

# INDEX

Full titles of papers are in **boldface type**

- Actinolite  
Austria, Zillertal 218  
swelling 218
- Absorption by organo-clay complexes,**  
**Part 2, by C. T. Cowan 226**
- Adularia, decomposition 445
- Albite, decomposition 446, 458
- Alkylammonium ions and mica-type layer  
silicates 191
- Amine cations  
areas 183  
montmorillonite surface coverage 174
- Amine-saturated montmorillonite 163,  
174
- Amphiboles, decomposition 452
- Anauxite, discovered 426
- ANDERSON, J. U.: An improved pre-  
treatment for mineralogical analysis  
of samples containing organic matter  
380
- Anthrophyllite, synthesis 7
- Argillation, hydrothermal, volcanic glassy  
rock 333
- Arizona, montmorillonite, Chambers 390,  
391, 392
- Aromatic liquids, complexes with mont-  
morillonite 469
- Attapulgite (*see also* Palygorskite)  
dispersibility 287  
distribution 404
- Attapulgite: properties and uses, by**  
W. L. Haden, Jr. 284
- Australia, vermiculite, Young River 76
- Austria, actinolite, Zillertal 218
- Ball clay  
Tennessee, Paris 247  
in whitewares industries 311
- Basalt, weathering 453
- BASSETT, W. A.: The geology of vermicu-  
lite occurrences 61
- Batavite  
*n*-alkylammonium derivatives 195  
Fourier synthesis 209  
Germany, Kropfmühl 195, 209  
X-ray diffraction data 214
- Bauxite, Czechoslovakia 429
- Beidellite  
*n*-alkylammonium derivatives 195  
cation exchange with proteins 220  
swelling with various solutions 198f  
X-ray diffraction data 198-202
- Bentonite (*see also* Montmorillonite)  
amine-saturated 174  
birefringence of complexes with aroma-  
tic liquids 469  
as bonding agent 278  
Czechoslovakia 430  
definition 274  
density 319, 320, 321, 322  
industrial applications 272  
ion exchange capacity 392  
organic cation-stabilized 235  
production 273  
properties 274, 276  
reactivity 280  
surface area 279  
swelling capacity 125, 281  
uses 272  
Wyoming 3, 125, 174, 235, 319, 460, 469
- Bentonite-methylamine complexes, by**  
R. A. Rowland and E. J. Weiss 460
- Bentonite-water mixtures 277
- Birefringence of clay mineral complexes,  
by R. Greene-Kelly 469
- Biotite 82  
*n*-alkylammonium derivative 194  
alteration to vermiculite 65  
cesium sorption 394
- Bonding agents 278
- BRADLEY, W. F., WEISS, E. J., and  
ROWLAND, R. A.: A glycol-sodium  
vermiculite complex 117
- BURSON, J. H., with CORBETT, W. J.,  
and YOUNG, R. A.: Gamma-irradi-  
tion of kaolinite 344
- Calcium oxalate formation in soil treat-  
ment 385
- Caliche and uranium 27
- California, vermiculite-biotite, Daggett  
Pass 64

- CAMEZ, THÉRÈSE, with MILLOT, GEORGES:  
Genesis of vermiculite and mixed-layer vermiculite in the evolution of the soils of France 90
- Carbonate occurrences of vermiculite 63
- Cation exchange capacity (*see also* Ion exchange capacity)  
illite, Beavers Bend 378  
kaolinite, irradiated 352  
montmorillonite, Wyoming 129  
organic cations 301  
soil from glacial till 112  
soils, Virginia 104  
vermiculite 85, 129  
dioctahedral 103
- Cation exchange of mica-type layer silicates with proteins 220
- Ceramic industry  
clay minerals in 309  
Czechoslovakia 435
- Cesium sorption reactions as indicator of clay mineral structures, by Tsuneo Tamura 389
- Chalcedony  
neof ormation 406  
from tuffaceous rocks 26
- Characterization of montmorillonite saturated with short-chain amine cations: 1, Interpretation of basal spacing measurements, by S. Diamond and E. B. Kinter 163
- Characterization of montmorillonite saturated with short-chain amine cations: 2, Interlayer surface coverage by the amine cations, by E. B. Kinter and Sidney Diamond 174
- Charge density, influence on basal spacing of mica-type layer silicates 204
- Chemical analyses  
halloysite, Mexico 337  
hydrobiotite 77  
illite, Beavers Bend 375  
kaolin, Georgia 292  
vermiculite 72  
volcanic glassy rock, Mexico 337  
Chemical composition  
hydrobiotite 70  
vermiculite 70
- Chemical weathering 443
- Chlorite  
formation from vermiculite 65  
France, in soils 90  
heat stability 111  
Iowa, Mississippian strata 418  
origin, Triassic 401  
as weathering product 113
- Chlorite-vermiculite, France, in soils 90
- Chloritized weathering products of a New England glacial till, by R. M. Quigley and R. T. Martin 107  
"Cimolite," 426
- Classification of clay minerals 434
- Clay-liquid systems, application of density studies to core analysis 318
- Clay minerals (*see also specific clay minerals classification*) 434  
distribution, Iowa, Mississippian strata 418  
evolution 399  
irradiation 266  
and sedimentary facies 400  
structures as indicated by cesium sorption 389  
terminology 434  
transformations in soils 403  
wettability 44
- Clay minerals in the ceramic industries, by T. W. Smoot 309
- Clay mineralogy of Mississippian strata of southeast Iowa, by J. B. Hayes 413
- Clay-organic complexes (*see also specific complexes*)  
adsorption by 226  
stepwise hydration 225
- CLEM, A. G., and DOEHLER, R. W.: Industrial applications of bentonite 272
- Climate and silicification 406
- Clinooenstatite, unit cell characteristics 370
- Colorado  
dickite, Ouray 247, 248  
halloysite, Wagon Wheel Gap 246  
vermiculite  
Hillside 75  
Salida 63
- Connecticut, vermiculite, Gaylordsville 64
- Controlled synthesis of heteropolytypic (mixed-layer) clay minerals, by J. T. Iiyama and Rustum Roy 4
- COOK, M. G., with RICH, C. I.: Formation of dioctahedral vermiculite in Virginia soils 96
- CORBETT, W. J., BURSON, J. H., and YOUNG, R. A.: Gamma-irradiation of kaolinite 344
- Core analysis by density studies in clay-liquid systems 318
- CORRENS, C. W.: Experiments on the decomposition of silicates and discussion of chemical weathering 443

