

GENERAL INDEX.

INDEX.

- ACETONE, condensation with benzoin. 17.
Acetophenone, condensation with ketols. 46.
Acheta abbreviata. 132.
 vittata. 135.
Acrididae of Vigo county, 15.
Action of phenyl-hydrazin on furfurof. 57.
Actinia, 20.
Aesthesiometer, 16.
Aegeria of Central Ohio. 168.
Agkistrodon, breeding habits, etc. of 107, 108.
Agkistrodon, contortrix. 107, 108.
 piscivorus, 108.
Albumen in urine. 30.
Allen county Kames. 18.
Allocoystites, 67.
Amblystoma tigrinum, 21.
Amblystomas, 22.
Ammodramus henslowii, 161.
 leconteii, 166.
Amphisorex leseurii, 163.
Amphiuma means, 22.
Anaxipha pulicaria, 137.
Anaxiphus, 128, 137.
Anchor ring, sections of 64.
Anilic acid, 27.
Annelida, 68.
Anthrozoa, 68.
Apatuna celtis, 31.
Apical growth of Botrychium, 79.
 of Pinus, 79.
 of Tsuga, 79.
Apthes, 128, 139.
 agitator, 139.
 azteca, 139.
 McNeillii, 138.
 quadrata, 139.
Archaeological discoveries, 26, 98.
 methods, 98.
 research, 26.
Archegonium of Pinus, 79.
 of Tsuga, 79.
Ardea egretta, 165.
Argynnis diana, 19.
Arizona plants, 28.
Arizona plant zones. 25.
Arkansas, 15.
Arthropods, 24.
Arthur, J. C., 97.
Asprendae, on the presence of an operculum in, 175.
Aster, 25.
Astronomical study in Indiana, 24.
Atmospheric electricity, 26.
Atomic weight of oxygen, 27.
Automatic repeater, 34.
BACTERIA CULTURE, 15.
Bacterial disease of sugar-beet root, 92.
Baker, P. S., 55.
Bamberger, E., 58.
Baseanion constrictor, breeding habits of, 106, 119, 120.
Beet-root, diseases of, 92.
Benzoin, condensation with acetone, 17.
Beta-nitro-para toluic acid, 27.
Bigney, A. J., 151.
Biological stations, 19, 172.
Biological surveys, 18, 76.
Bird migration, 19.
Birds, destruction of, 16.
Birds, Indiana, 161, 166.
Black racer, 106, 119, 120.
Blarina brevicauda, 162.
 cinerea, 163.
 platyrhinus, 163.
 parva, 163.
Blue jay, 21.
Blind fishes, 24.
 ancestors of, 21.
Botany, systematic, 18.
Botrychium, 17, 27.
Botrychium, sporangium and apical growth, 79.
Brachiopoda, 68.
Branchipus, 22.

- Branchysorex harlanii, 163.
 breviceaudatus, 163.
 Brown, W. V., 64.
 Buckeye, a Kansas species, 74.
 Buffalo gnats, 31.
 in Illinois and Indiana, 155.
 Building stone, quality of, 66.
 Butler, A. W., 161, 164.

 CACTACEÆ, spines of, 19.
 Cactus flora of the Southwest, 92.
 California viviparous fishes, 19.
 Campbell, J. L., 98.
 Carboxylated derivatives of benzoquinone, 27.
 Carbon dioxide in the urine, 30, 48.
 Carbonic acid in the air, 30.
 Carolina parakeet, 17.
 Carroll county birds, 19.
 fishes, 19.
 Carya alba, 27.
 stomata of, 76.
 Caryocernus, 67.
 Cephalanthus occidentalis, 138.
 Cephalopoda, 68.
 Certhia familiaris, 167.
 Chaetodontidæ, 19.
 Charadrius squatarola, 165.
 Character of well waters in a thickly populated area, 56.
 Chloranil, 37.
 Chlorine estimations, 18, 49.
 Chloroform, 11.
 Chrysomelidæ Tasmanian, 168.
 Cincinnati silurian island, 18.
 Cistothorus stellaris, 161.
 Cleistogamy in Polygonium, 92.
 Cicus discolor, 15.
 Cocaine, 11.
 Coccinellidæ Tasmanian, 168.
 Coccythraustes vespertina, 165.
 Coefficient of expansion of solids, 25, 26.
 Colaptes, 30.
 Collecting mosses, 11.
 Collett glacial river, 17.
 Colors of letters, 21.
 Colors of sounds, 21.
 Color variation, 21.
 Columbian Exposition and science, 98.
 Committees, 2.
 past, 3.
 Companion plants, 26.
 Composite, organogeny of, 79.
 Condensation of acetone with benzoin, 17.
 Conifere, 18.
 Contopus borealis, 165.
 Control magnet, 27.

