

Derivations on a deep-blue theme: disentangling definitions & concepts for MGR in the draft treaty text



Psychropotes semperiana, photo by Diva Amon, 2013

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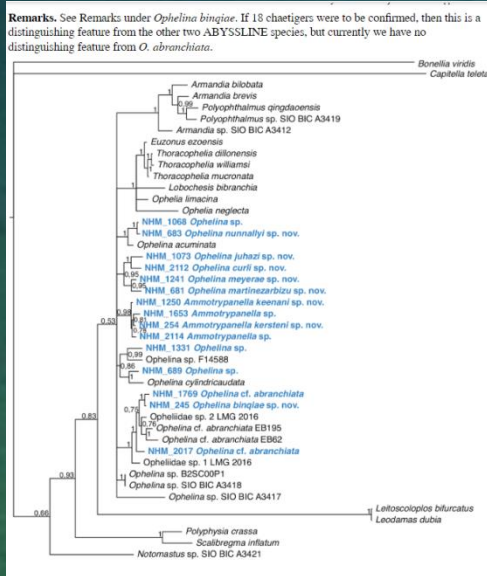
Derivations on a deep-blue theme

Draft treaty text: complexities- definitions MGR, derivatives, DSI++

Science translated into law and law into science...

Scientific perspective on definitions

Sediment Trap Deployment, Brie Maillot, 2015



Scolecida sequences, Wiklund et al, accepted

Oneirophanta sp. Amon, 2013

A derivation on DSI

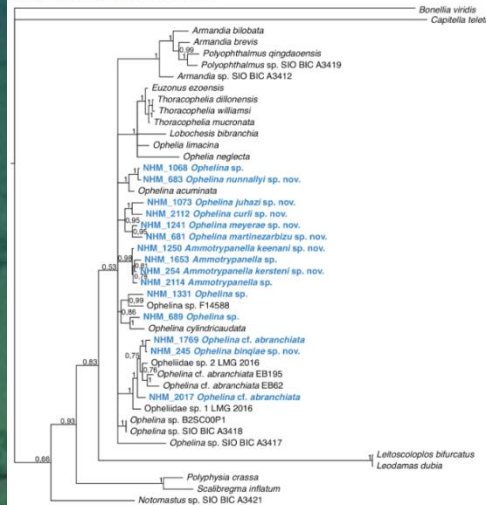
No common understanding of term “*in silico*” in science community & neither term commonly used

Alternative terms? NSD- Nucleotide sequence data (CETAF 2019): more accurate, representative

Debate on inclusion DSI in definition genetic resources underway in NP

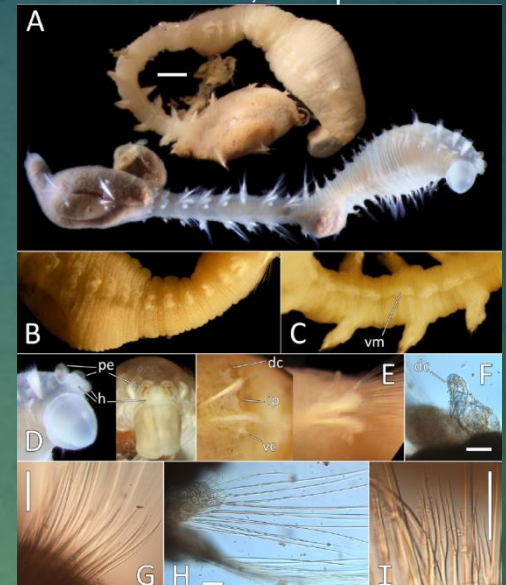
Scolecida sequences,
Wiklund et al, accepted

Remarks. See Remarks under *Ophelina bingiae*. If 18 chaetigers were to be confirmed, then this is a distinguishing feature from the other two ABYSSLINE species, but currently we have no distinguishing feature from *O. abbranchiata*.



Oneirophanta sp. Amon, 2013

Oligobregma whaleyi sp. n.
Wiklund et al, accepted



A derivation on DSI

In light biotech- most usage of MGR would be 'in silico', synthetic biology..

MGR- samples and data intrinsically linked, doesn't make scientific sense to split

DSI open by default: any infringement of this highly problematic to science community. Ensure steps taken to avoid any risk of potential restrictions



Slicing megacore, courtesy Eric Vetter, CCZ, 2013



Partitioning core, courtesy Ward Appeltans

Derivatives: definitions

Nagoya Protocol: 'naturally occurring biochemical compound resulting from the genetic expression or metabolism of biological or genetic resources, even if it does not contain functional units of heredity',

therefore encompassing secondary metabolites, enzymes, natural products.