- Corrensite, genesis 403
- COWAN, C. T.: Adsorption by organo-clay complexes, Part 2 226
- m*-cresol, adsorption by organo-clay complexes 226
- Cristobalite, Mexico, Etzatlan 334
- Crystallinity  
 index, kaolinite 357  
 kaolinite, irradiated 348
- Czechoslovakia  
 bauxite 429  
 bentonite 430  
 ceramic industry 435  
 deweylite, Mladotice 432  
 dillnite, Banská Belá 434  
 hydrothermal clay minerals 431  
 iron ores 431  
 kaolin  
 primary 427  
 Sedlec 51  
 kaolinite, Zettlitz 247  
 laterites 429  
 research on clay minerals and argillaceous rocks 426
- DEEDS, C. T., and VAN OLPHEN, H.: Density studies in clay-liquid systems, Part II: Application to core analysis 318
- DEEDS, C. T., with VAN OLPHEN, H.: The stepwise hydration of clay-organic complexes (abs.) 225
- DEMIREL, TURGUT, with ROSAUER, E. A. and HANDY, R. L.: X-ray diffraction studies of organic cation-stabilized bentonite 235
- Density  
 bentonite, Wyoming 319, 320, 321, 322  
 crystallographic, of various clays 321, 322, 326  
 hectorite 319, 322  
 illite 321, 322  
 kaolinite 321, 322  
 sand, Ottawa 321, 322  
 vermiculite 320, 321, 322, 323
- Density studies in clay-liquid systems, Part II: Application to core analysis, by C. T. Deeds and H. van Olphen 318
- Detailed field and laboratory studies on the origin and occurrence of Wyoming bentonites, by M. Slaughter and J. W. Earley (abs.) 3
- Deweylite  
 Czechoslovakia, Mladotice 432  
 with vermiculite 65
- Diagenesis  
 definition 25  
 Sahara Desert 329  
 tuffaceous rocks 25, 26  
 and uranium 23
- Diagenesis of clays in sedimentary and petroliferous series, by Georges Kubicki and Georges Millot 329
- DIAMOND, SIDNEY, and KINTER, E. B.: Characterization of montmorillonite saturated with short-chain amine cations: 1, Interpretation of basal spacing measurements 163
- DIAMOND, SIDNEY, with KINTER, E. B.: Characterization of montmorillonite saturated with short-chain amine cations: 2, Interlayer surface covered by the amine cations 174
- Dickite  
 Colorado, Ouray 247, 248  
 Mexico, San Juanito 247, 249  
 X-ray diffractometer pattern 248
- Differential thermal analysis  
 apparatus 432  
 saponite, synthetic 19, 20  
 saponite-talc, synthetic 19, 20
- Differentiation between endellite-halloysite and kaolinite by treatment with potassium acetate and ethylene glycol, by W. D. Miller and W. D. Keller 244
- Dillnite, Czechoslovakia, Banská Belá 434
- Dispersibility of attapulgite 287
- Distribution of clay minerals  
 attapulgite 404  
 Iowa, Mississippian strata 418  
 sepiolite 405
- DODD, C. G., with MANKIN, C. J.: Proposed reference illite from the Ouachita Mountains of southeastern Oklahoma 372
- DOEHLER, R. W., with CLEM, A. G.: Industrial applications of fentonite 272
- Double layer repulsion in montmorillonite 139, 142
- Drilling mud 279, 287
- Dunite, vermiculite with 62
- EARGLE, D. H., with WEEKS, A. D.: Relation of diagenetic alteration and soil-forming processes to the uranium deposits of the southeast Texas Coastal Plain 23

