Sustaining a chemical knowledge commons

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"Building a Chemical Commons" | 2012

Organized by

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"Because our individual efforts will be strengthened by commonly created definitions and strategies that are designed to nurture, protect, and expand all alternatives assessment and chemical hazard work."



THE COMMONS PRINCIPLES FOR ALTERNATIVES ASSESSMENT

Addressing Chemicals of Concern to Human Health or the Environment

In October 2012, a group of 26 environmental health scientists, advocates, funders and policy makers met in Boston, Massachusetts for two days of meetings entitled **Building a Chemical Commons:** Data Sharing, Alternatives **Assessment and Commu**nities of Practice. One of the key outcomes of this meeting was an agreement regarding the need for a common definition and set of principles for chemicals alternatives assessment. Following this meeting, a subcommittee met over four months in 2013 to refine a consensus set of principles. These principles were based on earlier foundational work by the Lowell Center for Sustainable Production, the Massachusetts Toxics Use Reduction Institute, the Environmental Defense Fund, and the BizNGO Working Group. These principles are now available to be shared and used in framing discussions about alternatives assessment and to guide decision making about safer chemical use.

Iternatives Assessment is a process for identifying, comparing and selecting safer alternatives* to chemicals of concern (including those in materials, processes or technologies) on the basis of their hazards, performance, and economic viability. A primary goal of Alternatives Assessment is to reduce risk to humans and the environment by identifying safer choices.

These Principles for Alternatives Assessment are designed to guide a process for well informed decision making that supports successful phase out of hazardous products, phase in of safer substitutes and elimination of hazardous chemicals where possible.

REDUCE HAZARD Reduce hazard by replacing a chemical of concern with a less hazardous alternative. This approach provides an effective means to reduce risk associated with a product or process if the potential for exposure remains the same or lower. Consider reformulation to avoid use of the chemical of concern altogether.

MINIMIZE EXPOSURE Assess use patterns and exposure pathways to limit exposure to alternatives that may also present risks.

USE BEST AVAILABLE INFORMATION Obtain access to and use information that assists in distinguishing between possible choices. Before selecting preferred options, characterize the product and process sufficiently to avoid choosing alternatives that may result in unintended adverse consequences.

REQUIRE DISCLOSURE AND TRANSPARENCY Require disclosure across the supply chain regarding key chemical and technical information. Engage stake-holders throughout the assessment process to promote transparency in regard to alternatives assessment methodologies employed, data used to characterize alternatives, assumptions made and decision making rules applied.

RESOLVE TRADE-OFFS Use information about the product's life cycle to better understand potential benefits, impacts, and mitigation options associated with different alternatives. When substitution options do not provide a clearly preferable solution, consider organizational goals and values to determine appropriate weighting of decision criteria and identify acceptable trade-offs.

TAKE ACTION Take action to eliminate or substitute potentially hazardous chemicals. Choose safer alternatives that are commercially available, technically and economically feasible, and satisfy the performance requirements of the process/product. Collaborate with supply chain partners to drive innovation in the development and adoption of safer substitutes. Review new information to ensure that the option selected remains a safer choice.

* "Safer Alternative: An option, including the option of not continuing an activity, that is healthier for humans and the environment than the existing means of meeting that need. For example, safer alternatives to a particular chemical may include a chemical substitute or a re-design that eliminates the need for any chemical addition." From Tickner, J. and Eliason, P. *Alternatives Assessment for Chemicals: From Problem-Evaluation to Solutions-Assessment and Implementation: A background paper created expressly for use in the March 31-April 1, 2011 Interagency Discussion on Alternatives Assessment, EPA Potomac Yards Conference Facility, Crystal City, VA. March 24, 2011*



Q Search Chemicals

You may search chemicals by Systematic Name, Trade Name, Synonym, Registry Number, or chemical group. (?)

The Data Commons lets you search over 100,000 chemicals for key health and environmental information using:

- 46 scientific lists for specific human and environmental health hazards
- 32 restricted substance lists
- GreenScreen List Translator scores based on the most current GreenScreen version (1.4)

Announcements



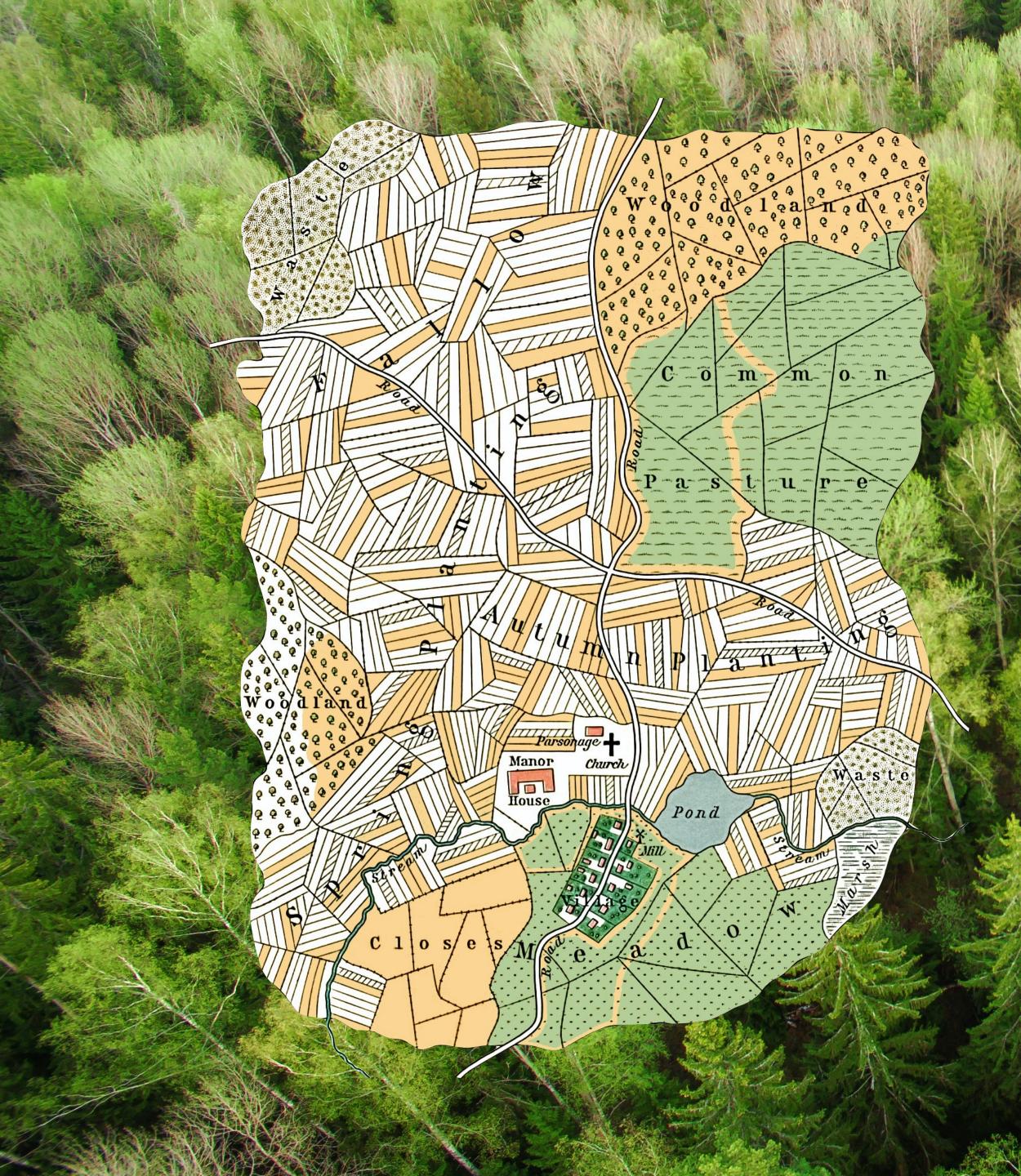
Data Commons adds modeled hazard data for 20,000 new chemicals

Posted by Michel Dedeo 1 week ago

Anyone reading this likely knows that many chemicals in commerce have little or no ...







