

Ohio Pedologist Newsletter
Vol. 5 No. 3 - November 1979

George Hall - Editor

At a recent meeting of midwest experiment station pedologists, someone inadvertently said "when the soil surveys are completed". This misspeak was quickly challenged by the rest of the group. It is very clear that throughout the region there is an optimism about whole soil survey program. Recognition of the value of the soil survey reports is increasing by leaps and bounds. People who formerly thought soil was something to be wiped off on the doormat are now using terms like Alfisols and Inceptisols. In addition to the necessity of remapping some areas ten years from now, there will be an increasing demand from health departments and other agencies for people who have walked over the "ground", bored the holes and know how the soils fit on the landscape. Now is a great time to be out there mapping because the future holds so many opportunities for experienced, resourceful pedologists willing to meet the challenges to come.

AOP Summer Picnic

If fun and enthusiasm are any criteria, the summer picnic was a great success. A total of 54 people including 19 AOP members signed the registration sheet at dinner. There seemed to be more than that but maybe that was because the youth was moving around so fast that there seemed to be two for every one. One observation was that the wives are getting to know each other and they are more willing to sit and talk while the paraathletic types are out playing softball. Improving communications is one of the AOP goals. It was accomplished at the picnic.

Executive Council Meeting (Summary)- Robert Parkinson

July 21, 1979 - Upper Sandusky

Treasurer's Report showed a balance of \$1,678.68.

A Summary of AOP membership and funds is as follows:

<u>Year</u>	<u>Membership</u>	<u>Balance on Hand (12/31)</u>
1976	54	\$299.29
1977	60	1070.88
1978	61	1442.87
1979	57 (as of 8/79)	-----

AOP cash flow was summarized as follows:

<u>Year</u>	<u>Intake</u>	<u>Outflow</u>	<u>% of \$ Spent</u>
1976	\$547.00	\$247.71	45%
1977	1160.45	388.86	34%
1978	891.75	519.76	58%
1979	(721.90)	(486.09)	67%
	<u>3321.10</u>	<u>1642.42</u>	<u>49.4%</u>

There was a general discussion of the current membership rates. There was a general consensus that, considering the affects of inflation, the membership dues are fair, especially since a significant percentage of dues are being spent on the membership or on projects beneficial to the membership.

The sessions of the NOGS seminar were taped by Jim Bauder and are available through him.

Dwain Waters will contact an attorney this summer on the AOP Constitution and Bylaws for incorporation. The AOP also needs to get a different Social Security number, since the current number is that of Jon Gerken, the first AOP Treasurer.

The application of Michel Ransom was approved for Affiliate Membership.

Members Present: Dwain Waters, Marvin Bureau, Bob Parkinson, George Hall, Tim Gerber, Mike Plunkett, Neil Smeck

September 15, 1979 -- Townshend Hall

Treasurer's Report showed a balance of \$1,506.68.

There was a discussion on contacting those members who have not renewed their membership for 1979. The Secretary-Treasurer mailed membership renewal letters in February for delinquent members. It was decided that President Dwain Waters would make another contact.

There was a consensus that AOP needs three standing committees: Membership, Certification and Education. Present membership of two of these committees is as follows:

Education

Norris Williams, Chairman
Jim Bauder
Marv Bureau

Certification

Joe Steiger, Chairman
Mike Plunkett

It was agreed that committees should be appointed early each year and that membership of each committee would be published in the AOP Newsletter early each year as a record and reminder.

Date for the Annual Winter Meeting was set for Tuesday, January 15 following the SCSA Meeting. Approval was given to underwrite the cost of the luncheon by \$2.00 per person. Rex Mapes and Neil Smeck will be asked to make arrangements. The luncheons for Honorary Members will be paid for by the AOP.

Marvin Bureau agreed to have an official gavel made.

The Nomination Committee for the 1980 elections consists of Tim Gerber, Marvin Bureau and Bob Roseler.

It was decided that the 1980 AOP dues would remain the same with AOP underwriting \$2.00 of the subscription rate to Soil Survey Horizons.

The Committee approved a \$100 contribution to the Agronomy Department Soil Judging Team. The team receives no departmental financial support. The regional contest this fall is in Michigan. Dr. Jerry Bigham is the coach.