- EARLY, J. W., with SLAUGHTER, M.:  
 Detailed field and laboratory studies on the origin and occurrence of Wyoming bentonites (abs.) 3
- Effect of radiation damage on mullite formation in kaolinite**, by C. M. Head, W. E. Moody, Lane Mitchell and R. A. Young 356
- Endellite  
 differentiation from kaolinite 244  
 Indiana, Bedford 245, 246, 248, 250  
 Mexico  
 Etzatlan 333  
 Oyamel 246  
 origin 251  
 potassium associated with 341  
 X-ray diffractometer pattern 248
- Endellitization of volcanic glassy rock 333
- England, kaolinite, Cornwall 247
- Equilibrium stability of heteropolytypes 18
- Ethylene glycol imbibometry 43
- Experiments on the decomposition of silicates and discussion of chemical weathering**, by C. W. Correns 443
- Feldspars, decomposition 444
- Fire clay  
 France, Olliers 247, 249  
 Germany, Ramsbach 247  
 Missouri  
 Bland 247  
 Mexico 247, 249  
 Owensville 247  
 in refractories industry 312  
 Scotland, Bonnybridge 247
- Formation of dioctahedral vermiculite in Virginia soils**, by C. I. Rich and M. G. Cook 96
- FOSTER, M. D.: Interpretation of the composition of vermiculites and hydrobiotites 70
- Foundry molding sand 278, 282
- Fourier syntheses  
 batavite 209  
 glycol-vermiculite 121  
 vermiculite, Llano 118
- France  
 chlorite in soils 90  
 chlorite-vermiculite in soils 90  
 fire clay, Olliers 247, 249  
 hydrobiotite, Haute-Loire 79  
 illite in soils 90
- France—*cont.*  
 illite-vermiculite in soils 90  
 vermiculite in soils 90
- Freudlich isotherms, dodecylammonium bentonite-phenol-water 228
- Gamma-irradiation of kaolinite**, by W. J. Corbett, J. H. Burson and R. A. Young 344
- Gelling mechanisms 304
- Genesis  
 chlorite, Triassic 401  
 corrensite 403  
 endellite vs. kaolinite 251  
 opal 407, 408  
 pseudomorphs 450  
 uranium, Karnes 36  
 vermiculite 61, 64, 67, 90
- Genesis of vermiculite and mixed-layered vermiculite in the evolution of the soils of France**, by Georges Millot and Thérèse Camex 90
- The geology of vermiculite occurrence** by W. A. Bassett 61
- Georgia  
 kaolin, Dry Branch 245, 251, 291  
 kaolinite  
 Macon 246, 248, 390  
 Twiggs County 344, 357  
 Washington County 344
- Germany  
 basalt weathering, Göttingen 453  
 batavite, Kropfmühl 195, 209  
 fire clay, Ramsbach 247  
 kaolinite, Amberg 247, 248  
 vermiculite  
 Röhrenhof 75  
 Zöblitz 75
- Glacial till, New England, weathering products 107  
 X-ray diffractometer patterns 109, 110
- Glass, volcanic, kaolinization 333
- Glauconite, cesium sorption 395  
 ion exchange capacity 392
- Gley, clay minerals in 92, 93, 94
- Glycerol retention in montmorillonite, amine-saturated 175, 176, 178
- A glycol-sodium vermiculite complex**, by W. F. Bradley, E. J. Weiss and R. A. Rowland 117
- Gneiss, vermiculite in 63
- Granitic occurrence of vermiculite 64
- Gravimetric thermal analysis apparatus 432

- GREENE-KELLY, R.: Birefringence of clay mineral complexes 469
- Grinding studies, kaolinite, irradiated 353
- Ground water, Texas, Karnes 28  
silica in 29
- Grundite  
cesium sorption 395  
ion exchange capacity 392
- Gunnbjarnite, structure 365
- HADEN, W. L. JR.: Attapulgite: properties and uses 284
- Halloysite  
chemical analysis 337  
Colorado, Wagon Wheel Gap 246  
differentiation from kaolinite 244  
Indiana, Bedford 246, 248  
Mexico, Etzatlan 246, 252, 333  
Utah, Eureka 246  
X-ray diffractometer patterns 248, 338
- Halloysite-endellite, Idaho, Latah County 246
- HANDY, R. L., with ROSAUER, E. A. and DEMIREL, TURGUT: X-ray diffraction studies of organic cation-stabilized bentonite 235
- HAYES, J. B.: Clay mineralogy of Mississippian strata of southeast Iowa 413
- HEAD, C. M., MOODY, W. E., MITCHELL, LANE, and YOUNG, R. A.: Effect of radiation damage on mullite formation in kaolinite 356
- Heat stability of chlorite 111
- Hectorite  
*n*-alkylammonium derivative 194, 195  
density 319, 322  
organic cation exchange on 153
- Heteropolytypes (*see also* Mixed-layer minerals)  
effect of pressure on formation 16  
equilibrium stability 18  
synthesis 4  
X-ray diffractometer patterns 17
- Heulandite, Texas, Karnes 26
- Humic acids, intracrystalline swelling 210
- Hudration, stepwise, of clay-organic complexes 225
- Hydrobiotite  
cesium sorption 394  
chemical analyses 77  
chemical composition 70  
France, Haute-Loire 79  
Montana, Libby 79
- Hydrobiotite—*cont.*  
Morocco  
Bou Ifouloussène 79  
Haut Atlas de Midelt 79  
North Carolina, Spruce Pine 79  
South Africa  
Loolekop 79  
Transvaal 79  
South Carolina, Traveler's Rest 390  
structural formulas 80  
Tanganyika, Kwekivu 79  
U.S.S.R., Upper Ufaleisk 79  
vermiculitization 79
- Hydrophlogopite, South Africa, Loolekop 88
- Hydrothermal clay minerals, Czechoslovakia 431
- Hydrothermal kaolinization (endellitization) of volcanic glassy rock, by W. D. Keller 333
- Hydrothermal vs. supergene origin of vermiculite 67
- Idaho, halloysite-endellite, Latah County 246
- Identification of clay minerals and the study of agrillaceous rocks by the imbibometric method, by Jiri Konta 42
- IYAMA, J. T., and ROY, RUSTUM: Controlled synthesis of heteropolytypic (mixed-layer) clay minerals 4
- Illinois  
illite, Fithian 321, 322, 390, 392, 393  
sand, Ottawa 321, 322
- Illite  
*n*-alkylammonium derivative 194  
cation exchange capacity 378  
chemical analysis 375  
density 321, 322  
France, soils 90  
Illinois, Fithian 321, 322, 390, 392, 393  
imbibometry 43  
ion exchange capacity 392  
Iowa, Mississippian strata 418  
"open" 45  
Oklahoma, Beavers Bend 372  
porosity 54  
reference, Beavers Bend 372  
structural formula 377  
surface area 54  
X-ray diffractometer patterns 374, 375
- Illite-vermiculite, France, soils 90
- Illitization of kaolinite 330
- Imbibometry 42, 434