 Copper ammonium oxide, 14.
 Copperhead, 107, 108.
 Corals, 67.
 Corn cob pentaglucose, 29.
 Cornus, distribution of, 18.
 Coulter, John M., 76.
 Coulter, Stanley, 92.
 Cray fish, 21, 22.
 Cray fishes of Indiana, 117.
 Cremation, 17.
 Crepidula, 27.
 Crickets, 128.
 Crinoidiæ, 68.
 Crustaceæ, 68.
 Crotalidæ, 107, 109.
 Crustaceans of Indiana, 147.
 Curimatinæ, 19.
 Cyprinodon, 19.

 DAVIS, SHERMAN, 19.
 Dearborn county, 14.
 Decatur county, physical geography of, 28.
 fishes, 29.
 butterflies, 29.
 Development of viviparous fishes of California, 159.
 Diagrams from iron and steel, 20.
 Di-benzyl carbinamine, 27, 28.
 Diemyctylus viridescens, Hay on, 111.
 Digestibility of the pentose carbohydrates, 57.
 Diseases of sugar-beet root, 92.
 Diplodus, 19.
 Dolichonyx oryzivorus, 167.
 Drift deposits, 66-67.
 Drift, limit of, 15.

 EARTHQUAKE CENTER, 30.
 Eburia quadrigeminata, 25.
 Egg membrane, 19.
 Eigenmann, C. H., 159, 169, 172, 175.
 Eigenmann, Carl H. and Rosa, 159.
 Elaps fulvus, 151.
 Elasticity constant, 20.
 Electric currents, strength of, 20.
 Electro-magnet, 26.
 Electrometer, new, 26.
 Embiotocidæ, a review of, 176.
 Emys, concinna, 22.
 concinna, 106.
 floridana, 106.
 Eutainia, breeding habit, etc., of, 109.
 saurita, 111.
 sirtalis, 109.
 Entomology, economic, 20.
 in high schools, 25.
 Entomologizing in Mexico, 114.
 Enzym, relation in seed to growth, 97.

- Erythrina, 19.
 Eels of America and Europe, 24.
 Estimation of chlorine by Volhard's plan, 49.
 Equations, graphical solution of, 57.
 Evolution, 17.
 and Lebanon beds, 18.
 address on, 33, 45.
- FAUNA, river and island, 83.
 Field and home crickets, 132.
 meetings, 9.
 Fisher, E. W., 79.
 Fishes, distribution of, 23.
 dispersion of, 24.
 aspredinidae, on the presence of an
 operculum in, 175.
 development of the viviparous fishes
 of California, 159.
- Floral decorations, 21.
 Floras, Arizona, 97.
 Florida, 83.
 Henry county, 76.
 Mt. Orizaba, 89.
 Putnam county, 89.
 western plants at Columbus, Ohio, 94.
 Florida ferns, 30.
 Forests, distribution of certain trees, 92.
 unused resources, 92.
 Forms of nitrogen for wheat, 55.
 Fossils in Colorado, 17.
 Fungi, connecting forms among polyporoid,
 92.
 Fungus, plum leaf, 11.
 Furfurol, 29.
- GARTER SNAKES, breeding habits, etc.,
 of, 109, 112.
 Gasteropoda, 68.
 Gautemalan composite, 28.
 Genera, origin of, 24.
 Geologist, training of, 15.
 Geology, town, 14.
 Geometrical propositions, 30.
 Geothlypis formosa, 166.
 Germ plasma, continuity in vertebrata, 168.
 Ghost fishes, 20.
 Grant beaver, 26.
 Golden, Katherine E., 92.
 Graphical solution of the higher equa-
 tions, 57.
 Great lakes, 29.
 Green, R. L., 65.
 Grosbeak, evening, 16.
 Gryllide, 126, 127, 128.
 key to family, 12.
 of Indiana, 126.
- Gryllotalpa, 128, 129, 130.
 longipennis, 131.
 brevipennis, 130.
 borealis, 131.
 Columbiana, 131.
- Gryllus, 128, 132, 133.
 abbreviatus, 130, 132, 137.
 luctuosus, 133.
 Pennsylvanicus, 134.
- Guaymas, fishes of, 23.
- HALDEA, breeding habits, etc., of, 129.
 Halids, vapor densities, 14.
 Hathaway, A. S., 57, 63, 65.
 Hay, O. P., 32, 106, 120, 144.
 Hay, W. P., 117.
 Height of the atmosphere, 29.
 Heloderma suspectum, 152.
 Henry county flora, 26.
 prehistoric earth works.
- Heterodon platirhinos, breeding habits, etc.,
 of, 111.
 Histeresis curves, 65.
 Hoffmannseggia, the genus, 29, 79.
 Hognosed snake, breeding habits, etc., of,
 114, 118.
 Holtzman, C. L., 79.
 Hubbard, Geo. C., 77.
 Hudson river or Cincinnati group, extent
 of, 68.
 Hudson river, location of upper limits of, 69.
 Owen, Prof. Richard, views
 of, 69.
- Huston, H. A., 55, 57.
 Hydra fusea, 21.
 Hypnotism, 17.
- INDIANA, acridide, 15.
 birds, 16, 17, 20, 25, 164.
 butterflies, 15, 31.
 botanical work in, 17.
 conchology, 26.
 cray fishes, 117.
 crustaceans, 22, 117.
 earthquake, 15.
 entomology, 14.
 erosion, 28.
 feeding material, 23.
 fishes, 23.
 flora, additions to, 22, 23.
 origin of, 17.
 peculiarities of, 18.
 forest trees, 18.
 fungi, 20.
 geodetic survey, 17.
 geography, 28.
 geology, 15.
 gryllide, 15.

