SCIENCE:

PUBLISHED BY N. D. C. HODGES, 874 BROADWAY, NEW YORK.

SUBSCRIPTIONS.—United States and Canada..... .....$3.50 a year.
Great Britain and Europe..... 4.50 a year.

To any contributor, on request in advance, one hundred copies of the issue containing his article will be sent without charge. More copies will be supplied at about cost, also if ordered in advance. Reprints are not supplied, as for obvious reasons we desire to circulate as many copies of *Science* as possible. Authors are, however, at perfect liberty to have their articles reprinted elsewhere. For illustrations, drawings in black and white suitable for photo-engraving should be supplied by the contributor. Rejected manuscripts will be returned to the authors only when the requisite amount of postage accompanies the manuscript. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guaranty of good faith. We do not hold ourselves responsible for any view or opinions expressed in the communications of our correspondents.

Attention is called to the "Wants" column. It is invaluable to those who use it in soliciting information or seeking new positions. The name and address of applicants should be given in full, so that answers will go direct to them. The "Exchange" column is likewise open.

BOGDANOV ON THE PRIMITIVE RUSSIANS.

BY JOHN BEDDOE, LL.D , F.R.S.

THE Anthropological Congress lately held at Moscow, however much its attractions and its attendance may have been diminished by the cholera scare, has at least produced one very notable and interesting paper — that by the veteran Professor Anatole Bogdanov, entitled "Quelle est la race la plus ancienne de la Russie centrale?" In it Bogdanov recalls the fact that twenty-five years have elapsed since he published his first researches into the subject on which he now delivers a fairly matured opinion. During a great part of the interval he has been laboring in this field and collecting material, not from the centre only, but from all parts of Russia, though at times he seems to have abandoned the effort for a while in a kind of despair.

His earlier researches led him to form the opinion that the kurgans (tumuli) of central Russia, believed to date from the ninth up to even the fifteenth century, contained the remains of two races, one dolichocephalic, tall and strongly made, with light-brown hair, the other smaller, with short, broad head and dark-brown hair. The former he found preponderated in the earlier kurgans, and in the south-western part of the central provinces, the latter at later dates and more to the north-east. In spite of the mode of location, but in accordance with the apparent dates, those who considered these facts mostly agreed that the dolichocephals were of Finnish kindred, Merians probably, and that the shorter heads belonged to the Slavs who invaded and incorporated them.

Later discoveries and the products of a wider field do not, in Bogdanov's opinion, confirm this view. These long skulls, which, though the occiput projects considerably, have usually well-developed frontal regions, and are by no means of low type, are found to prevail in the older interments throughout the west and south as well as the centre of Russia, while short heads abound in the north and east, in the ancient kurgans of the Uralian region and in those of the Bashkir territory. Bogdanov inclines to the opinion of Poesche, that the Slavs "descended in reality from a dolichocephalic source." And, seeing that the modern Slavs are on the whole moderately brachycephalic, he thinks that the prevailing form has somewhat changed through contact and crossing with races having broader heads (meaning probably the Mongoloid races which lie and have lain to the east of them), but also owing to the operation of other (external) causes. "With the progress of civilization," he says, "begins another series of influences, which has played a great part in the history of peoples, and may play a still greater one in the future, because the conditions of civilization bring about necessarily in the course of time an increase of brachycephalism. . . . Dolichocephalism declines more and more in Europe, and the heads become larger and finer."

Thus does Bogdanov range himself on the side of the short heads in the curious controversy which is arising in Europe as to the relative merits of the two leading forms of cranium, and to which Obedenare, Laponge, and Von Ammon have contributed both facts and opinions. I recollect asking Professor Rokitansky, five and thirty years ago, whether the Czechs were not brachycephalic. Rokitansky was himself a Bohemian, and he was evidently nettled by a question which he thought touched upon a weak point in his fellow-countrymen. "Ah! well!" he said, "they are a very clever people for all that." On the other hand, Messrs. Jacobs and Spielmann, in their recent paper on the physical characters of British Jews, almost apologized for the long-headedness (in a physical sense) of the Sephardim, as a mark of inferiority! Since Topinard claimed the Aryan language as the original property of the short-headed Kelto-Slavo-Galcha family, their congeners have taken heart, and threaten to push us long-heads from our stools of conceit.