Members present: Dwain Waters, Marvin Bureau, Jim Bauder, Bob Parkinson, George Hall, Neil Smeck, Mike Plunkett, Tim Gerber

From SCS State Office

Personnel - Gordon M. Gilmore, soil scientist trainee, reported for work on September 20, 1979. Gordon will be in training at Logan with Jon Gerken. Gordon is a native of Uhrichsville, Ohio, and graduated from The Ohio State University in 1974.

New Published Soil Surveys - The Mercer County soil survey was received in July. Mercer County is the 39th modern, detailed soil survey for Ohio.

Introduction and release meetings have been held for the Crawford and Mercer soil surveys.

We expect to have the Ashland and Logan soil surveys by January.

Interest in New Project Soil Surveys - Letters of resolution to cost share for new project soil surveys have been received from Hardin, Noble, and Jefferson Counties.

Recently Completed Field Work - The field work for Geauga County was completed in August. The final correlation was completed in September. Good work Norris and others.

Project Soil Surveys Nearing Completion - The field parties in Hamilton and Wyandot Counties will be completing the field work in December. What a Christmas present!

OSU Ivy Towers

The new Agronomy, Natural Resources, and Plant Pathology building is continuing to grow. The concrete on the third floor is now being poured. So far it is right on schedule.

As most of you probably heard, OSU has a new record enrollment for the Autumn Quarter. In the breakdown of the figures the College of Agriculture showed a slight loss. Since part of our support is based on college enrollment and students taught, it is important that those of you out around the state continue to encourage students to pursue careers in agriculture and particularly Agronomy.

Ted Zobeck has been hired to fill the position of Assistant Professor, Soil Classification, Soil Genesis and Land Use (85% research, 15% extension). Ted, a native of Michigan, is finishing his Ph.D. at the University of New Mexico. In New Mexico he has been mapping part time with the SCS. His research on the separation of temperature and moisture regimes was supported in part by the SCS. His appointment is scheduled to start January 1. If everything is "normal" he will be here sometime after January 1.

Graduate students presently enrolled in the area of Pedology include:

Ph.D.

Mickey Ransom
Mike Thompson
Billy Jaynes
Karen Brady
Mostafa Nosseir
Darrell Norton

Masters

Lou Lamb
Jon Cochran
Marty Shipitalo
Etim Amba
Jay Halley
Dan Crowner

Observation on Expert Testimony - Joe Steiger

I was recently called to serve as a juror in a trial involving telephone threats. The evidence included a tape recording of a male voice on the telephone. Witnesses for both prosecution and defense listened to the tape. Some said it was the voice of the defendant others said it was not his voice and some said they could not tell. Expert witnesses in voice identification were called to present the results of spectographic analysis of the telephone recording. By comparing the original tape recording with a recording of the same message made by the defendant the expert witness concluded that the voices were the same person.

The position of the expert witness is similar to that of a pedologist in legal affairs. His skill is highly specialized and not well understood by the public. There are very few individuals that are qualified to make the investigations. A professor of speech and audiology spent several hours explaining the basis of the voice identification procedure. The expert witness established his qualifications by citing his training experience and membership in the International Association of Voice Identifiers, a select group of 18 people with similar training and skills. That association is very similar to the Association of Ohio Pedologists in its function. They required apprenticeship and testing to qualify as a professional. The testimony of this expert witness help clarify an otherwise confusing array of facts.

CERTIFICATION

The message to our association is that we need to continue our efforts towards certifying the ability of professional pedologists to identify, classify, survey and interpret soil properties.

As the first step toward recognition of professional pedologists the Association of Ohio Pedologists was formed in 1975. Since that time our association has investigated various means for gaining wider acceptance of pedologists through either a state registration program or professional certification. A number of facts are now clear:

- 1) Professional standards are needed,
- 2) State registration of professionals numbering less than 100 would be very expensive,
- 3) Public opinion and legislators are opposed to new laws without obvious benefits,
- 4) Professionals are not limited by state boundaries in their work,
- 5) The American Registry of Certified Professionals in Agronomy Crops and Soils (ARCPACS) is receiving continued nationwide support of professionals and cooperating societies - ASA, CSSA, and SSSA.