- An improved pretreatment for mineralogical analysis of samples containing organic matter**, by J. U. Anderson 380
- India, vermiculite, Malavanghatta 76
- Indiana  
endellite, Bedford 245, 246, 248, 250  
halloysite, Gedford 246, 248
- Industrial applications of bentonite**, by A. G. Glem and R. W. Doehler 272
- Industrial applications of kaolin**, by H. H. Murray 291
- Infrared spectra, alkylammonium polyphosphates 215
- Interpretation of the composition of vermiculites and hydrobiotites**, by M. D. Foster 70
- Intracrystalline swelling, humic acids 210
- Ion exchange capacity (*see also* Cation exchange capacity)  
bentonite  
  Arizona, 392  
  Wyoming 392  
glauconite, New Jersey 392  
Grundite 392  
illite, Fithian 392  
muscovite 392
- Iowa  
clay mineralogy of Mississippian strata 413  
vermiculite as unconformity marker 421
- Iron ores, sedimentary, Czechoslovakia 431
- Irradiation of clays 266  
  gamma, kaolinite 344
- Japan  
  vermiculite  
    Odaka 75  
    Uzumine 75
- JORDAN, J. W.: Organophilic clay-base thickeners 299
- Kaolin** (*see also specific kaolin minerals*)  
  calcined 297  
  chemical analysis 292  
  Czechoslovakia  
    primary 427  
    Sedlec 51  
  Georgia, Dry Branch 291  
  industrial applications 291
- Kaolin—cont.**  
  organophilic 297  
  particle size 293  
  potassium acetate treatment 244  
  uses 291  
  viscosity of slurries 294  
  X-ray diffraction data 246, 250, 251
- Kaolinite**  
  crystallinity as function of radiation dose 348  
  crystallinity index 357  
  Czechoslovakia, Zettlitz 247  
  decomposition 456  
  density 321, 322  
  differentiation from endellite-halloysite 244  
  effect of radiation damage on mullite formation 356  
  England, Cornwall 247  
  gamma-irradiation 344  
  Georgia  
    Dry Branch 245, 251  
    Macon 246, 248, 390  
    Twiggs County 344, 357  
    Washington County 344  
  Germany, Amberg 247, 248  
  illitization 330  
  imbibometry 43, 46, 51  
  irradiated  
    cation exchange capacity 352  
    crystallinity 348  
    grinding studies 353  
    particle size 349  
    specific surface area 351  
  Mississippian strata 418  
  porosity 54  
  and quaternary ammonium salts 239  
  radiation-damaged, mullite formation 356  
  surface area 54  
  synthesis at low temperatures 409  
  with vermiculite 65  
  X-ray diffractometer patterns 248, 346, 347  
  X-ray fluorescence analysis 357
- Kaolinization**  
  of mica 329  
  of volcanic glassy rock 333
- KELLER, W. D.: Hydrothermal kaolinization (endellitization) of volcanic glassy rock 333
- KELLER, W. D., with MILLER, W. D.: Differentiation between endellite-halloysite and kaolinite by treatment with potassium acetate and ethylene glycol 244

