

regards the dimensions of the cranium, is prognathous, platyrrhine, and microseme in the measurements of the face. The now extinct Tasmanian race was, like the Australian, prognathous, platyrrhine, microseme, microcephalic, but in the relations of the length to the breadth of the cranium not dolichocephalic but mesaticephalic, *i.e.*, between dolichocephalic and brachycephalic. The Bushmen, whilst mesaticephalic, platyrrhine, microseme, microcephalic, are, as regards the upper jaw, not prognathous, but orthognathous. The Bush crania differ in an important manner from their near geographical neighbours the Kaffirs and Zulus, which, though platyrrhine in their nasal relations, are dolichocephalic and megacephalic in their cranial dimensions, mesognathous as regards the projection of the upper jaw and mesoseme in their orbital dimensions. The skulls of the African Negroes are dolichocephalic, mesocephalic, prognathous, platyrrhine, and mesoseme; whilst the Andamanese, of which the Museum possesses a remarkably good series, are brachycephalic, microcephalic, mesognathous, mesorhine, and megaseme. As regards the Australian and the dark races with frizzly hair dolichocephalism and prognathism, with small or moderate cranial capacities prevail, except in the Bushmen and the Andamanese. The prevailing characteristics of the races inhabiting Europe, North Africa, and South-West Asia are a moderate latitudinal index, a moderate orbital index, a low alveolar index, a low nasal index, and a high cerebral capacity. In the Mongoloid races again the orbital index is usually high, the cranial capacity variable, whilst in its dimensions the skull ranges from brachycephalism in the Siberians and Peruvians to extreme dolichocephalism in the Eskimo. The jaw may be either orthognathous or prognathous.

The study of this Catalogue is essential to all who are interested in physical anthropology, but more especially to those who may be engaged in working with the cranio-logical collection in the Museum of the Royal College of Surgeons of England.

OUR BOOK SHELF

The Village Life (Glasgow: Maclehose, 1879.)

THIS is a volume of poems intended to picture various phases of Scottish village life. It is beyond our province to criticise the quality of the poetry, but it deserves some notice at our hands for the prominence given throughout to the most recent scientific doctrines, especially that of evolution. With the latest teachings of science in this direction the author appears to be thoroughly acquainted, as is evidenced especially in the two poems on "The Schoolmaster" and "The Doctor." It seems to us a noteworthy fact in the progress of science that its latest developments should form so prominent a feature in a work so purely literary, as a series of poems. The author himself, while he has evidently a tenderness for the old beliefs and bygone customs, still, cannot help showing how strong is his leaning to the revelations of the science of to-day. We venture to think that the anonymous author's presentation of the latest results of scientific investigation ought to reassure those who dread that science and poetry cannot co-exist, that the spread of science and the increase of scientific knowledge will leave no room for the exercise of the poet's fancy. If ignorance is a necessary condition for the exercise of this function, it is quite safe to predict that there is no chance of the poet's occupation ever being gone. Let us suggest to the author of the "Village Life," as a

subject to try the mettle of his fancy and the extent of his knowledge, the "Lake Dwellers." We think the present volume is likely to afford a quiet pleasure to many readers, and as a specimen of the versification and to show how clearly and musically the author can put a puzzling problem, we give the following quotation from the poem on "The Doctor":—

"Search as we may, no trace is found
Of how the man-ape was transformed
Into the man with speech and creed;
We know not how he shed his hair,
Or shortened his fore limbs and rose
On back-bone straight, with head thrown back,
With arch'd foot, and supple knee;
Or by what process came the hue
Of his now soft and hairless skin,
Its brown, its red, its jetty black,
Its yellow, and the tints between;
Or how the straight and flattened nose,
Developed from the monkey's face,
The jaw prognathous, square or thin;
And above all how speech began—
How first the inarticulate,
Long-armed, broad-chested, roaring clan
Of men-apes, out of shouts and cries,
Formed syllables and meaning words;
How, from the jarring harsh discords
Of brutal sounds there broke instead,
Liquid utterances, replies,
Sweet conversation, grave debate?—
A vast development, so great
And splendid that the tail-less ape
At once became the planet's lord,
A god in reason, as in shape.