GOVERNING the COMMONS

ELINOR OSTROM

The Evolution of Institutions for Collective Action



Political Economy of Institutions and Decisions



How can we left Half of

who, if any-there look-

THE MAN ON THE FEAR

at if school spirit at Harrison wasn't totally

for't have far to po. and to Ricky Trent, who was sitting next to trying to keep a bored Disa quiet. Ricky

y seems to be having much fun, do they?"

L'ANNÉ CONSTANTIN

- Eh bien, moi, je veux tout vous dire, s'é

vaincu par son émotion. Aussi bien 1 vaut-l

vuins machine pair son emotion. Anime tore search of vous machine tout. Vous rester ici, vous, vous a au chitera ... vous la reverrez ... elle! 5 -- Qui ... elle? -- Bettina! -- Bettina?

- Bettina?
 - Je Fadore, mon parraia, je l'adorel
 - O mon pazvre enfant!
 - O mon pazvre enfant!
 - Pardonnez-moi de vous parler de ces choses
 je vous les dis comme je les dirais à mon père. Et pui
 je n'aj jamais pu en pader à personne, et cola m'éto
 ...Oui, c'est use foile, a d'e eu à peu, s'est empamoi, malgré moi, car vous comprenez bien... Mon
 13 c'est ici mènes que J'ai commencé à l'aimer. Vous
 comot de est venue nue su servi... les petits re-

quand elle est venne avec sa sceur ... les petits s de mille francs ... ses cheveux qui se sont défait le soir, le mois de Marie?... Puis il m'a été per

la voir librement, familièrement ... et, vous-mêm 20 cesse, vous me partiez d'elle, sous me vantiez sa d

an hoesté. Que de fois vous m'avez dit qu'il n'y ave de meilleur au mondet - Et je le pensais ... et je le pense encore

sonne lei ne la connaît mieur que pois e restore ... 17 l'avoir vue cher les pauvres. En su su via, clara non-nérs, le matin, elle est si tendre et si brave! Ni la n ni la souffrance ne la rebutent ... Mais jui tort de

- Non, non, je ne venz plus la revuir, gais je ven pe entendre parier d'elle. — Tu se rencontreras pas dans la vie Jean, de fer meilleure et qui ait des sentiments più dievés. A seg

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tout cela ..

aid, trying a smille. licky brushed syrup from Dina's populckle off the re of her dress. "Maybe I'm just getting old, but it

"When are we going home, Mo-ther?"

or Jess's friends second

d they monived many evenings, which Sodia a had never learned with a poor card sense athew's offer to teach preasure that he gave

dily and Neal Barren, of at Groy Walls, but telephones, and Stella weise which welcomed her and Matthew to not be a fashionship effress, and went down har simple olive grows of trying to create an

horately colleared and fit waves, her argainly these lustre highlighted

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and multing

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if her dress. "Maybe I'm just getting old, but it ferent, wasn't it, when-Disa, be still until I

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ald have

THE MAN ON THE PEAK

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yes entroy and connect motion,

THE GIRL FROM MARRISON HIGH

"Sconer than you think, if you don't keep---" Ricky shock her head at Hendry. "The band is good and the cheerleaders are good; at least they try. Bat--how many students would you say are here tonight? It how it inn't a big game, but I'll bet there aren't five impacted of our bld hure." red of our kids here

Five hundred out of sixteen hundred." "Prive hundred out of scrittern hundred." "I'm sorry for Jin's sike. He's worked very hard and nobody cares much whether they win or lose." She sighed. "I think I'd better take Dins home. Jim won't mind if we leave early." Rickly looked once more around the stadium and at a crowd that wouldn't encend two thousand. "It was fun once," she said hulf to hernelf. "Not that I miss it so much--but, Nell, I feel to budly out of tooch. I look at some of theirs kids and I wonder what they're thinking. I should know I wonder what they're thinking.

--shenida't I?"
"What I keep asking myself," Hendry admitted, and he stood as the half ended. "I'm feeling as restless as Dina, and it looks like this one is sewed up. I'll drive you two home if you'd like, Ricky," They left the stands slong with a good many others and made their way patiently down the crowded run-ning tack that circled the field. Hendry smiled at greet-ing tack

.

"I'll walk across the fields with you," Dermot Ught No, I did the right thing in coming back

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Upil No, I did the right thing in coming back See didn't use the word 'home'. Claire noticed, and in a subdued frame of mind went up to bed. But was some time before size got off to sleep, mented by the story of Tounderflash. Dermot had bid it briefly and without emotion. But the under-ing tragedy was clear enough. His father had metagedy and clear enough. His father had metagedy may clear enough. His father had metagedy may clear enough. His father had metagedy may clear enough. His father had metagedy has clear enough. His father had metagedy may clear the root of Dermot's bitter-metaged clear end of the second of the second metaged clear enough of the second of the MacDura meta father would harfly be aware of the MacDura metaged in the would certainly mever ecour to him to peculate upon its demostic implications. The world which finance is not buill like that. Meaning one of them--she didn't know which-met riding one of them--she didn't know which-met ride in taking a fence, throwing her to the product. She could ase Dermot MacDura standing metage. She could ase Dermot MacDura standing metage trimershear ever the more father to the product field in taking a fence, throwing her to the stand it for a standing over her in her Bachura standing metage over the metage over the in her Bachura standing metage over the metage over her in her Bachura standing metage over the metage over her in her Bachura standing metage over the metage over her in her Bachura standing metage over the metage over her in her Bachura standing metage over the metage over her in her Bachura standing metage over the standard the

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After dinner, Venice stood on the afterdeck watch-ing the churning wake which left a frothy trail across the water. Scapills acresched over the debris thrown overboard, the advent of the birth a sure sign that land was near. Dusk had failes and a few stars shore. From the depths of the ship came the sound of a balalaka band; the off-dusy case were entertaining the lew passeneers.

hand; the outdaty circs were entertaining the less passengers. She knew he was there before she saw him, though his rubber-soled samala made no summit on the deck. He came up beside her and had his hands next to here on the rail. In every nerve she was aware of him. For some while mether up, there as aware of him. For some while mether up, there as any longer. Venice restarked that they would som be home, at observation that by its very triteness restared them to commonplaze.

commonplane. "It has been a successful trip, yes?" he commented, his knowing gaur faced on the sea. "Very pleasant." "Pleasant." "

"And what do you mean by that?"

ery formidable pile of correspondence. It's most aving you so much occopied just now." orbore to ask if she would have found it any less t say other time. hem for yos, shall 17' she offered.

CHAPTER V

For a moment Alison mood staring after her must until the door closed. Then she turned many and slowly began to mount the stairs. Was it just incleanness or real malice that made Aunt builts and dones theory? the uncohered.

Lydis wy these things? the wordered. There hadn't been the smallest rescon to make such a comment, quies spart from the fact that it was very unlair to the unknown Jennifer. "She just wanted to make me feel uncasy and minerable." Alion thought, And then: "Well, I won't give is satisfaction. It's all too petty and absurd to worry in result."

