and taken by myself, is *Phlepsius humidus* Van Duzee. Though not uncommon, this species is recorded but once outside of New York State, by two or three examples labeled Delta R.R. I have taken it quite frequently, and Professor Van Duzee says "it is not uncommon about Buffalo, in low, swampy meadows and other humid situations." He has also taken it near Lake Ontario, and states that this is the "large variety mentioned in his list of Hemiptera from that locality, published in the *Canadian Entomologist*, for 1889, under the name *Allygus irroratus* Say."

Jassus excultus Uhler is now to be known as *Phlepsius excultus* Uhler. This species is well recorded from New York, through Texas, to New Mexico. As yet I have not collected this species, nor does Professor J. B. Smith, in his "Catalogue of the Insects of New Jersey," record it from that State. A thorough search will no doubt reveal its whereabouts in this locality also.

Among the Jassidæ collected by me in this locality, and determined by Professor Van Duzee, is *Cicadula 6-notata*. It is very common and easily taken with a sweep-net.

Jassus subfaciatus Say is also common, and Professor Smith records *Jassus clittellarius* Say, and *Jassus irroratus*, now known as *Phlepsius irroratus* Say. *Athysanus* (grypotes) is represented in my collection by four species, taken here, *tergatus* Fitch, and *unicolor* Fitch, and two new species named by Professor Van Duzee as *Athysanus galbanatus* Van Duzee and *Athysanus viridius* Van Duzee. None of the species are very abundant; and they are represented in my collection by from three to six specimens, although the former two species are much more abundant that the latter. Professor Smith gives *A. fenestratus* Fitch, *minor* Fitch, *nigrinasi* Fitch, *variabilis* Fitch, *striatulus* Fallen, and *unicolor* Fitch, as *Jassus unicolor* Fitch. No doubt all these species are found here, and as far as Fitch's types are concerned, we believe, belong to this State.

In Deltocephalus I have collected *inimicus* Say, and *Sayi* Fitch, both being quite rare as far as my collecting goes. Professor Smith has *inimicus* Say recorded as *Jassus inimicus* Say. *Scaphaideus* is represented by two species, one of them new to science, and the other *Scaphaideus immistus* Say.

Athysanus is represented by *Curtisii* of Fitch, which is not uncommon with me.

In the sub-family TYPHLOCIBINÆ, we have *Typhlocyba rosæ* Fitch, and other species not yet determined, one species being very common on *Ptelea trifoliata, L*, and of a delicate green color. One of the undetermined species may be *trycincta* of Fitch, and recorded by Professor Smith as occurring in New Jersey.

Erythroneura vitis Harris is common with us; but I have not as yet found *comes* Say, or *vulnerata* Fitch, both found and recorded from New Jersey, and the latter from New York State also.

In the genus *Empoa*, Professor Smith records *querci* Fitch, *fabæ* Harris, and *rosæ* Harris, the latter now known as *Typhlocyba rosæ* Fitch, as before noticed.

Professor Smith also records *Cœlidea olitoria* Say, and *C. subbifasciata* Say. I have not as yet collected any of this genus, although, in the present unsettled state of the arrangement in several of the orders, it is quite impossible to state just what one has, until such an arrangement as Professor Van Duzee has given us with the genus *Phlepsius* is worked out for all the families.

It is to be hoped that hemipterists and all entomologists will assist specialists by sending them specimens; and more accurate data should be given, with the material, than, I must confess, I have been able to give in the past, so the distribution and numbers may be determined.

EDMUND B. SOUTHWICK, PH
The Arsenal, Central Park, New York.

LETTERS TO THE EDITOR.

**** Correspondents are requested to be as brief as possible. The writer's name is in all cases required as proof of good faith.*

On request in advance, one hundred copies of the number containing his communication will be furnished free to any correspondent.

The editor will be glad to publish any queries consonant with the character of the journal.

Readjustments of the Loup Rivers: Examples of Abstraction Due to Unequal Declivities.

REGRETTING that my article on the "Evolution of the Loup Rivers" has been misunderstood, partly on account of an error in drawing the map, I present herewith a corrected map (Fig. 1), showing the true location of the old channel connecting the head of Wood River with the South Loup at Callaway, also some additional features not shown on the first map.

