

deluge lasted 40 days and 40 nights of incessant and universal rain . . . and if you were to say that . . . the shells quitted their first home" [near the seashore] "and followed the increase of the waters up to their highest levels . . . I answer, that the cockle is an animal of not more rapid movement than the snail is out of water, or even somewhat slower; because it does not swim, on the contrary it makes a furrow in the sand by means of its sides, and in the furrow it will travel each day from 3 to 4 braccia; therefore this creature, with so slow a motion, could not have travelled from the Adriatic Sea, as far as Monteferrato in Lombardy, which is 250 miles distance, in 40 days; which he has said who took account of the time. . . ." The last few words are probably not free from an intended gentle sarcasm (we meet it again elsewhere); but how unanswerable is this argument, as are many others, of this brilliant observer and thinker!

Leonardo refers also to "the bones and teeth of fish, which some call arrows and others serpents' tongues . . ."—surely the very "glossopetræ" already mentioned.

What puzzled naturalists of later times was abundantly clear to him of the fifteenth century.

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The Athenæum, May 5.

#### The Identity of "Alumen" in Pliny's Natural History.

"ALUMEN" is mentioned frequently in the *Historia Naturalis* of the elder Pliny, and there has been some controversy about its identity. It is probable that the term was used loosely to describe a number of astringent salts, and it is clear from the tests prescribed in Pliny, H.N. 35, 184-5 (the blackening of pomegranate juice and nut-galls), that the word was sometimes used to describe a compound of iron, perhaps the sulphate, derived from iron pyrites by oxidation. Ajasson, however, boldly identifies the "alumen" mentioned in H.N. 33, 88, as sulphate of aluminium, but gives no reasons for so doing.

The passage in question concerns the preparation, for use as a pigment, of "chrysocola." Though the identity of this latter substance has been a matter of dispute in the past, there is now general agreement that it was malachite, or basic carbonate of copper. The passage runs as follows:

H.N. 33, 87. "(Chrysocola) illa quoque herba quam lutum appellant tinguitur. . . ."

88. "Pulvis (sc. chrysocolae) semper in catino digeritur et ex aceto maceratur ut omnis duritia solvatur, ac rursus tunditur, dein lavatur conchis, siccatur. Tunc tinguitur alumine schisto et herba supra dicta, pinguiturque antequam pingat. . . ."

89. "Summa commendationis, ut colorem in herba segetis laete virentis quam simillime reddat."

There is little doubt that "lutum" is the "reseda luteola" or weld, an extract of which dyes yellow with aluminium mordants and greenish olive with iron mordants.

The writer prepared an extract of weld by boiling the chopped-up plant with water. Finely-powdered malachite (bluish-green in colour) was treated with vinegar, washed, and boiled with weld extract to which had been added (a) aluminium sulphate, (b) ferrous sulphate, or (c) iron alum. The colour finally obtained depended on the proportions of dye and mordant and on the time of boiling, but in a general way (a) gave an emerald green powder, while (b) and (c) gave dark greens—approximately the colour of the holly leaf.

It seems clear that the former is the colour referred to as "colorem in herba segetis laete virentis" rather than the latter. It is almost certain, therefore, that

"alumen" includes salts of aluminium as well as salts of iron.

In conclusion, it should be added that Dioscorides (5, 104), in a sentence the exact meaning of which is uncertain, seems to describe "chrysocola" as being of "a full leek green," but it is probable that he is speaking of the original material and not of the dyed product as he does not mention the dyeing process at all.

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#### Effect of an Alternating Magnetic Field on the Polarisation of the Resonance Radiation of Mercury Vapour.

RECENTLY, A. Ellett (*NATURE*, December 27, 1924, p. 931) and W. Hanle (*Zs. f. Phys.*, 30, 93, 1924) observed the depolarising effect of a weak magnetic field on resonance radiation. When the intensity of the field was sufficiently small they found, not only partial depolarisation, but also a rotation of the plane of polarisation. This is accounted for, on the classical point of view, by the superposed effect of the Larmor rotation and of the damped vibrations of the oscillator.

The same classical views suggest that the depolarising action of a high frequency alternating magnetic field of constant amplitude will vanish with increasing frequency. The effect should be well observable with fields of 2 or 3 gauss, and frequencies between  $10^6$  and  $10^7$ .

We have performed the experiment, and have detected the presence of the expected phenomenon. A strong increase of the polarisation was actually observed in passing from a frequency of  $1.5 \times 10^6$  to one of  $5 \times 10^6$ , though the amplitude of the field remained constant.

We are carrying out further experiments in order to determine the quantitative features of the effect.

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#### Visible Wind.

IN reference to the report published in *NATURE* of May 2, of the Royal Meteorological Society's "Celebrations," including the interesting address by Prof. E. van Everdingen on "Clouds and Forecasting Weather," may I be allowed to remind international meteorologists that in 1906, by official sanction in Great Britain, the status of "wind waves" was raised from that of a purely theoretical deduction to that of a normally observable natural phenomenon. "Wind waves" operating in the free and cloudless air are recognisable as such from among other sources of deformation of the definition of telescopic images. They are most adequately observable by means of a telescopic image of the sun projected for the purpose into a darkened room. Their approximately horizontal progressive wave-motions describe prevailing conditions of atmospheric stratification, wind directions, and turbulence above the place of observation always ahead of and generally many hours ahead of any visible formation of associated clouds. Thus the main objects of cloud-observation are obtainable by means of *yet earlier* observations of winds, up to all heights of known cloud formation, in any brief moment of sunshine, with the utmost ease and expedition. But Ruskin is aptly quoted by the writer of the report to the effect that "the meteorologist is impotent if alone."

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