But of course, the couldn't dismiss it enti-mind like that. Instead, the recombered th julian's voice when he had said, 'On, Jerus looking-warv'

ultimity visite when he had many on the social acking-wave?." Made when shows \$2? Alison solied here Haden't for slow solid that he had known her soul far, he would have done to long ago. She rich not to lister to the little volke wh chere had showy here. Rossile before to thoughts, Now these was no Rossile before to thoughts, Now there was no Rossile before to thoughts, how there was no Rossile before to be when the supportion?

ing unoccupied meant having these ridion She went down again to her sum's stud

Incid in. 'Can I do snything for you, Amrt Lydia? She managed to make that sound shthough her feelings towards her same were 'I'ca, Alione, you certainly can. I have I how I was to get through all this.' Anne I

A know Migai has sind yas to marry him, yes.' Do do yas approve?' Enno i sense to wards him. The considered for the magnitude, Y. H. do vit knows. How not sense wards and the sense to ward the sense wards and the sense wards and the sense that is the sense of the The sense wards and the sense that the sense of the sense wards to be sense wards and the sense of the factors is how you understand.' How may doed and there is the sense you understand.' How may doed and the sense of the is factors is a single part of the country!' He prevent the statute hang is the sense of the factors is the part doed reason and the sense of the factors is the part doed reason.' He coundered the glowing the of the factor is a single reason wards and the sense of the part doed reason and the sense of the factors is the part doed reason.' He coundered the glowing the of the factor is a single reason wards and the sense of the factors is the factor is a single reason ward wards and the sense of the factors is the factor is a single reason of the country!' He prevent part doed reason and the counter of the factors is the sense of the factor is a single reason of the country.' He prevent the factor is a single reason of the country.' He prevent the factor is a single reason of the country.' He prevent the factor is a single reason of the country.' He prevent the factor is a single reason of the country.' He prevent the factor is a single reason of the country.' He prevent the factor is a single reason of the country.' He prevent the factor is a single reason of the country.' He prevent the factor is a single reason of the country.' He prevent the factor is a single reason of the country.' He prevent the factor is a single reason of the country.' He prevent the factor is a single reason of the country.' He prevent the factor is a single reason of the country.' He prevent the factor

er---'Adept?' supplied Rams questioningly. 'Si, that will do. He we adept at playing the plane. P

Is she dead

Si, señerita, 25, also.' 25 something

If,' Juan was

UNDER MOONGLOW

in our, obviously. Fur it under the grill, and by you'd like a drink while we're waiting?' ally also moved to the sizes. The steak was do e put it under the grill, aware that he was bury now. It was straight to see so masculine a man source. Bur if he chose a life like this then he have do his new mathema. She chosed at his

try do his own cooking. She glaced at his wyrs and decided he had an artistic streak a doght he was a mas of varied and da-

the states are sensed in the sitting-room where hidd by the smaller of two windows. Is to use the dising-room when I'm on so and. By manic's in here and I like to have

was on the table, which was laid with a

ternel muts, glearning niver and fine of laid her place and was now at the cupb

are here her dreick. study you like, Miss Chapman?² erry, please," she assurement, wiching the was con-der such an obligation to hum. I hour later they were assured at the table and reasonaly hangpy as she was, had some consider ulty in esserching her contourney good meanner scorerioed in one at slowly, and she savourd ever , aware that the would be on her diet of fruit to

vine?" There as a host was furtifients in his or-ing sure the had everything the required. She we attractive side of him which brooght on the herman warely have had some experience at charg-free it second impossible that he had at one actions fore-affair. He appeared for to have been able to excape women alongth chaing the bentle, wairing for her answer, and

t all?

being a very little boy, you understand.' Emma nor again and Juan unlied to - when he is older, he is

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plan

which you would.' Her assnt immediately gave up her presence of examining them herself. Then, after a site added, if suppose I musuit texpict much help you, now that you don't feel it necessary to mudy me my longer." How she does judge other people by hersell,' thought Aliana, 'No wonder Unde Thrackare despises her." But shead she said, T doo't imagine I shall be so busy as all that, Anat Lydia. I'll still do what I can to help you, of

in , and and bun the

Emma went to see Miguel that evening. She had taken some

me deciding what to wear and had finally put on one of the reases Victor had liked so much. It was very plain, its navy arkness unrelieved by any adorament, and yet with her

newly styled hair it looked altogether different. She had been tempted to keep on the trouser suit, but it was hardly the attire for an evening appointment, and besides, she was

To her surprise, a girl let her into the suite, a tall, dark

ger trying to prove anything - to anyone.

, remember, and hitle play perice. Analye have we have. The Caroy cell and win that, an or worried ab regret using an or the movality of the movality of the movality of the movality of the movality. I a Advanced Eth and real people, do nothing. We wunch, if you will get resuble than to compress state -compress state -compress the Ana

UNCER MOONGLOW

Bind saying yes, she would like some more wine. The Mind the glass; it caught a reflection from a stand-hup and sent sparks of light thought; it needs only in the centre of the table. She thought; it needs only wand candles for this to be the most semention.

ad candles for this to be the most romantic setting a meal could ever be eaten. She upped her drink

a proper drink of her wine. a weak to your liking? he asked, breaking the

the backs to your lixing? he soled, breaking the constraint and section between them. You didn't over-it? He eyed it with a slight frown; she had noticed in steak was very rane. If deficious, 'she answered and, to herself, she was say-ted it was the most deficious meal such the had exist for Bar sever would she have given him the satellar-it knowing just how much the was appreciating his

al. Help yourself to more vegetables if you want

Thank you, I will." The main course was followed by a triffe--a acramptions-set of the second secon

a shout this dramatic change is his strong was not encouraged her to say that the agreed shout the foods, and could not retain adding. You made the lot of the housewife so much easier, they are a strong to the source of the so

over so," without much interest. I was speaking system I find that as long as I see that the deep-is kept anothed, I'm not short of asything I could I form on Mable."

'Oh, why,' she whispered in a low quivering soice,

On, wird, sine whisperred in a low quivering suice, that it have to be you?' He shrugged slightly. 'Kismet.' He took hold of her writt and turned her to face him. Their features were himred in the dim light, and he was only a dark shape in front of her, but he still held her wrist and his

In the start of the still held her write and his ingre were warm and vital.
 ² Maaringe between us would be suicide for me and animes for you.' he told her quietly.
 ³ Warringe between us would be suicide for me and mailer experiment a shock to realize that he had the family considered marringe, something that he had the second start is would be minderen. She was start in the start of the second start in the shade of the second start of the second start is would be minderen. She was start in the start of the second start is would be minderen. She was start of the second start in the shade of the second start of the second start is the second start is something at the second start of the second st

conscious of his critical stare.

and a wrong the second second

Her sunt appeared satisfied with that, slithough the didn't

The Fabulous Onassis

tioned earlier. Contrary to what has been written on the subject, the difference that ended their many years of friendly relations started with a favor that Onassis rendered to his good friend Embiricos. The stock that Onassis bought in 1952 gave him complete control of the casino, but involved so much work that by 1959 he decided to hire someone to take over this responsibility. Embiricos suggested that one of his cousins who had lost all his money in the stock where in New Mark needed a job and would be an

> I many talents, but he sims of the casino. First, he w redesigning the gardens ad the Calé de Paris, withall. As a result, the stock Rainier was tired of seeing

deteriorate in the hands of e asked Onassis to sell his usis is not the kind of man around after somebody has sover, he was insulted that not taking care of Monte Lecordingly, Onassis offered nce Rainier could take it or

suggested \$8,000,000 and ad joked ad joked as of in his of the sys-ary abym ay ron just going to sit down e may crack, and give you

e was t were or asal. Tuck,' amiled years elation 17 We'r of one b wroig? e. The l

been the

ubbern, a troubled, a troubled, a, he said. 'I don't like the responsibility id, he said. 'I don't like the responsibility ind. He knew Alex's moods, they had be an now, and they had gotten beyond to toonday. 'You're taking yourself a triffe sa borned by 'You're taking yourself a triffe sa toonday. 'You're taking yourself a triffe sa we're jant doing our job.' we're jant doing our job.' we're jant doing our job.' and Fit was your plan, remember, and fit was your plan, the bar of the same before, it thick.'

t with the prospect, Marakis effection, hired him for the

> s man once who was on after their ship had burnt. e water. One of them drank to wreck the boat so that a menace to all of them. In yoard - with the result the od and water to last until me it he'd have died, any-et likely.' lecisively, 'we couldn't do

anyone - especially not for Laybe you're not the kind

If it were Alan you were row him overboard, we'd and we can't do it - not with any of us; we just ether. I'm much closer

H our thoughts; but I knew with certainty

couldn't do m....' 'The alternative is the sword over your heads,' he said. 'I know,' I spreed unhappily. 'But that isn't the way. A sword inside us would be worse.' the need of one and discuss that solution with the others for f

t she was being more such

then they do kno

Olivia shook her head weakly. 'Lie still,' he rapped. 'I want to catch your horse,' and disappeared through the waist-high

The second secon

to know ...' "E'ell, you know now. I can't jump. I never have. I never will. I may never jump again—and I don't mean on a horse

Stop being dramatic. Where does it hurt? Matthew knelt by

Stop being dramatic. Where does it hurt?' Matthew leads by benetic. The pave a bitter laugh. 'My goodness, don't come showing the old concern, if you please! I quite make you're more worted show the hore than me. Why don't you catch him and see if he's all night and' 'And why don't you try shutting up? Hell, woman, I didn't wate him youting to with the others and worrying them, or plane tok uncernary and ...' 'On, really? Well, it would be nice to have someone around here who was worted about me ...'