In responding to the call of Professor Davis for "examples of the lateral abstraction of one stream by another *on a slope of planation*," I must premise that planation is wholly distinct from abstraction. The efficient factor in the former process is latteral corrosion, in the latter headwater erosion. Planation shifts one stream bodily over to another, whereupon both unite in that channel, below the point of contact, which is the lower of the two. In the process of abstraction the capturing stream does not itself shift over to the captured stream, but extends one of its tributaries across the original divide by headwater erosion.

Omitting, therefore, the phrase "on a slope of planation" from the question as propounded by Professor Davis, I will say that the phenomena in the Loup valley are such as to raise a strong presumption at least that some abstractions have occurred. As he remarks, "the slopes are in the proper direction for such abstraction." Moreover, the old empty channels are there as silent witnesses of adjustments already accomplished, and the ravines of greater slope and more vigorous erosion, leading into that stream which lies at a lower level to the north-east, have already captured much more than half of the space between streams, thus threatening further abstractions in the future.

In addition to the one at the head of Wood River I would cite as another example of abandoned channels the depression leading up to the Dismal River in the line of Mud Creek, the approximate position of which is roughly indicated by dotted lines, marked "Old Channel" on the map. Mud Creek is a weak stream in a great valley, itself as eloquent a witness of change as the dry valley above. It must have carried a large volume of water, and have been a worthy mate to the Middle Loup, before it was beheaded by the Dismal, a vigorous tributary of its neighbor on the north-east — the winning side in all these re-adjustments.

To show the actual position of existing divides, as indicating further abstractions, I have traced the water-shed by dotted lines for some distance between the North and Middle Loups, and between Cedar Creek and the North Loup and Calamus River. On the latter line the distances are 13½ miles from the divide to Cedar Creek, and 4½ miles to the Calamus. The eastward stream has already captured three-fourths of the territory. On the former line, at the south-east end, the divide is 12 miles from the North Loup and 6½ miles from the Middle Loup. Here two-thirds of the divide yields allegiance to the eastward stream. At the north-west end of the same line it will be observed that the water-shed is nearer to the North Loup than the Middle Loup. This is because the North Loup is a re-adjusted stream above the mouth of the Calamus. If we measure from the latter, which is the true original head of the North Loup, the divide assumes its normal position nearer to the higher stream lying to the south-west. The larger and longer stream, called the North Loup on account of its size, is really an overgrown tributary, which owes its superior vigor to the fact that it now flows more nearly in the line of maximum gradient than does the Calamus, or the unadjusted North Loup

below the confluence. The energy of westward headwater erosion is unmistakable. All of the Loups bend that way at their heads, and have their most vigorous tributaries on that side.

It is noteworthy that the North Loup, having no large, aggressive eastward neighbor, has retained its original head, the Calamus. It has itself encroached upon the territory of the Middle Loup, but that stream escaped capture by turning aggressor on its own account. Possibly its original head was captured by the North Loup. If so, it was after the Middle Loup had seized so much territory westward, including the head of the large valley in which Mud Creek now flows, that the conquest was a barren one. It was no more serious in its effects upon the Middle Loup

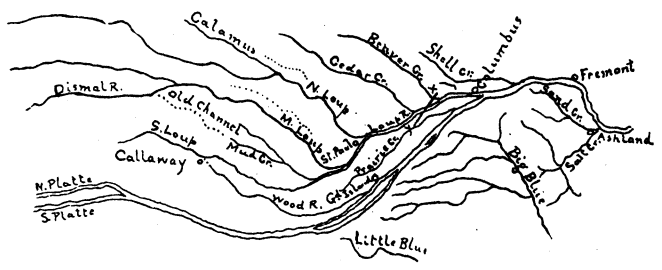

FIG. 1.

Drainage map of Central and Eastern Nebraska. The dotted lines along the Middle and North Loups mark the present water-shed, lying in each case nearer to the higher stream to the south-west. The short stream near x is Lost Creek, so called because it disappears in the sands of the valley. The line xy shows the trend of the buried cliffs of Cretaceous shales bounding the old gorge of the Platte.

than the capture of the Calamus by a tributary of Cedar Creek would now be to the North Loup.

