branch of the Survey. He has resumed quadrangle mapping of surficial deposits in the area around Torrington, Connecticut.

William S. Cooper (Boulder, Colorado) completed his manuscript on the Coastal sand dunes of California for GSA. He recently received from the Amer. Geographical Society, the Charles P. Daly medal for geographic research.

Arthur L. Bloom (Cornell Univ., Ithaca, N. Y.) asks: Are geomorphologists sufficiently aware of processes and rates? He says oceanographers want to know how fast sediment is being brought to the sea, in what form is it being brought to the sea, and what the rates of denudation have been in the past. Several good recent surveys of these topics have appeared, but they all comment on a conspicuous lack of detailed source studies.

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

The annual field conference of the Rocky Mountain Section, Friends of the Pleistocene, will be held August 27-28, 1966, in the Rio Grande region of southern New Mexico. The conference headquarters will be at Las Cruces-University Park. Emphasis will be on landscape evolution and soil genesis in a portion of the Mexican Highland section, Basin and Range Province, characterized by broad, internally-drained, intermontane basins flanking the entrenched valley of the Rio Grande.

John W. Hawley and Leland H. Gile, staff members of the Soil-Geomorphology Group Desert Project, Soil Survey Investigations, SCS, USDA, will lead the conference. The Desert Project studies were initiated near Las Cruces in 1957-60 under the direction of Robert V. Ruhe. Detailed investigations of the geologic-geomorphic-soil relationships have continued since 1960, with Gile and F. F. Peterson studying the soils and soil-geomorphic relations and Hawley mapping the geology and geomorphology in certain areas.

On August 27 and 28, conference participants will visit sites on stable remnants of geomorphic surfaces ranging in age from Recent to middle Pleistocene. Quantitative data on the soils associated with these surfaces plus information on the geologic-geomorphic setting will serve as background for discussions at sites showing soils in both buried and relict land-surface positions.

A special pre-conference field trip requiring use of four-wheel drive vehicles will be held for a limited number of participants (25 to 30) on Friday, August 26. Late Cenozoic stratigraphy and geomorphology will be emphasized. Standard vehicles will be suitable for the main session of the conference. For further information, write: John W. Hawley, Soil Survey Investigations, SCS, P. O. Box 129, University Park, New Mexico 88070.

MISCELLANEOUS ITEMS

Soils of the Western United States (Exclusive of Hawaii and Alaska), 69 pp., 10 photographs, map in color at 1:2,500,000, Sept. 1964, outlining soil occurrences, character, and distribution of Great Soil Groups, and their relationship to physiography, climate, and vegetation has been issued as a joint publication of the Agricultural Experiment Stations of Arizona, California, Colorado, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington, and Wyoming; it may be obtained from any of these offices, although published at Washington State Univ. at Pullman. It is a companion volume (and map) of Soils of the North Central Region of the United States, reported on here several years ago.

Ewart M. Baldwin's review of the Geology of Oregon has been revised and reissued (1964), available from Univ. Oregon Cooperative Store, Eugene; $2.65 (soft back), $3.95 (hard bound).

John S. Shelton (Claremont, Calif.), deeply involved in the A.G.I.-Encyclopaedia Britannica Films project, has completed 9 films and 9 filmstrips, and is finishing 18 more filmstrips to complete the series. Although the films offer elementary concepts and ideas in geology, the examples, as some of you know, are quite spectacular and definitely have a place in our university and college classrooms. John Shelton writes that it is rewarding to observe the enthusiastic response the films and filmstrips have evoked from audiences of all ages. He suspects this is the case because nature is shown as it really is: "real rivers, real faults and folds and landslides, real volcanoes, real erosion, real transport of sediment, real crystallization from melts ... . We use USC&GS crews doing professional work, not actors, for leveling and mapping. The man who takes the river sample at a gaging station on the Colorado River has been doing this work for over 27 years."