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A Fabulous Success Story

ivestened to arrange that Onassis would no longer be the major stockholder if he refused this offer. Onastis had no choice but to accept. Most people throught that Onassis' investment in

Monte Carlo earned him a great deal of money, but that is completely untrue. Although he did manage to double his investment, the same amount invested at a mere 5 percent over fourteen years would have netted him the same profit. Needless to say, Onassis was not me who made his fortune by investing his money at wh a low rate of return. The only good thing to come of this risk, which he took out of friendship for Maris Embinicos, was that he kept the old winter sports holding, which still houses the Monte Carlo offices of

I would like to conclude this chapter with a story that in a way goes against all of Omassis' principles of good business. One day in August, 1960, he was exected to arrive in Glyfada in the afternoon. I was one of the individuals scheduled to meet him on shore

Onastis was quite late in arriving, and without wasting mael, not stopping to speak to anyone. The engines

aying: "Mr. Onassis, I absolutely have to talk to you!

with the Chris-Craft and transport him to the Christina, which had been at anchor in the bay for over two weeks. The usual crowd had gathered at the port and some policemen were on hand to preserve order. my more time he went straight from the car to the were already running and the Chris-Craft was just hout to cast off when a young boy broke through the police lines and plunged fully clothed into the water.

what their verdict on it would be. I knew that Uncle Axel had

posed the only practical solution; and I knew, too, its im-ibility meant recognizing that nothing could be done. ne now transmitted nothing whatever, we caught no trace r, but whether she had the strength of will not to receive ere still uncertain. From Rachel, her sister, we learnt that

could listen only to words, and was doing her best to pre-

And in the following weeks Anne kept it up, so that one

wise to marry beneath her, but otherwise there was little uring the next few months we heard scarcely anything of

ne idea n quic)

Zor

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to all man

a such over and let you." She sat up cautiously, and so facthers's inquiry of 'what horts?' she replied emotionally: Desrything!" Matthew mood up and held out his hands. "Come along----

"If you insist," groaned Olivia. He hoisted her up callly al when she would have staggered held her firmly in has no while she tested her kep. What an extraordinary day,

asperienced man like Caret on an esomeone like Elli Linato quera. Suddely Anna was holding an an intellighte chance babbeli in quickly to her ear. Tr's all right indice the search was been up to her ear. Tr's all right indice the search is stated down at the analytic particular of the search is stated down at the search is stated down and the respected having life of the net of the search is stated to her and the search is stated to her and her search is stated to her sear

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almost believe that she had succeeded in renouncing her ifference and becoming a norm. Her wedding-day arrived rith nothing amins, and she and Alan moved into the house chich her father gave them on the edge of his over land. Here ad there one encountered hints that she might have been

herself that she was a norm in every way, but that could

drew unconcernedly. "A next?" "Of hooded crows. They halld down there and it's a good opportunity to get rid of them. We don't allow the creasures to propagain their rate if we can possibly result it."

the creatures to propagate tents take it of can plantary "I with I could use Microfith," mild Robbie excludy. Will be have taken all the app?" "They'd hanched, Robbie, He's hilled one of the surrent, I expect, so he'll be dealing with the

They have been all the solution with the second of the solution of the solutio

"A fahing lodge." "You fish in the loch?" and when he nodded, "You catch salmon?" 48

THE DARK DASIS

wise to renormber that I am the provider. Td rather starvet¹ His voice was silky. My answer to that should be to imprison you in some inferior tent, of which we have several, but in depriving you, mademosielle, I would also be depriving myself. So I will take no notice of your childish rantings, I'll leave you, though, with a word of warning. If you refuse to hath and change your clothing

yd well ami Gareth p Sof / Sof / Sof / Sof / Careth Careth Careth Careth Careth Mar fra Sof / Careth Careth Careth Careth Ion good Sof / Sof

then she always was be table, watched his e. I wondered what he e love and admiration he resent the fact that with his grim English for the excitement of 'or sure; but I thought ano failed to relish his

Salone dei Tritoni and rothers played; I had had admired his pre-. Andrea played with e did not repeat the romantic ballads in es at me during the s all in good fun, and ming went on I won-ing overexcited. His feverial.

re created barrent and for the stair, l for an and be want to be stair, l for control to be stair, l for sould be stair, l bottom of the stair, I not wing. The family and there were more now that something

The door of one of the bedchambers was open and a beam of yellow candlelight spilled out into the hall.

like a hull-beed gypey with his growth of beaut and his <text><text><text><text><text><text><text>

proparelising his champsionship." Though Sonya knew Thomasina was wrong in her narmise, is hour her to hear hernell dubbed a sock and her new-frand couldence wavered. If that was how th club members assessed her, her task was even more

The scheme are in the river," Robbie instantly in-figure the second sec

stream?" Andrew lifted his brows at that. "Probably non-but we aren't in the habit of poath-

She flushed, but his mood led her to say. Not newsdays, but the Scots have a dreadful re-

"Not neveralize, but the local to all," "Bot neveralize, but the local tasks a dreadful re-putation." He langhed and Gall caught her breath Louise had declared him to be the handcoment man she had ever sen, Gall modeliny recalled... "There was a time in our himnry when we did exist in a wase of tribal warfare, preferring to rob our mighbours-or, even being, the weakty effect English across the border." Gall langhed then. "That's net very nice!" We are speaking of long, long ago," he reminded her. "Were you as had as the binning.

her. Were you as had as the historians make cast? The abraid with the deminant Y was see. Social and preve index the class system: we had chiefhaims who theme would be also be able to be able to be able to be unable and heres, descended as they were able hos-buildes and heres, descended as they were from the worst in all participants and the bloodhimsty deeds committed have not been excapterated. He went on to expand and Gail linened with here interest. How

49

THE DARK CASES

has a peculiar habit of catching up with little cheatt, especially those who are too promiscuous for their own Taking an involuntary step backwards, she stared up

Taking an involutionly step backwards, she stared up at him. You sound both insulting and threatening, mon-sieur, but I don't know what you're talking about.' 'Ten, you do.' Soutching her arm, he dragged her close to his hard body, fixing her immobile with his relention dark eyes. 'You are aware of a certain foeling hetween the mademoiacile. As yet I am not quite sum what it is myself, but I intend number a few involvement. m. mademoizelle. As yet 1 am not quite sure what it is myself, but 1 intend passing a few intriguing hours finding out. And 1 don't mean to be denied that which you've squandered so generously in the past on other men. Twe told you, you're mistaken't she cried, her face going white as his words filed her with dread. She knew is specke the truth, there was asserbine herbeness them.

e was samething herweep them, when he had kissed her there when he looked it her, when he had kissed her there was the sensation of two live wires meeting and fusing, but whatever the cause it could only be an illusion. Nothing permanent could develop in so short a time. 'You're spate mistaken,' she repeated, tenuely. The never mistaken, mademoiselle.'