Whence came these aboriginal dolichocephals of Russia? "Not from Asia or the Caucasus," says Bogdanov. "It is more likely that they came from the Danube, where we find at present dolichocephaly predominant [in Bulgaria]. They probably followed the Dnieper into White Russia, thence to Novgorod and into Sweden. This was the northward stream. About the same time there was probably an eastward current through Minsk to Yaroslav and Moscow, and a western one by Galicia, the Vistula, and the Danube."

ON "TYPE-SPECIMENS" AND "TYPE-FIGURES" IN ENTOMOLOGY.

BY W. F. KIRBY, LONDON, ENG.

A "TYPE SPECIMEN" is the specimen of an insect from which the original describer drew up the first description of a species; and it is often of great importance to settle disputed points of nomenclature, where any doubt exists respecting the actual identification of a species; for if we are certain that we have the original specimen before us, no further dispute is possible. A "type-figure" is the figure quoted by the original describer as illustrating his species, or is a figure supposed to represent the species published by a later author.

This appears plain enough; but in practice it is not always satisfactory. The specimens described by the older authors, such as Linné and Fabricius, are not always in existence, and in other cases it is not always certain that the specimens in various old collections supposed to represent the types of these authors are actually the real specimens which they described. Again, Linné frequently quoted several figures of different species as illustrating one of his species; and, in several other cases, he seems to have described quite different species in his successive works. Under these circumstances it does not follow that a specimen, even if ticketed by Linné himself, is necessarily the species which he originally described. Some of the later authors, too, such as Müller and Hontheim, have figured insects as species of Linné, and applied wrong Linnean names to their figures in the most reckless manner.

In the case of Fabricius, we already meet with far more careful and conscientious work; and when Fabricius describes an insect from a known locality, there is often very little doubt about what he really intended. But his names, too, were frequently misapplied by his contemporaries; and it is only lately that several insects which he described from India, but which his contemporaries mistook to refer to European species more or less resembling them, have been correctly identified. Gross errors, too, have been committed by certain recent authors who have found specimens of insects supposed to have been named by Fabricius in old collections, and have jumped to the conclusion that they were his original types, though neither the locality nor the description may have applied to them at all. This does not apply to collections indubitably referred to by Fabricius, such as the Banksian and Hunterian, which may usually be regarded as authoritative.

Again, some authors have cared more for the condition of their specimens than for scientific accuracy, and may in some cases have actually got rid of their own types and replaced them with better specimens, possibly of a different species more or less re-

sembling the real one; this, apart from errors or transposition of labels, to which accidents all collections are more or less liable, in proportion to their age.

While, therefore, fully admitting the great value of a type, or type-figure, it is necessary to ascertain that it is really the specimen or represents the specimen originally described. If it contradicts the original description in any important respect, and especially if it is an insect known to be from a different locality to that assigned to it by the original describer, it is more than probable that it is not the original type at all, and is worse than misleading. Errors of locality are always possible; but much will depend on the author. Donovan, for instance, was extremely careless about localities, but, as he figured all his species, this matters less; on the other hand, Fabricius was far more careful than later authorities have given him credit for; and an error of this kind in his work was quite exceptional.

THE CONVEX PROFILE OF BAD-LAND DIVIDES.

BY W. M. DAVIS, HARVARD COLLEGE, CAMBRIDGE, MASS.

IN Mr. Gilbert's analysis of land sculpture, constituting chapter V. of his "Geology of the Henry Mountains," he explains why the surface of an eroded region possesses slopes that are concave upwards and steepest near the divides, and shows that it is for the reasons there stated that mountains — that is, mature and well-sculptured mountains, such as are of ordinary occurrence — are steepest at their crests (p. 116). The *arêtes* of the Alps illustrate this perfectly. Gilbert calls this generalization the "law of divides."

But in discussing the forms assumed by eroded bad-lands, or arid regions of weak structure with insignificant variety of texture, he finds an exception to the law of divides. The two lateral concave slopes of a bad-land ridge do not unite upwards at an angle, forming a sharp divide, but are joined in a curve that is convex instead of concave upwards. "Thus in the sculpture of the bad lands there is revealed an exception to the law of divides,— an exception which cannot be referred to accidents of structure, and which is as persistent in its recurrence as are the features which conform to the law,— an exception which in some unexplained way is part of the law. Our analysis of the agencies and conditions of erosion, on the one hand, has led to the conclusion that (where structure does not prevent) the declivities of a continuous drainage-slope increase as the quantities of water flowing over them decrease; and that they are great in proportion as they are near divides. Our observation, on the other hand, shows that the declivities increase as the quantities of water diminish, up to a certain point where the quantity is very small, and then decr ase: and that declivities are great in proportion as they are near divides, unless they are *very* near divides. Evidently some factor has been overlooked in the analysis,— a factor which in the main is less important than the flow of water, but which asserts its existence at those points where the flow of water is exceedingly small, and is there supreme" (pp. 122, 123).