Draft treaty text: "material made from material" – could be anything- tissue sample, DNA extraction

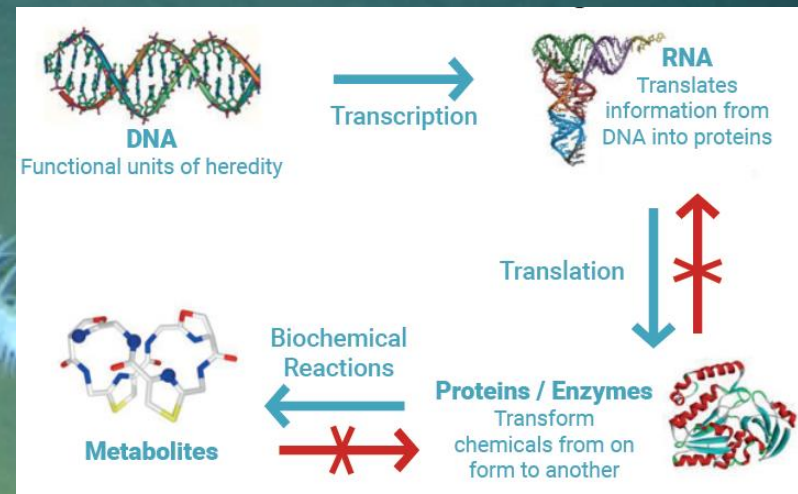
Marlowe et al (2019) DOSI policy brief

DOSI
DEEP-OCEAN STEWARDSHIP INITIATIVE

The Full Value of Marine Genetic Resources (MGR)

FIG 1 A brittle star living commensally on a deep-sea octocoral.
NOAA OER

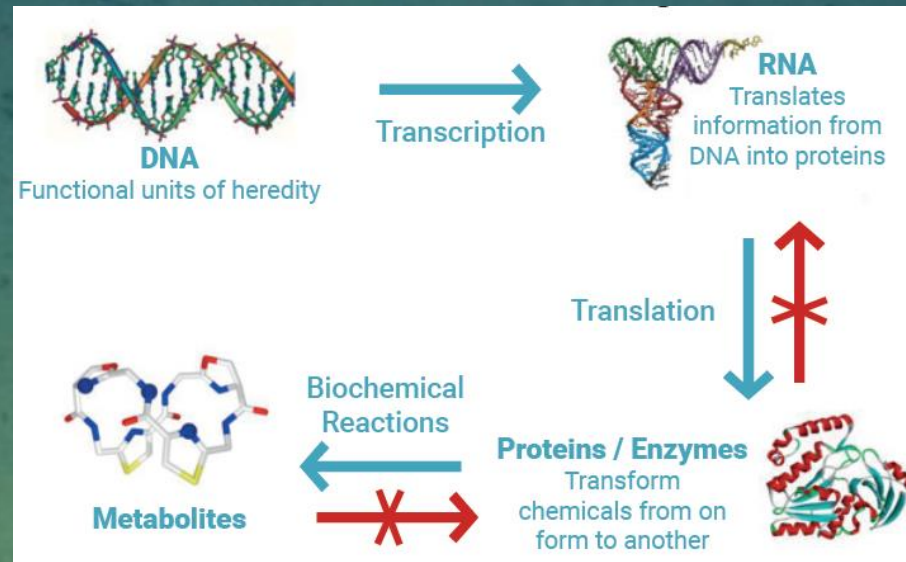
FIG 2 A tube-dwelling anemone or cerianthid.
NOAA OER



BBNJ “loophole”

difficult to argue that a derivative (protein, natural product etc) is included in the definition of genetic material when they don't contain DNA.

BUT most biotech from secondary metabolites, natural products
In terms tracing commercial utilisation for monetary benefits would miss this
derivatives ARE included in monitoring in treaty, nb not as separate definition

