All Dutch painters.
One easy case of *naturalistic aphid* lie in the paintings of Maria Sibylla Meriam, a painter and entomologist of the seventieth century who has painted aphids in numerous works, and both entitled some of her paintings with the word, and depicted the whole aphid ecosystem including all trophic levels in the global picture (*Rode akelei met bladwesp en bladluis*, 1684).
One important item in our quest is the topos of the *female aphid* (and eventually *superfemale aphid*). It probably did not start with Charles Bonnet, but at least has fully expanded after him. This talented Swiss student of Réaumur discovered, described, and demonstrated parthenogenesis in what could be called one of the first modern scientific papers in biology, its *Traité d'entomologie* (1745). This signed a series of quasi-quotes all over the following centuries, exemplifying the importance of this reproductive trait in biology, as well as the importance of aphids as a model for this trait: this started by a pejorative citation of Eugène Delacroix in a letter to a friend in 1830 *("What a pity that such brilliant mind and man has lost his time and eyes for understanding the venial sin of such hideous animals"*), followed by a real tribute to parthenogenesis in the masterpiece of Simone de Beauvoir, *Le deuxième sexe* (Volume 1, Chapter 1, "The data of Biology"). One may also quote in this very context the interesting parallel, made by the contemporary art blog Quadrivia, between parthenogenesis and the codified representation of *"Sainte Anne trinitaire"* in the European religious sculpture of the late Middle Ages (https://quadriv.wordpress.com/2011/06/10/jesus-aphids-and-parthenogenesis/). The sculptural code of Ste Anne consisted in a triptychal representation of Virgin Mary, her mother Anne, and child Jesus in a strange character proportionality of adult (Anne), child-adult (Mary) and child-child (Jesus). This invasion of the female-only character over the Holy Trinity was increasingly popular in central Europe from the fortieth to the sixtieth century (https://fr.wikipedia.org/wiki/Sainte_Anne_trinitaire), and was only stopped by a specific canonical law codifying the Marial cult, or hyperdulia, within the Council of Trento (1542–1563). Although no aphid is represented in such topoi, of course, the parallel between parthenogenesis *and* viviparity, somehow unique to aphids, and the mystery of immaculate conception ought to be underlined.
Already exemplified by Eugene Delacroix, cited above, the recurrent and frequent topos of the *evil aphid* has been used many times in French literature. Victor Hugo listed the vile aphid among a list of biological fearsome fellows (*Les Contemplations*, T3 L6 26, p. 467 as appears in the Frantext database). However, the complimentary figure of the *humble aphid* is also present in post-ninetieth-century occurrences, typically shown in Maurice Carême's poem entitled Le Puceron.
Coming to modern art, the appearance of aphids tends to explode, and I will only quote two examples. One is what could be called the *surrealistic oulipian aphid* by Boris Vian (Fig. 2), the other being the *situationist aphid* of the musical theme of the Polish artist Duy Gebord in the well-named *Mildew* album (https://duygebord.bandcamp.com/album/mildew). The former merits a short outline, as it is emblematic of the mosaic Carollian style of Boris Vian (*Les Fourmis*, Fig. 2A). The prose starts as a very standard description of a explicitly boring subject, to fall out into the final black-hole of Oulipian fantasy (which translates as "The rearing of the Tyrolian 'gnatlet' or the milking of woolly aphids"). The induced image explicitly (again) looks as Fig. 2A, driving the reader in a universe of gentle and poetic madness typical of Vian's prose. It should be noted that the French mouchetis tyrolien (translated as Tyrolian gnatlet) does not refer, as it seems through subtle juxtaposition, to an insect: instead it refers to an industrial painting technique, also typical of the universe of *engineer* Boris Vian, who started as *fonctionnaire* of the French normalization agency AFNOR (as did Albert Einstein with the Swiss patent agency)...
We hope that our short survey of a hitherto boring subject has driven the reader on the wild side of the history of arts and sciences, and that the final references will allow him to escape even more, at night, from its truly exciting daytime highways

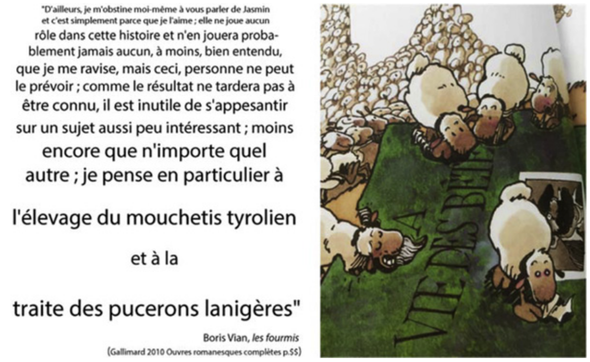

Fig. 2 The milking of woolly aphids, as cited by Boris Vian in *Les Fourmis* (Gallimard, La Pléiade) and reported on the left, with a possible representation on the right: *Le Génie des alpages*, F'Murr, Casterman.

of insect science. This compendium and conference is part of an ongoing project, involving the aphid BAPOA community for data collection, and partially published by Encyclopaphid [6]. The full corpus contains more than 100 entries and the present outline is thus only the hidden part of the iceberg, to be fully published soon.
This conference is quoted in the CNRS repository HAL as: https://hal.archives-ouvertes.fr/hal-02069668.

Disclosure of interest The authors declare that they have no conflict of interest.