Until we are able to take more specific actions here in Ohio to further recognition of pedologists the obvious alternative is to encourage members of AOP to apply for certification by ARCPACS. The procedure is simple:

1. Obtain a standards and procedures booklet from any member of ASA, CSSA, SSSA or write to ARCPACS at 677 So. Segoe Road, Madison, Wisconsin 53711.
2. Decide if you are best qualified for agronomy, crops, or soils certification.
3. Assemble information on your education, experience, employment record, and professional activities.
4. List three references who are active members of ASA, CSSA, SSSA or ARCPACS certified professionals. (This changes to five references after January 1, 1980). References must be from different geographic locations.
5. Find \$30.00 to send with your application and save \$10.00 for renewal each year.

The immediate benefits of the certification are few for those employed by state and federal agencies but the long term career benefits are very significant, especially as more people seek early retirement and consulting and contract work becomes more common.

Joe Steiger, Chairman
Certification Committee

News Item--

The Metric standard has now been adopted by SCS for all measurements in the technical section of soil survey reports. This will introduce a dual English (Metric) system for Ohio soil surveys.

FROBISHER BAY, NORTHWEST TERRITORY, CANADA, Don Musgrave

I had the opportunity to take a side trip to Frobisher Bay, Northwest Territory, Canada in conjunction with the Soil Conservation Society of American annual meeting. I thought fellow Soil Pedologists might be interested.

To give you a setting Frobisher Bay is 1485 miles north of Ottawa, Canada. It has an air strip built by the USA and was a small base during World War II. The USA has since given it back to Canada. It has a population over 2,000; 80 per cent being Eskimo. The high temperature in July is 11.7 degrees Cent. and low of 3.9. The January high is -18.7 and low -34.1 with yearly average of -9.0 cent. Precipitation is average 409.2 mm with 2395.22 mm of it in the form of snow. The topography is rolling with very little soil, being mostly rock and boulders.

We arrived there by air approximately 11 PM and left at 4 AM. We were to see the sun set and rise and only becoming dusk. However it was very cloudy and rained. It snowed that morning leaving some snow on the hillsides. We didn't see the sun while there.

When we landed, the Eskimo children flocked out of the government barracks. Most of them were smoking - even as young as six and seven. A lot of them smoke pot and I was asked 3 times for pot. Government estimated over 50 percent on drugs. Our guide said it was closer to two thirds. The Eskimo now lives mostly out of tin cans and they just throw them outside of their door. With only one dog sled team in town anymore, they use snowmobiles which are abandoned where they break down.

For drinking water they pump steam into a lake to melt ice. For sewage they have a man leave one plastic bag and pick up one at each house daily which are then disposed of by dumping into the ocean.

The tide there is 40 feet. They have flat bottom ships come into harbor. When the tide gives out, they are able to drive trucks to the ship for unloading.

Plant life has a hard time. Most plants take four years to make cycle of seed to seed. The biggest plants are around seven inches tall. A pine tree the size of your finger is said to be 100 years old. We saw several arcticflowers. We picked arctic cotton which is one of the largest plants with a white ball three inches in diameter.

It was a very education trip in that it showed what the white man has done to the Eskimo.

Soil Survey Horizons

The American Society of Agronomy journal aimed primarily at the field soil scientist, Soil Survey Horizons, is gaining in readership and is financially solvent. At the ASA Fort Collins meeting it was announced that the journal presently has 869 subscriptions (34 through AOP). Publication is running behind schedule due in part to a lack of articles. Ed Ciolkosz, editor, said the files for future issues were pretty thin. In contrast to SSSAJ where the acceptance rate is less than 70% (Division S-5 had 53% approval in 1978), the chances of a reasonably well written article being approved for Soil Survey Horizons probably runs well over 90%. More of the Ohio field soil scientists should consider this avenue for publication of their work and ideas. Of course a good proving ground is your AOP Newsletter.

Positions Open

Erie Co. Health Department, Sandusky, Ohio. Sanitaricians will conduct field investigations for location and design of on-site waste treatment systems. Innovative designs are often needed to deal with variable soil and site conditions. Other duties would include assisting on public health programs such as food service inspection. Degree with strong training in soils and some experience in soil investigation and mapping. Salary competitive with federal and state civil service. Contact Stephan L. Casali, R. S. Chief Sanitarian.

Hallmark, C. T., and N. E. Smeck. 1979. The effect of extractable aluminum, iron, and silicon on strength and bonding of fragipans of northeastern Ohio. *Soil Sci. Soc. Am. J.* 43:145-150.