- INDIANA, herpetology, 24.
 insects, injurious, 31.
 invertebrate zoology, 23.
 lakes, 18.
 lichens, 19.
 mammals, 20.
 mammology, 28.
 meteorology, 28.
 mildews, 17, 164.
 ornithology, 16.
 physics, 26.
 reptiles and amphibians,
 shrews, 17, 164.
 star nosed mole in, 19.
 statistical investigations, 19.
 wood ibis in, 19.
- Infection, contest against, 28.
 Infinity and zero in algebra, 20.
 Insect increase and decrease, 31.
 Insects, injurious, earliest published refer-
 ence to, 168.
 Insects of Tasmania, 68.
 Integrations, some theorems of, 63.
 Invertin fermentation, 30.
 Isthmus of Panama, 24.
 Isoetes, macrospores, 17.
- JEFFERSON COUNTY BIRDS, 23.
 butterflies, 22.
 cystidians, 23.
 wasps, 23.
- Johnson county geo. section, 17.
 Juglans nigra, 25.
 Junco hyemalis, 164.
- KANKAKEE river, 39.
 valley, 39.
- Kellerman, W. A., 74.
 Kentucky fishes, 31.
 Keokuk group, 14.
 Ketols condensation with acetophenone, 46.
 Kelauca, 23.
 Kellicott, D. S., 168.
 Knox County plants, 29.
- LAGODON, 19.
 Lammellibranchiata, 68.
 Lepidoptera, scales of, 30.
 carnivorous, 168.
 Leptimus testaceus, 162.
 Lesser striped ground cricket, 136.
 Liverworts, 26.
 Lixus macer and concavus, 31.
 Loantharia rugosa, 28.
 Longwinged crickets, 131.
 Loxia curvirostris minor, 165.
 Long winged mole cricket, 131.
 striped cricket, 136.
 Lyons, R. E.—See Van Nuys, T. C., 46.
- MACKINAC ISLAND, 29.
 Madison, 23.
 Magnetic permeability, 17.
 Matalemys genus, observations on, 120, 126.
 Matalemys genus, geographica, 121.
 oculifera, 121.
 pseudogeographica, 121.
 Mammalia, 67.
 Man an evolution, 28.
 Martin, G. W., 79.
 Map tortoise, observation on, 121.
 Matterhorn, top of, 31.
 Mammee glacier, 19.
 Maxima and minima, 30.
 McBride, R. W., Notes on Indiana birds,
 166.
 McDougal, D. T., 97.
 Meetings, field, 9.
 Members, 5.
 Mexico, 15.
 entomologizing in, 144.
 Microtome, a new compound, 77.
 Migration of western plants, 74.
 Mikels, Mrs. Rosa Redding, 76.
 Minor planets, some of the, 25.
 Mole crickets, 129.
 Monroe county, 15, 16.
 Monstera deliciosa, 31.
 Montgomery county, 14.
 Mosses, 14.
 Mottier, D. M., 79.
 Mount Orizaba, 28.
 Moore, J. E., 65.
 Moorhead, Warren K., 93.
 Mucor, 11.
 Musk Ox, 26.
 Mycorrhiza, 18.
 Myriapods, 15, 24, 25.
 Myrmecophila, 144.
 Myrmelon absolutus, 132.
- NARROW WINGED TREE CRICKET, 143.
 National Herbarium, 18.
 Natural gas and petroleum, 27.
 Naylor, J. P., 65.
 Necturus lateralis, 31.
 Nematognathi of South America, 19.
 Nemobius, 128, 134, 135.
 exiguus, 136.
 fasciatus, 136.
 fasciatus exiguus, 136.
 vittatus, 135.
- New crustacean fossils, 27.
 New switch, 31.
 Newt, notes on, 141.
 Niagara group, fossils of, 67.
 Niagara river, 28.
 Nitrate of di-benzyl carbinamine, 58.