His eyes glittered, 'You can't leave that alone, can you? I won't tell you again !' Her own temper rising hotly, she held his senoulder-

Her own temper raing holly, she held his sensulders big stars. Ten not that easily intrimidated!' 'No, you're not, are you?' his anger changed quickly to a soft mockery, which she found even more fright-ening. You aren't he same girl who ran, almost acream-ing, when you thought a camel was going to hise you, and who declared hysterically that the heat of the sum was reliable over complexies.' This new Maxima ensure was ruining your complexion? This new Maxime arouses my interest, and I have need of this interest—of the Pamion you move in me.' Before she could reply he let her go abruptly and left the tent, leaving her trensbling.

gave a sharp order.

the signora." The signora-s courtesy title-was Miss Perkins,

<text><text><text>

march on you

That will you to the second se

The room was filled with people. One of them was Miss Rhods, almost unrecognizable with her hair up in curl papers and her bony figure undisquised by the limp folds of her dressing gown. As I peered in, she "Get out, all of you. I don't need any of you except

The supports is courtesy this was this Fernan, who was looking down at the bed with an expression of concern. I could not see the occupant of the bed for the servants who stood around-two of the footmen and several maids. These people obeyed the order to leave, and as they came toward the door, I saw Andrea. His none were half closed and their blow hellings

BELICIANT PARTNERSEE

emidable, but surely she could not be so hopeless or

Sten would never have agrend to partner her. 'Over up, chick.' Thomasina's friend told her, here-

ing at her. Our ice maiden is use much of a Puritan r

appire to his head, so you'll have your interings there."

Twe already made a start in that direction," she

Sonya stood up and moved away out of earshos.

Sven's love life was no concern of hers, but the did not like to think of him in connection with Thomasina

who was her energy and would min no opportunity to designate her to him. He had sold her the blonde at

racted him to much he would not skate with her, but the idea of an affair between them nameated her. How

could she endure fiven's souch when he came to her straight from Thomasina's embraces) But she could not explain her revulsion and had no right to consur-him. Possibly Thomasina's insimuation had no founds

tion. She could only stills has averaion and give him the

benefit of the doubt. Just why she was so repelled by

towards Sven were still chaoric.

he said gloomily.

heir connection she did not try to analyse; her feetings

Sven with his glamour and obvious sexual charm was not a rival with whom he felt he could compete.

I suppose you'll end by falling in love with the guy."

dear. I do hope your hand ion't giving you no much pain. Freys was siming up before Deark could help her. The ardedity secury to give you all this module,' the spologized accepting the pain. 'The hand int't no bad.'

trek too was not pleased by the course of events.

Domasing threw Sonya a malicious look.

THE LAVAGE TOUCH

the heat of summer." Les gave a shoulder at the grim picture he painted. "I guess Fos city-orientated," she amilied, and he sizented her a muning grin. "Tied to an office deak, noise to five?" he hazarded,

and the laughingly shock her head. "No," she denied. "Searching on my feet all day tend-ing to accurate the searching mem's. It's an exacting

the heat of summer

e elsser you? The you and he sourced has at and the sourced has the has the hast discusse of a source of the hast discusse of a source of the source of the photon source of the house source of the house source of the house you have competing. She that presents the down of source halos competing. She that presents the down of a source halos competing. She that presents the down of a source halos competing. She that presents the down of a source halos competing. She that presents the down of a source halos competing and the house of a source halo house rates of the spectrum of a source house rates of the spectrum of a source house rates of the spectrum.

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the's she hast man I'd ever fall hat,' she declared

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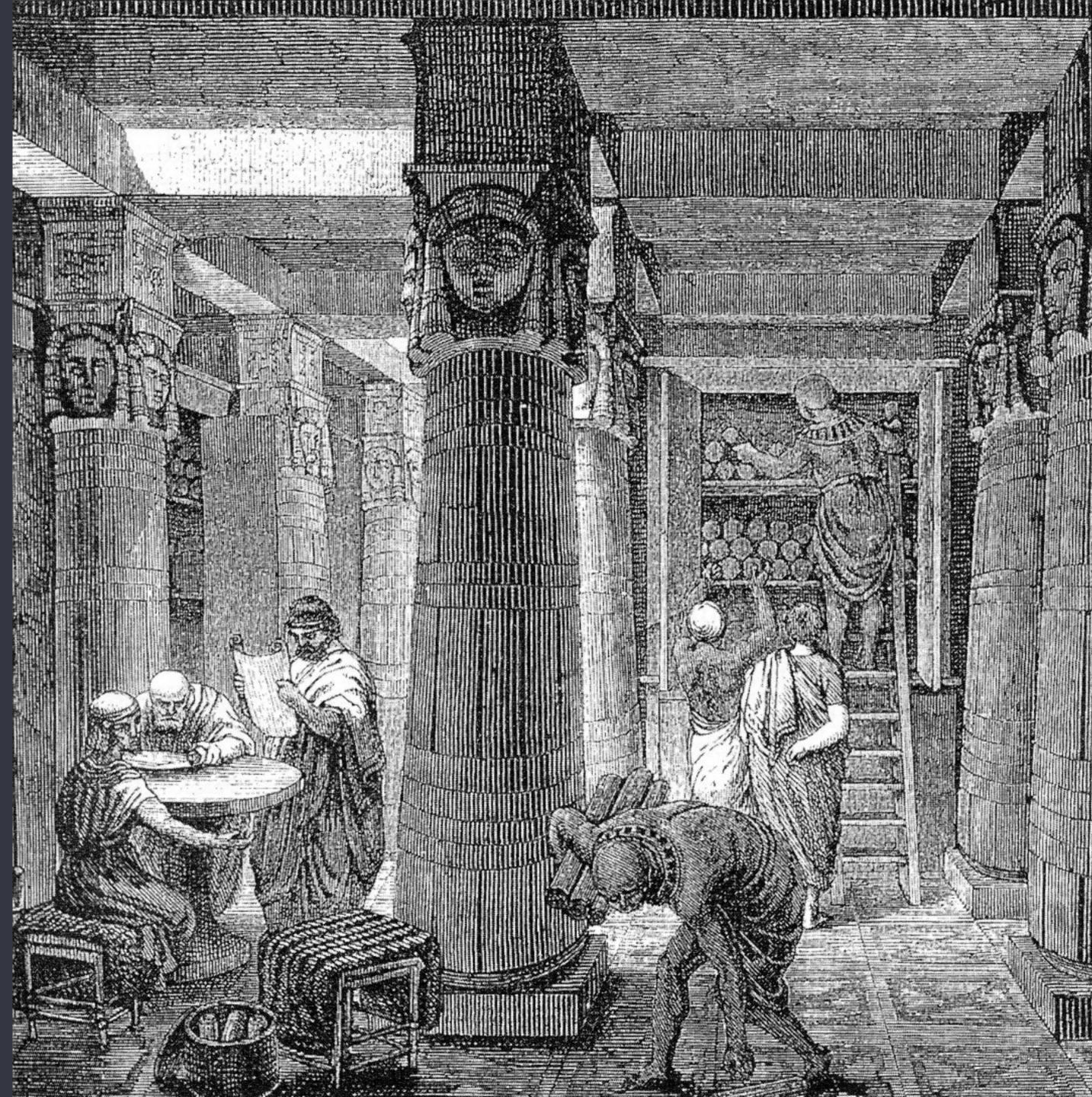
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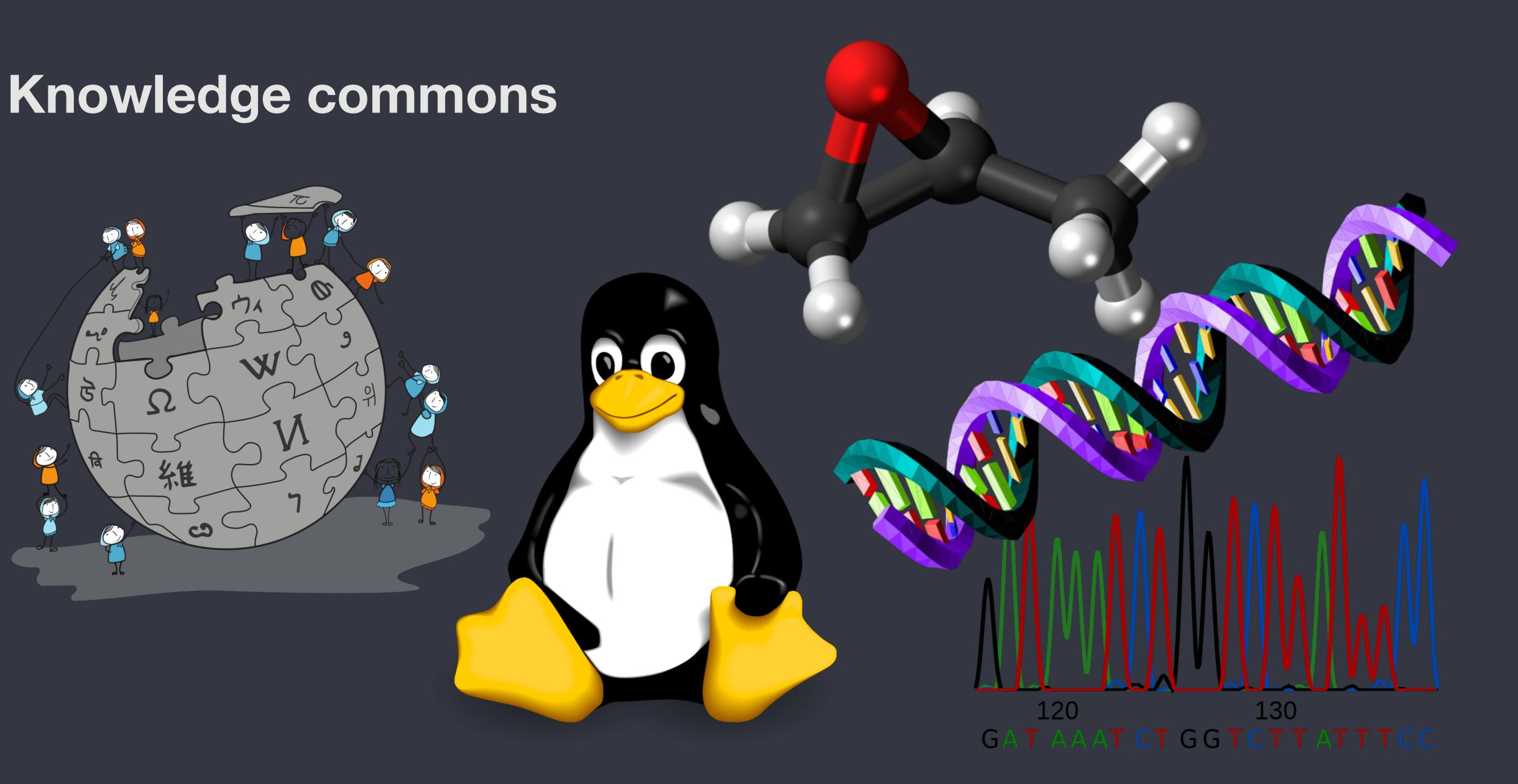
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Knowledge commons