ABSTRACT

Pyrophosphate, oxalate, and HCl-acetylacetone extractions for Al, Fe, and Si were made on five soils with fragipans (Aeric Fragiqualfs and an Aquic Fragiudalf) and two soils without fragipans (Aeric Ochraqualfs) from Ohio to evaluate the role of amorphous components in effecting bonding between soil particles of fragipans. The distribution of Al extractable in HCl-acetylacetone was found to coincide with the position of the fragipan and correlated positively at the 0.01 level with rupture strengths which are indicative of fragipan development. Rupture strengths of soil disks from fragipans were shown to decrease following treatment with HCl-acetylacetone as compared to water treatment alone confirming the removal of a bonding phase in the fragipan by HCl-acetylacetone. Although a number of features of fragipans are inherited from the parent material, evidence suggests precipitation of an amorphous phase at contact points between soil particles which imparts strength and brittleness observed in fragipans.

Hallmark, C. T., and N. E. Smeck. 1979. A rupture technique to determine fragipan strength. *Soil Sci. Soc. Am. J.* 43:198-200.

Abstract

A method is presented to evaluate the strength of fragipans based upon the rupture of 1.2 cm thick disks cut from air dry soil cores. Rupture values abruptly increase in the fragipan as compared to overlying horizons and decrease with depth in the lower B3 and C horizons. Rupture strength measurements may prove valuable in objectively assessing fragipan development and its subsequent influence on water movement and root penetration.

Lanyon, L. E., and G. F. Hall. 1979. Dissolution of selected rocks and minerals in a dilute salt solution as influenced by temperature regime. *Soil Sci. Soc. Am. J.* 43:192-195.

ABSTRACT

Soil environments are generally characterized by temperatures that vary diurnally and/or seasonally, but mean temperatures are often reported to describe these environments. This study was designed to monitor the dissolution of ground samples of olivine (OL), microcline (M), a sandstone (SD) and a shale (SH) in 0.01N AlCl₃ when subjected to an alternating temperature regime (mean 25°C with range 3 to 47°C) and constant temperature regimes of 3, 25, and 47°C for periods of up to 90 days. The concentration of a structural cation (Mg for OL and K for M, SD and SH) in the suspending medium was employed as an indicator of the extent of dissolution. Dissolution increased approximately linearly with increasing constant temperature in the order OL > M > SD > SH. The effect of the alternating temperature regime was to increase dissolution relative to a constant temperature of 25°C; the magnitude of the increased varied with the material. An "effective temperature" was calculated to quantify the relative effect of the alternating temperature to the constant temperature regimes. The ranking of the effective temperatures was OL > SH > SD > M. The concepts developed from this laboratory study may be related to reported observations of soil development/aspect relationships in the field where it appears that variables that describe factors such as the interaction of the nature of the parent material and the magnitude of environmental differences may need to be included.

Bigham, J. M., D. C. Golden, S. W. Buol, S. B. Weed, and L. H. Bowen. 1978. Iron oxide mineralogy of well-drained Ultisols and Oxisols: II. Influence on color, surface area, and phosphate retention. *Soil Sci. Soc. Am. J.* 42:825-830.

ABSTRACT

Subsoil samples from selected North Carolina Ultisols and Brazilian Oxisols were analyzed to determine how the colors of these materials were influenced by the nature and distribution of their constituent iron oxides. The effects of extraneous variables, i.e., other than the iron oxides, were minimized by utilizing pairs of red and yellow soils that were otherwise similar in their physical, morphological, and mineralogical properties.

The iron oxides were found to be concentrated in the <0.2- μ m fractions, and the colors of these clays were the same as or similar to those of the parent soils. The spectral properties of the <0.2- μ m clays were primarily influenced by iron mineralogy. Goethite or mixtures of goethite and hematite were identified in all of the clays; however, Mössbauer analyses indicated that the red members of all sample pairs contained larger proportions of hematite than did their yellow counterparts. In addition, as the clays became redder in hue, the ratio of hematite to goethite generally increased. Calculated surface areas for the iron oxides ranged from 60 to 200 m²/g; values from the yellow clays were consistently higher than those obtained from their red counterparts. The yellow clays were also more efficient adsorbers of phosphate.