- Nitrogen from wheat, 23.
forms for wheat, 35.
- Northern mole cricket, 180.
- Notation, changes in, 65.
- Notothylas, 26.
- Noyes, W. A., 56.
- Numerical radices, 30.
- Nyssa, stone characters of, 18.
- OECANTHUS, 128, 138, 140.
angustipennis, 143
latipennis, 141, 144.
nivens, 141, 142, 143.
- Officers, 1.
past, 3.
- Ohio, aegeria of central, 168.
recent archaeological discoveries in,
98.
- Orocharis, 128, 139.
saltator, 138.
- Organized work in chemistry.
- Organogeny of compositae, 79.
- Ornithology, economical, 21.
- Orthis occidentalis and sinuata, 18.
- Orthoptera of Illinois, 25.
- Osmundaceae, 17.
- Outlook in warfare against infection, 111.
- Owen, D. A., 76, 132.
- Oxidation, 14.
- Oxygen, atomic weight of, 27.
- PACIFIC DEEP WATER FISHES, 20.
- Para-nitro-ortho-sulphamine-benzoic acid,
27.
- Paraxylene-sulphamide, 27.
- Parus bicolor, 167.
- Peltandra undulata, 137.
- Penta-glucoses, 29.
- Pentose carbohydrates, digestibility of, 57.
- Periodicity in thermometers, 26.
of root-pressure, 29.
- Perkins synthesis, 14.
- Petroleum in southwest Indiana, 30.
- Phenyl-hydrazin, action on furfural, 57.
- Phosphate of alumina, 23, 57.
- Phosphoric acid, 23, 57.
- Photography without camera, 24, 27.
- Photometric methods, 25.
- Photomicrography, 18.
- Phylloseirtus, 128, 137.
pulchellus, 137.
- Physiology, 82, 91.
- Phytophagus coleoptera Tasmanian, 168.
- Picus, 30.
- Pinus, archegonium and apical growth, 79.
sylvestris, 26.
- Plantae, 68.
- Plants, variations of, 14.
- Plant zones of Arizona, 97.
- Plum leaf fungus, 14.
- Polygonium, 18.
cleistogamy in, 92.
- Polyporoid fungi, 30.
- Porichthys, phosphorescent organ of, 29.
- Porifera, 63.
- Potato tuber, 14.
as means of transmitting energy, 97.
- Potential functions, history of, 65.
- Potter, Theodore, 144.
- Prairie rattlesnake, 147.
- Prehistoric earthworks, 65.
- Protonotaria citrea, 165.
- Protoplasm in mucor, 14.
- Psychic phenomena, 31.
- Pteropoda, 68.
- Puccineae, 15.
- Purdue University, Laboratory of, 20.
- Putnam county fishes, 23.
flora, 30.
plants, 25.
- Pyrene and pyridone, from benzoyl acetone,
18.
- QUATERNION INTEGRATIONS, 63.
- Quercus coccinea, 140.
- RAFINESQUE, Sketch of, 24.
- Rattlesnakes, breeding habits, etc. of, 107, 109
- Recent archaeological discoveries, 98.
- Recent methods of determination of phosphoric acid, 57.
- Redding, T. B., 76, 98.
- Refractive index, value of, 31.
- Religion and continuity, 24.
- Rhinoptera, new species of, 20.
- Rhynchophora Tasmanian, 168.
- Root pressure, apparatus for periodicity, 28.
- SAILOR SPIDERS, 23.
- Sandwich Islands, fishes of, 23.
- Sap circulation, 26.
- Scales of Lepidoptera, 168.
- Scaphiopus holbrookii, 20.
- Seaton, H. E., 80.
- Seismology, 26.
- Seismoscope, 20.
- Selby, Aug. D., 74.
- Shelby county earthquake, 27.
- Shrews, Indiana, 161.
- Simulium, meridionale, 158.
pecuarum, 158.
- Siphonophores, 28.
- Sistrurus, breeding habits etc., of, 109.
- Smith, Alex., 46, 48.
- Snake cactus, 18.
- Snakes, breeding habits of, 106-120.
- Soap analysis, 28.