Hess, C., & Ostrom, E. (Eds.). (2007). Understanding knowledge as a commons: From theory to practice. MIT Press. Schweik, C. M., & English, R. C. (2012). Internet success: A study of open-source software commons. MIT Press. Frischmann, B. M., Madison, M. J., & Strandburg, K. J. (Eds.). (2014). *Governing knowledge commons.* Oxford University Press.

8

Knowledge commons

- Are governed by rules, protocols, and community practices
- Not the same as "open access"
- Face different challenges than natural resource commons

Hess, C., & Ostrom, E. (Eds.). (2007). Understanding knowledge as a commons: From theory to practice. MIT Press. Frischmann, B. M., Madison, M. J., & Strandburg, K. J. (Eds.). (2014). *Governing knowledge commons*. Oxford University Press.



Why knowledge commons for safer chemicals?



Initiatives for knowledge sharing in CHA/CAA



Toggle menu

MOVING TOWARDS SAFER ALTERNATIVES







SUBSPORTplus - SUBSTITUTION SUPPORT PORTAL

Welcome to SUBSPORTplus the Substitution Support Portal!

Here you can find information to support your efforts in substituting hazardous substances. Enjoy exploring the portal and please do not hesitate to **contact** the project team for any comments or questions.



State Chemicals Policy

The State Chemicals Policy Database is a searchable database of passed and pending state-level chemicals legislation. Users can search the ... Read more



States' Chemicals of Concern

Various IC2 members have developed ar published lists of chemicals of concern a their efforts to implement new state ... Read more

Welcome to the Interstate Chemicals Clearinghouse

The Interstate Chemicals Clearinghouse (IC2) is an association of state, local, and tribal governments the economy through the development and use of safer chemicals and products.



A unique collaboration of business and environmental leaders working to advance healthy materials and a safe chemicals economy

LEARN MORE

WHAT'S NEW

Dollar Tree joins Chemical Footprir Project

CONTACT: Alexandra McPherson, t)...

READ MORE

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Q Search...

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Try Benzene 50-00-0 surfactant roofing

About Pharos

Pharos provides hazard, use, and exposure information on 164,042 chemicals and 156 different kinds of building products.

Hazard Assessments

Certified GreenScreen assessments in the public domain or for sale.

Hazard Lists

Authoritative scientific lists for health and environmental hazards and restricted substance lists.

Common Products

Common contents and hazards of 156 different kinds of building products.

Data Services

Pharos data in bulk and expert analysis from HBN researchers.

Want to get the most out of Pharos? Upgrade your account to access more data and downloads, or visit our Tutorials page and Case Studies for inspiration.

Looking for building product guidance? Check out our sister website, HomeFree.

Announcements



Join us for a Webinar on Using Pharos to Power Platforms and Data Systems -Friday June 26, 2PM ET Posted by Michel Dedeo 1 week ago

Still manually managing lists of lists for your EHS, regulatory, or sustainability...

Discussion Activity

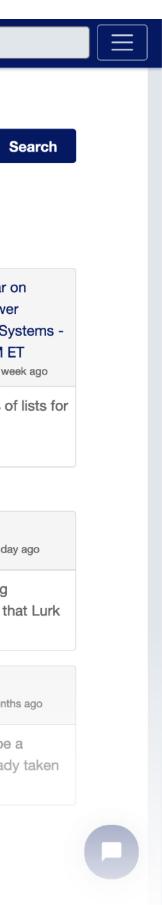
Wood Preservatives Posted by Patricia Ferris 1 day ago

Hi, I recently read an old blog post, "The Toxic Chemicals that Lurk in Unfinished...



Durisan Posted by Kevin Harr 2 months ago

If I were on "Who Wants to be a Millionaire?" and I have already taken a deal. I would...



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Some knowledge resources for safer chemical substitution

Resource Type	Access
Assessment methodologies	Shared
Certifications and standards	Shared
Data resources	Shared
Chemical assessments	Mostly private; some shared

Who	provid	les the	m

Examples

NGOs and government agencies, sometimes with external input

> NGOs, firms, and governments

EPA Safer Choice; GreenScreen; Cradle to Cradle Material Health

GHS; EPA Safer Choice Standard; Health Product Declaration

NGOs, firms, and governments

Pharos; Toxnot; SIN List; PubChem

Chemical profilers & platforms

ToxFMD; Scivera; ChemForward; Pharos



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Community goals motivate collective knowledge work



Community goals motivate collective knowledge work

Community goals

Create new shared resources

Reduce duplicative work

Alignment on technical, methodological, and scientific issues

Consistency & interoperability

Underlying shared challenges

Lack of existing methods, tools, databases

Many disparate centers of activity Many disconnected data sources

Scientific uncertainty & conflicting interpretations Hazard & exposure data gaps

Making the case for safer substitution in practice Having an aggregate effect on industry

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The Chemical Hazard Data Commons





The Chemical Hazard Data Commons

- Provide publicly available data & tools for CHA/CAA
- Enable community participation in developing new knowledge resources
- Integrated into Pharos since 2019.09

for CHA/CAA eloping new







PRACTICE BRIDGE Building shared information infrastructure for chemical alternatives assessment