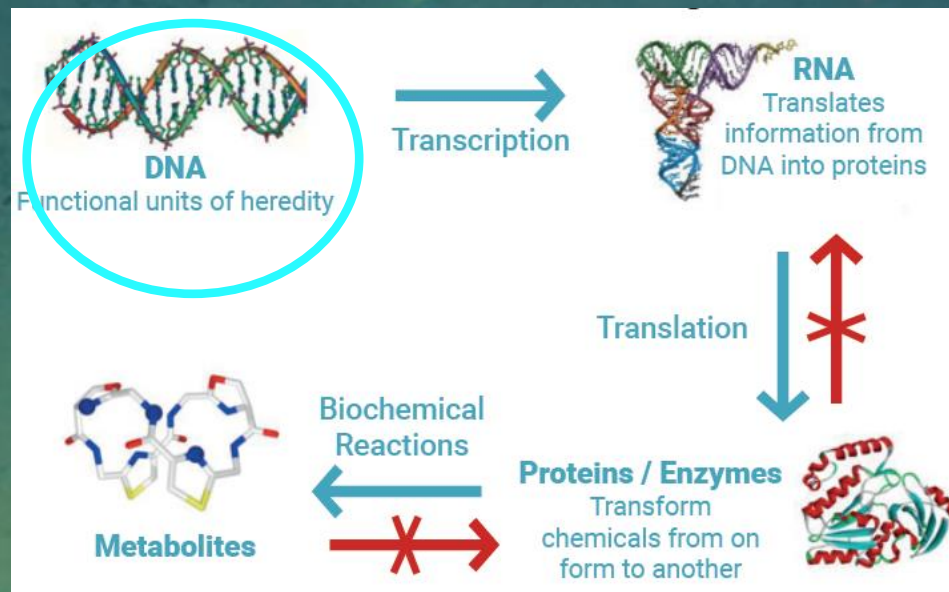


Backtracking to functional units:

“Marine genetic material” means any material of marine plant, animal, microbial or other origin containing **functional units of heredity**...

functional gene referring to protein coding but that small fraction of genes.

Anything from an organism- gene, 2ndary metabolite ultimately from DNA, RNA so consider alternative more specific language e.g. ‘containing DNA or RNA’ (DOSI commentary draft text 2019)



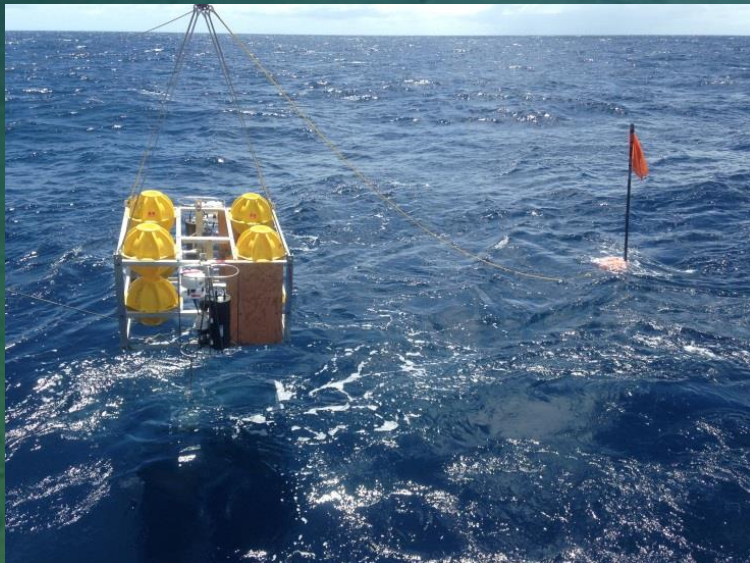
Deep blue theme: coastal states and MGR

9.2 [in cases where MGR of ABNJ are also found within AWNJ, activities with respect to those resources shall be conducted with due regard to rights and legitimate interests of any coastal state under jurisdiction of which such resources are found]

Implies single origin, implies MGR can be known in advance

Key to recognise realities scientific research and fundamental biological realities:

Implies marine systems are static- when their very essence is dynamic



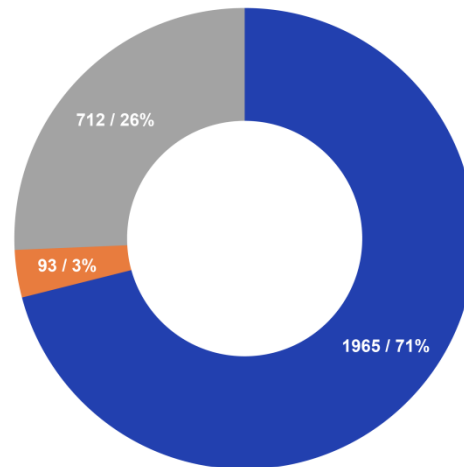
The boundary

Realities of research- where does what apply

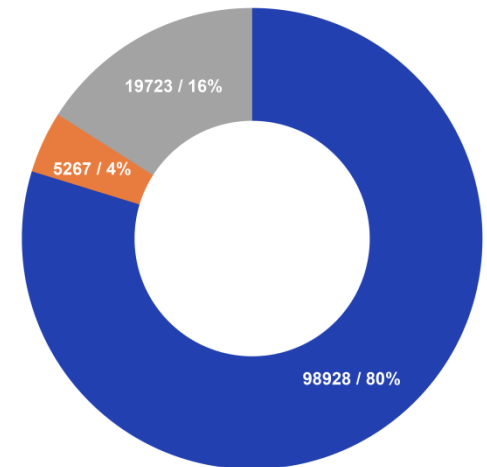
most data on OBIS- AWNJ, 26% over both AWNJ and ABNJ, via OBIS Feb 2019 (Rabone et al, in press)

