Among the ranks of hardy naturalists who represent the true pioneers of American zoology, perhaps the most outstanding is the remarkable scientific waif, Constantin Samuel Rafinesque-Schmaltz. Few other workers have been so versatile, industrious, and sincere; probably none has been subjected to such abuse and ridicule by both contemporaries and successors. Manifold as were his activities, Rafinesque was at heart a taxonomist; his views on the value of systematic investigations, so eloquently presented in the introduction to his *Annals of Nature*, might be read with appreciation and sympathy by many of the current defenders of "pure science" in biological studies. His knowledge of the American flora and fauna was gained first-hand through extensive and arduous travels. We can never cease to lament the loss of most of his collections.

Many of Rafinesque's contemporaries, well-bred gentlemen with whom zoology was little more than a pleasant diversion, were often disposed to overlook or discredit the work of the eccentric, socially indifferent naturalist, and up to the present time more than a few workers have sought to deal with Rafinesque's briefly diagnosed species by the simple expedient of declaring them to be unidentifiable. Yet it is becoming increasingly evident that his work may not be disregarded! Considering the conditions under which he lived and worked, and the diversity of subjects which engaged his attention, one is inclined to wonder that he did so well!

Despite the numerous species described by Rafinesque in almost every animal group, he has traditionally been credited with but a single myriapod species—*Selista forceps*. Also by tradition, fallacious in this as in most other cases, Thomas Say has been regarded as the first American worker to describe a considerable number of chilopods and diplopods. The error in this instance may be attributed to our predecessors in the study of these animals, among whom Horatio C. Wood and Lucien M. Underwood may be held particularly culpable. Both of these individuals had access to Rafinesque's 1820 work, *The Annals*
of Nature, and noted the description of Selista forceps on page 7. But by the most consummate carelessness, they failed to recognize that the seven genera and eleven species immediately following forceps are clearly myriapodous! Relying on the authority of Underwood’s erroneous statement in 1893 (Bull. U. S. Nat. Mus., 43: p. 9), no subsequent worker has ever re-examined the Annals with respect to myriapod species.

It is, therefore, a matter of some interest to resurrect these long-neglected names, and to ascertain as far as possible their identity in terms of currently known species. Their rediscovery came about, it might be added, by a most fortuitous circumstance, in that one of us (Hoffman) happened to be glancing through a copy of the Annals in connection with quite a different subject, when his eye was caught by the italicized word “Polydesmus” appearing in the diagnosis of the genus Cryptomera. Immediate close scrutiny ensued, bringing the realization that most of the species appeared to be recognizable. Considering the generally unwarranted rejection of Rafinesque’s works, and disregard of his pioneering efforts, we are somewhat gratified at being able to bring his myriapods to the attention of other workers, and, incidentally, to restore him to his rightful position as the father of American myriapodology. What Rafinesque says about Narceus linctorius and Mycotheres vittata makes more sense than some descriptions of millipedes and centipedes which have been published within the past few years! His descriptions, considering the standards of the time, generally equal or surpass those published by Brandt, Gray, Leach, Newport, even the revered Say. Many zoologists may deplore this defense of one who has been regarded with such ill-esteem. Yet we believe that the descriptions, carefully studied, will speak for themselves. Compare Rafinesque’s type localities, usually given with some accuracy, with those generally cited by his contemporaries, who felt that mention of a state was adequate.

A certain amount of allowance must be made for errors of detail. Numbers cited for antennal and leg joints are often incorrect, but such lapses, attributable to the poor lens available to Rafinesque, are not entirely absent from current literature.

We have adopted the scheme of presenting first the original Rafinesquean description, following it, under special heading, with our interpretations. It should be understood that responsibility for the chilopod section lies entirely with Crabill; that for the diplopods with Hoffman, although the general plan of
this paper was worked out jointly. A summary of genotypical considerations is suffixed to each section.

Quoted descriptive material is given verbatim from the *Annals*, including all of the original errors and omissions.

**CHILOPODA**

"VI. N. G. SELISTA. Body depressed, with nine segments, including the head and tail. Head large; forehead notched, ending in a large curved forceps with a tooth inside. Two palps as long as the forceps, with two articles and two claws at the end. Eyes lateral round; antenna inserted before the eyes, as long as the frontal forceps, with two long segments and two terminal threads. Fourteen lateral legs, with two articles and two claws besides, or bifid at the end.—A very singular genus of the family *Myriapoda*, and sub-family *Scolopendra*. The name was that of a nymph.