Professor Todd has added some welcome and valuable contributions to this discussion (*Science*, Mar. 11, p. 148), but his objection to the "efficiency of abstraction," on account of the porosity of the strata in this region, does not appear to me to be well taken for two reasons. First, the impression given by his remarks, of the degree and extent of porosity, is exaggerated. It chimes with a widespread popular notion of extensive subterranean flows from one river to another, but the real exceptions to that general hydrographic law which predicates the volume of each river to be the product of rainfall on its own basin, are not much more frequent or striking here than elsewhere. There is no indication that the Blue receives any appreciable increment by subflow from the Platte, or the Salt from the Blue, although both are at a lower level than the larger stream to the west. Each has a volume which may all be accounted for by the size of its basin and the depth of annual precipitation. Those tributaries of the Salt which approach nearest to the Blue are the weakest; if subflow from the Blue were an important factor they should be the strongest. The divide is formed by a moraine of the first glacial epoch, running along the east bank of the Blue, where the words "Big Blue" are written on the map. This moraine is the cause of the peculiar arrangement of the tributaries of Salt Creek, and of the abrupt turn to the south of all the Blue rivers to form the Big Blue. It has the usual composition of a moraine — sand, gravel, and clay. Many examples of morainal lakes held up, and rivers turned aside, by such material, testify to the fact that it is not very porous.

Secondly, headwater erosion would not cease on account of subflow unless the latter absorbed the whole run-off. As long as there are any surface streams, and they are rather numerous in this region, they will erode their channels and, by virtue of the law of unequal declivities, push the divide towards the higher stream, ultimately abstracting the latter. If the subflow does rob them of some part of their volume and eroding power, the process will only be retarded, not prevented.

I leave it to Professor Todd to answer the question of Professor Davis respecting the deflection of rivers by rotation of the earth. He has already adduced the Platte as an example, assuming it to have flowed once in the channel of the main Loup. The accompanying profile (Fig. 2), reduced from one published by Chief Engineer E. S. Nettleton (Irrigation Survey, U. S. Dept. of Agriculture Progress Report, Part II.), will be useful in discussing this assumption. The Loup at St. Paul is 95 feet below the Platte at Grand Island. Since rivers do not shift from lower to higher levels, it is physically impossible that the Platte should have shifted from the Loup channel to its present position, unless there has been a great change of levels. But such change is claimed. Professor Todd thinks the Platte occupied the Loup channel ("the north channel already described" cannot be other than that of the main Loup, since it is said that "the Loups did formerly flow through to the Platte" in that position) "when it was flowing on a level seventy-five to a hundred feet higher, relatively, than at present." Ths would bring it up to the position of the dotted line O. C. Fig. 2, one hundred and ninety-five feet in the air above the present Loup. There are no flood-marks, or other evidences, to show that it ever flowed there. The "alluvian terrace," which is the most significant and interesting feature of Professor Todd's map, in its westward extension along the Loup, is obscured by a range of sand hills, which form a broken and ragged divide between the Loup and Prairie Creek. Its main mass, aside from the dunes blown up on its back, is *below the present channel of the Platte*. It therefore furnishes no evidence that the Platte ever flowed at a higher level between St. Paul and Grand Island. On the contrary, it furnishes distinct evidence that the same relative levels, the same relative gradients (the Loup having less fall than the Platte) and the same relative positions of the two streams existed as far back as the second glacial epoch, substantially as they now exist. Some obstruction at that time in the lower Platte, possibly an ice-dam near Fremont, raised the waters till they overflowed the divide at the head of Sand Creek. It is surprising that this new short cut did not become the permanent channel of the Platte. Possibly the ice-dam extended below Ashland, but with less elevation than at Fremont, thus permitting the new channel to be cut down to its level, but not to the level of the old channel. Hence the longer course by way of Fremont was resumed when the ice retired.

Both the Platte and the Loup are so heavily charged with sediment that a slight reduction of their gradients would cause deposition of silt, and this result of retarded flow would be felt in both streams far above the obstruction, but farther up the latter than the former on account of its lower gradient. The ice-dam ponded the Platte for some miles above it, producing still water, in which sediment rapidly accumulated. Thus was built up the eastern end of the terrace to a level "seventy to ninety feet above the

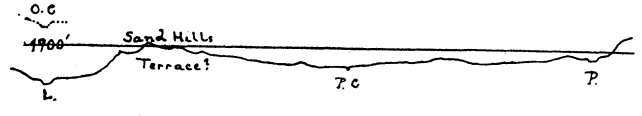

FIG 2.

Profile across the Loup, Prairie Creek, and Platte, running from St. Paul to Grand Island, Neb. Horizontal line 1900 feet above sea-level. *L.*, Loup River, 1775 ft.; *P.C.*, Prairie Creek, 1843 ft.; *P.*, Platte River, 1870 ft. above sea-level; *O.C.*, alleged old channel of the Platte.