Richard E. Kucera (Univ. South Dakota, Vermillion), for more than a year was technical advisor on the Britannica project. His detailed photographic exploration of the Athabasca glacier recorded the behavior of the ice, its speed and motion, net budget, structural characteristics, and its erosional and depositional abilities. His laboratory experiments involving extrusion of ice under varying pressure and temperature demonstrated a form of glacier ice flow. Also a series of photomicrographs presented visual evidence of the transformation of firn to ice. The 9 films are : Rocks that Form on the Earth's Surface (16 mins., color - $180, B/W - $90); Rocks that Originate Underground (22 mins., no prices available); Erosion - Leveling the Land (14 mins., color - $150, B/W - $75); Evidence for the Ice Age (18 mins., color - $210, B/W - $105); Why do we still have Mountains (20 mins., color - $240, B/W - $120); Waves on Water (16 mins., color - $180, B/W - $90); The Beach - a River of Sand (18 mins., no prices available); What Makes the Wind Blow (16 mins., color- $180, B/W - $90); What Makes Clouds (19 mins., color - $210, B/W - $105). The 5 filmstrip series, all in color, involve: Dating the Past (3 filmstrips), Glaciers and the Ice Age (4), Investigating Rocks (9), Geological Measurements and Maps (6), and Fossils (5). Encyclopaedia Britannica Films, Inc., 6519 Fountain Ave., Hollywood, Calif.

Grand Valley State College (Allendale, Michigan) has applied for NSF support for a pioneer course for undergraduates in practical oceanography, utilizing a 50 foot motor vessel, Angus, donated to the College. If approved, this will be an interdepartmental basic techniques course involving, Biology, Chemistry, Geology, and Physics, as a foundation for graduate work in Oceanography.

A symposium on the Pleistocene in Ohio was held in Columbus, February 19, 1966; it was sponsored by the Ohio Academy of Science and Jane L. Forsyth, held in the auditorium of Battelle Memorial Institute, and emphasized the interdisciplinary nature of Pleistocene studies with short summaries of the status research in the following fields related to the Pleistocene: Status of glacial geology in Ohio - 1966, R. P. Goldthwait; the Ohio soil survey, G. K. Dotson; Distribution of sponge spicules in Ohio soils, L. P. Wilding; A Sangamon paleosol in Hocking County, Ohio, F. Ugolini; Plant geography and pollen stratigraphy, J. G. Ogden, III; Ecological relationships of Pleistocene features of Neotoma, G. E. Gilbert and V. L. Riemenschneider; the relationship of some geological and physiographic factors to the distributional patterns of certain aquatic invertebrates in post-Wisconsin Ohio, D. H. Stansbery; Pleistocene molluscan studies in Ohio, A. La Rocque; Pleistocene vertebrates, why not?, J. J. Stephens; Early man and the late Pleistocene, R. S. Baby; Importance of Pleistocene glacial deposits to Ohio's underground-water supplies, A. C. Walker; and Engineering geology and the Pleistocene in Ohio, R. A. Dunbar. A total of 130 geologists, botanists, soil scientists, zoologists, archeologists, High School teachers, geographers, and meterologists attended the symposium; so successful was it that it quickly was dubbed a "Junior INQUA" and plans are being made for a second one. For dittoed copies of the program and abstracts of the talks given, write to Jane L. Forsyth at Bowling Green State University.

John A. Elson has been disturbed by his inability to keep himself suitably informed for teaching purposes in all fields of geomorphology. As a result of his frustration, he has endeavoured to indicate by means of the following tables obtained from a study of Geoscience Abstracts and Geomorphological Abstracts what has been happening in the publication field. In the construction of Table 1, there is some overlap between the various subjects he chose, so that there are probably about 5% too many papers in the "total" column. If one could manage it, one would have to read twice as many papers in 1965 as in 1959 to cover geomorphology alone and four times as many to cover the three fields of geomorphology, geohydrology, and engineering geology. Table 2 shows the trends over the past five years in the 14 subdivisions that Keith Clayton, Editor of Geomorphological Abstracts, had made of geomorphology. John Elson has summarized his information this way: from 1961 to 1965, the literature has increased by a factor of 2.5, partly a result, though, of improved abstracting services. The fewest abstracts concern the Oceans, and Wind and Arid Regions; these are obviously areas of interest to be selected by those who become easily frustrated by a mass of literature. Elson continues: to keep up to date in the whole field, one would have to examine 2.85 papers every day of the year! Nobody has time to examine critically all these. The abstract journals are absolutely essential, but we still need some sort of assistance. Elson has the following suggestion; what do you think of it? Might not our Geomorphology Division assign annually some 14 or more volunteers the task of reviewing the more important papers in these various fields, including regional studies, with a view to publishing each year, if possible, in the G. S. A. Bulletin a review paper that might be entitled, "Progress in Geomorphology" in which the authors sorted out and reviewed the papers that make important contributions (in each of the 14 fields) ... ? There is more to Elson's suggestion on how the mechanics of such might be accomplished. He concludes by stating that the geomorphologists are no worse off than are those in several other branches of geology. What is your reaction to this suggestion? If you feel strongly moved by this, why not write to John Elson and let him know (Dept. Geological Sciences, McGill University, Montreal).