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4
The shining world of beetles

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Twisted liquid-crystalline organizations are ubiquitous in living matter [1,2]. Many insects own a tessellated carapace with bumps, pits, indentations, stripes or spots (Fig. 1). These geometric variation often exhibit iridescent colors, which are the consequence of a complex twist of chitin macromolecules. Such optical information with vivid structural colors might be of paramount importance in the life and the evolution of most day-living insects. Many biological functions are yet debated. They are related to conspecific or intra-species communication, thermoregulation, camouflage, survival or navigation [1,3].
For example, the cuticle of the scarab beetle *Chrysina gloriosa* exhibits two bands (Fig. 2). The green band serves as a wavelength-selective (green) diffuser due to the set of polygons

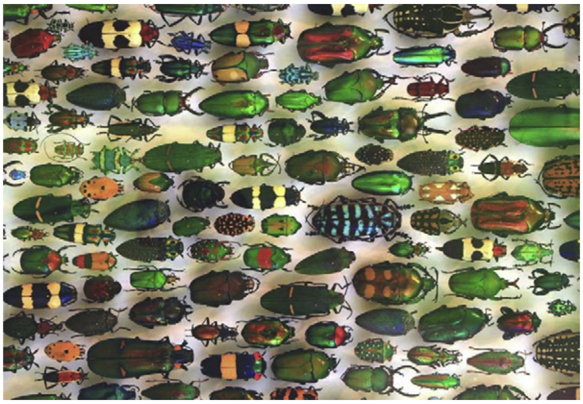

Fig. 1 A set of insects with a variety of patterns and iridescent colors issued from the State Museum of Natural History in Karlsruhe, Germany (image by H. Zell).

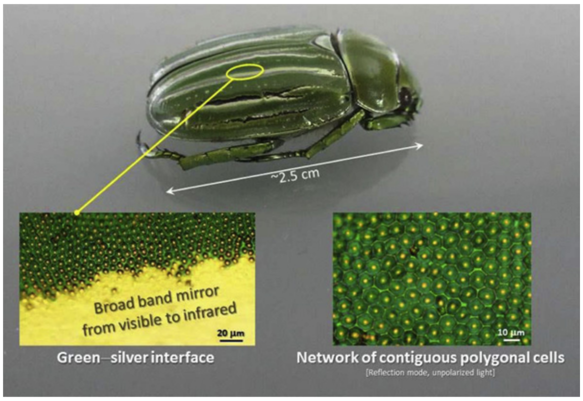

Fig. 2 *Chrysina gloriosa*, from a macroscopic view to microtextures as observed in the green and silver bands.

arranged on a curved surface and, at the mesoscopic scale, it behaves as an array of wavelength-selective micromirrors [4]. The silver stripe plays the role of a flat metallic reflector operating over the visible spectrum and into the infrared spectrum [4]. The orientation of the helicoidal structure varies in green stripes (Fig. 3), whereas it is fixed in silver stripes.

The outermost part of insect cuticles is very often covered with wax, which restricts water loss, prevents desiccation, may lend superhydrophobic and self-cleaning properties to the cuticle, and serves for chemical communication in many species. While cuticular waxes are considered isotropic, the wax layer of the cuticle of *C. gloriosa* exhibits an intriguing nanoscale laminate texture, as revealed by electron microscopy of the transverse sections [5].

Micro-textured cuticles of scarabs may inspire researchers and engineers to make their replicas as optical materials. Potential applications are in the field of wavelength-specific light modulators in routing technologies, broadband reflectors for energy savings, coatings for cryptography purposes (wavelength-dependent and polarization-dependent micro- and nanoscale patterns), camouflage (suits with a broad reflection in the IR spectrum identical to the one of the background) or thermoregulation for buildings.

Disclosure of interest The author declares that he has no competing interest.

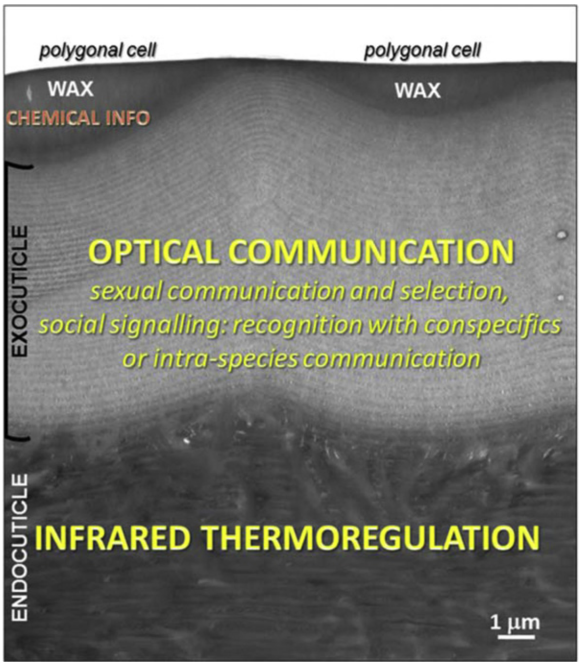

Fig. 3 Transverse view of the cuticle of *Chrysina gloriosa* in a green band as seen by transmission electron microscopy. A typical fingerprint texture is displayed in the chitin network of the cuticle. The distance between two lines of equal contrast is related to the pitch of the twisted structure. The helical axis is perpendicular to the lines. Concave nested arcs are visible below each polygonal cell. Hypothetical functions are reported: chemical information (wax layer), optical communication in the visible and near-infrared spectra, infrared thermoregulation.

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5
Géopolitique du moustique

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Pour l'économiste que je suis, doublé d'un romancier passionné par les ménages à trois et les meurtres, aucun animal n'est plus intéressant que le moustique, vieux de 250 millions d'années et riche d'environ quatre mille espèces.

D'abord, même s'il ne peut voler loin, on le retrouve partout, d'un bout à l'autre de la planète. Il incarne donc la mondialisation et l'unité de la santé: *one health*, une bonne santé des humains n'est possible que si se portent aussi bien les animaux et les végétaux.