"42. *Selista forceps*. Fulvous brown, frontal forceps as long as the head, tail bidentate.—Found near Baltimore by Mr. H. Hayden. It comes into the houses, length one inch."

**PRESENT INTERPRETATION.** This name is a junior synonym of *Scutigera coleoptrata* (Linne), 1758, a well-known European centipede that was evidently introduced into this country in colonial times and that has since spread throughout the settled regions of the United States. Although Chamberlin was unable to distinguish between French and North American specimens in 1920 and consequently concluded that the valid name must be *coleoptrata*, the Rafinesquean *forceps* continues to appear in the literature.

"VII. N. G. CRYPTO MERA. Body depressed, linear, narrow, with many segments, each with one pair of lateral filiform legs with four articles; alternate segments shorter and almost entirely covered and concealed by the larger ones. Head truncate; eyes obsolete; two long filiform multiarticulated nearly lateral, and distant antenna; no visible palps.—It belongs to the family *Myriapoda*, sub-family *Chilognathia*, next to the genus *Polydesmus*. The name means concealed parts.

"43. *Cryptomera lunularis*. Reddish brown; sixteen pairs of legs, the last pair longer; antenna one-third of total length; sides straight, tail short, lunulate; length about one inch.—Found near Baltimore and Philadelphia on the ground: segments as long than broad."

**PRESENT INTERPRETATION.** Mention of the alternate segments (i.e., tergites) which largely cover and conceal the smaller segments and of sixteen pairs of legs suggests that *lunularis*

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2 Rafinesque frequently erred in citing numbers of leg-pairs, probably partially because of his poor magnifying equipment. In the case of *lunularis* I assume he miscounted by one, for the number should be fifteen; not sixteen. He often called the ultimate legs "filaments"; therefore, by ultimate legs we understand penultimate appendages. A miscount of the number of leg-pairs accompanies each of his descriptions save, perhaps, that of *Mycotheres oligopoda*. 
is either a Lithobimorph or a Scutigeromorph. The rather short antennae (one-third the body's length), the reddish-brown color, and the presence of the centipede near Baltimore and Philadelphia on the ground point to the former order. Only three Anamorpha about an inch long are known from the region; these are Bothropolys multidentatus (Newport), 1844, Lithobius forficatus (Linne), 1758, and Scutigera coleoptrata (Linne), 1758. If we assume lunularis to be a Lithobiomorph, the reddish-brown color and the length of the antennae seem more characteristic of multidentatus than of forficatus. On the other hand, the generic diagnosis is more suggestive of Scutigera coleoptrata owing to the extensive and concealing segments (i.e., tergites) that he mentions. I do not feel that we can rule out coleoptrata; the rather short antennae and ultimate legs could be explained by their having been broken off, certainly a common enough phenomenon that could be detected with difficulty even with an adequate lens. Since the identity of lunularis appears to me to be controversial, I shall consider it species inquirenda.

"44. Cryptomeria nemura. Brown; fourteen pairs of legs, the posterior pairs very long; antenna nearly as long as the body, large segments gibbose, rounded, scutiform, sides notched; tail having two filaments as long as the body; length over one inch.—Found by Mr. Hayden in the cellars of Baltimore: segments longer than broad."

PRESENT INTERPRETATION. The very long antennae and ultimate legs together with the fourteen (correctly fifteen) pairs of legs identify this species as Scutigera coleoptrata (Linne). Its habitat, "the cellars of Baltimore", further strengthens this contention. This form is surely the common house centipede; consequently Cryptomeria nemura should be considered a junior synonym of the Linnaean name.

"VIII. N. G. STENOMERA. Differs from Cryptomeria by narrow segments visible not covered; the first segment is a narrow one; head oval, antennae setaceous, thick and approximated at the base.—Very near to Cryptomeria: the name means narrow parts.

"45. Stenomera interrupta. Antenna twice the length of the head; fourteen pairs of legs, the posterior ones longer and thicker; sides deeply notched, tail bidentate.—I have found it near Hadley's falls (in 1816) on the Hudson river, on mushrooms, upon which it feeds probably. Length one and an half inches; colour pale brown; many of the large segments are slightly lunulate behind, all are broader than long."

PRESENT INTERPRETATION. The number of legs, the length of the antenna (twice that of the head), and the total length of the animal strongly suggest but one eastern species presently
known from the typical region; this is *Lithobius forficatus* (Linne). The length of the antennae of *Bothropolyss multidentatus* (Newport) is more on the order of three times the length of the head. Also, I have never heard of nor seen a specimen of the latter form that measured much more than an inch, whereas aged *forficatus* individuals frequently exceed an inch and a quarter in length. I believe that *interrupta* is a junior synonym of *Lithobius forficatus*.