Table 1. Numbers of abstracts in Geoscience Abstracts for the months of July, August and September. (in years 1959 to 1965).

Year	Geomorphology	Geohydrology	Engineering Geology	Total (some duplication)
1959	68	24	13	105
1960	69	39	24	92
1961	75	74	72	221
1962	57	105	88	250
1963	88	132	28	248
1964	98	87	52	237
1965	190	174	75	439

Table 2. Total number of abstracts in Geomorphological Abstracts by subjects. First year of publication (1960) omitted.

Subject	1961	1962	1963	1964	1965	Average 1964-65
1. General	1	-	2	27	24	26
2. Structural	14	16	23	39	38	39
3. Oceans	3	7	10	23	38	31
4. Weathering & Slopes	69	49	94	98	97	98
5. Rivers & river terraces	28	37	42	99	71	85
6. Regional Physiography	61	71	80	139	121	130
7. Glaciology	19	22	28	54	78	66
8. Glacial morphology	55	50	54	101	110	106
9. Other Pleistocene	38	56	58	107	132	120
10. Periglacial	34	25	37	58	73	66
11. Karst	18	20	10	56	46	51
12. Wind & Arid	15	17	9	30	21	26
13. Coasts	38	46	69	62	91	77
14. Misc.	38	30	30	84	72	78
Totals	424	447	549	957	1004	

RECENT PUBLICATIONS

Have you had time yet to study John T. Hack's U.S.G.S. Professional Paper 484 on the Geomorphology of the Shenandoah Valley, Virginia and West Virginia, and origin of the residual ore deposits? For those really concerned with an application of the principle of dynamic equilibrium to a landscape, a reading of this paper in its entirety will certainly prove worthwhile. This careful presentation and thorough documentation sustains the close relationship that exists between resistance of rocks, declivity of slopes, and resulting topography. Hack successfully applies the dynamic equilibrium concept to a classic region of diverse lithology and structure, and demonstrates the manner by which slopes adjusted to bedrock during a long period of weathering and erosion. The present distribution of landforms and surficial deposits is accounted for in such a way as to obviate any other possible alternate explanation.

The General Introduction to A. L. Washburn's mass wasting studies is now published in Meddelelser om Grønland as: Geomorphic and Vegetational Studies in the Mesters Vig district, northeast Greenland (Bd. 166, Nr. 1, 60 pp., 1965). This is his introduction to the series, including botanical, soil, and geomorphic (weathering, frost action, patterned ground, mass-wasting, glacial geology, and deleveling) studies. Instrumental Observations of Mass-wasting in the Mesters Vig district, northeast Greenland, is in press with Medd. om Grnld.

You will find Keith Clayton's latest "A Bibliography of British Geomorphology" (George Philip & Son, Ltd., London, 1964) worth purchasing for $2.60, if you are interested in publications by British geomorphologists, or about the British Isles (mostly), or published in British journals, from 1945 until 1962. This 211-page bibliography took great effort on the part of the six-member Sub-Committee (and nearly one hundred other geomorphologists) of the British Geomorphological Research Group, and is subdivided into the same 14 areas of geomorphology as are the publications listed in Geomorphological Abstracts.

You may remember that with the 1965 issue of Geografiska Annaler, a new series, Series A, Physical Geography, mainly devoted to geomorphology, climatology, and glaciology, was to appear. It did. The first 3 numbers appeared in Autumn, 1965, within a short period of each other; No. 4 appeared in May, 1966. To give you an idea of contents, we offer the following:

Geografiska Annaler, Series A, Physical Geography, vol. 47A, 1965:

No. 1: Problems of dating ice-cored moraines, by Gunnar Østrem, 38 pp.; Contorted glacial lake sediments, and ice blocks in outwash deposits at Østerdalsisen, Norway, by Wilfred H. Theakstone, 6 pp.; Karst phenomena in the Lummelunda area of Gotland, by Carl-Fredrick Lundevall, 16 pp.; Some remarks on Swedish speleology, by Leander Tell, 4 pp.; Notes on glaciological activities in Kebnekaise, Sweden during 1964, by Valter Schytt, 7 pp.