Platte." Deposition, induced by retarded flow, an indirect result of the obstruction, extended far up the Loup on account of its low gradient. Professor Todd's map is correct in representing the terrace as following the Loup instead of the Platte above their confluence. From Columbus westward it is a Loup formation. Not only does it draw away from the Platte, but it also sinks below its level. It therefore furnishes no evidence of a change of levels, or of a shifting of waterways, but rather of the persistence of both as they now exist, since it fits well into present conditions.

Another reason for doubting this alleged shifting of waterways is found in the position and trend of the ancient rock trough of the Platte. Its buried bluffs of Cretaceous shales have been just touched by recent erosion sufficiently to reveal their existence near the mouth of Beaver Creek, along Cedar Creek, and in the bed of the main Loup between the mouths of these two creeks. The trend of these ancient bluffs is shown by the line xy on the map. It is oblique to the Loup channel, leaving the mouth of Cedar Creek, and of all three of the Loup rivers, *outside of the Platte valley*. If they ever entered the Platte directly and independently, it must have been as indicated in my article of Jan.

29, 1892. The eastward prolongation of the ancient bluffs is probably not continued in the line *yx*, but bending east about where the turn occurs in the courses of Lost Creek and Shell Creek. The former is a considerable stream so long as it has the impervious Cretaceous shales for a substratum, but soon disappears when it encounters the deep mass of silt in the Platte valley.

There is no evidence, so far as I know, that the Platte has ever shifted out of its old rock bed, except during the transient episode at Sand Creek. The existence of a gorge excavated in Mesozoic and Palæozoic rocks, once five hundred feet deep though now silted up to its brim, is the best reason for its present course. Nor can any inferences respecting the influence of rotation be drawn from the trend of this gorge, for the reason that a considerable part of it was formed by a stream which flowed *west*. When the Platte first stretched across the plains, its several parts of different ages and opposite flow being united in one great river, it found a ready-made channel, to which it has, in the main, steadily adhered. The hypothesis that it once flowed in the channel of the Loup fares badly in the light of the facts, and, looking across to the southward, we find no evidence that it ever flowed in any of the numerous heads of the Blue, as suggested by Professor Davis. None of them has any marked pre-eminence over the rest, and all of them are slight recent furrows, mostly below the level of the Platte, so that it must have shifted up-hill if it once flowed in them.

The suggestion that it once flowed in Prairie Creek falls into a different category, since this stream is within the old rock trough. But it is a mere pin scratch in a wide alluvial plain, any other line of which is just as likely as that to have been the flow-line of the Platte at some period. Of course this great river has shifted about within its rocky gorge. The most significant fact in respect to the influence of rotation is that it now, in many places, crowds upon the south bluffs, as shown in Fig. 2.

It is agreeable to have the concurrence of Professor Todd in my opinion that "the Loups did formerly flow through to the Platte.' I trust he will not recede from this harmonious attitude in consequence of finding it impossible to put the Platte over into the Loup in order to get them together. Strictly speaking, however, that is not impossible. A big canal would accomplish it literally. The real difficulty is to get the Platte back to its present higher channel. It is not now a constructive stream, building up its bed above the surrounding country, else we might suppose that it had shifted to its present position and then built it up above the Loup. It has not probably been a constructive river at any time since the Rocky Mountain uplift emptied Lake Cheyenne, and gave the Platte such a steep gradient that it is able to accomplish a little vertical erosion in spite of its great burden of sediment. It trembles on the verge between vertical erosion and deposition, the balance inclining to the former, but so slightly that it maintains its levels with great steadiness. Herein lies another reason for doubting that great changes of level have recently occurred in its valley.

L. E. HICKS.

Lincoln, Neb.

Sistrurus and Crotalophorus.