"IX. N. G. MYCOTHERES. Differs from *Cryptomera* by all the segments equal and apparent, and head of various shapes, eyes lateral when visible, &c.—This genus differs from *Julus* by having only one pair of legs to each segment. The name implies feeding on mushrooms, as most of the species do. There are many of them in the United States. I shall merely mention three at present.

"46. *Mycotheres Oligopoda*. Antenna one-third of total length, bent outwards; head rounded; body attenuated behind; seven pairs of equal legs; tail bifid. Found on the Lusene mountains of New York, near Glen's falls. Length one fourth of an inch, colour fulvous. It may be the type of a subgenus, *Eucera."

**PRESENT INTERPRETATION.** The short antennae, seven pairs of legs, and its diminutive size identify *oligopoda* as an immature Lithobiomorph, probably in the first *pullus* instar. The lack of additional significant morphological details, together with the fact that numerous small Lithobiomorphous species are known to inhabit New York state, preclude even a good guess as to the animal's identity. The form must be designated *species inquirenda*.

"47. *Mycotheres leucopoda*. Antenna straight, one-fifth of total length; head truncate body linear, fulvous, about twenty pairs of white legs, the posterior ones rather longer; tail bisetose. Found in the knobs of Kent'y. Length less than 1 inch."

**PRESENT INTERPRETATION.** The reference to twenty pairs of legs, which is sufficiently close to the correct figure, twenty-one, identifies *leucopoda* as a Cryptopid Scolopendromorph. The name is undoubtedly referable to one of the following three species, the first two of which are now known to inhabit Kentucky: *Cryptops hyalinus* Say, 1821. *Theatops posticus* (Say), 1821; *Theatops spinicaudus* (Wood), 1862. The last two of these would seem to be eliminated because the ultimate pedal segment of each is conspicuously much longer than the segment preceding, whereas the generic diagnosis of *Mycotheres* clearly specifies that all of the segments are equal. I believe this striking feature would not have escaped Rafinesque. This leaves *Cryptops hyalinus* Say, a fulvous-colored, inch long centipede
whose legs are rather pale. Moreover, the study of numerous collections of Kentucky centipedes that I have received during the past four years indicates that *hyalinus* is probably the most commonly encountered Chilopod of the state. I believe the evidence is sufficient to justify our viewing *leucopodus* as the senior synonym of the well-known Say name, *hyalinus*.

"48. *Myothorax vittata.* Fulvous, a longitudinal brown streak on the back; antenna moniliform, longer than the head; about fifty pairs of legs, almost equal; tail elongate obtuse, with a lateral setaceous appendage on each side; head oval, pandurate, obtuse; eyes lateral, visible, round.—A fine species about two inches long and one-twelfth broad. It may form a sub-genus *Nemopleura.* Found in the highlands of New York. The antenna have about fifteen rounded articles. Eyes black, almost inferior. The head and tail are not streaked."

**Present Interpretation.** Rafinesque’s description of *vittata’s* fulvous body, which is marked dorsally by a longitudinal brown streak and which bears “about fifty pairs of legs”, can refer only to one known eastern Geophilomorph, the handsome and ubiquitous *Geophilus rubens* Say, 1821. Objection might be raised to this interpretation because of his reference to its black, lateral, and almost inferior eyes (all known Geophilomorpha are eyeless). This may be resolved, however, if we take his evidently poor magnifying equipment once again into consideration. Rafinesque very probably mistook the prehensorial distal (tarsungular) condyle, which is black, lateral, and almost inferior, for an eye. There can be no doubt that Rafinesque’s *vittatus* is the valid name for the centipede which heretofore has been called *rubens*.

**Genotypes**

*Selista* Rafinesque, 1820. Proposed with one species.  
**Type:** *Selista forceps* Rafinesque, 1820 [*= Scutigera coleoptrata* (Linne)] (Monobasic). Isogenotypic with *Scutigera* through synonymy.

*Cryptomera* Rafinesque, 1820. Proposed with two species.  
**Type:** *Cryptomera nemura* Rafinesque, 1820 [*= Scutigera coleoptrata* (Linne)]. (Present designation). Isogenotypic with *Scutigera* through synonymy.

*Stenomera* Rafinesque, 1820. Proposed with one species.  
**Type:** *Stenomera interrupta* Rafinesque, 1820 [*= Lithobius forficatus* (Linne)]. (Monobasic). Synonymous with *Lithobius*. 
Mycotheres Rafinesque, 1820. Proposed with three species.