Akos Kokai^{*}, Ann Blake[†], Michel Dedeo[‡] and Tom Lent[‡]

The substitution of hazardous substances with safer alternatives is being driven by policy pressures and business demands. As a result, scientific techniques for chemical alternatives assessment (CAA) have been established and communities of practice are emerging. Interest in safer chemical substitution is widely shared throughout a range of stakeholder groups across science, industry, public policy, and advocacy. Yet there is an unmet need for intentionally designed public information infrastructure to support the highly knowledge-intensive nature of CAA. We report here on the process of developing the Chemical Hazard Data Commons, an experimental project intended to support a diverse community of practitioners by providing publicly accessible chemical hazard data and tools for understanding it. In an arena where market forces and regulatory regimes have largely failed to generate the necessary knowledge, this project represents a novel application of a commons-based approach emphasizing building shared intellectual and technical capacity for CAA. The Data Commons—now a part of the related Pharos Project—includes an online portal providing simultaneous access to many different sources of information and enabling effective interactions with it. Foremost among these interactions are search and retrieval of hazard information about chemical substances, uniform display of the most relevant information, and the ability to automatically screen substances against consistent and transparent hazard-based criteria. We describe the motivation for the project and report on the principles and key considerations that guided its design as a participatory information infrastructure. We present our approach to organizing chemical information; the process of community engagement and planning; and how we constructed the system to provide functional tools. We discuss the outcomes of the project and highlight important challenges—such as fostering active participation and planning for long-term governance. With this article, we hope to inform future efforts for the collaborative development of knowledge resources for chemical alternatives assessment.

Kokai, A, et al. 2020. Building shared information infrastructure for chemical alternatives assessment. *Elem Sci Anth,* 8: 26. DOI: https:// doi.org/10.1525/elementa.422



Participatory information infrastructure

124-38-9

Information infrastructure

- Organizing data meaningfully
- Practical tools based on accepted frameworks (e.g., GreenScreen LT)



0 Othe



Participatory information infrastructure

Participatory

- Community engagement in development
- Interactive system (forums, projects)
- Aggregating community expertise



Collaborative knowledge production: How?

- Harness people's interest & available expertise
- A variety of motivations; no universal incentive structure
- Channel attention to problems that need solving
- Make it easy to contribute
 - Modular projects
 - "Microcontributions"

Benkler, Y. (2006). *The wealth of networks.* Yale University Press. Schweik, C. M., & English, R. C. (2012). *Internet success: A study of open-source software commons.* MIT Press. Nielsen, M. A. (2012). *Reinventing discovery: The new era of networked science.* Princeton University Press.

xpertise icentive structure ed solving



Forms of collaboration

- Adding NGO research to the Data Commons
 - Unpublished US EPA regulatory documents (with NRDC)
 - Plastic packaging chemicals (with Food Packaging Forum)
- Shared scientific literature library
- Community discussion and support (forums)
- Collaborative development of chemical groups methodology
- Collaborative review of studies & datasets
- Collaborative work on hazard assessment science



Challenges to collaboration

- A poor fit between problem-solving needs, community availability, and online tools Limited available ways of participating
 - High technical demands for participants
 - Long-term projects without compelling immediate benefits
- Majority of development effort went into tools
 - Lack of sustained community engagement efforts



Lessons learned

- business projects
- "Scaling" chemical hazard assessment won't work without addressing the institutional and economic background conditions

Schwarzman, M. R., & Buckley, H. L. (2019). Not just an academic exercise: Systems thinking applied to designing safer alternatives. J. Chem. Ed. 10.1021/acs.jchemed.9b00345

Shared information infrastructure and tools have benefited educational, NGO, and

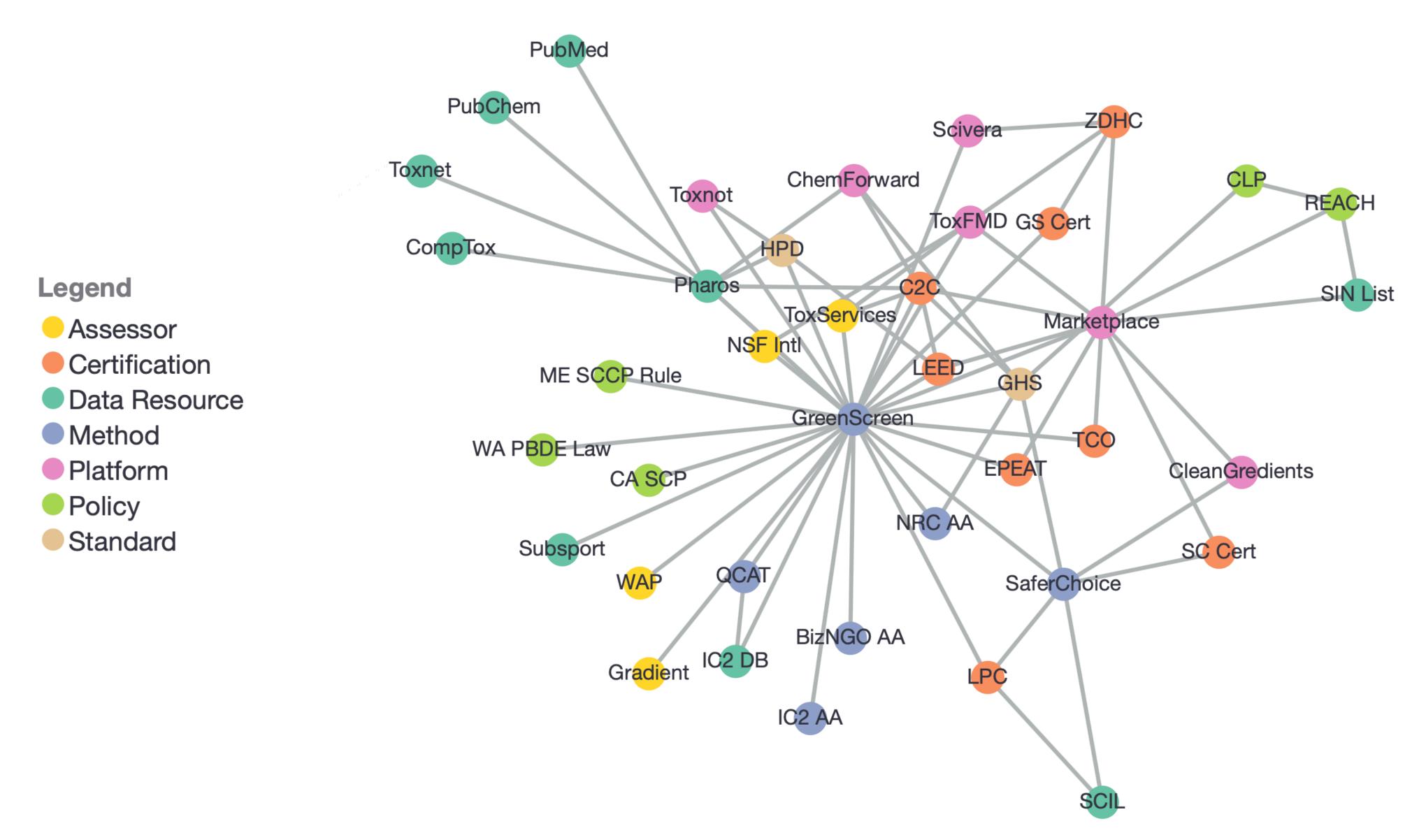


The GreenScreen Ecosystem











The GreenScreen "ecosystem" is a knowledge commons

Resource

GreenScreen method

Derivative methodologies

Associated tools, databases

GreenScreen assessments

Private; some shared

Δο	cess	
	JC33	

Provision

Shared

Shared

Clean Production Action with community input

NGOs & governments

Shared

NGOs & firms

Profilers





How are knowledge resources are produced, verified, and shared?