The Doctor hoped that searchers keen,
Might find before the glacial age
Some traces of an earlier stage—
Man Pliocene or Miocene—
A skull, or skeleton that showed,
The type improving from the ape;
Some form revealing how a broad
Divergence intellectual,
May come from trifling change of shape;
That showed complete, a reason why
The glorious art of speech arose;
How shortened arm, and thickened thigh,
Deepened the chest, enlarged the lung;
The larynx and the mouth and nose
Transforming with the breast and brain,
Became sonorous, and the tongue
Shaped simple words, they grew again
To language musical, and song.
But though the search is deep and long,
And evolutionists await
With eager hope, the early 'brave'
Emerging from the brutal state;
He comes not from his ancient grave;
His grave is lost; his fossil bones
No geologic era owns."

LETTERS TO THE EDITOR

[The Editor does not hold himself responsible for opinions expressed by his correspondents. Neither can he undertake to return, or to correspond with the writers of, rejected manuscripts. No notice is taken of anonymous communications.]

[The Editor urgently requests correspondents to keep their letters as short as possible. The pressure on his space is so great that it is impossible otherwise to ensure the appearance even of communications containing interesting and novel facts.]

Artificial Diamonds

THE fate of the Glasgow diamonds, as recorded in NATURE, vol. xxi. p. 203, reminds me of an adventure of my own that happened about ten years ago, and is likely to be repeated by

others. For showing the popular class-room experiment of burning phosphorus in oxygen, I was in the habit of using a little cup of chalk made deeper and with smaller rim than the brass cups usually made for the purpose. The object of this was to limit the too rapid outburst of combustion. I noticed that a cup which had been used several times was coated on the inside with a hard, glassy enamel, which I supposed to be phosphate of lime. To test this, the cup was thrown into some hydrochloric acid and dissolved bodily, but I found at the bottom of the beaker an insoluble residue of crystalline particles. What were these? Could it be possible that the carbonic acid driven off by heating the chalk had, on reaching the heated phosphorus, become dissociated, its oxygen combining with the phosphorus, and its carbon thrown down as veritable diamond? To test this startling theory, I collected the particles and rubbed them between a glass pestle and mortar. They appeared hard enough to scratch the glass, but were too small for further examination. To obtain a better supply, I dissolved some phosphorus in bisulphide of carbon, pounded some chalk and made it into a paste with the solution, then filled a porcelain crucible with this and fired the mass by heating it over a Bunsen burner. It blazed magnificently, throwing out eruptive jets of flame. Here, in the absence of surrounding oxygen, the carbonic acid had every opportunity of becoming dissociated or reduced by the heated phosphorus. The residue was treated with hydrochloric acid, and this time I found at the bottom of the beaker quite a respectable quantity of crystalline grains. These left unmistakable scratches on the glass pestle and mortar, and seemed to make some fine scratches on an agate pestle and mortar. I next examined them under a microscope, and found that they were more like pebbles than crystals, so much so as to suggest another theory of their composition and origin, viz., that they were miniature chalk flints formed by the fusion and aggregation of the siliceous cuticles of fossil diatoms, or such-like organisms of which chalk appears to be in some degree made up.

To test this, I precipitated some pure carbonate of lime, soaked it with the solution of phosphorus and fired as before, then treated with hydrochloric acid; when, alas! my *Eldorado* of dissociated carbonic dioxide melted into thin air as the effervescent liquid gradually cleared itself and showed no traces of crystalline residue.

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Solar Phenomenon

ON the afternoon of the 18th ult., in company with Herr Lohse, of this observatory, I was occupied in adjusting a spectroscopic telescope attached to the 15-inch refractor. The sun was disappearing behind the ridge of the hill of Fare, about five miles distant. To utilise the last rays of the sun, I was directing the telescope on the gradually lessening segment of the sun's disk, while Herr Lohse was looking through the spectroscopic telescope. Under these circumstances it will be understood that we were both standing near the inner vertical surface of the drum-shaped dome, close to where it was lit up by the sunlight coming through the opposite vertical opening, which is 40 inches wide. It may be well to add that the dome is made of corrugated iron, painted slate-colour, the corrugations of the wall being vertical. Under the impression that the sun had wholly disappeared, I looked at the inner wall of the dome to see if it was actually shaded by the distant hill.