Exocera Rafinesque, 1820. Proposed as a subgenus of Mycotheres with one species.
TYPE: Mycotheres (Exocera) Oligopoda Rafinesque, 1820. (Monobasic and original designation).

Nemopleura Rafinesque, 1820. Proposed as subgenus of Mycotheres with one species.
TYPE: Mycotheres (Nemopleura) vittata Rafinesque, 1820 [Geophilus rubens Say, 1821 = Geophilus (Nemopleura) vittatus (Rafinesque)]. (Monobasic).

DIPLOPODA

"X. N. G. PLEUROLOMA. Body oblong, convex above, unable to contract into a globe; many narrow segments, the middle ones larger, each with a marginal scale on each side and commonly two pairs of ventral legs, with four articles and a ciliated claw; the first segment of neck nearly concealed and without scales or feet. Head short; antennae lateral moniliform, with six oblong articles.—A fine genus next to Glomeris: the name means lateral margin. Hind legs shorter as in all the following three genera.

"49. Pleuroloma flavipes. Antenna grey, one-fifth of the body; head brown, transversely oblong; eyes black, back blackish shining, marginal scales reddish, eighteen segments and only thirty pairs of legs; belly, legs, and tail yellow, tail mucronate. Length one and half inches; eyes very small, lateral.—Found on the ground in the woods near Catskill in New York state."

PRESENT INTERPRETATION. Reference to alternating narrow and broad "segments", thirty leg pairs, and eighteen segments places this form in the order Polydesmida. Of the two families of this order occurring in northeastern United States, the Polydesmidae is eliminated by the statements "body ... convex above", "back blackish ... marginal scales reddish" and "Length one and half inches". The several polydesmids of the region are flattened dorsally and are uniform brown, and do not exceed 28 mm. in length. Remaining for consideration are two genera of the family Xystodesmidae: Apheloria and Zinaria. The first is represented in New York State by two species, coriacea (Koch), 1847, and trimaculata (Wood), 1864. A. coriacea is black dorsally, with reddish keels, but in addition has a promi-
nent bright yellow crossband on each tergite. *A. trimaculata* is blackish with three longitudinal rows of yellow spots on the dorsum. Neither of these conform to what is said about *flavipes*. There is, however, a species of *Zinaria* in the area under consideration which answers the Rafinesquean description very well, being blackish with reddish-orange keels. This species, not included in Causey’s recent (1951) review of the genus, probably is distinct from all of the currently recognized forms. It may in all probability be that to which Wood (1865) restricted the name *Fontaria virginiensis*. As a consequence of this identification, *Zinaria* becomes a junior synonym of *Pleuroloma*. The characters of the population to which *flavipes* has been applied have not yet been made known, a deficiency which I hope to correct at an early date.

"XI. N. G. NARCEUS. Body cylindrical, with many narrow segments, each with two pairs of geminate legs, except the anterior segments which have only one pair. Head obtuse with a visible neck; eyes anterior irregular; antenna lateral hardly longer than head, recurved behind in a lateral groove, with six depressed articles, the second longer, the last globular. Legs with four articles and a claw, ventral, the posterior ones rather shorter. Tail scutiform, mutic, concealed beneath.—Next to *Julus*: the name is mythological.

"50. *Narceus tinctorius*. Black brown, 90 pairs of feet, pale purple; the six anterior segments with a single pair; tail obtuse, split beneath; length about three inches.—It is found in the woods of Kentucky. When handled it dyes the fingers of a purplish colour. Discovered by Mr. John D. Clifford."

Present Interpretation. This is certainly the easiest name to allocate. I have read the description to several persons, who have unhesitatingly identified it with one of the abundant and widespread spiroboloid species of eastern United States. The size, number of legs, coloration, and defensive exudation noted, all point to this group, which has in the past been referred to as *Spirobolus* by Wood, Bollman, and Chamberlin, or as *Arctobolus* by Cook and Loomis. The members of this genus are very poorly known, and their ranges imperfectly defined. Just what species occur in central Kentucky, I cannot say at present. If it happens to be the same as that of the Atlantic Coast, another change of name must be made, *tinctorius* falling as a synonym of *americanus* Beauvois, 1802. In all probability, however, the Kentucky population is at least subspecifically distinct.