- Kenya  
vermiculite  
  South Kitui 75  
  swelling 125
- KINTER, E. B., with DIAMOND, SIDNEY:  
  Characterization of montmorillonite  
  saturated with short-chain amine  
  cations: 1, Interpretation of basal  
  spacing measurements 163
- KINTER, E. B., and DIAMOND, SIDNEY:  
  Characterization of montmorillonite  
  saturated with short-chain amine  
  cations: 2, Interlayer surface co-  
  verage by the amine cations 174
- KONTA, JIRÍ: Identification of clay  
  minerals and the study of argillaceous  
  rocks by the imbibometric method 42
- KONTA, JIRÍ: Research work on clay  
  minerals and argillaceous rocks in  
  Czechoslovakia 426
- KULBICKI, GEORGES, and MILLOT, GEOR-  
  GES: Diagenesis of clays in sediment-  
  ary and petroliferous series 329
- Laterites, Czechoslovakia 429
- Lattice defects, kaolinite, irradiated 348
- Lattice expansion  
  montmorillonite 137  
  vermiculite 133
- Lepidomelane 82
- Leucite, decomposition 447
- Loughlinitite, structure 366
- Loughlinitite "anhydride," structure 368
- Low-angle X-ray diffraction studies of  
  the swelling of montmorillonite  
  and vermiculite, by K. Norrish and  
  J. A. Rausell-Colom 123
- LUCAS, JACQUES, with MILLOT, GEORGES,  
  and WEY, RAYMOND: Research on  
  evolution of clay minerals and  
  argillaceous and siliceous neofor-  
  mation 399
- Lungs, human, and swelling silicate 218
- MCATEE, J. L. JR.: Organic cation ex-  
  change on montmorillonite as ob-  
  served by ultraviolet analysis 153
- Madagascar, sepiolite, Ampandrandava  
  365
- Magnesite with vermiculite 63
- Magnesium in vermiculite formation 66
- MANKIN, C. J., and DODD, C. G.: Proposed  
  reference illite from the Ouachita  
  Mountains of southeastern Oklahoma  
  372
- Map, Texas, Karnes area 24
- MARTIN, R. T., with QUIGLEY, R. M.:  
  Chloritized weathering products of a  
  New England glacial till 107
- Maryland  
vermiculite  
  Baltimore 75  
  Pilot 75
- Methylamine-bentonite complexes 460
- Mexico  
  cristobalite, Etzatlan 334  
  diekrite, San Juanito 247, 249  
  endellite  
    Etzatlan 333  
    Oyamel 246  
  halloysite, Etzatlan 246, 252, 333  
  perlite, Etzatlan 333
- Mica  
  decomposition 454  
  kaolinization 329  
  trioctahedral, alteration to vermiculite  
    71  
  weathering 98  
  X-ray diffractometer patterns 99, 100
- Mica-montmorillonoid, synthetic 18
- Mica-type layer silicates with alkylam-  
  monium ions, by Armin Weiss 191
- MILLER, W. D., and KELLER, W. D.:  
  Differentiation between endellite-  
  halloysite and kaolinite by treatment  
  with potassium acetate and ethylene  
  glycol 244
- MILLOT, GEORGES, and CAMEZ, THÉRÈSE:  
  Genesis of vermiculite and mixed-  
  layered vermiculite in the evolution  
  of the soils of France 90
- MILLOT, GEORGES, with KULBICKI, GEOR-  
  GES: Diagenesis of clays in sediment-  
  ary and petroliferous series 329
- MILLOT, GEORGES, LUCAS, JACQUES, and  
  WEY, RAYMOND: Research on evolu-  
  tion of clay minerals and argillaceous  
  and siliceous neoformation 399
- Mineralogical analysis of samples con-  
  taining organic matter 380
- Mississippian strata, clay mineralogy,  
  south-east Iowa 413  
  X-ray diffractometer patterns 417, 423
- Missouri  
  fire clay  
    Bland 247  
    Mexico 247, 249  
    Owensville 247
- MITCHELL, LANE, with HEAD, C. M.,  
  MOODY, W. E., and YOUNG, R. A.:  
  Effect of radiation damage on mullite  
  formation in kaolinite 356

- Mixed-layer minerals (*see also specific minerals*)  
 synthesis 4
- Montana  
 hydrobiotite, Libby 79  
 vermiculite-biotite, Libby 62, 63, 67, 103
- Montmorillonite (*see also Bentonite*)  
*n*-alkylammonium derivative 194, 195  
 amine-saturated 163, 174  
 X-ray diffraction data 165  
 Arizona, Chambers 390, 391, 392  
 from basalt, Göttingen 453  
 birefringence of complexes with aromatic liquids 469  
 cation exchange capacity 129  
 cation exchange with proteins 220  
 decomposition 456  
 double layer repulsion 139, 142  
 external surface 178  
 imbibometry 45, 46  
 lattice expansion 137  
 organic cation exchange on 153  
 picoline complexes 225  
 porosity 54  
 pyridine complexes 225  
 surface area 54, 178  
 surface densities of charge 129  
 swelling 123  
 swelling pressure 124  
 synthesis 7  
 van der Waals' attraction 141  
 Wyoming, Clay Spur 390, 392, 393  
 X-ray diffractometer patterns 136
- Montmorillonite-organic complexes  
 adsorption by 227  
 optical properties 471
- Montmorillonoid-mica, synthetic 18
- MOODY, W. E., with HEAD, C. E., MITCHELL, LANE, and YOUNG, R. A.:  
 Effect of radiation damage on mullite formation in kaolinite 356
- Morocco  
 hydrobiotite  
 Bou Ifouloussène 79  
 Haut Atlas de Midelt 79  
 vermiculite, Jebel Bou Ifouloussène 75
- Mountain wood structure 365
- Mozambique, vermiculite, District de Tete 76
- Mullite formation in radiation-damaged kaolinite 356
- MURRAY, H. H.: Industrial applications of kaolin 291
- Muscovite  
*n*-alkylammonium derivative 194, 195  
 Muscovite—*cont.*  
 cesium sorption 395  
 ion exchange capacity 392  
 Ontario, laboratory weathering 100  
 X-ray diffractometer patterns 101
- NAHIN, P. G.: Perspectives in applied organo-clay chemistry 257
- New England, glacial till, East Boston 107
- New Mexico  
 soils 384  
 vermiculite, Las Vegas 63
- New York, vermiculite, Hawthorne 64
- Nontronite  
 from basalt, Göttingen 453  
 cation exchange with proteins 220
- Nordfinland, vermiculite, Maaninka 75
- NORRISH, K., and RAUSELL-COLOM, J. A.:  
 Low-angle X-ray diffraction studies of the swelling of montmorillonite and vermiculite 123
- North Carolina  
 hydrobiotite, Spuce Pine 79  
 vermiculite  
 Ashville 62  
 Burnsville 75  
 Day Book 62, 65  
 Franklin 75
- Oil, volume in core 325
- Oklahoma, illite, Beavers Bend 372
- Olivine, decomposition 452
- Opal  
 genesis 407, 408  
 neof ormation 406  
 from tuffaceous rocks 26, 27  
 "Open" illite, imbibometry 45
- Optical properties, montmorillonite complexes 471
- Organic cation exchange on montmorillonite as observed by ultraviolet analysis, by J. L. McAtee, Jr. 153
- Organic cation-stabilized bentonite, X-ray diffraction studies 235
- Organic cations, exchange capacity 301
- Organic matter, removal from samples 380
- Organo-clay  
 architecture 262  
 bonding 261  
 chemistry, applied 257  
 complexes  
 adsorption by 226  
 stepwise hydration 225  
 definition 259  
 uses 261, 267