ON page XXVI. of the introduction to a work on North American Reptiles, in the "Memoirs of the Museum of Comparative Zoology," VIII., 1883, the name Sistrurus was applied to one of the two genera of rattlesnakes because Crotalophorus, the previous title, was a synonym for Crotalus, the other genus. Professor Cope, in his latest paper on the serpents, Proc. U. S. Mus., 1892, p. 624, objects to the change in these terms: "Mr. Garman has named this genus Sistrurus, on the ground that the name Crotalophorus was preoccupied at the time it was employed by Gray. This does not, however, seem to be the case. It is true that Linnæus uses it instead of Crotalus in the sixth edition of the Systema Naturæ (1748, p. 35), but the system of nomenclature thus adopted is not binomial, so that the names are not authoritative as against later ones." This makes a considerable display of lack of caution, to say the least of it. If use by Linné in the sixth edition of the Systema (as also in the seventh and the ninth editions, and the Amoenitates) was all that bore on the question there might be nothing to say. But in proposing the new name I had in mind more than appears from the citation. Linné and Gronow only were mentioned. The dates for the latter were 1756 and 1763, which brings us within the range of the tenth edition, 1758. Gronow might be put aside as unsound binomially. If so, I still had Houttuyn, 1764, who certainly regarded the names as synonymous, for he says, "De geslagtnaam deezer slangen, *Crotalophorus*, en by verkorting *Crotalus*, is afkomstig van den ratel, dien zy aan't end der staart hebben." But, again, if not allowed to go farther back than the twelfth edition, 1766, there was another authority for Crotalophorus instead of Crotalus, Vosmaer, 1768, according to whom, "De Heer Linnéus geeft de benaaming van *Crotalophorus* aan dit geslacht, in het welk hy drie onderscheidene soorten heeft opgeteekend, die hy *Horridus*, *Dryinas* en *Durissus* noemt."

Under the name Crotalophorus, 1748–68, neither Linné, Gronow, Houttuyn nor Vosmaer included any of the species of the genus defined by Gray, 1825, with the same name. That they were not binomial authorities may be urged against Linné and Gronow, but not against Houttuyn and Vosmaer, who, though they retained the earlier name, adopted the genus and the species from the tenth edition of the Systema. Linné dropped Crotalophorus for Crotalus in 1758. In 1766 he described the first species of the other genus, placing it in Crotalus, where it was kept by most authors until removed by Gray. The necessity of the change I have made in the name of Gray's genus is best shown by a concise view of the synonymy for the two genera.

Crotalus.

Caudisona Linn., 1735–47; Laur., 1768; Flem., 1822; Cope, 1861–71; Coues, 1875.

Crotalophorus Linn., 1748–56; Gronow, 1756–63; Houtt., 1764; Vosm., 1768.

Crotalius Linn., 1754.

Crotalus Linn., 1758–66; Daud., 1803; Merr., 1820; Gray, 1825–49; Fitz., 1826–43; Wagl., 1830; Holbr., 1842; Bd. and Gir., 1853–59; Dum. Bibr., 1854; Cope, 1859, 1875–92; Garm., 1883. (Many omitted. In most cases, from 1766 till 1825, a species of Sistrurus was included.)

Crotalinus Raf., 1815.

Uropsophus Wagl., 1830; Gray, 1831–49; Fitz., 1843.

Urocrotalon Fitz., 1843.

Aploaspis Cope, 1866–75.

Aechmophrys Coues, 1875. (The last four apply to particular species.)

Sistrurus.

Crotalophorus Gray, 1825–31, 1849; Holbr., 1842; B. and G., 1853–59; Cope, 1859, 1886–92.

Caudisona Fitz., 1826–43; Wagl., 1830; Bon., 1831; Gray, 1842; Yarr., 1875; Cope, 1875–80.

Crotalus Flem., 1822; Cope, 1860; Coues, 1875.

Sistrurus Garm., 1883.

S. GARMAN.

Mus. Comp. Zool., Cambridge, Mass.

"Scientific" Genealogy—Rejoinder, No. 2.

QUITE recently I contributed to these columns (*Science*, Vol. XIX., No. 476. "'Scientific' Genealogy—A Rejoinder."—Veritas.) a brief paper intended to curb some tendencies prevalent in genealogical circles, notably untenable assumptions regarding family traits and likenesses inherited.

Since the appearance of the above article several criticisms have been sent to this magazine — rather surprising to "Veritas" for the reason that they indicated a lack of acquaintance with what he opposed in the article.

General discussions of biology, breeding of animals — human and brute — are, I doubt not, of interest and profit, only, — they hardly touch my point in the argument, and it is important in open discussion to keep to the question, — so many readers mistake a rambling generalization for argument and fact. Then, too, I object to portions of the article by "Enquirer," namely, p. 155, paragraphs 1 and 4, as mistakenly quoting my views (for light on which my article is in evidence) and also to his last para-