It has for some time seemed to me that the overlooked factor is the creeping of the surface soil; and, as I have not seen mention of this process as bearing on the form of the crest-lines of divides, a brief note on the subject is here offered.

The superficial parts of rock-masses are slowly reduced to rock-waste or soil by the various processes included under the term, *weathering*. Unconsolidated materials are in the same way reduced to finer texture near their surface. The loose and often fine material thus provided at the surface is carried away by various processes, of which the chief are moving water, moving air, and occasionally moving ice; but there is an additional process of importance, involving dilatation and contraction of the soil, and in consequence of which not only the loose particles on the surface are transported, but a considerable thickness of loose material is caused to creep slowly down-hill.

Dilatation is caused by increase of temperature, by increase of moisture, and by freezing. Vegetable growth may probably be added to this list. The movements are minute and slow. They are directed outwards, about normally to the surface. Contraction follows dilatation, when the soil cools or dries, or when its frost melts. The movement of the parts is then not inward at a normal to the surface, but vertically downwards, or even downwards along the slope. As the two motions do not counterbalance each other, a slow down-hill resultant remains. This is greatest near the surface, where the dilatations and contractions are greatest; but it does not cease even at a depth of several feet, perhaps of many feet. Hence the down-hill dragging of old-weathered rock often well shown in fresh railroad cuttings in non-glaciated regions. I presume all this is familiar to most readers; although from the frequent inquiry concerning the means by which valleys are widened it is evident that the creeping process is not so generally borne in mind as that by which running water washes loose material down-hill.

The form assumed by the surface of the land depends largely on the ratio between the processes of washing and creeping. Wherever the concentration of drainage makes transportation by streams effective, the loose material is so generally carried away (except on flood-plains) that the action of creeping is relatively insignificant. But on divides, where drainage is not concentrated but dispersed, the ratio of creeping to washing is large, even though the value of creeping is still small. This is especially the case in regions of loose texture and of moderate rainfall; that is, in typical bad-lands, where the supply of loose surface-material ready to creep is large, and where the loose material is slowly taken away by washing. On the divides of such regions, the surface form is controlled by the creeping process. The sharp-edged divides, that should certainly appear if washing alone were in action, are nicely rounded off by the dilatations and contractions of the soil along the ridge-line. The result thus determined by the slow outward and downward movements of the particles might be imitated in a short time by a succession of light earthquake shocks.

Mr. Gilbert has himself given several beautiful illustrations of the close dependence of sharp or rounded divides on rainfall; structure remaining constant. If the rainfall should increase in bad-land regions, would not all their divides become sharper; and if the rainfall were continuous, so as to carry away every loose particle as soon as it is loosened, would not the divides assume the sharp ridge-line expected from Mr. Gilbert's analysis but not found in the actual arid bad-land climate? In the eastern and well-watered part of our country, I have often seen clay-banks much more sharply cut than the equally barren surface of the western bad lands; but even on clay-banks, the minute divides between the innumerable little valleys are not knife-edge sharp; they are rounded when closely looked at. Perhaps they are sharper in wet weather and duller in dry spells.

If rainfall remain constant and structure vary, then the harder the structure, the less the supply of soil for creeping and the sharper the divides; the weaker the structure, the more plentiful the supply of soil for creeping and the duller the divides. Numerous examples of this variation might be given.

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.

Some Remarks on the Botanic Trinomial.

AN article in *Science* for September 16, signed C. H. Tyler Townsend, contains certain statements which cannot be passed, it seems to me, without some few words of discussion. It is quite evident that this article loses sight entirely of the main purpose of a biological name, and seems to imply that the name of a thing has to do with justice, right, etc. For example, I find therein the following expressions: "In no case can the name of the original erector and describer of a genus be separated therefrom without gross injustice." "There is no necessity whatever for shedding glory upon the one who has made the transfer. . . . He has no right whatever to the species." These words, "injustice," "right," belong to the field of Ethics, not that of Taxonomy.