- Organophilic clay-base thickeners**, by J. W. Jordan 299
- Oriented aggregates, preparation 470
- Oscillating-heating diffractometer records, glycol-vermiculite 119
- Oscillating-heating X-ray data, bentonite-methylamine complexes 461, 462, 463, 464
- Palygorskite** (*see also* Attapulgitite) structure 366
- Palygorskite "anhydride," structure 369
- Paper, kaolin in 293
- Particle size  
kaolin 293  
kaolinite, irradiated 349
- Pegmatite, vermiculite proximity to 66
- Pennsylvania  
vermiculite  
Chester County 75  
West Chester 62, 65-66
- Perlite, Mexico, Etzatlan 333  
X-ray diffractometer pattern 338
- Perspectives in applied organo-clay chemistry**, by P. G. Nahin 257
- Petroliferous sandstone, diagenesis of clay 329
- Phenol adsorption by organo-clay complexes 228
- Phlogopite  
South Africa, Loolekop 88  
vermiculitization 76
- Phlogopite-saponite, synthetic 14
- Phlogopite-talc, synthesis 5
- Picoline-montmorillonite complexes 225
- Podzol, vermiculite in, France 90
- Porosity  
illite 54  
kaolinite 54  
montmorillonite 54
- Potassium  
acetate treatment of kaolin minerals 244  
in endellite formation 341  
treatment of glacial till 107
- PREISINGER, ANTON: Sepiolite and related compounds: its stability and application 365
- Pressure, effect on formation of heteropolytypes 16
- Production  
bentonite 273  
clay for ceramics industries 314
- Properties, bentonite 274, 276
- Proposed reference illite from the Ouachita Mountains of southeastern Oklahoma**, by C. J. Mankin and C. G. Dodd 372
- Proteins, cation exchange in mica-type layer silicates 220
- Pseudomorphs  
origin 450  
vermiculite after high-temperature minerals 64
- Pyridine-montmorillonite complexes 225
- Quantitative mineralogical analysis of clay minerals 433
- Quartz  
neof ormation 406  
and quaternary ammonium salt 239
- Quaternary ammonium chlorides as soil stabilizers 236  
X-ray diffraction data 238
- QUIGLEY, R. M., and MARTIN, R. T.: Chloritized weathering products of a New England glacial till 107
- Radiation damage in kaolinite, effect on mullite formation 356
- Radiochemical analyses, uranium, Texas 39
- RAUSELL-COLOM, J. A., with NORRISH, K.: Low-angle X-ray diffraction studies of the swelling of montmorillonite and vermiculite 123
- Reactivity, bentonite 280
- Refractories industry 312
- Relation of diagenetic alteration and soil-forming processes to the uranium deposits of the southeast Texas Coastal Plain**, by A. D. Weeks and D. H. Eargle 23
- Research on evolution of clay minerals and argillaceous and siliceous neof ormation**, by Georges Millot, Jacques Lucas and Raymond Wey 399
- Research work on clay minerals and argillaceous rocks in Czechoslovakia**, by Jiri Konta 426
- RICH, C. I., and COOK, M. G.: Formation of dioctahedral vermiculite in Virginia soils 96
- ROSAUER, E. A., HANDY, R. L., and DEMIREL, TURGUT: X-ray diffraction studies of organic cation-stabilized bentonite 235

- ROWLAND, R. A., with BRADLEY, W. F., and WEISS, E. J.: A glycol-sodium vermiculite complex 117
- ROWLAND, R. A., and WEISS, E. J.: Bentonite-methylamine complexes 460
- ROY, RUSTUM, with IYAMA, J. T.: Controlled synthesis of heteropolytypic (mixed-layer) clay minerals 4
- Sahara Desert, diagenesis of clays 329
- Sand, apparent density, Ottawa 321, 322
- Sandstone, tuffaceous, diagenesis 25
- Saponite  
*n*-alkylammonium derivatives 195  
 from basalt, Göttingen 453  
 composition 10  
 differential thermal analysis 19, 20  
 stability 20
- Saponite-phlogopite, synthetic 14
- Saponite-talc, synthetic 11, 12, 16, 18  
 differential thermal analysis 19, 20
- Schist, vermiculite in 63
- Scotland, fire clay, Bonnybridge 247
- Sedimentary facies and clay minerals 400
- Sepiolite  
 "anhydride," structure 366  
 distribution 405  
 Madagascar, Ampandrandava 365  
 stability 365  
 structure 364  
 Tanganyika, Amboschi 365  
 Turkey, Eskischir 365  
 uses 371
- Sepiolite and related compounds: its stability and application**, by Anton Preisinger 365
- Sericite, vermiculite "weathered" from 103
- Siderophyllite 82
- Sierra Leone, vermiculite, Amba 75
- Silica in ground water, Karnes, Texas 29
- Silicate decomposition experiments and chemical weathering 443
- Silicification  
 and climate 406  
 and uranium 27
- Silicosis 218
- SLAUGHTER, M., and EARLEY, J. W.: Detailed field and laboratory studies on the origin and occurrence of Wyoming bentonites (abs.) 3
- SMOOT, T. W.: Clay minerals in the ceramic industries 309
- Soil  
 clay mineral transformations 403  
 -forming processes and uranium 23  
 from glacial till 112  
 mesotrophic hydromorphous 92, 93, 94  
 New Mexico 384  
 stabilizers 235  
 Virginia, cation exchange capacity 104  
 X-ray diffractometer patterns 100, 101, 102, 105, 385, 386
- Sorption  
 apparatus and imbibometry 47  
 of cesium by 2:1 layer lattice silicates 389
- South Africa  
 hydrobiotite  
 Loolekop 79  
 Transvaal 79  
 hydrophlogopite, Loolekop 88  
 phlogopite, Loolekop 88  
 vermiculite  
 Loolekop 75, 88  
 Transvaal 75  
 vermiculite-phlogopite, Loolekop 62
- South Carolina  
 hydrobiotite, Traveler's Rest 390  
 vermiculite-biotite  
 Enoree 62  
 Tigerville 62, 63
- Spain, vermiculite, Badajoz 76
- Specific surface area, kaolinite, irradiated 351
- Spectrographic analyses, tuffaceous rocks, Texas 33, 34, 35, 37
- The stepwise hydration of clay-organic complexes (abs.)**, by H. van Olphen and C. T. Deeds 225
- Stevensite, hydrothermal 371
- Structural clay products 309
- Structural formulas  
 hydrobiotite 80  
 illite, Beavers Bend 377  
 vermiculite 80
- Structure  
 bentonite-methylamine complexes 460  
 clay minerals as indicated by cesium sorption reactions 389  
 gunnbjarnite 365  
 loughlinitite 366  
 loughlinitite "anhydride," 368  
 mountain wood 365  
 palygorskite 366  
 palygorskite "anhydride," 369  
 sepiolite 365  
 sepiolite "anhydride," 366  
 xylotile 365