- Solidago*, 25.
 Some suggestions to teachers of science or mathematics in high schools, 51.
Sorghum sugar, 31.
 Species, description of, 11.
Sphyrapicus varius, 167.
Spirogyra, 18.
 Sporangium of *Botrychium*, 79.
 Spreading alder, breeding habits, etc., of, 114.
 Starch in cereals, 30.
 Steamer "Albatross," 20.
Stelleria, 68.
 Stomata developed by phylloxera, 76.
 Stone, W. E., 57.
Storeria dekayi, breeding habits, etc., of, 111.
 Striped tree cricket, 143.
 ground cricket, 131.
 Sucrose in sorghum, 31.
 Sugar beet in Indiana, 55.
 Sun fishes, 15.
 Sun's light, 29.
 Sweet potatoes, 29.
Synaptomys cooperii, 16.
 TAUTOMERIC COMPOUNDS, 27.
 Tasmanian insects, 31, 168.
Taxodium distichum, 18.
 Texas, flora of, 18.
 Thomas, M. B., 82, 168.
Thysanura, 22.
Tillandsia, 28.
 usneoides, 17.
 Tingley, E. M., 65.
 Titanium, 27.
 Toepler-Holtz machine, 25.
Tridactylus, 128-129.
 specialis, 129.
 minutus, 111.
 terminalis, 111.
 Triphenyl benzene, formation of, 47.
Tropidonotus, breeding habits, etc., of, 112.
 grahamii, 113.
 kirtlandii, 111.
 leberis, 113.
 sipedon, 112.
 Trusts, effects of, 23.
Tsuga, archegonium and apical growth, 79.
 canadensis, 26.
 Turtles, observations on, 120.
 ULMUS AMERICANA, 149.
 Umbelliferae, 28.
 Umbellifers, 13.
 Underwood, L. M., 83, 89, 92.
 Uranscopidae, 25.
Urinator imbec, 166.
 Urine, blood in, 25.
 United States Coast and Geological Survey, 26.
 United States Fish Commission, 21.
 VAN NUY'S, T. C., 51, 48.
Veratum woodii, 29.
 Vermillion, Newt., notes on, 111.
Vernonia pasciculata, 111.
 Vertebræ in fishes, 21.
 Vigo county composite, 15.
 drift, 28.
 fish, 19.
 geology, 28.
Viola pedata, 30.
 WABASH ERIE DIVIDE, 18.
 Wabash fishes, 20, 23.
 Wabash river, 17.
 Waldo, C. A., 65.
 Waldo county, 17.
 Water in oils and fats, 25, 30.
Water moceasin, breeding habits, etc., of, 107.
Water snakes, breeding habits, etc., of, 112.
 Water supply for cities in Northwestern Indiana, 71, 72.
 Chicago, location of pipe line, 72.
 New York, 27.
 Webster, F. M., 155, 158.
 Well waters, 27, 56.
 Western plants, 28.
 at Columbus, Ohio, 71.
 Wheatstone's bridge, 27.
 White climbing cricket, 141, 142.
 White spored agaries, 26.
 Wingless striped cricket, 135.
 XANTHOCEPHALUS XANTHOCEPHALUS, 165.
Xanthoxylum americanum, 139.
 Xylose, 29.
 YELLOWSTONE PARK, 21.
 ZOOLOGY, systematic, 21.