To my great surprise, the still illuminated surface was crossed by a number of distinct, horizontal, black lines, which ascended at a uniform pace about a foot and a half in a second. The lines were, on an average, about $\frac{1}{4}$ inch thick, while the intervals may have been mostly some $2\frac{1}{2}$ inches, but I do not think that the intervals were uniform. Herr Lohse, on turning from the spectroscopic telescope, also saw the lines; but while he feels sure that some of them terminated in points, I am under the impression that all the lines crossed the entire illuminated space.

The lines had a distinct quivering motion, which, combined with their uniform ascent, gave the whole phenomenon a most beautiful appearance. We both independently estimated the number of lines seen at about thirty, and the duration of the phenomenon at half a minute from the time when we first saw it. It was, however, certainly fully developed when first caught sight of. These lines seem to be closely allied to those repeatedly seen at the beginning or end of the total phase of a solar eclipse. See particularly *Astronomische Nachrichten*, Nos. 1,921 and 1,922, and "Le Soleil" (German edition), p. 301, *et seq.*

Some of the observers referred to speak of the lines as undulating; in this case it is difficult to say if the lines were quite straight or not, because of the corrugations of the surface on which they were thrown. My own impression is that they were straight except in so far as they were affected by the quivering before mentioned.

It would be remarkable indeed if this is the first time they have been seen at the daily disappearance or reappearance of the sun.

RALPH COPELAND

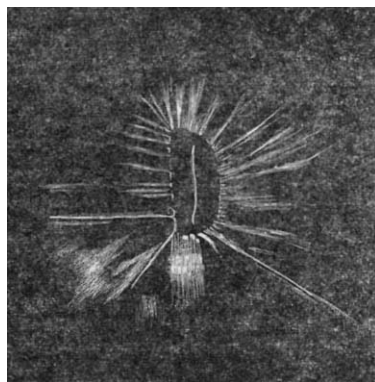
The Observatory, Dunecht, Aberdeen, December 23, 1879

Carbon and Water Figures

THE separation of clear water from a uniformly diffused mixture with soot is so remarkable that it seems worth attention, especially in connection with the behaviour of charcoal powder in water, which is always streaky after any amount of shaking.

For some months I have observed and recorded these figures, as shown in a large white basin of sooty rain water, which is left undisturbed for twelve to twenty-four hours; they only appear occasionally, perhaps once in a week, are not constant when formed, and are entirely destroyed by stirring or mixing the water. They always consist of lines, planes, or patches of clearer water, sometimes not containing certainly more than a quarter of the proportion of soot around them; no aggregation of sooty water, or soot, has ever been seen. These quasi vertical planes are very thin, sometimes the clearest part as little as $\frac{1}{80}$ th inch wide, and the extreme thickness $\frac{1}{2}$ th, the other dimensions being $\frac{1}{2}$ to 1 inch deep, and 1 to 5 long. Most usually only one plane appears, the azimuth of which is quite irregular; occasionally it is curved; sometimes a row of quasi-parallel planes or lines appear—once as many as six, at irregular intervals averaging $\frac{1}{8}$ inch; once a clear circular spot about $1\frac{1}{2}$ inch across appeared.

The last form I found was by far the most complex, and is here given from a careful sketch.



The lines were not as thin as usual, only one or two being as little as $\frac{1}{80}$ inch wide. They were very bright, probably not containing $\frac{1}{4}$ of the average soot around them; the water was unusually dark. The central semicircular space was $3\cdot6$ inches long \times $1\cdot7$ inch; when first seen this space was uniformly grey, but in a few minutes, after slightly disturbing the water, the bright sharp plane across it appeared, inclined at about 5° to vertical. Some of the other planes were inclined 15° . The most striking point was the sharp definition of the central space, all the lines ending abruptly at its regular outline.

The depth of these figures bears strongly on their cause. They are never at the surface, but usually on the bottom. The water is about 2 inches deep, and the upper limit of these planes is $\frac{1}{4}$ to $1\frac{1}{2}$ inch from the top. In the above figure the lines or planes appeared to lie on the bottom, and to turn upwards at the edge of the central space, leaving it untouched, thus forming a bright edge to it. I have also, on disturbing water, seen apparently that a clear layer existed below a uniformly sooty surface.

The conclusions are, that water tends to separate from the finely divided carbon, in a clear bottom layer (or lines) of uncertain thickness (though lamp-black sinks if diffused in water), and that parts of this layer are (by convection?) turned