- Supergene vs. hydrothermal origin of vermiculite 67
- Surface areas  
 bentonite 279  
 illite 54  
 kaolinite 54  
 montmorillonite 54, 178
- Surface densities of charge  
 montmorillonite, Wyoming 129  
 vermiculite, Kenya 129
- Surface-treated clays, uses 304
- Swelling  
 actinolite 218  
 beidellite with various solutions 198  
 capacity, bentonite 281  
 humic acids 210  
 montmorillonite 123  
 pressure, montmorillonite 124  
 silicate and human lungs 218  
 vermiculite 123
- Synthesis  
 anthophyllite 7  
 heteropolytypic clay minerals 4  
 kaolinite at low temperatures 409  
 mica-montmorillonoid 18  
 montmorillonite 7  
 phlogopite-talc 5  
 saponite-talc 11, 12, 16, 18
- System  $\text{Na}_2\text{O}-\text{MgO}-\text{Al}_2\text{O}_3-\text{SiO}_2-\text{H}_2\text{O}$   
 6, 15
- Talc-phlogopite, synthesis 5
- Talc-saponite, synthetic 11, 12, 16, 18
- TAMURA, TSUNEO: Cesium sorption reactions as indicator of clay mineral structures 389
- Tanganyika  
 hydrobiotite, Kwekivu 79  
 sepiolite, Amboschi 365
- Tennessee, ball clay, Paris 247
- Terminology of clay minerals 434
- Tetraline imbibition in clays 55, 57
- Texas  
 ground water, Karnes 28  
 heulandite, Karnes 26  
 map, Karnes area 24  
 uranium, southeast Coastal Plain 23  
 vermiculite, Llano 63, 75, 86, 117, 320, 321  
 vermiculite-biotite, Llano 63  
 vermiculite-chlorite, Llano 62  
 zeolites, Karnes 25, 26
- Thickeners, organophilic clay-base 299
- Tuffaceous rocks  
 chalcedony from 26
- Tuffaceous rocks—*cont.*  
 diagenesis 26  
 weathering 27
- Turkey, sepiolite, Eskischir 365
- Ultramafic and mafic occurrence of vermiculite 62
- Ultraviolet analysis of organic cation exchange on montmorillonite 153
- Unit cell characteristics of clinostatite 370
- Uranium  
 micas, alkylammonium derivatives 216  
 Texas, southeast Coastal Plain 23
- Uses  
 attapulgite 287  
 bentonite 272  
 kaolin 291  
 organo-clay 261, 267  
 sepiolite 371  
 surface-treated clays 304
- U.S.S.R.  
 hydrobiotite, Upper Ufaleisk 79  
 vermiculite, Kaslinskaiia 75
- Utah, halloysite, Eureka 246
- van der Waals' attraction, montmorillonite 141
- VAN OLPHEN, H., with DEEDS, C. T.: Density studies in clay-liquid systems, Part II: Application to core analysis 318
- VAN OLPHEN, H., and DEEDS, C. T.: The stepwise hydration of clay-organic complexes (abs.) 225
- Vermiculite  
*n*-alkylammonium derivative 194  
 Australia, Young River 76  
 from biotite 65  
 carbonate occurrences 63  
 cation exchange capacity 85, 129  
 chemical analyses 72  
 chemical composition 70  
 chlorite from 65
- Colorado  
 Hillside 75  
 Salida 63
- Connecticut, Gaylordsville 64  
 density 320, 321, 322, 323  
 dioctahedral, cation exchange capacity 103
- Fourier synthesis 118
- France, soil 90  
 genesis 61, 64, 67, 90