However, it is not to be understood that *Spirobolus* Brandt, 1833, must become a junior synonym of *Narceus*. It was origi-
nally proposed for two species from China and Brazil, of which the former (*bungii* Brandt, from Pekin) was later (1894) designated by Pocock as type of the genus. Other spiroboloids from northeastern China, including the immediate vicinity of Pekin, doubtless congeneric with *bungii*, are generically distinct from the American species. Previous suggestions that *Julus marginatus* Say, 1821 be taken as the type of *Spirobolus* were made on the premise that *bungii* was a *nomen nudum*, which is not the case. In any event, *Narceus* is the oldest generic name available for the North American forms, and Rafinesque’s reference to a type locality will facilitate a definite allocation of the name *tinctorius* within the near future.

"XII. N. G. RHEXENOR. Differs from *Narceus* by all the segments with two pairs of geminate ventral legs, having five articles and a claw. Eyes rounded in facets. Antenna nearly under the head, recurved upwards in a groove, with seven articles; six oblong, the sixth longer; the seventh or last depressed obtuse.—The name is also mythical.

"51. *Rhexenor annularis*. Bluish brown with reddish brown rings on the margin of the segments; legs brown, one hundred and ten pairs; neck broad, tail large, obtuse, split beneath; vent linear, margined with yellow.—Found in the woods of the highland hills of New York. Length three inches."

**PRESENT INTERPRETATION.** *Rhexenor* is said to differ from *Narceus* by having two pairs of legs on each of the anterior segments. This is clearly an error in observation, as no millipeds known to me are so endowed. It appears, therefore, considering the other characters mentioned, that *Rhexenor* is to be regarded as a junior synonym of *Narceus*. On the basis of locality, however, the trivial name may be considered valid. I do not doubt that it is based upon the form described by Cook in 1904 as *Arctobolus omandaga*. It will now be known as *Narceus annularis* (Rafinesque).

"XIII. N. G. ABACION. Differs from *Narceus* by anterior segments with two pairs of legs; neck hardly visible; head rounded, eyes rounded, lateral; antennae longer than the head, lateral before, straight, club-shaped, six oblong articles increasing in size upwards.—The name means little texture.

"52. *Abacion tesselatum*. Body reddish-brown, striated longitudinally, or tesselated; antennae more than double the length of head; legs pale, variable in number, about sixty pairs; tail acute.—I found it on the knobby hills of Estill county in Kentucky, under stones: length nearly two inches."

**PRESENT INTERPRETATION.** In the diagnosis of *Abacion* we again find the incorrect reference to two leg pairs on the anteriormost segments. In general there are some items which
render application of this name a little doubtful. At first reading, the description might seem to apply to either of the genera now known as Spirostrephon and Cambala, superficially similar although belonging to different orders, and it is not impossible that Rafinesque drew his description from species of both genera. However, consideration of each characteristic mentioned would seem to restrict the choice almost certainly to Spirostrephon. The following statements indicate lysiopetaloid rather than cambaloid features:

Eyes rounded; collum small; antennae twice as long as head; antennal articles increasing in size (length) upwards (distad); legs pale; found under stones.

In Cambala, the eyes consist each of a short linear series of ocelli partially concealed by the rather large collum; the antennae are not conspicuously longer than the head, and their joints generally are subequal in size; the legs are usually about the same color as the dark brown body; and specimens are rarely (at least in my experience) found under stones. On the other hand, Spirostrephon species in the Southern Appalachians are almost obligate saxicolous. I believe that on the basis of these considerations, Spirostrephon Brandt, 1841, must be regarded as a junior synonym of Abacion Rafinesque, 1820. It would, however, be premature to postulate conspecificity of the names tessellatum and lactarium Say, 1821, until specimens from Estill County, Kentucky, have been studied. The length of two inches cited for tessellatum more nearly approximates the large montane species which I recently named highlandensis.

Genotypes

Pleuroloma Rafinesque, 1820. Proposed with one species.
  TYPE: Pleuroloma flavipes Rafinesque, 1820. (Monobasic).

Narceus Rafinesque, 1820. Proposed with one species.
  TYPE: Narceus tinctorius Rafinesque, 1820. (Monobasic).

Rhexenor Rafinesque, 1820. Proposed with one species.
  TYPE: Rhexenor annularis Rafinesque, 1820 [≡ Arctobolus annadaga Cook, 1904 — Narceus annularis (Rafinesque)].
  (Monobasic). Isogenotypic with Narceus through synonymy.

Abacion Rafinesque, 1820. Proposed with one species.
  TYPE: Abacion tessellatum Rafinesque, 1820. (Monobasic).