Potential for confusion and unintentional non-compliance

A DATASETS (N = 2770)



B SPECIES (N = 123918)



■ AWNJ only ■ ABNJ only ■ AWNJ + ABNJ

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Articles

POLICY AND PRACTICE REVIEWS ARTICLE Provisionally accepted The full-text will be published soon. Notify me

Front. Mar. Sci. | doi: 10.3389/fmars.2019.00520

Access to Marine Genetic Resources (MGR): raising awareness of best-practice through a new agreement for biodiversity beyond national jurisdiction (BBNJ)

Muriel Rabone¹, Tammy Horton², Harriet Harden-Davies¹, Sabine Zajderman¹, Ward Appeltans¹, Gabriele Droege³, Angelika Brandt⁴, Liliana Pardo Lopez⁵, Thomas G. Dahlgren^{1,6,7}, Adrian Glover^{1,8,9} and Jane Collins^{1,10}

And what is value anyway...

MGR: marine genetic material of actual or potential value-

Value- means?

Intrinsic value- scientific, ecological, environmental, societal, educational, cultural value MGR- full value (Marlow et al 2019)

Referenced in CBD preamble



cf. *Amperima* sp, Amon, 2013

Open Access MGR samples:

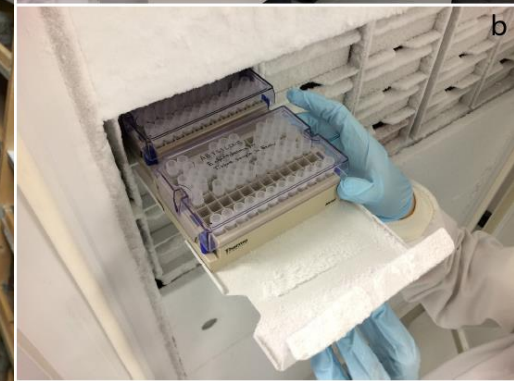
Art 10.3 Ensure open access to MGR ex situ

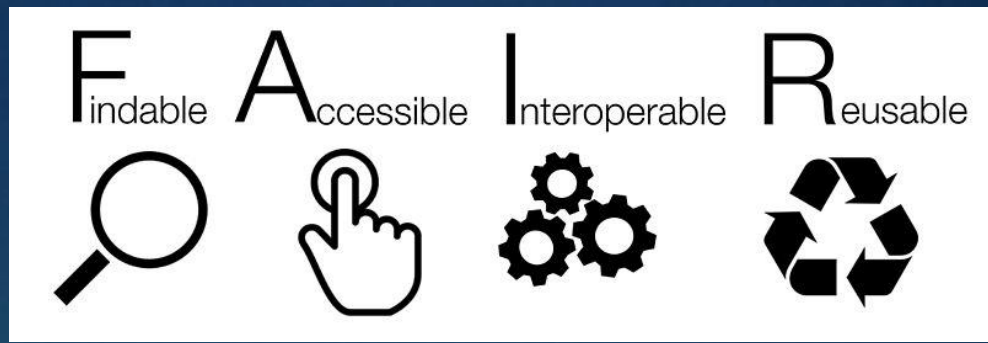
Critical to allow sharing benefits, and also encourage reuse

Need guidelines for judicious use of a potentially **finite** resource:
MGR samples finite unlike MGR data