- Vermiculite—*cont.*  
 geology 61  
 Germany  
   Röhrenhof 75  
   Zöblitz 75  
 in gneiss 63  
 in granite 64  
 hydrothermal vs. supergene origin 67  
 India, Malavanghatta 76  
 Iowa, as unconformity marker 421  
 Japan  
   Odaka 75  
   Uzumine 75  
 Kenya, South Kitui 75  
 lattice expansion 133  
 layer charge relations 83  
 with magnesite 63  
 Maryland  
   Baltimore 75  
   Pilot 75  
 Morocco, Jebel Bou Ifoloussene 75  
 Mozambique, District de Tete 76  
 New Mexico, Las Vegas 63  
 New York, Hawthorne 64  
 Nordfinnland, Maaninka 75  
 North Carolina  
   Ashville 62  
   Burnsville 75  
   Day Book 62, 65  
   Franklin 75  
 occurrence 61  
 and pegmatites 66  
 Pennsylvania  
   Chester County 75  
   West Chester 62, 65-66  
 pseudomorphs after high-temperature  
 minerals 64  
 in schist 63  
 Sierra Leone, Amba 75  
 South Africa  
   Loolekop 75, 88  
   Transvaal 75  
 Spain, Badajoz 76  
 structural formulas 80  
 surface densities of charge 129  
 swelling of 123  
 Texas, Llano 63, 75, 86, 117, 320, 321  
 ultramafic and mafic occurrence 62  
 U.S.S.R., Kaslinskaia 75  
 Virginia, dioctahedral in soils 96  
 Wyoming  
   Encampment 63, 75  
   Glenrock 76  
 "weathered" from sericite 103  
 "weathered" from vermiculite-biotite  
 103
- Vermiculite—*cont.*  
 X-ray diffractometer patterns 103,  
 130, 134  
 Vermiculite-biotite  
   California, Daggett Pass 64  
   Montana, Libby 62, 63, 67, 103  
   South Carolina  
     Enoree 62  
     Tigerville 62, 63  
   Texas, Llano 63  
   X-ray diffractometer pattern 103  
 Vermiculite-chlorite, Texas, Llano 62  
 Vermiculite-glycol complex 117  
 Vermiculite-phlogopite, South Africa,  
 Loolekop 62  
 Vermiculitization 70, 76, 79  
 Virginia, vermiculite, dioctahedral, in  
 soils 96  
 Viscosity of kaolin slurries 294  
 Volcanic ash as source of uranium 25  
 Volcanic glassy rock, kaolinization 333
- Water, imbibometry 43  
 Weathering  
   basalt 453  
   chemical 443  
   glacial till, New England 107  
   laboratory simulation 443  
   mica 98  
   sericite 103  
   tuffaceous sediments 27  
   vermiculite-biotite 103  
 WEEKS, A. D., and EARGLE, D. H.:  
 Relation of diagenetic alteration and  
 soil-forming processes to the uranium  
 deposits of the southeast Texas  
 Coastal Plain 23  
 WEISS, ARMIN: Mica-type layer silicates  
 with alkylammonium ions 191  
 WEISS, E. J., with BRADLEY, W. F., and  
 ROWLAND, R. A.: A glycol-sodium  
 vermiculite complex 117  
 WEISS, E. J., with ROWLAND, R. A.:  
 Bentonite-methylamine complexes  
 460  
 Wettability of clay minerals 44  
 WEY, RAYMOND, with MILLOT, GEORGES,  
 and LUCAS, JACQUES: Research on  
 evolution of clay minerals and argil-  
 laceous and siliceous neoformation  
 399  
 Whitewares industries 311  
 Wyoming  
   bentonites 3  
   amine-saturated 174

- Wyoming—*cont.*  
 complexes with aromatic liquids 469  
 density 319, 320, 321, 322  
 -methylamine complexes 460  
 organic cation-stabilized 235  
 swelling 125  
 montmorillonite, Clay Spur 390, 392,  
 393  
 vermiculite  
 Encampment 63, 75  
 Glenrock 76
- X-ray diffraction data  
 batavite 214  
 beidellite 198-202  
 kaolin minerals processed with potas-  
 sium acetate 246, 250, 251  
 mica-type layer silicates, *n*-alkylam-  
 monium 193, 194  
 montmorillonite, amine-saturated 165  
 oscillating-heating, bentonite-methyl-  
 amine complexes 461-4  
 quaternary ammonium chlorides 238
- X-ray diffraction studies of organic  
 cation-stabilized bentonite, by  
 E. A. Rosauer, R. L. Handy and  
 Turgut Demirel 235
- X-ray diffractometer patterns  
 dickite 248  
 endellite 248  
 glacial till, New England 109, 110  
 halloysite 248, 338  
 heteropolytypes, variation with pressure  
 17
- X-ray diffractometer patterns—*cont.*  
 illite, Beavers Bend 374, 375  
 kaolinite 248, 346  
 irradiated 347  
 mica, weathering 99, 100  
 Mississippian sediments, southeast Iowa  
 417, 423  
 montmorillonite, swollen 136  
 muscovite, weathering 101  
 perlite, Mexico 338  
 soils 100, 101, 102, 105, 385, 386  
 variation with composition of hetero-  
 polytypes 11  
 vermiculite, dioctahedral 103  
 vermiculite, swollen 130, 134  
 vermiculite "weathered" from vermicu-  
 lite-biotite 103  
 vermiculite-biotite 103
- X-ray fluorescence analysis, kaolinite,  
 metal impurities 357
- Xylotile, structure 365
- YOUNG, R. A., with CORBETT, W. J., and  
 BURSON, J. H.: Gamma-irradiation of  
 kaolinite 344
- YOUNG, R. A., with HEAD, C. M., MOODY,  
 W. E., and MITCHELL, LANE: Effect  
 of radiation damage on mullite forma-  
 tion in kaolinite 356
- Zeolites, Texas, Karnes area 25, 26