No. 2: Mappings and geochronological investigations in some moraine areas of south-central Sweden, by Bo Strömberg, 10 pp.; Plastically sculptured detail forms on rock surfaces in northern Nordland, Norway, by Ragnar Dahl, 58 pp.;

No. 3: Problems concerning winter run-off from glaciers, by Thorsten Stenborg, 44 pp.; Some aspects of cirque distribution in the west-central Lake District, northern England, by Paul H. Temple, 9 pp.

No. 4: Submarine peat in the Shetland Islands, by G. Hoppe, M. Fries, & N. Quennerstedt, 9 pp.; Seasonal precipitation regimes in Baja California, Mexico, by J. R. Hastings & R. M. Turner, 20 pp.; Observations on pingos and other landforms in Schochertdal, Northeast Greenland, by J. G. Cruickshank and E. A. Calhoun, 13 pp.; The ice gauge, by L. Arnborg, J. Peippo, & R. Larson, 3 pp.

If you like the idea of having your own copies of Geografiska Annaler, why not subscribe. It costs $10 a year, and you may order it through Generalstabens Litografiska Anstalt, Vasagatan 16, Fack, Stockholm 1, Sweden. Anders Rapp writes that he is having difficulty supporting the journal; additional subscriptions would help put it on a paying basis. You can't lose on this one.

In view of several requests to list contents of geomorphology periodicals not readily available to some of us, we are trying out this idea by recording titles of papers in two foreign journals. (Do you wish this service to be continued, to be enlarged, or to be dropped?)

Zeitschrift fur Geomorphologie, new series, vol. 9, 1965: No. 1, March: Hans Mortensen in memoriam, by Jürgen Hövermann, 15 pp.; A forgotten factor in the interpretation of glacial stairways, by J. P. Bakker, 17 pp.;
Ein Beitrag zur Frage der Solifluktionsgrenze in den Gebirgen Vorderasiens, by Carl Rathjens, 15 pp.;
Glacial erosion in the Finger Lakes Region (New York State, U.S.A.), by K. M. Clayton, 13 pp.;
Some aspects of the geomorphology of domes and tors in Nigeria, by M. F. Thomas, 19 pp.;
The weathered land surface in central Australia, by J. A. Mabbutt, 33 pp.;
Geomorphologie and erdwissenschaftliche Praxis, by Gerhard Klammer, 15 pp.;
No. 2, June: Présentation d'un extrait de carte Géomorphologique detaillee, by J. Tricart, A. R. Hirsch and F. Le Bourdiec, 23 pp, and Étude des échantillons, by M. Michel and Tricart, 10 pp.;
Plateau calcrete, clacreted gravels, cemented dunes and related deposits of the Maalegh-Bomba region of Libya, by Frank Moseley, 20 pp.;
Analysis of younger beach ridge deposits in eastern Malaya, by J. J. Nossin, 23 pp.;
A reassessment of the Chalky Boulder Clay or Marly Drift of North Norfolk, by Allan Straw, 13 pp.;
Musterböden in tropisch-subtropischen Gebieten und Frostmusterböden, by Hanna Bremer, 15 pp.;
Entstehung und Alter des Golfstroms. Florida-Strom, by W. Staub, 10 pp.
No. 3, September: Ayers Rock, ein Beispiel für klimagenetische Morphologie, by Hanna Bremer, 36 pp.;
Some features of granite weathering in Australia, by C. D. Ollier, 20 pp.;
La succession des épisodes fluviatiles périglaciaires et fluvio-glaciaires à l'aval des glaciers, by G. Seret, 16 pp.;
Ein Beitrag zum Blockmeerproblem, by Klaus Rother, 11 pp.;
Some aspects of the geomorphological significance of soil texture in eastern Nigeria, by P. D. Jungerius, 14 pp.;
Geomorphologische Untersuchungen in den Randgebirgen des Van-See (Ostanatolien), by Wendelin Klaer, 10 pp.;
Eiszeitforschung in Deutschland (Bericht über die Tagung der Deutschen Quartärvereinigung vom 8. bis 12. Oktober 1964 in Lüneburg), by Karlheinz Kaiser, 28 pp.
No. 4, December: Hammada - Serir - Erg, by M. Fürst, 37 pp.;
The explanatory description of coasts, by Arthur L. Bloom, 15 pp.;
Das Längsprofil der Flüsse, by Klaus Hormann, 20 pp.;
Über Strukturböden im Hoggar-Massiv, By C. Becker, 3 pp.;
Ein Beitrag zur Frage der Solifluktionsgrenze in den Gebirgen Vorderasiens (Kritishce Bermerkungen ...), by K. Kaiser, 20 pp. (13 papers in German, 10 in English, and 2 in French)