Discovery Collections. Courtesy of Tammy Horton, National Oceanography Centre

Chiho Ikebe, Natural History Museum





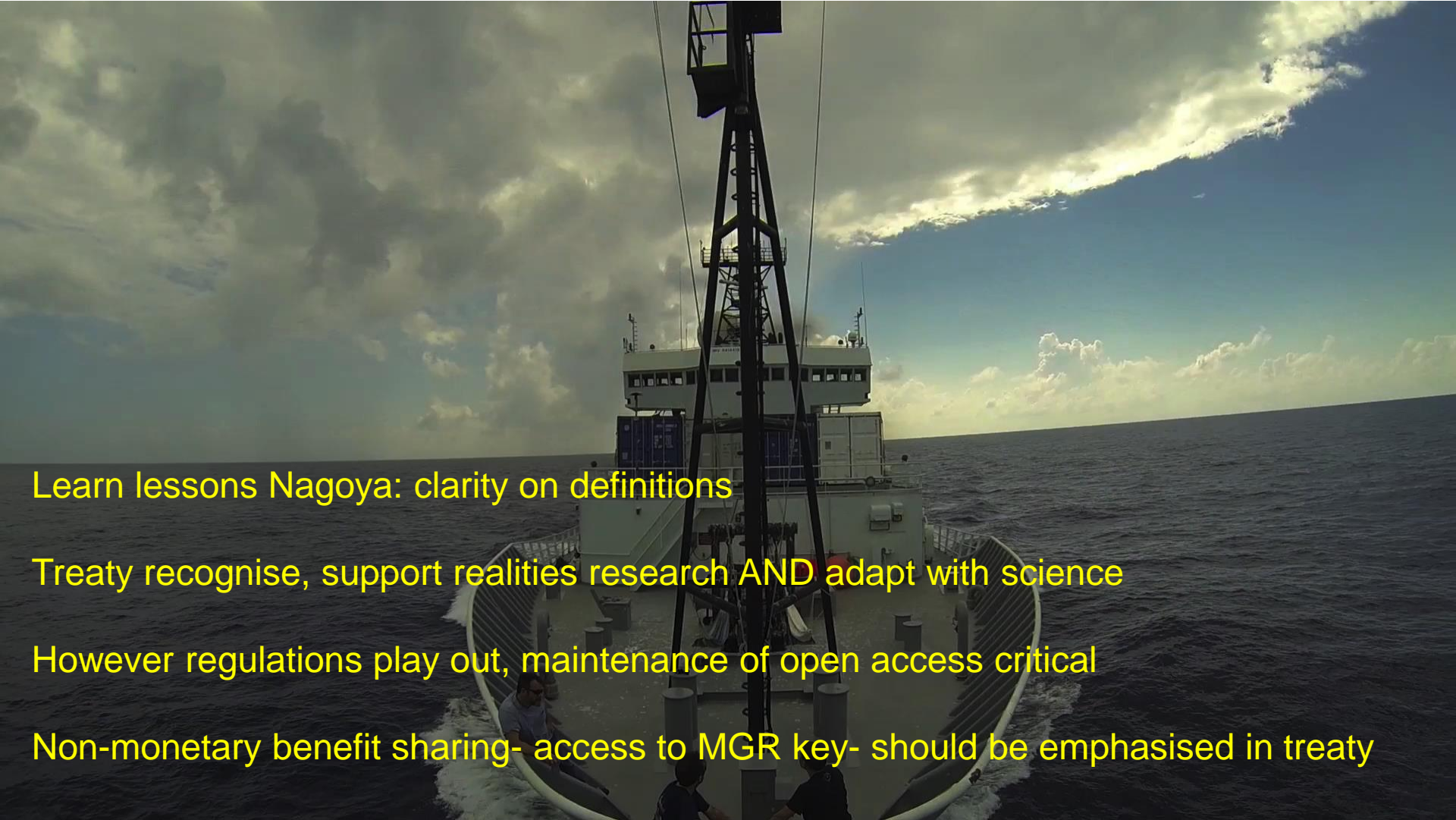
ABS of MGR (samples & data):

standardised sampling and lab methodologies, full documentation and open access, usage of global data standards

Importance of common understanding of terms- whether in science or law, and transparency

Treaty should focus on these non-monetary benefits- greater and more sustained benefits through CB/TT than monetary ones

SUMMARY



Learn lessons Nagoya: clarity on definitions

Treaty recognise, support realities research AND adapt with science

However regulations play out, maintenance of open access critical

Non-monetary benefit sharing- access to MGR key- should be emphasised in treaty

Jackie Mackenzie-Dodds, Chiho Ikebe, Sarah Long, Chris Lyal, Matt Woodburn, Gordon Patterson, Miranda Lowe, Emma Sherlock, Marcel Jaspars, Maria Baker, Jeff Marlow, Kristina Gjerde, Sergio Taboada, Craig Smith, Magdalena Georgieva, Madeleine Brasier, Pedro Martinez Arbizu, John Taylor, Christiane Todt, Les Watling, Chris Mah, Tim O'Hara, Sabine Zadgerman, Torben Rhiel, Lupita Bribiesca-Contreras

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