Challenges for policy-relevant science

- Data gaps
- Scientific uncertainty
- Conflicting interpretations
- Political contestation

Judson, R., et al. (2009). The toxicity data landscape for environmental chemicals. *EHP*. <u>10.1289/ehp.0800168</u> Wilson, M. P., & Schwarzman, M. R. (2009). Toward a new U.S. Chemicals policy. *EHP*. <u>10.1289/ehp.0800404</u> Scruggs, C. E., & Ortolano, L. (2011). Creating safer consumer products: The information challenges companies face. *Env Sci & Pol.* <u>10.1016/j.envsci.2011.05.010</u>





Challenges for policy-relevant science

- Contested definitions of safety
- What counts as acceptable evidence
- History of adversarial deconstruction & delegitimization of science (U.S.)

Jasanoff, S. (1987). Contested boundaries in policy-relevant science. Social Studies of Science, 17(2). 10.1177/030631287017002001 Markowitz, G. E., & Rosner, D. (2003). Deceit and denial: The deadly politics of industrial pollution. University of California Press. Vogel, S. A. (2013). Is it safe? BPA and the struggle to define the safety of chemicals. University of California Press. Boudia, S., & Jas, N. (Eds.). (2014). Powerless science? Science and politics in a toxic world. Berghahn.







Socially robust knowledge



Helga Nowotny

Nowotny, H., Scott, P., & Gibbons, M. (2001). Re-thinking science: Knowledge and the public in an age of uncertainty. Polity. Nowotny, H. (2003). Democratising expertise and socially robust knowledge. Science and Public Policy, 30(3). 10.3152/147154303781780461 Iles, A. (2013). Greening chemistry: Emerging epistemic political tensions in California and the United States. Public Understanding of Science, 22(4). 10.1177/0963662511404306

- Tested in the real world, not just scientific labs • By an extended community of experts
- Through an iterative, participatory process of testing & modification



Can the GreenScreen commons produce socially robust knowledge?





Empirical investigation

- Formal rules and protocols
- Informal community norms
- Processes of GreenScreen method development
- Quality-control processes for GreenScreen assessments
- Scientific controversies

velopment reen assessments



GreenScreen knowledge commons

Method development processes

Socially robust knowledge

GreenScreen method

Yes

Tested in the real world

Extended expert community

Yes

Iterative, participatory testing & modification

Yes

- Formal mechanisms for community input
- Open and iterative processes
- Practical testing

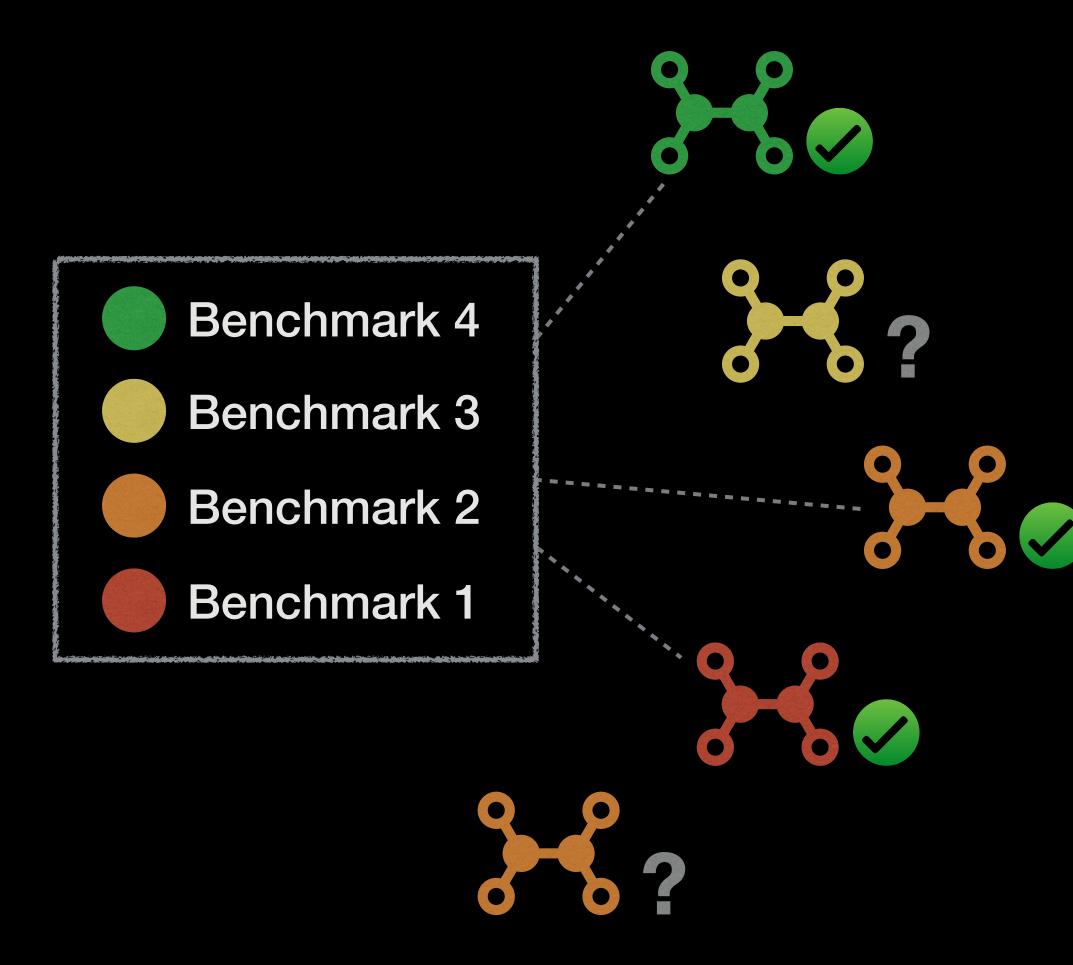




Chemical assessments

Quality control processes

- Profiler accreditation
- Limited transparency rules
- Conflict resolution protocols
- Intellectual property rights





Chemical assessments

Socially robust knowledge

GreenScreen assessments

Tested in the real world

Yes

Extended expert community

Sometimes, depending on access

Iterative, participatory testing & modification

No

- Verification processes don't include community review or stakeholder participation
- Community is excluded from knowledge unless granted access



Commons dilemmas



Underproduction

- Privatization
- How to produce a breadth of chemical hazard & alternatives knowledge to meet community demands?
- How can the commons provide actionable chemical knowledge for everyone who needs it - not just private sector clients?
- How to produce GSAs for many, many more substances?

Quality control

- How to produce chemicalspecific knowledge that is robustly verified?
- How will knowledge from the commons stand up to outside tests of validity?



Influential background conditions

- The proprietary market for chemical knowledge
- Legal regimes and industry practices that structure the market
 - IP rights
 - Chemical CBI protection
- Regulatory systems that have co-evolved with these conditions
- Scientific approaches co-evolving with regulatory systems...



Business model innovation?

- Pooled chemical assessment resources
- Lowering costs for access
- Offering some assessments free of charge (e.g. ToxFMD, ChemForward)
- Still shaped by background conditions





Economic & policy solutions?

- Government funding of CAA R&D
- Collaborative funding of full chemical assessments Industry consortia
 - Civil society crowdfunding
- Regulatory or certification requirements to publish full CHA information





Should there be greater transparency and public access to chemical knowledge?



What is the purpose of transparency?

- Transparency as a form of public oversight in governing chemicals & materials
- Transparency as a tool for industry innovation & self-transformation



Thank you

Inspiration & action Green chemistry & safer alternatives community

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Funding **US National Science Foundation** Berkeley Center for Green Chemistry

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Key concepts & findings

- Commons dilemmas
 - Underproduction
 - Privatization
 - Quality control
- Socially robust knowledge
 - Real-world testing
 - Iterative development
 - Extended peer community
- Tensions
 - What is the purpose of transparency?

Questions

- How might the CAA community approach "extended peer review" of chemical-specific assessments?
- What lessons would you take away from the Data Commons or GreenScreen case studies?



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Thank you