Hanson, C. T., and R. L. Blevins. 1979. Soil water in coarse fragments. *Soil Sci. Soc. Am. J.* 43:819-820.

Abstract

The amount of availability of water contained in coarse fragments is often considered to be negligible, but may in fact play an important role in the water relations of soils containing numerous coarse fragments. The objective of this study was to measure the availability of water contained in two contrasting types and several size fractions of fragments. Field capacity, -15 bar potential, and wilting point (WP) measured by plant extractions were made on sandstone fragments from the surface layers of Cutshin soil and shale fragments from a Colyer soil. The sandstone fragments contained about 11% available water by volume, and the shaly fragments contained 23% available water by volume based on WP measurements by plant removal in the greenhouse. The -15 bar potential determined in the laboratory compared closely with WP measured by plant removal for the sandstone fragments, but the -15 bar potential indicated higher levels of moisture retained in the shale fragments than WP as determined in the greenhouse.

¹Contribution from the Dep. of Agronomy, Univ. of Kentucky, Lexington, KY 40546.

SOILS DEVELOPED FROM COLLUVIUM IN THE RIDGE AND VALLEY AREA OF PENNSYLVANIA¹

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ABSTRACT

Soils developed from colluvium are found on the side slopes of all the major and many of the secondary ridges in the unglaciated Ridge and Valley area of Pennsylvania. The texture of these soils varies from sandy loam to clay and, for the most part, has been inherited from the parent material. Vertically within these soils there are many textural changes. These changes are the result of argillic horizon development and textural heterogeneity of the parent material. These soils are well leached in the well-drained sites and less thoroughly leached in the more poorly drained sites. Fragipans occur in all the medium textured soils, but not in the finer textured ones or in the soils that have significant limestone influence in their parent material. The clay mineral content of these soils indicates significant illite weathering with a trend of less intensive weathering with depth and with increasingly poorer drainage. The presence of argillic horizons, fragipans, significant illite weathering, and appreciable leaching indicates that these soils are moderately well developed. This implies that the landscapes on which these soils are found are relatively stable today, probably dating back to the Wisconsin glacial time.

ABSTRACT

Kwaad, F.J.P.M. and Mûcher, H.J., 1979. The formation and evolution of colluvium on arable land in northern Luxembourg. *Geoderma*, 22(2): 173-192.

The paper deals with colluvial deposits found in dry valley heads in a farmland area near the village of Berl  in northern Luxembourg. The colluvium, with a maximum depth of 1.50 m, overlies a truncated red and gray mottled IIBtb horizon of an older soil. The colluvium shows signs of groundmass illuviation in the form of matriargillans, matrans or agricutans, as this feature is variously called. These coarse grained cutans are also found in the buried IIBtb horizon, where they are superimposed upon illuviation ferriargillans. From a review of the literature it appears that matrans are generally considered to result from structural breakdown of the superficial soil horizons under human cultivation. That the colluvium was formed under cultivation is in agreement with its pollen content of practically only non-tree species associated with human occupation and cereals.

The colluvium contains heavy minerals from a volcanic eruption in the Eifel which took place during the Upper-Pleniglacial or Late-Glacial of the Weichselian. Furthermore it is rich in charcoal fragments, presumably from charcoal burning after 1450 A.D. and/or from forest burning for agricultural purposes. The presence of pollen of *Fagopyrum* (buckwheat), which was introduced in the area around 1460 A.D., in the colluvium confirms a late-mediaeval and/or later time of formation of the colluvium.

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ABSTRACT

Fahey, B.D., 1979. Frost heaving of soils at two locations in southern Ontario, Canada. *Geoderma*, 22: 119-126.

Frost-heave measurements conducted over two winters in frost-susceptible soil at two adjacent Canadian locations, one near Guelph, and the other near Elora, Ontario, are examined in the light of supporting environmental data. The trend in the penetrating frost line, and the total depths achieved in each season at the Guelph site were similar, but surface displacement during 1976-1977 was less than half that recorded in 1975-1976. This disparity is attributed to seasonal variations in the proximity of the water table with respect to the soil freezing level. When the former is deep, closed-system conditions prevail, and frost heave is severely curtailed. The importance of access to water is also demonstrated at the Elora site where frost heaving was sustained by a water table close to the surface despite the presence of a snow cover.

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